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MISSING

THE O. A. C. REVIEW

" HE PROFESSION WHICH I HAVE EMBRACED REQUIRES A KNOWLEDGE OF EVERYTHING."

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Milk Production in 1916---And After

By H. H. Dean, Professor of Dairy Husbandry.

THE principles of dairying are the same the world over and will be similar for all time. Climatic and other local conditions may cause a variation in details, but the general rules are the same in all places and for all dairymen.

These principles centre around three points—the Dairyman, the Dairy Cow, and Feed for the Cow.

Since dairying is as old as the human race and has been carefully studied by some of the best minds interested in Agriculture, it is difficult to say anything new on the subject. However, there are a few outstanding features with reference to milk production which may be briefly noticed at the beginning of another dairy season. It is a compliment to the Dairy Industry that the Editor of the O. A. C. REVIEW should have conceived the idea of devoting a special number to this one branch of agriculture. The field of a College magazine is so wide, that to restrict its pages, even for one number, might look like showing partiality. Readers interested in Dairying will appreciate the compliment paid them.

DAIRYING LARGELY A SUMMER BUSINESS IN CANADA

Winter production of milk is gradually increasing in Ontario, but the bulk of milk is still produced in the "good-old-summer-time." For many years it was thought necessary to have the cows dry nearly all winter. Farmers, at that time, who kept twenty-five or more cows on the farm, frequently had no milk for home use during winter. Or, if they had milk, it was got from a "stripper" or two, probably milked once a day. Frequently this milk had such a bad flavor, due to feeding turnips, or advanced lactation, that when placed in hot tea or coffee, it was impossible to drink it.

Dairymen are gradually getting away from summer-milking cows only, and are increasing the number of winter milkers. This is a commendable change for the reason that winter milk is worth more money and costs no more to produce, on high-priced land where corn and clover can be grown successfully. The farmer has more time to give to the stock in winter and with the right kind of feed, and stabling, and fresh cows, the greatest profit results from winter milk. In spite of the foregoing, we are safe in saying that seventy-five per cent of the annual milk production of the Province of Ontario takes place in the summer months. Cows naturally freshen in the spring of the year and "go dry" in the autumn. The unthinking man is inclined to allow nature to take its course. The thinking man is ever trying to improve on nature's methods. The "let-well-enough-alone" policy, is a poor policy for a progressive people. The poets have held up nature as a model in all ages, but the poets, as a rule, have been unprogressive farmers. Poetry and farming do not harmonize.

Nature's plan is for a cow to give sufficient milk, that her offspring may get a fairly good start in life, then the cow "dries up" and the calf picks a living from nature's food, grass.

When man began to study the problem, he stepped between the cow and calf and thereby obtained more milk from the cow, and also raised a better calf for dairy purposes. He was able to do this by persistently milking the cow, thus increasing the flow of milk at each milking and extending the length of time during which the cow produced milk—say from three months, to nine or ten, and in some cases, twelve months of the year. The calf was, and is, reared on whole milk for a time, then is fed skim milk and substitutes for the cream. In this way the cow produced more milk and the calf developed an organism better suited for milk production, if not so good for beef-making.

Instead of depending on grass alone, the dairymen perceived that while grass is, and always will be nature's food for producing milk, it is not a dependable food. Scorching sun and drying wind, wither the plants that nature intended for cows and other animals, consequently the hungry cows look up and are not fed. Nature is a fickle dame. She starts out in the spring full of promise to her trusting spouse. It has always been so easy to "fool a man", but even the most foolish fools learn, after a time, not to trust, where trust has been betrayed a number of times. Because of this, wise dairymen do not "trust-to-luck", or trust in nature, which is much the same thing, for feed-supply during the summer time. (Long ago Canadian cow owners learned to provide for winter feeding by storing surplus crops.)

Soiling and Silage Crops

Without going into details regarding these two classes of crops, we should like to emphasize the importance of growing at least some crops to supplement the pastures of 1916. What 1916 has in store for us, no one knows, but it is hardly likely to be so good a season for grass as was 1915, which will be long remembered as the best year for pasture in the history of dairying in Ontario. It is estimated that the cows of the Province increased their average milk-yield by from 500 to 700 lbs. each. There are approximately one million milk cows in Ontario. An increase of 500 lbs. per cow means an increase of five hundred million pounds of milk, which at the low price of one dollar per hundred pounds means an increased value of five million dollars for milk alone, during last season. Why? Because the "weather-man" was kind enough to provide frequent showers, which caused the grass to grow abundantly, thereby the cows were well-fed and the milk-flow was stimulated. Neither men nor cows worked more than in ordinary seasons, to any appreciable extent, but it was a case of favorable weather conditions. We cannot control the weather, but we can circumvent it, by growing crops, not so easily affected by dry weather conditions as is the case with grass. Such crops as peas and oats, peas, vetches and oats, alfalfa, and corn should find a place on every dairy farm. They are preferably sown near the barn so as to be convenient for feeding. It is also best to sow the grain crop at two or three intervals, so that they may not all be ready for feeding at one time. That not needed for soiling purposes may be made into hay for winter feeding.

Corn Silage is the best supplementary

feed for summer milk production, chiefly because it is most convenient for feeding to the cows. The labor problem is so acute on most dairy farms, that even though green, or soiling crops are available, instead of cutting them and hauling the crop to the stable for feeding, the wasteful plan of turning the cows into the crop is often followed in order to save labor. Or, it may be cut and thrown over a convenient fence, which is also wasteful.

Nothing seems clearer than that dairymen, located on high-priced land, must reduce the area devoted to pasture in milk-production. The method is too expensive. On the average hundred acre farm where twenty to twenty-five cows are kept, and some young stock as well as horses, at least one-third of the farm is required for pasture under present methods. This is altogether too great a proportion of land for one crop. Not more than one-third of the farm should be required for both hay and pasture on a well-regulated dairy farm, and the tendency is to reduce this area where suitable labor can be obtained. Otherwise, the acreage devoted to pasture and hay is being extended, which is not best for economic dairying.

More Cows, More Feed, More Milk, More Money, More Happiness for 1916—and after.

Milk Production for City Trade

By W. F. Stephen, Huntingdon, Que.

THE production of milk and cream to supply our cities has become a *special* line of the dairy business, and requires extra care in its production. It also calls for more skill on the part of the dairymen in the management of the herd. The use of milk and cream is fast increasing, and cities find it necessary to go further afield for their supply. There are three causes for this:—The increase of the urban population, a realization of the food value of milk, and the low price of milk as compared with other food products. "We are told that a quart of milk, twelve ounces of beef, and six ounces of bread all represent about the same amount of nutriment and yet only that can be considered as true nutriment to the body which is digested and assimilated, and under different circumstances these three substances may have entirely different food values." So says Dr. J. Allen Gilbert, and he farther says, "Being a liquid, we are prone to look upon milk as a mere matter of drink rather than a food, whereas in it are contained all the elements necessary to the maintenance of the human body, and evidence is to be had in abundance showing that milk is in no sense a luxury, but it is an economical article of diet. Meats and milk are both rich in protein and are, in a sense, interchangeable as regards food value. Consequently the amount of solids in milk becomes of great importance."

As the population of our cities increases so will the demand for milk, cream, and milk products correspondingly increase, and each season we will find more dairymen within easy reach of our cities turning their attention to producing milk for city trade.

In order to make this side of dairying return a reasonable profit to the producer it may mean changes from former

methods pursued on the farm, such as remodelling stables and fitting them for winter dairying, erecting a dairy room and ice house (as a supply of ice is indispensable), also it may mean the selecting of a breed of cows better suited for the production of wholesome milk. By wholesome milk, I mean milk with not less than 3.25 per cent. of butter fat, and 8 per cent of other solids. Milk below that standard may be wholesome but is not wanted by the consumer. It is recognized by the medical fraternity that milk with a fair amount of butter fat, say from 3.25 to 4 per cent, and with a proportionate amount of solids is the best balanced milk for the use of humans.

Such being the case, we conclude, that the best breeds to produce milk for city trade are the Ayrshire and Holstein, or their crosses, leaving the Channel Island breeds to produce the cream. The Ayrshire and Holstein are milk breeds, and give large amounts of milk when liberally fed. In days gone by, around the cities of Toronto and Montreal, Ayrshire-Shorthorn crosses supplied the largest bulk of milk consumed. These cows were very popular, they being good producers at the pail and also giving a good carcass for the butcher when milked out. We find fewer of these to-day, their place being taken by Ayrshires and Holsteins and their crosses.

One problem of the city milk producer is to keep up a constant supply of milk at all seasons of the year, and especially during the winter.

The success or failure of the milk producer is largely in his own hands—in managing the herd, breeding his cows to freshen at different seasons, and especially to freshen when milk is in greatest demand and selling for the highest price, which is during the winter season. The larger per cent of his cows should freshen during the months of September, October, November and December, and when liberally fed, properly housed and cared for, will give a good milk flow all winter and to within two months of freshening the following season, and will be dry when the pastures are short during the late summer and fall months. Cows handled in this way will give a large milk flow at a minimum cost over spring calved cows.

A factor that must be observed, is, the cost of production, which must be kept as low as possible. This may be done by providing corn ensilage for winter feeding. Mangels and sugar beets for fall and early winter will be found of great value, but the corn ensilage is indispensable. Well saved oat straw and inferior quality hay may be run through the cutting box and mixed with the ensilage and fed with good results, a liberal feed of this mixture twice each day with one feed of alfalfa or clover, together with a mixture of oats and barley, 4 lbs., gluten meal, 2 lbs., and bran, 4 lbs., as a concentrated feed, should give good returns when fed to fresh cows. For summer feeding the wise dairyman will not depend altogether on pasturage. Grass may become short during a dry season, therefore, a soiling crop should be provided either in the form of corn ensilage carried over the winter or a crop of green oats and pease or oats and vetches, sown at different times, at least 8 days apart, an acre for every 8 or 10 cows. Such a crop will supplement the pasture feed during the months of July and August.

By September the early corn will be ready for feeding and may be fed liberally if required. All this green feed should be cut the day previous to being fed and allowed to wilt as it becomes more palatable, a proportion

of the starch being turned to sugar. When such a course of feeding is followed its effect on the milk flow will be apparent to the intelligent dairyman. On no account should the cows have unwholesome or musty food, or impure water, as this has a decided effect on the quality of the milk, and milk for city consumption must be of first-class quality and without taint or odor.

The housing of the stock is important. The day was when any old shack was good enough in which to house cows that produced milk for city trade, but that day is past and we find regulations adopted and carried out by every City Board, (that has the health of its citizens in mind), to govern such important matters. There is a demand for milk from sanitary stables—well-lighted, well-ventilated, warm and clean, and having not less than 500 cubic feet of space to every full grown animal. The water supply should be installed in the stable so that the cow may get an unlimited supply of fresh water at all times. The cow in full milk requires a large quantity of water for the proper assimilation of food for the production of milk, as we are told that milk contains from 80 to 90 per cent water. *A good herd, liberal feeding, comfortable housing, and kindly treatment* is the secret of success of the true dairyman.

A vital question to many milk producers is that of labor. No dairy farm can be operated successfully without a full quota of laborers. The farm laborer is rather a transient being, here to-day and away to-morrow, a "bird of passage," as it were. Are farmers to blame for this state of affairs? I believe we have to answer to the charge, as we have encouraged the short term of service rather than the yearly which has given the farm labor side an unstable condition. Again the long hours on the dairy farm has led men to shun these places. As dairying increases more help will be required and where is this to come from. War conditions have aggravated this situation to a great extent and many dairy farms are under manned at the present time. There will still be some home help available but help will have to be brought from elsewhere to man our dairy farms in the not distant future. The experienced farm hand from the British Isles, Sweden, Denmark and Holland may supply us with a number of good dairymen, and women too, when the war is over. If we can induce them to leave their native country and come to our Dominion this labor question is in a measure solved for our dairy farmers. Along with this the hours of labor must be shortened and the term of service must be longer, if this production of milk for city trade and in fact the great dairy industry of our country is going to develop in keeping with the possibilities of soil production of Canada.

The Manufacture of Small Cheese at the Finch Dairy Station, Finch, Ont.

By George H. Barr, Chief, Dairying Division, Ottawa.

CONSUMERS to-day much prefer buying their groceries and provisions in the original package instead of having the retailers measure or weigh the order from bulk. Not many years ago, the whole supply of milk and cream used in our towns and cities was delivered to customers from large cans into open pitchers or other vessels, which were often left outside on the door-steps exposed to the dust of the streets; a pound of butter was indifferently scooped from a tub or crock and wrapped in ordinary paper. To-day, milk and cream are delivered in neat, clean, well-stoppered bottles, the pound of butter is neatly wrapped in parchment paper and many other things are handled in a similar manner. The customer's order for Canadian cheese, however, is still cut from the large cheese on the counter, where it is kept exposed to the atmosphere, which both dries the surface and spoils the flavor, while the piece bought continues to dry out when taken home. This all tends to make the retail selling of Canadian cheese unpopular both to the seller and the consumer.

Last year the Dairy Division tried as an experiment the making of one-pound cheese at the Finch Dairy Station. Two styles were made, an oblong block and one the same shape as the ordinary Cheddar cheese. A few of each style were placed in the hands of grocers in Ottawa. The oblong style did not prove satisfactory to the trade. The other, or cylindrical style, however, proved quite a good seller, and has been growing in favor rapidly during the present season. It is 3½ inches in diameter and 3 inches high. The hoops in which these cheese are pressed are made of heavy tin 3½ inches in diameter and 4½ inches high with a loose tin bottom resting on a narrow ledge which is made by turning in an eighth of an inch of the sides. The followers are wood 2 inches thick. By placing both thumbs on the loose bottom, the cheese can be pushed out of the hoops quite easily. In putting the curd in the hoops, a very light piece of cotton is placed in the hoop similar to the bandage of an ordinary cheese, and 18 ounces of curd weighed into each hoop. They are then pressed over night. The following morning the cheese are taken out of the hoops, the cloth removed and the cheese put back in the hoops again without any cloth, and pressed during the forenoon. They are then taken out and paraffined before being placed in the curing room. If the pressing and paraffining are done carefully, the cheese will have a very neat, smooth appearance.

These cheese are made from the regular factory curds, handled in the ordinary way up to time of salting. At that stage, a sufficient amount of curd for the small cheese is taken out and salted from ¼ to 1-3 of an ounce per pound of curd. The pressing can be done very conveniently in an ordinary gang press by placing a board platform on top of the regular trough and laying the hoops on their sides, four wide. A wide plank, placed against the screw-head and the ends of the hoops, presses them the same as large cheese. It takes one man's

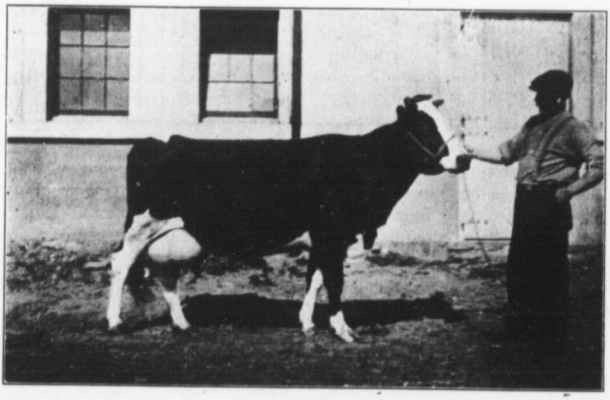
time to make and paraffin one hundred one-pound cheese each day. Another very popular size is a five-pound cheese 6 inches in diameter and 4 inches high. This year, by supplying the farmers with five-pound cheese instead of cutting large cheese, the consumption was almost double that of any previous year. A stock of well-cured ten-pound cheese is always kept on hand at the factory and people come from long distances to purchase, expecially for their winter supply. This size, has, of course, been on the market for years.

The past season's business would indicate that a one-pound Canadian cheese is popular with both grocers and consumers. These cheese were sold for 19 cents each at shipping point, and retailed at 25 cents each.

The Long Distance Cow

By A. Leitch, B.S.A.

WHEN, eight years ago, the Holstein cow Colantha 4th's Johanna, made an official year's test of 27,432 pounds of milk, containing 998 pounds of butter fat, the statement was often made that such a record was the utmost to which any cow of any breed could possibly attain for years to come. It looked reasonable at that time to put considerable faith in such



YOUNG SPRINGWOOD
Sire—Johanna Rue 4th's Lad, 2105

This Holstein cow at the O. A. C. Farm Department on March 8th, completed a new world's record for milk and butter fat production. From March 9th ,1915, to March 8th, 1916, she produced 20072.9 lbs. of milk containing 819.95 lbs. of butter fat, equivalent to 1,024.94 lbs. of butter. This constitutes a record for cows milked just twice daily, for both milk and butter fat. All previous records of over 18,000 lbs. of milk and 650 lbs. of fat in a year have been made by cows milked three and four times daily throughout the greater part of the year. It is interesting to note that but four cows in Canada, three Holsteins and one Jersey, have given more butter fat in a year than has this cow.

This cow was five years old at the commencement of her year's test. She was bred and raised at the College. At no time was she forced in feeding, the largest amount of grain fed being 12 lbs. per day.

The accomplishment of this record is largely due to the painstaking care and regularity of Mr. Sam Shaw one of the herdsmen of the Farm Department.

statements, because that record was about 25 per cent. better than any previously made and such a large increase all at once was remarkable enough to raise the belief that this cow was more or less of a freak and that her kind only appear at long intervals. Yet to-day, after a lapse of only seven years, the gap between the best previous record and that made by Colantha 4th's Johanna is filled with a multitude of records and there are at least eight cows of the Holstein breed alone with greater records than hers. The largest one is that of Duchess Skylark Ormsby, with 1,205 pounds of fat in a year, over 20 per cent. better than that of Colantha. In addition, there are now on record many cows with milk records greater than hers, some reaching to over 30,000 pounds. Moreover, cows of all the other recognized dairy breeds have reached the 1,000 lb. fat mark, although five years ago it looked as though the Holstein cow was the only one large enough to consume sufficient feed to reach such an enormous production.

The great strides made of late in procuring high records are in part due to selection of the best strains of the different breeds, to the more general use of bulls carefully selected from high producing ancestry, and to a more widespread knowledge of the principles of breeding and nutrition. But the ever-recurring instances of cows of no fancy blood lines, making high records when in the hands of certain breeders leads us to believe that the main reason for such advance in record making is due to something more than breeding and good knowledge of the use of feeds. In fact, it is quite plain that the attention and care received by the cow while on test is the greatest single factor entering into the accomplishment of high records. The dairy cow is a complex and finely adjusted machine. The greater the amount of milk being produced the higher the tension up to which her nervous system is brought. Irregularity in attention, even if it doesn't extend to the point of neglect, reacts comparatively more on the high producing cow than on the ordinary milker. While it is the common belief that the great milk records heretofore made were due to the fact that cows were milked and fed four times per day, the writer thoroughly believes that success has been attained more because the man who would take the time and pains to milk so often would also see, in addition, that no detail of care, attention and kind treatment was lacking, and consequently the response of the cow was very encouraging.

The average breeder, usually a farmer, in considering high records, is prone to believe that such results are, for him, impossible of attainment. His round of duties will not permit him to spend fifteen to nineteen hours out of his bed every day for a year, and that is what three or four milkings per day means. To make exceptionally high records, it may always be necessary to milk more than twice a day as it appears physically impossible for a cow to give more than 80 pounds of milk a day on two milkings. However, it is quite possible to accomplish extremely good records under the ordinary system of twice a day milking, if the breeder will give the same regular attention and care that he would give if he were milking more often. The accompanying table, giving the results of some record work done at the Ontario Agricultural College, during the past year, shows the possibilities from milking just twice a day. The records were made under Record of Performance regulations.

Cow	Breed	Age	Dys. in milk	Lbs. milk	Lbs. fat	Lbs. 80% butter
Young Springwood	Holstein	6	365	20072.9	819.95	1024.94
Blackie	Hol. Grade	13	365	17119.8	639.71	799.64
Molly Rue	Hol.	6	365	16386.9	626.60	783.20
Marg. Cornucopia	Hol.	10	365	14978.9	552.25	694.06
Beauty of O.A.C.	Hol.	12	365	13160.6	409.17	511.50
Waterloo Baroness 1915	Shorthorn	5	353	10422.	398.20	497.80
Waterloo Baroness 1914	Shorthorn	4	.....	11257.0	398.00	497.60
Flora Hope	Shorthorn	2	352	7773.0	318.40	398.00

The cow, "Young Springwood," is the first cow on record to produce 20,000 lbs. of milk in one year on two milkings per day, while her butter fat record is surpassed by only four cows of all breeds in Canadian Record of Performance.

In no case was the amount of grain fed these cows over 12 pounds per day. The main grain mixture consisted of bran, cottonseed meal and brewers' grains during the first half year, and bran, oats and brewers' grains with oil meal added while the cows were newly calved. The roughage consisted of silage, mangels and clover hay. Some alfalfa hay was fed during four months of the year. A study of the daily milk yields of these cows is particularly interesting as very seldom was the variation from one day to another more than one pound of milk. Good care, good milking and regular attention were the largest factors in producing these records. These, every breeder can give, even if he hasn't the time to milk three or four times a day.

National Standards for Canadian Butter

By F. Herns, Chief Dairy Instructor, Western Ontario, London, Ont.

THE Western Ontario creamery industry has, for the past several years, expanded very rapidly. Perhaps a few figures on this point may be of interest.

OUTPUT BUTTER WESTERN ONTARIO

Year	Lbs. of Butter
1908	6,542,000
1909	6,560,000
1910	9,552,000
1911	12,968,000
1912	13,839,000
1913	18,336,000
1914	20,116,000
1915	About same or a little less

Of the butter produced in 1914 about 3 million pounds were made in the City of Toronto, a portion of the cream for which came from Eastern Ontario.

There were in operation in 1907 about 63 creameries with 12 thousand patrons and in 1915, 125 creameries supplied by 35 thousand producers. Eastern Ontario has about 35 creameries, making approximately 3 million pounds of butter.

It is evident from these figures that the problem of further improving the quality of Ontario butter concerns chiefly Western Ontario.

For the work of creamery instruction there are only three creamery instructors; the third instructor having been employed recently.

With a rapidly increasing creamery butter output, a growing market has kept pace right here in Ontario, especially in the print trade, under the creamery brand and probably fifty or sixty per cent of our very best creamery butter is now marketed in this form.

Steadily increasing competitive markets for cream have not assisted in inducing all creamery men to see the necessity for rejecting poor cream, nor has it convinced all the producers of the necessity for taking special care, since the same price has usually been paid irrespective of quality.

In our efforts to encourage payment for cream by grade and the general adoption of pasteurization, the "flat rate" system of marketing butter has not been a progressive factor.

No doubt there are several reasons for a "flat rate" price; perhaps one similar to that given by the creamery men when faced with the problem of poor cream; "If I don't take it and do the best I can with it some other fellow will."

Recently some creamery men and dealers have endeavored to do business on a quality basis but individuals can do comparatively little. There must be co-operation in the trade as a whole.

With an approximate output by the three Western Provinces of 15 million pounds of creamery butter in 1915, compared with about 3 million pounds in 1907, it is evident that, if this output continues to increase, the time is coming when these provinces will seek Eastern markets for their surplus butter.

There is also some revival in dairying in the far eastern section of Canada

BUTTER GRADES

(TABLE 2)

Have Adopted Standards	Standards or Grades				Perfect Score 100				
	Special	1st Grade	2nd Grade	3rd Grade	Flavor	Body of Texture	Color	Salting	Finish
Province of Saskatchewan Dairy Branch Dept. Agri.		Score 92-100 points	Score 84 and under 92 points	Score under 84 points	45	25	15	10	5
Province of Alberta Dairy Branch Dept. Agri.	Score 94-100 points	Score 91-94 points	Score 87-91 points	Score under 87 points (off grade)	45	25	10	10	10
Quebec Province Co-operative Agricultural Society		Score 95-100 points	Score 92-95 points	Score under 92 points	45	25	15	10	5
Montreal Produce Merchants' Association *		Score 95 points or over	Score 90 points or over but under 95	Score 85 points or over but under 90	40	25	15	10	10
Province of Manitoba Dairy Branch Dept. of Agri.		Score Minimum Flavor 40 Total 91 points	Score Minimum Flavor 37 Total 85 points		45	25	15	10	5

*Under 85 points is below 3rd grade.

and it begins to look as though, if prices are maintained, that Canada is in a fair way to again supply the home market with butter without importing and also at times to have a surplus for export.

Taking into consideration these points, there is every reason to believe that a co-operative movement on the part of producers, creamery men and dealers to purchase and sell cream and butter on a quality basis would be in the right direction to encourage a more uniform quality.

Ontario has not as yet adopted butter standards. The grades adopted by other provinces follow in table 2.

A description of the grades decided upon by the Montreal Produce Merchants' Association may be of interest.

FIRST GRADE

Flavor—Sound, sweet and clean.

Body and Grain—Waxy; not too much moisture.

Color—Even, no streaks or mottles, not too high.

Salting—Not too heavy, salt all dissolved.

Finish—Good quality parchment paper lining, neatly arranged; packages well filled; bright even surface.

Packages—Well made, of good material and clean. Boxes to be of right size to hold 56 pounds of butter when properly filled. Paraffined on inside. Neatly branded.

SECOND GRADE

Flavor—Not quite clean or other objectionable flavors.

Body and Grain—Salvy; overworked; too much moisture but not over 16%.

Color—Slightly mottled or streaky; too high or objectionable shade.

Salting—Too heavy; salt undissolved or unevenly distributed.

Finish—Very light or poor quality parchment paper lining; lining not arranged to protect butter; mould on parchment paper. Rough, uneven surface. Package not properly filled.

Packages—Rough, badly made, or of poor and unseasoned material, including sap-wood. Dirty packages, uneven weight.

THIRD GRADE

Flavor—Very stale; very strong stable flavor, or anything inferior to second grade.

Body and Grain—Very salvy; "mushy"; mould in butter.

Color—Very mottled or otherwise inferior to second grade in regard to color.

Salting—No question of salt alone sufficient to make third grade if other qualities are up to first grade.

Finish—No parchment paper lining, very rough finish. Dirty surface.

Packages—Inferior to second grade.

It will be seen from the above comparison of grades from different Provinces that there is a lack of uniformity in the grades of Canadian butter at the present time.

If Ontario dairymen intend to adopt grading standards in the near future would it not be advisable for representatives of the different provinces to agree upon uniform national standards. The results of such a plan should be the means of eventually establishing uniform grades for Canadian butter in the inter-provincial trade and in addition should be a practical method of identifying Canadian butter produced in any part of the Dominion.

Cream and Butter Grading

By R. J. Skelton, '16

EVOLUTION is not confined to the plant and animal kingdoms. Organized industry strives constantly for better things, and the relentless laws of business competition add impetus to the effort. Applying this truth to the great dairy industry what wonder that we find progress in all its varied branches. It is the writer's intention, however, to confine his observations to one branch of this great business, namely cream and butter grading.

"Can a man gather grapes of thorns or figs of thistles?" An equally difficult task it is to make good butter from bad cream. This is specially true in Ontario, since the "whole milk" creamery has been almost wholly superseded by the "cream gathering" system. In case the uninitiated fail to understand, let me say that where formerly the creamerymen received the whole milk fresh from the farm and separated and refined the cream to suit himself, he now receives the cream only. Too often this cream is already "ripe," in fact, it is "rotten." If Mr. Creameryman protests against receiving such cream, Mr. Farmer casually remarks that there is another creamery down the road ready and willing to do business with him. This hits at the most serious problem confronting the creameryman to-day, namely to evolve some system whereby he can retain his patrons, and, at the same time, get his raw material in such condition as to permit him to make a first-class finished product.

Dairying in Alberta is developing into one of the chief industries of the Province. The Provincial Legislature, recognizing the importance of "getting away to a good start," built a number of modern creameries throughout the Province and has since conducted them on the co-operative plan. During the summer of 1909 some experiments were carried out at one of these creameries to ascertain the difference in the quality of butter made from first and second class cream. The results of these trials were so markedly in favor of the butter made from first class cream that all the co-operative creameries adopted the plan for the remainder of the summer.

It was found that some farmers sent uniformly good cream at all times; others invariably supplied the direct reverse and still others sent good and bad at irregular intervals. The experiment proved that it is possible to supply first class cream under the cream gathering system, and further, that the classification or grading of the cream could be done at the creamery by having the cream hauler take a small sample of about four ounces from each patron's cream at the time of gathering. The creameryman could grade this sample quite accurately by flavor alone.

So successful were these experiments that the following summer a uniform system of cream grading was adopted by all the Government creameries, with the following standard grades:

First Grade: Cream perfectly sweet, from which first-class butter can be made by a competent butter-maker; the flavor to be clean and fresh and consistency smooth and even.

Second Grade: Cream sour or sweet, which is slightly stale or old or bitter in flavor, but of a smooth and even consistency.

Third Grade: Cream that will not

grade as above. Dirty cream which is lumpy, stale or old should not be accepted.

While it was not made compulsory to grade the cream, the Legislature made butter grading compulsory, so that all butter sold from these creameries went on the market stamped exactly as to quality of the butter warranted.

The result of this system was quickly seen. The higher price commanded by first grade butter allowed the creameries to pay a premium for first-class cream. It is not difficult to understand now that this was an incentive to the farmer to supply the best quality of cream possible. Thus we see a problem that had proved a difficult one to solve as a purely educational one, easily remedy itself when it became a financial one.

Saskatchewan and Manitoba presented the same difficulties as Alberta. After watching for some time, cream grading operations in the latter Province, the system, with some modifications, was introduced into these Provinces. In Saskatchewan, instead of having butter grading compulsory, cream grading was made compulsory, with standards very similar to those in Alberta. The system followed in Manitoba makes both cream and butter grading compulsory. In both Provinces the results have been equally as favorable as those of Alberta.

Up to within recent years the majority of creameries in Quebec were operated on the "whole milk" system; but the "cream gathering" system is rapidly gaining ground. In order to cope with new conditions introduced, legislation has been passed, which compels the grading of both cream and butter, with provisions that each be paid for according to quality. The standard set by Quebec butter is a high one, which may be attributed, in part at least, to the beneficial working of the aforementioned legislation.

"Old Man Ontario" is a conservative old gentleman. He has viewed with calm confidence his sisters of east and west striving to improve their dairy products, until he no longer receives many prizes on his butter at the great annual agricultural exhibitions of the Dominion. To-day he is rubbing his eyes in a sort of mild surprise which bids fair to become the forerunner of action. In fact it would occasion little surprise to see him gather his coat-tails under his arms and strike off down the road in an attempt to catch up.

Dairying is many-sided in Ontario. The farmer is more or less independent on account of having so many markets for his milk; but if Ontario is to retain her "place in the Sun" as a producer of butter of a quality to compare favorably with that of other Provinces something must be done soon. Will that something be cream and butter grading? We shall see what we shall see.

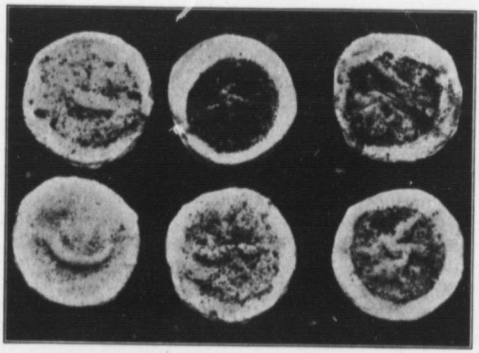
The Milk Sediment Test

By C. E. Lackner, '16

THE amount of sediment in milk is an indication of its sanitary condition. Sediment or dirt in milk not only looks unsightly, but is harmful to the milk on account of the large number of varieties of bacteria introduced with it. Milk containing a great deal of sediment always has a high bacterial content. These bacteria, which are of many varieties produce bad flavors in milk and may cause various diseases to the consumers of the milk.

Various tests have been used at creameries and cheese factories to determine the purity as well as the quality of the milk received. The acid test shows to some extent the age and condition of the milk. The Wisconsin curd test and the fermentation test are used to determine the presence of gassy or undesirable ferments. The flavor and odor of milk determine its quality to a large extent.

The sediment test is a comparatively new test and has not yet come into general use in the cheese factories and creameries of Ontario. It is an excellent method of determining the amount of dirt present in the milk supplied by patrons to cheese factories. The test is simple, rapid and easily made. The patrons can see the milk they deliver to the factory tested and can understand the test. It furnishes indisputable evidence of the amount of sediment in each lot of milk.



The dirt adherent to each of these filters was obtained from one pint of milk. The milks tested were produced on different farms.

The sediment test is made by straining a pint of milk through a cotton disk one inch in diameter, which is attached to the bottom of the tester. The amount of dirt that collects on the cotton disk shows the amount of dirt contained in the pint of milk. The disk is renewed for every test and many samples may be tested in a short time. The most common forms of testers have a tightly closed cover and a rubber pressure bulb by means of which the milk is forced through the

disk. Pressure is necessary in order to hasten the test where many samples are to be tested and where a very dirty sample is being tested as the dirt clogs the cotton filter.

The uses to which the sediment test may be put vary with local conditions. It is used for testing market milk at supply stations, at creameries and cheese factories. It can also be used for city inspection of milk on the streets and at railway stations by testing samples from the milk wagons of the dealers and from shipping cans at the station. The sediment test can also be used for cream but not with the same efficiency as for milk, as particles of cream as well as the sediment will adhere to the filter.

In addition to these uses of the sediment test, a series of observations have been made to show (1) The amount of dirt removed from milk by ordinary farm straining (2) The effect of the cream separator as a clarifier on the amount of sediment in milk; (3) The efficiency of the small top pail in keeping the dirt out of milk; (4) The relation between the sediment tests and the number of bacteria in milk; (5) The detection of gargety and colostrum milk.

The sediment test is especially a good practical test for the cheese factories. Farmers do not generally realize that the milk is dirty until they see the dirt; but when this is filtered from a pint of milk in their presence they are often surprised at the amount of dirt in the milk and will usually try to provide conditions which will bring clean milk from their farms.

At the O. A. C. Dairy School, all the milk received from farmers for cheese making and other purposes is tested regularly. When this test was first started, much of the milk received contained a great deal of sediment. The farmers who sent the dirty milk were notified, their tests shown to them and instructions were sent to them as to how to keep the milk clean. Within two months of the time the test was started, a great improvement was noticed in the quality of the milk and the amount of sediment contained.

This test has one defect, however. Milk may be strained through a cloth on the farm and the dirt removed so that very little sediment remains on the disk when tested. Such milk may curdle and have just as bad flavors as other milk which contains a great deal more sediment when tested. Most farmers, however, do not strain the milk through a cloth and when they see the amount of dirt in the milk they will take steps to improve the quality.

For cheese factory use, the sediment test is one of the best tests that can be used to detect improperly cared for milk and should be used in all factories on account of its efficiency and on account of its simplicity and the ease with which it is understood by the patrons.

Kinds of Milk

By Eleanor Hopper, '16

IN discussing such a subject as "Kinds of Milk," it is perhaps necessary to state that this refers to the different forms in which cow's milk can be obtained on the market, the milk of other animals being used very rarely in this country, although used quite frequently in European countries.

Milk, as it comes from a healthy and perfectly clean cow, may be regarded as practically sterile and, in fact, it is said to have feeble germicidal properties. But how often do we find the above conditions? Still further, how often are the operations in caring for and transporting the milk conducted in even a moderately sanitary way?

You hear one woman announcing to another in the "most pleased with herself" way: "Do you know, my dear, I made the most wonderful discovery to-day. I found a new milkman who is selling milk for a cent less a quart." This news soon spreads and before long all the women in town are flocking to this new milk peddler.

Now this woman would almost faint if asked to eat some food that had by chance fallen on the floor in her own home. Yet, does she ask how this "one cent less a quart" milk has been produced? Would it make any difference to her if she should see the condition of the stable, the cows, the various milking utensils, and even the milker himself? Would she still be as ready to pass by her own milk man, who is perhaps trying to produce clean milk, and trust the health and perhaps life of herself and family to this new-found treasure, the cheap milkman?

Too much cannot be said on the subject of clean milk, and the milkman trying to produce clean milk should receive the loyal support of all persons taking an intelligent interest in the question.

But to pass on from the subject of clean and unclean milk, we will talk about the different kinds of preserved milks:—pasteurized, sterilized, condensed—and the use of preservatives.

To quote one authority, "Preservatives should on no account be tolerated in the milk." Milk, as we all know, forms the entire food of infants and invalids, and such should receive our greatest care, whereas preservatives usually cover carelessness in the handling of the milk.

Pasteurization is defined as "A process which consists in heating milk to such a temperature for such a time as will destroy the most bacteria with the least damage to the milk itself." It is claimed for this milk, that although it is now practically a safe milk to use, it is not inferior in food value or digestibility to raw milk.

Sterilization is a process whereby milk is raised above boiling point and kept there for some time. This seems to be undoubtedly the most efficient way of treating milk as it destroys not only the pathogenic bacteria but also those which produce souring.

It is not without its disadvantages, however, as it alters the taste of milk, destroys the fine emulsification of the fat, coagulates the lactalbumen and renders casein less easy to digest.

The last class comprises the various forms of condensed and evaporated milk found on the market to-day.

But this is a very wide subject to discuss as these vary greatly in composition, all, however, having the water greatly reduced. They may generally be divided into two classes, sweetened and unsweetened. It has been stated, in a recent article, that the unsweetened is really safer as it can be raised to a higher temperature in the preparation than can the sweetened. It must be remembered, however, that where fresh milk can be obtained it is always wise to use it, as in the case of the condensed milk, we are paying the manufacturer for reducing the amount of water, which has to be added again before the milk can be used.

In closing, I should like to suggest that a person hesitating about what kind of milk to buy should consider the question from the standpoints of safety, decency and price, and when the question of the safety of an individual is at stake the value of the "almighty dollar" should not loom too large in the mind.

Sanitation of Milk

By Annie Scott, '16

THE universal use of milk as a food, and the important place it holds in the diet of the world justifies every effort towards rendering milk available and wholesome for human consumption.

By the ordinary observer, impure milk is recognized by its containing particles of dust, dirt, hay, cow-feed, cow-bedding, cow-manure, hairs, dandruff or insects which float on the surface or settle on the bottom of the can or bottle. But the absence of these by no means indicates that the milk is pure and safe. Milk may be entirely unfit for food when none of these conditions are present, but due to the bacteria which it contains, and bacteria are far too small to be seen by the unaided eye. Milk is the only article of food in which nearly all bacteria grow rapidly and in it they multiply at a favorable temperature, that is, about blood heat. From a single germ as many as 200 may be produced in three hours, 10,000 in six hours; 10,000,000 in nine hours and 2,000,000,000 in eighteen hours. As the bacteria grow and increase in numbers they impair the nutritive properties of the milk and so injure it as a food, and what is much more important, they produce many new substances, some of which are poisonous. It is the result of the activities of bacteria which causes milk to sour and produce in it bad tastes and odors. But long before the milk has become sour to the taste, it may contain enormous numbers of bacteria and has usually become unwholesome, and probably a source of great danger.

Most of the bacteria fortunately are not those which induce disease. They are the bacteria associated with dirt. They come from dirty cows, stables, hands, pails, the dust of the stables, of the atmosphere of the milk house or creamery where milk is bottled. But these dirt bacteria are not the only ones which find their way into milk. The germs which cause various infectious diseases, such as typhoid fever, tuberculosis, diphtheria and mouth and foot diseases live and rapidly multiply in milk.

Now let us consider the conditions that should prevail in order to produce pure milk.

The dairy farm should provide ade-

quate pasture and an ample enclose for the cows to collect in. It is generally noticed that in summer, when the cows are out doors, day and night, they are clean, and through no exercise of the herdsman. The reason for this is quite simple. The cow is naturally a clean animal and when at liberty in a field grooms her own body. She only becomes dirty when kept like a prisoner in a loathsome place. The farmer should be fair with his cows and not drive them into a filthy yard. Specifications for a cow barn should come from experts. The building should be designed, constructed and used entirely as a stable for cattle, not a storage place for feed, vehicles, and utensils, nor a stable for other animals. If the farmer bears these facts in mind he has done much towards the cleanliness of his cows.

The milker should make a toilet for the dairy as that of the maid who waits on the table. The person handling milk should be selected with the greatest care. The person handling milk, while it is exposed, should be free from disease, and be clean in person and clothing. When we consider that milk is not in the majority of cases sterilized, by cooking, and that it readily absorbs flavors and odors, we realize the need of these precautions.

The utensils are an important consideration in the production of clean milk. They should expose as little of the milk as possible contained in them, and be made so that seams and joints are well soldered and closed. Open joints and cracks in the seams offer a hold for coagulated milk, which is a medium for bacterial growth and is responsible for the odor in cans and has a share in causing milk to sour. The cans should be carefully washed and rinsed clean, but the cleaning of the milk utensils is not complete until they are sterilized.

If the milk were perfectly clean there would be no need for straining it. But since such is not the case, the best strainer available should be obtained and if cloth is used it must be kept scrupulously clean. The milk should be strained into bottles or cans which have been thoroughly sterilized and then cooled as soon as possible to prevent growth of bacteria. Milk should never be dipped from cans if to be delivered. A can will be opened many times on an ill-smelling wagon, standing in numerous streets where the atmosphere registers a tremendous bacterial count, or in retailers' shops where the milk is exposed to every degree of contamination or infection.

What part must the consumer take? Too often is good milk contaminated by the consumers' carelessness. Many times are the milk utensils with tickets inside, to be seen standing on the door step, all the time being exposed to dust, dirt, germs and the heat of the sun. Milk in the household is governed by the very same rules which are in force in the dairy barn.

In conclusion, there are two main points to bear in mind in the production of clean milk: first, cleanliness; second, low temperature.

The Soft Cheese Question

By Bella Millar

LET us add "to-day" to our subject and when we say "The soft cheese question of to-day" we will put the emphasis on the last word because to-morrow it will be different.

At present the term "Soft Cheese" is so misunderstood that two persons can be conversing on what they consider the same subject and yet be talking about things entirely different. While one may be thinking of the many kinds of fancy little cheese, soft and moist and of smooth creamy texture, the other may consider eligible for the soft class anything that is not as firm as an export Cheddar.

In the cheese to-morrow we will hope that the present confusion of names will have disappeared for as long as the word "cream" stands for both Cream and Club Cheese we will have trouble and we continue to disappoint our English friends when we put the label Canadian Stilton on Cheddar Cheese that is "Stilton" in size only.

This is a question often asked: "Is soft cheese liked?" and to it we can give the two big answers: "Yes" and "No".

There are people who enjoy eating every kind of cheese you may choose to give them, while others select certain types and exclude all others from their list of liking.

Some are very limited in their choice of cheese being fully satisfied with Cheddar in one form or another. These people, as a rule, dislike the soft varieties of mild flavor, and although many acquire a taste for these newer kind, yet it takes time.

We think of the old saying "It takes all kinds of people to make a world," so while some look at soft cheese as a necessity and others as a luxury, many more regard it as an intruder that has no right in the cheese field where Cheddar is King.

Soft cheese making has looked so profitable to many that they have considered floating their whole milk supply in the business. They have read how one hundred pounds of milk made into certain varieties of soft cheese could be retailed for three or four dollars and they have made a rapid calculation to find out how soon they might retire on their profits.

No one likes to hang even a small cloud in the sky of the optimist, but it is sometimes necessary to bring them down until their feet touch the commercial world in order to show them the situation as it now stands.

There is a market for soft cheese in this country of ours at the present time, but it is limited in comparison with what it will be in the near future. The soft cheese trade is growing slowly and surely, and steady growth is preferable to spasmodic leaps and setbacks.

Remembering this, the would-be manufacturer will begin in a small way and work up.

He will make a first-class article and put it up in an attractive package.

The quality must be uniform from week to week in order to secure the confidence of the people.

The public must be taught that cheese is a food. It should also know that some varieties are perishable and that provision for keeping cheese cool is necessary in the home as well as at the store.

He should avoid the mistake of

placing too many kinds of cheese in the market he is trying to establish, whether catering to the stores, the hotels and restaurants, or any other trade. One or two kinds should be selected, keeping in mind the question of suitability as well as remuneration.

Too many people over-estimate their profits because they fail to add the cost of the raw material the value of their time and labor and the upkeep of their workshop.

He should make what the people want—not what he likes best himself.

Many have become stranded on the rocks of failure because personal likes and dislikes have been held so near their eyes they could not see past.

Now, what is the public demanding? A whole cheese, even if it only weighs one pound. People are beginning to rebel at the sliver, for what else can we call the wedge the average householder buys from the grocer?

Such cheese as McLaren's and the Ingersoll are popular for several reasons, but not the least of these is the fact that there is not the drying out, but all can be used.

The cheese in the lime light at the present moment is the one-pound Cheddar, and no cheese has received a kindlier welcome. Although newly introduced, it is being much talked about and dairy people are sending samples to other dairy people and they in turn are telling their friends. At present the supply is not keeping up with the demand but before many months go by this difficulty will be overcome.

It has been said that we should "eat cheese, talk cheese, advertise cheese and get the press to boom cheese," and this would be all right if we were delivering the best goods to our own people, but, are we?

Each year at the Canadian National Exhibition the dairy branch of the Department of Agriculture cuts up some of "Canada's finest" and as the people sample these half-inch cubes of Cheddar cheese their exclamations tell us that they would eat it if they could get it.

There are many reasons why we have not been classed as a cheese consuming nation, but the coming years will find us not only consuming more cheese but a greater variety as well.

Such varieties as Cream, Neufchatel, Gervais, Camembert, Coulomnier, Cottage and Buttermilk have their followers, but Club Cheese, which is made from Cheddar, is the prime favorite. So many Canadians seem to be "cheddarized" and unless a cheese savors that way then C-H-E-E-S-E does not spell cheese.

The Production of Certified Milk

By J. Blair Ketchen, '99

CERTIFIED milk is milk which has been attested to by a milk commission as to its chemical and bacterial purity. It is simply clean milk produced under medical inspection. Since bacteria increases much more rapidly in a high temperature than in a low one, it is essential that milk freshly drawn from the cow be cooled as rapidly as possible. Bottles and utensils used in milk production must be thoroughly cleansed and sterilized with approved apparatus.

The milk commission is composed of a Committee of Doctors appointed by the Academy of Medicine. It employs an expert Bacteriologist who devotes his entire time to the work. He is a Physician especially trained, not only in the examination of the milk but in all that pertains to its production, preservation, and transportation, and he constantly makes tests as to the butterfat and bacterial count. Certified milk must test 3.5% butter fat and must not contain more than 5,000 bacteria in winter and 10,000 in summer. This official visits the farm frequently and sometimes it is necessary for the inspector to take his laboratory apparatus to the farm in order to locate the cause of the high bacterial count. The results of these tests are sent each week to the farm producing this milk. A Veterinarian is also employed to look after the health of the herd. Each cow is tuberculin tested twice a year and, if the cow once reacts, she is not allowed back in the certified herd. The cows are under his inspection all the time and any cow with udder trouble is removed until better.

The stables are constructed so as to be kept scrupulously clean. The floors of cement or some other non-absorbent material, the walls, smooth, tight, and capable of shedding water, and the ceiling smooth and dust tight. The walls and ceiling are whitewashed at least twice a year. Six hundred cubic feet of air space must be provided for each cow, and at least two square feet of window to each six hundred cubic feet of space, the windows constructed in such a manner, that screens can be substituted to exclude all flies. Since dust is a great factor in the high bacterial count, all precautions to guard against its entry are most essential. The dust from the bedding and hay is most detrimental and this is overcome by sprinkling with water before being taken into the stable. The manure is removed twice daily, at least one hour before milking, and if temporarily stored, is moved 300 feet from the barn or dairy building. The cows are kept scrupulously clean, the clipping of the tail, udder and flanks being a great help to this end.

The milkers use white suits and caps, worn for no other purpose. The hands of the milkers are thoroughly washed with soap and hot water before they begin to milk, and are rinsed with clean water between the milking of each cow. The practice of moistening the hands with milk is strictly forbidden, and during the milking, the milkers are careful not to touch anything but the clean top of the sanitary enamelled stool used, and the milk pail and cow's teats. There is an attendant to every five milkers, who keeps ahead of the milkers and thoroughly moistens the udders, flanks and thighs of the cows

(in order to allay any particles of dust or loose hair that may be adhering to the cows), and thoroughly dries the teats and udder with a sterilized towel, using a clean towel for each cow. He milks the foremilk into a separate vessel as this milk contains large numbers of bacteria. The milker uses a pail with a small opening, and as soon as one cow is milked, that pail is covered with an airtight lid and conveyed to the dairy.

The dairy building is a building combining simplicity with efficiency, and is situated 150 feet from the barn. Here the milk is promptly filtered, bottled, sealed with a seal bearing the date of production, and the name of the Milk Commission granting the license to produce this certified milk as well as the name of the firm producing and marketing same. It is immediately packed in ice and held at a temperature of from 35 to 40 degrees until delivered to the customer, which has to be within 24 hours of milking.

Anyone who has not been actively engaged in the production of certified milk, can have no idea of the eternal vigilance required in every phase of its production, so that the product may be kept rigidly to the required standard. It is but ten years ago since the first quart was delivered in New York City, but the value of the product has been so much appreciated by physicians especially, that it is now used extensively in all the large cities of the United States and Canada.

The Composition of Milk

By Mary Birkett, '17

MILK is frequently called a perfect food. This is rather an ambiguous statement since to be a perfect food, it must live up to five requirements:—

1. It must contain all the nutrient constituents required by the body.

2. It must contain these constituents in the correct proportions.

3. The total amount of nourishment required daily must be supplied by it.

4. It must be capable of easy absorption and yet leave bulk for intestinal ballast.

5. It must be obtained at moderate cost.

Now milk fulfills only one of these requirements, viz., it contains all the nutrient constituents demanded by the body. Hutchinson gives the following approximate composition of milk:

Water, 87 to 88 per cent.
Proteid, 3 to 3½ per cent.
Sugar, 4 to 5 per cent.
Fat, 3½ to 4½ per cent.
Mineral matter, 0.7 per cent.

Casein is the principal proteid of milk. It is held in solution by phosphate of lime, which gives milk its white color. The sugar present in milk is called lactose or milk sugar. Micro-organisms act readily on lactose producing lactic acid. This is the action that takes place when milk becomes sour. The fat in milk varies considerably. In cows' milk it varies from 3% to 8%. For ordinary household use 3½% of fat in milk should be insisted upon, not only because it is one of the most important nutrients, but because a milk rich in fat will also be rich in proteid and sugar. Milk fat is very finely emulsified and hence

easily digested. It has been estimated by Rothschild that a drop of milk not larger than a pin's head contains 1,500,000 separate fat globules. The chief salts in milk are the phosphates of potash and lime. The former is a muscle builder and the latter a bone builder. Since bone and muscle are the two chief tissues which require to be built up in young animals, milk is a very good food for this purpose. Iron however, which is one of the constituents of the blood, occurs in milk in very small quantities. In fact it would require five pints of milk daily to supply a full grown man with the necessary amount of iron while a child is already supplied with sufficient iron for the first few months of growth. Last comes water which forms about 88% of milk. It holds the other constituents in solution but it is owing to the large amount of water that milk is regarded as a dilute and bulky form of food.

Thus we may conclude that milk used alone is not a perfect food for adults. It certainly contains all the food principles but it does not contain them in proper proportion. For instance, if you were to give an adult enough milk to supply the proper amount of proteid and fat there would be an insufficient amount of carbohydrate. Moreover, milk used alone is an expensive food.

On the other hand, milk plays a very important part in a mixed diet where it may be used to supplement other deficiencies. From a nutritive standpoint a quart of milk may take the place of a pound of beefsteak. Bread is rich in carbohydrate. Milk is rich in proteid and fat. Thus bread and milk supply as many calories of heat and energy as a restaurant lunch costing four times as much. Many other instances of milk used in combination with other foods might be quoted.

One place in which milk is almost indispensable is in an invalid's diet. Being a liquid it is easily swallowed, easily measured and regulated. Here, the large percentage of water is an advantage since in this case milk both quenches the thirst and provides nutrients in a dilute condition.

From the above facts we may conclude that milk plays a very important part in mixed diets but is used alone only for infant feeding or for invalid diets.

Foods Derived from Milk

By B. J. Grant, '17

MILK forms one of the most valuable sources of human food and on account of its many products can be served in a great variety of ways. Some of the more familiar products are: whey, cream, butter, buttermilk, koumiss, and casein preparations.

Whey has as its percentage composition 93.64% water, 0.82% proteid, 0.24% fat, 4.65% sugar, 0.65% mineral matter. It is the fluid which exudes from clotted milk. As its composition indicates, it is a fluid of but small nutritive value, and rarely enters into an ordinary diet, but is often an aid in the feeding of infants, and in cases of jaundice, nephritis and typhoid fever.

Cream consists essentially of the fat of milk but contains in addition proteid and sugar in nearly as high proportion as milk itself, the composition

being water, 74%; proteid, 2.5%; fat, 18.5%; carbohydrate in the form of sugar, 4.5%; mineral matter, .5%. The main difference, indeed, between milk and cream is that, in the latter, some of the water of the milk has been replaced by fat. In a physiological sense, cream is chiefly to be regarded as a fuel food. One pint should yield about 1,425 calories of heat or as much as 1 1-8 pounds of bread, or 1½ dozen bananas, or 4½ pounds of potatoes. In sick-room feeding cream is an important aid in securing fat in the diet, as it is very easily digested. It is, however, by no means an economical source of fat and hence is to be regarded as a luxury.

Butter contains 11% water, 1% protein, 85% fat, 3% mineral matter, and is produced from cream by churning. This causes all the fat globules in the cream to run together into a solid mass, while the fluid part, containing almost all the sugar and most of the casein, remains in the form of buttermilk. The flavor and aroma of butter are due to the growth of organisms in the cream during ripening; butter prepared from pasteurized cream is devoid of flavor. Butter can be made to keep indefinitely by melting it down and then boiling till all the water is driven off. It can then be strained through a muslin cloth to remove the casein, and corked. Butter is the most easily digested of fatty foods, which renders it of great value in the diet of sickness.

Buttermilk is the fluid which is left after the fat has been removed from cream by churning, and has a composition of 91% water, 3% protein, 0.5% fat, 4.8% sugar, 0.7% mineral matter. The sourness of buttermilk is due to the presence of lactic acid. It contains very little fat and is chiefly deserving of notice as a source of proteid. Its nutritive value is considerable, an ordinary glassful yielding about as much nourishment as two ounces of bread. Buttermilk is very easily digested.

Koumiss is a drink prepared by the fermenting of milk by means of yeast. The fermentation is a double one. The sugar of the milk is partly converted into lactic acid by the same process which takes place when milk turns sour; in part also it undergoes the same changes as those by which wine is produced from the sugar contained in the juice of the grape. Thus the sugar in the milk is to a large extent replaced by lactic acid, alcohol and carbonic acid gas; the casein is partly precipitated in a state of very fine division and partly predigested and dissolved, while the fat and salts are left much as they were previously. Hence this forms an excellent means of furnishing milk to an invalid.

In practical dietetics, the want of a tasteless, compact, easily digested and moderately cheap preparation of pure proteid is often felt. Casein is admirably adapted to meet these requirements and has now been separated from milk and introduced as a dietetic preparation on its own account. In these forms casein is digested with ease and is readily capable of neutralizing acids, being used in those cases of dyspepsia in which too much acid is being poured into the stomach.

The Dairy Industry in Alberta

By O. McConkey, '17

PROBABLY nowhere are greater opportunities afforded the dairy farmer than are to be found in Alberta. Conditions of climate and fodder are ideal, as is evidenced by the fact that an Alberta cow holds the dairy championship of Western Canada. The cities and towns afford a large market for milk and cream, and the price paid is usually higher than in older districts, where the dearer lands make the cost of producing milk considerably greater. The Carlyle Dairy Company, of Calgary, Alberta, reports that during the year 1915 the lowest price paid at any time for milk was $1.60 per hundred pounds, and from that it varied to $2.20 per hundred pounds. Comparison of these figures with the prices paid in dairy districts in Eastern Canada and the U. S. A. leaves no doubt as to the profit available to the Alberta dairy farmer.

To the dairyman of Alberta the year 1915 has been the most satisfactory and successful yet from every point of view. The climatic conditions throughout the Province were favorable to a heavy milk production. The grazing season was three to four weeks longer than that of 1914. The spring opened up about three weeks earlier, plenty of rain fell during the summer and kept the pastures green well into autumn. The heavy grain and forage crops in 1915 provided a plentiful supply of winter feed for the stock and there is every reason to believe that this winter's milk production will be comparatively heavy.

The creamery business of the Province has shown marked progress

VROUKA QUEEN.
"Queen of the Prairies," with record of 20,575.6 lbs. of milk, 630 lbs. butterfat; 365 days milking.

during the past year, not only in point of quantity but also in the matter of quality, and market value of the butter manufactured. With very few exceptions the fifty-eight creamery plants that were in operation during 1915 reported a substantial increase in the volume of their business.

The total butter output for the year ending Oct. 31, 1915, was reported to be 7,400,000 pounds, as compared with 5,450,000 pounds for the previous twelve months, making an increase of 1,950,000 pounds, or 35.78 per cent.

There are fifteen central creameries operating in the cities of Edmonton, Calgary and Lethbridge. They produced during the year 74 per cent. of the total butter output. The other 26 per cent. was manufactured by forty-three local creameries, of which thirteen were operated on semi-co-operative lines.

While, as we have now seen, there was a marked increase in the butter output of the creameries in the Province, a few comparisons from a geographical point of view may be of interest here. The twenty-five creameries operating north of Red Deer made 57.38 per cent., and the thirty-three creameries running south of Red Deer made 42.62 per cent. of the year's creamery butter output. The former showed a 21.74 per cent. increase in their output over 1914, and the latter reported a 68.95 per cent. increase covering the same period. The thirteen creameries that were operating south of Calgary reported a 68.95 per cent. increase in their year's butter production as against an increase of 36.21 per cent. in 1914. The splendid increase in the creamery butter output of the southern part of the Province is to some extent due to more favorable climatic conditions and the excellent grazing during the summer, but the percentage of the annual increase during the past four years for this section has been higher than the average for the whole of the Province. This indicates that mixed farming and dairying is steadily gaining ground in the southern as well as in the central part of the Province.

One very gratifying feature about the report of the year's work was that 96 per cent. of the total creamery butter production was made from cream that had been bought from the farmers and paid for upon a grade basis. The "grading system" is fully explained in an article on "Grading" in this number. The forty-five cream grading creameries reported a combined patronage of some 13,500 dairy farmers throughout the Province, have rendered a notable service in bringing home to their patrons in a tangible way—the "quality idea" which is bound to grow and extend to the production and marketing of such other products of the farm as are still being handled on a "catch-as-catch-can" basis.

Cheese Factories

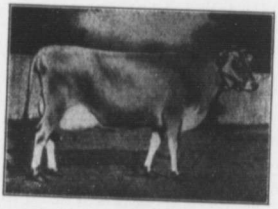
The cheese making industry has also made good progress during the past year. A total of 372,923 pounds of cheese were made in thirteen cheese factories, as compared with 70,581 pounds made in five factories during the season of 1914. It is interesting to note that 50 per cent. of the past season's factory cheese output was manufactured in three city dairies located at Calgary and Edmonton. The comparatively high cheese prices that ruled during the season made it practical for the city dairies to handle in this way, to mutual advantage, a fairly large temporary surplus of milk which they received from their milk shippers. The cheese was practically all marketed in the Province.

Markets and Marketing

The marketing of creamery butter during the past year and the prices realized by the creameries must have been very satisfactory to all concerned, including the farmers who patronized the creameries. The selling price of the butter determines the price which the creamery operator can pay the farmer for his cream. The creamery butter that was available for export was shipped chiefly to British Columbia; some ten carloads were shipped to Montreal and Toronto and a considerable quantity exported to Australasia in the early part of the summer. The Provincial Department of Agriculture, through its better marketing and grading service, has been able to keep in close touch and co-operation with the markets on the one hand and the butter manufacturers on the other. Twenty-five creamery operators availed themselves, to a greater or less extent, of the Department's marketing service during the year. The Department maintained butter grading stations at Edmonton and Calgary, and 6,203 churnings of butter were graded during the season.

The "quality" idea is rapidly gaining ground in the marketing of dairy products and the farmer, as the initial factor, stands to be the chief gainer thereby.

The World's Greatest Jersey Cow



SOPHIE 19th of Hood Farm, the world's champion Jersey cow, has completed another year's record, which stamps her as the greatest dairy cow in the world of any breed.

In 1914 "Sophie" broke the Jersey breed record with a production of 17,557.8 lbs. of milk, 999.1 lbs. of butter-fat. She calved on August 21, 1914, and was started on Sept. 20th, on the test which she has just completed. Milked but twice a day, and carrying a calf 175 days of the test, "Sophie" completed her sixth lactation and sixth year's record with a production of 11,915.4 lbs. of milk, containing 680.5 lbs. of fat, or 800.6 lbs. of 85% butter.

Her six records are as follows:

Age at Start of Test		Milk	Butter (85%)
Years	Months	lbs.	lbs.
2	2	7,050.2	446
3	8	9,924.8	672
4	11	14,373.2	1006
6	7	15,099.4	1097
7	11	17,557.8	1176
9	7	11,915.4	800

A total of 75,920.8 lbs. of milk, 5,217 lbs. of 85% butter, for six consecutive lactations earns "Sophie" the title of World's Champion Long Distance Dairy Cow.

Notes on Cow Testing

TO assist dairy farmers who desire to test their herds for milk production the Dairy and Cold Storage Commissioner at Ottawa has issued for public distribution a pamphlet entitled "Cow Testing Notes" and designated Circular No. 16 D. & S. Series. The pamphlet shows the necessary equipment as spring scales, box of sample bottles, dipper, etc., and tells the cost of each and where the outfit may be procured as well as the purpose and method of use of each.

The Department of Agriculture, through the Dairy and Cold Storage Branch helps farmers to test their cows. In July, 1915, the branch received records of 22,669 cows. Evidences of the value of cow testing are given:

"Cow testing not only produces better cows, but more interested and better dairymen.

"With each cow's record before him, the dairyman is able to feed more intelligently. 'Meal in proportion to milk' is a good motto.

"The figures of a creamery statement at Way's Mills, Que., show that from a herd of twelve cows in 1912, the cash received by the owner was $297.85. In 1914, from twelve cows he received $804.48. He discovered the poor cows and got rid of them.

"At Mallorytown, Ont., a herd of twelve cows has increased from 3,726 pounds of milk per cow in 1909 to 7,388 pounds per cow in 1914; this is an increase of 3,662 pounds of milk per cow, or 98 per cent.

"In Hastings County, Ontario, a farmer commenced cow testing in 1912 and found his herd of ten cows averaged 5,780 pounds of milk and 187 pounds of fat. In 1914 his ten cows averaged 7,436 pounds of milk and 254 pounds of fat, an increase of 1,656 pounds of milk and 67 pounds of fat in two years."

This pamphlet is available at the Publications Branch of the Department of Agriculture at Ottawa.

The Cost of Producing Milk

THE cost of producing milk obviously depends a great deal on the milking capacity of the cows used. Comparison between eight of the best and eight of the poorer cows in an Ontario dairy record centre shows that there was a difference in profit per cow of $24.56, the eight high yielding cows giving an average profit of $37.21 while the poorer cows returned a profit of only $12.65 per head. The milk in each case was valued at $1.15 per hundred pounds. The difference would no doubt have been very much reduced had the feeding been the same for all the animals. Those that yielded the higher profit were much better fed than the others. The average cost of their feed for the milking period being $43.96 per head, while the food received by the less profitable animals was valued at $32.33 per head. Calculating from the standpoint of cost of the milk the eight cows with the low yields made only 32 cents profit on a hundred pounds of milk, while the higher yielding cows made 54 cents profit from an equal amount of milk.

This information and a great deal more of equal value is contained in the

recently issued annual Report of the Dairy and Cold Storage Commissioner of the Department of Agriculture at Ottawa. This report, in addition to the Dairy and Cold Storage Commissioner's general report, contains twelve appendices which deal with the work of the Assistant Dairy Commissioner, the extension of markets, dairy and cold storage divisions, etc. An appendix of unusual interest gives statistics of the export and import trade in dairy produce, which show that the exports of butter increased from 1,951,585 lbs. in 1890 to 2,724,913 lbs, in 1915, while during the same period the exports of cheese increased from 94,264,187 lbs to 137,601,661 lbs.

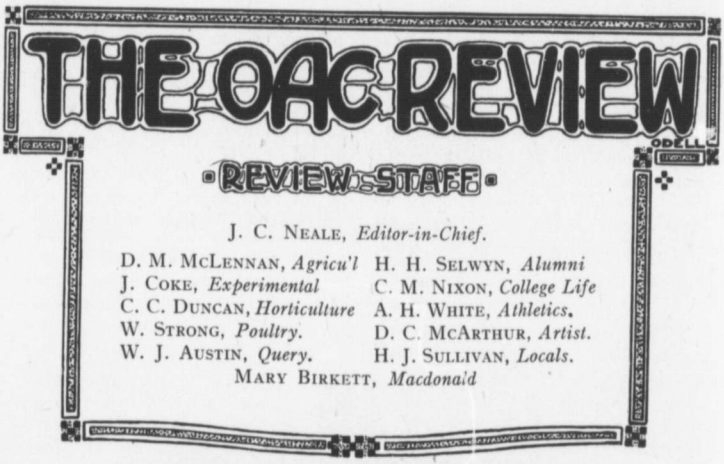
This report is available at the office of the Publications Branch of the Department of Agriculture at Ottawa.

OUTLOOK

Not to be conquered by these headlong days,
But to stand free: to keep the mind at brood
On Life's deep meaning, Nature's attitude
Of loveliness, and time's mysterious ways;
Of every thought and deed to clear the haze
Out of our eyes, considering only this,
What man, what life, what love, what beauty is,
This is to live and win the final praise.

Thru strife, ill-fortune and harsh human need
Beat down the soul, at moments blind and dumb
With agony: Yet, patience—there shall come
Many great voices with Life's outer sea,
Hours of strange triumph, and, when few men heed,
Murmurs and glimpses of eternity.

—*Archibald Lampman.*



EDITORIAL

THE MILITARY SITUATION AT THE O. A. C.

The students of the O. A. C. have been the recipients of much adverse criticism during the college year which is now so nearly ended. This criticism has been, of course, in connection with recruiting and has come, as is usually the case, from those who knew little or nothing concerning the actual circumstances. To the casual observer, between two and three hundred students going daily about their usual duties in connection with College life, may have seemed an evidence of a gross lack of patriotism on the part of the farmers' sons of Ontario. But was it? Most emphatically, we contend that it was not.

Since the outbreak of the war the farmers of Ontario have been constantly asked to increase their production that our fighting men in Europe may suffer nothing from lack of food. How was this production to be increased, or even maintained at its normal standard if their sons were to enlist for overseas service? The men of the O. A. C. are thinking men. At the opening of the College year last September, they firmly believed, many against their wills, that their greatest duty to the Empire lay in the producing of food. Therefore, when the rush of 1915 production was over, they entered, or re-entered College and applied themselves to the task of gaining information which would enable them, to a still further degree, to fulfill their duty in 1916.

But despite this decision and resolve,

the military spirit has been dominant in all student activities throughout the entire year. At the very beginning, practically every student who was physically fit, enrolled as a member of the C. O. T. C. The various branches of athletics, which had previously claimed most of the attention of the students, during leisure hours, were displaced by military drill. The men were preparing themselves for the time when the call to arms might supersede the call to production.

To some, this call came early. The fall term had but scarcely begun when the various years were depleted in numbers by some of their members leaving to join this or that overseas unit. Each man did his own thinking and when he reached the conclusion that his path of duty led to the trenches rather than to the farm, he immediately departed. The result was a constant outgoing stream of men from our college halls—unnoticed perhaps, save by those who were left behind. Finally, during the early part of the winter term, an agitation was begun for the formation of an O. A. C. Battery. The movement gathered followers daily until the culmination was reached on March 6th, when word was received that the recruiting of the O. A. C. (56th) Overseas Battery, had been authorized by Military Headquarters. Then, and then only, did the full realization come of the extent to which the men had been considering the problem of enlistment. Men, to whom the idea had been, *apparently*, the most remote, came forward to offer themselves—men who had calmly and deliberately reached the decision that *now* the call of "King and Country" came from the battlefields of Europe rather than from the harvest fields of Canada. It is a safe estimate that a census taken now at this College would reveal the presence of only a very few among the student body who have not the best of legitimate reasons for not having joined the colors.

Let us consider for a moment those of us who, of necessity, remain behind. There is not one but would be wearing the King's uniform if circumstances would permit. How can these men settle down to the work of preparing for examinations when their interests are with their fellows in khaki? It is a next to impossible task. Their only desire is to be "on the job" in whatsoever form they can fill it. Yet they do not feel justified in dropping their studies until the term is completed, even though the prospect of remaining is far from bright. We hope that the "powers that be" may consider these points when our fates rest in their hands after the final examinations.

To the Students of Macdonald Institute

In this issue of the Review appear four articles by students of Macdonald Institute. These are the first articles written by Mac. girls, which have appeared for some time, except those in connection with different activities at the Hall. Why have the girls taken, heretofore, such an apparently small interest in the Review? Perhaps it has not had any value or entertainment for them. If not, it has been because of the inability of the men, unaided, to produce a magazine of interest to women. A little co-operation would make the Review much more valuable to those on both sides of the campus.

There are innumerable topics upon which valuable articles might be written and we believe that there is as high a degree of literary ability among the girls as among the boys. Do not wait for a special request to write an article. It is true that Macdonald has a rep-

resentative on the REVIEW staff—and a good one—but she cannot be expected to think of all possible subjects and to make a special appeal for each article. It will not be a breach of etiquette to offer your assistance now and then. Let us have your co-operation to make the REVIEW a better magazine, with a wider scope than it has had in the past.

CORRECTION

In the February issue of the Review an article appeared, entitled "System in Farm Accounts," by Paul E. Angle. Through an oversight on the part of someone, an error was made in reproducing Figures 3 and 4,—Figure 4 being an exact duplicate of Figure 3. We wish to express our sincere regret that this mistake occurred, and give below a copy of Figure 4 as it should have appeared.

EXPENDITURES

1915		Paid Out	Bank	Labor	Harness	Cabbage	Potatoes	
Dec. 13	John Thomas	$10 00	$201 60	$10 00				
" "	W. Brown	9 90		9 90				
" "	John Jones	9 90		9 90				
" 16			782 82					
" 20		17 20						
" "	J. A. Simmers, Seed	3 00			$17 20	3 00		
" 21	Daisy Flour Mills, Potato Bags	25 00					25 00	

Fig. 4—Sample sheet of twelve column journal in which expenditures are posted. It also serves as a record of cost of production.

College Life

THE RURAL CONFERENCE

The Second Annual Conference on Rural Life and Work was held at the O. A. C. on February 25 and 26 under the joint auspices of the Y. W. and Y. M. C. A. At the afternoon session on Friday, Dr. Hill, Medical Officer of Health, London, Ont., was one of the speakers. In his address on "Medical Inspection of Rural School Children," he stated that as many as 90% of the school children were defective in some way and that in most of these cases only slight medical attention was needed to correct the evil. In his evening address Dr. Hill pointed out that we should give attention, if we wished to be healthy, to water, food, flies and milk, and that the last mentioned needed not the least of this attention.

The Saturday sessions were of a very interesting nature. Demonstrations of games, such as may be played in our rural sections, were given by students. Mr. A. Maclaren's evening address on "The Influence of Pageantry, Drama, Story-telling, Carnivals, etc., in arousing community consciousness and

spirit" was illustrated. Even though the practicability of using some of the illustrations in country communities was a little doubtful to some, no one disputed the fact that they were very entertaining to the audience of the evening.

Students from Macdonald Hall and the College gave short timely addresses during the various sessions.—*V. A. M.*

Inter-Year Debate

Sophomores *vs.* Freshmen

The second inter-year debate of the winter term was held in Massey Hall on Saturday evening, February 19th. The resolution "That the Provincial Government at the next session should pass legislation to prohibit the manufacture and sale of liquor in the Province of Ontario" was upheld by Messrs. C. M. Flatt and T. H. Shields of the first year, while Messrs. F. L. Ferguson and L. E. O'Neill of the second year constituted the opposition.

Each speaker advanced well ordered and splendidly arranged arguments making it rather difficult for the judges—Prof. R. Harcourt, Prof. W. J. Squirrell and J. E. Simmons, B.S.A., to come to a decision. The decision was finally given in favor of the negative. Prof. Harcourt also acted as critic and commented favourably on the ability of each speaker. He recommended that some of the audience have in future enough of the sense of justice to give the speakers proper attention in the short time they have to deliver their arguments.

Vocal solos by Miss D. Lyall and Miss J. McIlquham and selections by the college quartette were heartily encored, thus disclosing a musical talent here at the college of no mean quality.

—*W. P. S.*

The Philharmonic Concert

February this year generously gave one extra night for the Philharmonic Concert, and as a result of hard work on the part of the several associated clubs a full programme was presented to a large and appreciative audience, and a considerable sum of money was cleared in aid of the Red Cross Fund.

While not given the same time to prepare as for the autumn concert, the Choral Club showed good results in response to Mr. Heatley's leadership, rendering effectively a good variety of choruses, some of which were perhaps more difficult than had been previously attempted.

The College Quartette fairly eclipsed all earlier efforts, responding to repeated encores with selections rendered with splendid tone and color.

The orchestra also was well to the front with a series of new and high grade selections, well conducted and greatly appreciated by the audience.

The crowning event of the evening, was, without doubt, the work of the Dramatic Club. "Oh Susannah", a three act farce kept the house on the edge of merriment and in constant anticipation of approaching complications. Natural talent was well in evidence, and though the parts were by no means easy to interpret, the play moved forward in fine order through all the strange situations to the blissful end and the implied promise that "they all lived happy ever after."

—*V. C. L.*

Public Speaking Contest

Under the auspices of the Union Literary Society, the fifteenth annual public speaking contest was held in the college gymnasium, on Friday evening, March 3rd.

Prof. Zavitz occupied the chair, owing

to the unavoidable absence of Prof. G. E. Day, honorary president of the Society. The chairman explained that the president of the society, Mr. D. M. McLennan, being a modest man, did not wish to appear before the audience and since he, himself, was neither unavoidably absent nor modest his presence was easily accounted for.

The orchestra, conducted by Mr. James Reilly, gave several numbers which were very much appreciated by the large crowd present. It may be here stated that the reason for no encores after the enthusiastic applause was that the manager had other very important duties which demanded the greater part of his time and attention.

The solos given by Miss Estelle J. Carey, who needed no introduction to those present, having appeared here on previous occasions, delighted the audience and were well received. The same may be said of the readings given by Miss D. Adams.

The judges, Prof. H. H. Dean, C. F. Bailey, B.S.A., and W. P. Gamble, B.S.A., declared the winner of the contest to be Mr. J. H. McCulloch, '16, who gave a very masterful address on Co-operative credit for Western farmers. During the course of his speech, he reviewed conditions as they exist at the present time and pointed the need of a system of credit for the farmers of the prairie provinces. The solution of the question was shown to lie in the formation of Co-operative Credit Associations.

The other contestants with their respective places were:

Mr. R. J. Sutton, '17—Agricultural Education in Rural Schools.

Mr. M. H. Coughlan, '16—Co-operative Egg Marketing.

Mr. W. A. Weir, '18—The Business of Farming.

Mr. J. G. Archibald, '16—The Agricultural Short Course as Conducted by the District Representative.

The Creelman Class Prize, consisting of a Webster's Dictionary, was presented to the winner and the programme ended with the singing of the National Anthem. —*L.E. O'N.*

Final Inter-year Debate

The final meeting of the Union Literary Society was held on March 11th. Considerable interest had been aroused throughout the student body, owing to the fact that the Juniors felt confident that they could duplicate their victory of the fall term.

The sophomores, feeling they had some debaters of considerable ability in their midst, were equally confident of victory. The sophomores did prove that they had men of excellent debating qualities, but they did not prove to the satisfaction of the judges. "That we should have conscription in Canada during the present war" and therefore the Juniors again carried off the laurels, thus giving them the debating championship for the year.

The speakers of the affirmative were Messrs. W. A. Weir and J. A. Flock of the Second year, while the negative was upheld by Messrs. W. G. Marritt and W. J. Austin of the Third year.

These men created a very favorable impression and we look forward to hearing more of them in the larger spheres of public speaking.

The judges were Dr. J. H. Reed, Mr. M. Pettit and E. S. Simmons B. S. A. Dr. Reed, acting as critic, gave one of his characteristic speeches in which clever ancedote was interspersed with shrewd criticism.

Vocal solos by Miss J. McIquham and a violin solo by Miss V. Marsh were heartily encored.

Mr. G. H. Unwin gave two splendid readings which were greatly appreciated, and coupled with selections from our college orchestra, made for success and an evening long to be remembered.

O. M.

Alumni

The Editor would again call the attention of those interested in this department of the REVIEW that information of any kind in regard to the movements of ex-students is most acceptable, and in fact, essential, if the Alumni columns are to be kept alive and interesting. At the present time there seems to be a dearth of activity on the part of old boys with one exception, viz.:—enlisting. With regard to this fact we contemplate publishing in an early issue as complete a list as possible of those already wearing the khaki. There are over two hundred and twenty-five students and ex-students now enlisted and when the O. A. C. Battery completes its recruiting the honor roll will exceed three hundred and fifty, which is a record to be proud of.

Please remember then that we want to know of all those who are helping to make more famous the annals of the O. A. C.

The following is typical of letters received from time to time in regard to what our boys are doing.

116th Overseas Battalion,
Uxbridge, Ont.

To the O. A. C. REVIEW,
Guelph, Ont.

Dear Sirs:—

Please change my address from R. R. No. 5, Woodville, to 116th Overseas Battalion, Uxbridge, Ont.

Yours truly,
E. Garner Wilkinson."

Mr. Wilkinson entered the O.A.C. with the class of '14. We would take this opportunity of congratulating Mr. Wilkinson on his sense of loyalty to the Empire.

The Reverend Arthur Selwyn, who attended the O. A. C. in 1895 and for the past eleven years has been acting as Chaplain to a British regiment in India, has been loaned to the war office by the India office, since the outbreak of war. He is now at the front with one of the line regiments.

Bramshott Camp,
Liphook, Hants, Eng.

The O. A. C. REVIEW,
Guelph, Ont.

Dear Sirs:—

Will you kindly send the REVIEW to the above address until further notice. Since leaving Canada in November, I have missed the REVIEW very much, as through it I have been able to keep in touch with many of the boys of 1913. News concerning the old college at Guelph is always welcome and I have spent many a pleasant hour reviewing the REVIEW. Since leaving Guelph have been ranching in B.C. and found it very profitable and interesting. Now I am soldiering, trying to do my bit, finding it very interesting but not over profitable. Best wishes to yourself and the REVIEW.

Yours faithfully,
Herbert Herridge,
Assoc. 1913.

The above letter from Mr. Herridge expresses exactly the pleasure with which all our boys at the front relish receiving their monthly copy of the REVIEW and the Alumni columns to them are apparently most interesting of all. Let's try and fill them full these days when men are up and doing.

Private P. P. Armstrong writes to us from Hazelby Down, Winchester, England, to say he is anxious to receive his REVIEW as usual. Mr Armstrong is an associate of class 1910 and is now with the Second Canadian Pioneer Battalion C.E.F., England.

S. Waterman of year '16, who has been acting as Assistant to the District Representative at Carp, Ont., has enlisted with the 77th Battalion, C.E.F., at present in training at Ottawa.

Mr. Waterman has requested we mention in these columns that W. H. Boucher, of Carp, Ont., who took his first year at O. A. C. in 1914-15, has also joined the 77th Battalion.

Vernon King, Lt. R.N., has sent the above snap of himself and T. L. Atkinson, who attended the O. A. C. from 1901 to 1903.

Vernon King is a graduate of Class 1911.

We print in part a long letter from him as it is exceedingly interesting and tells of a part of the world of which we hear relatively little. Mr. King is attached to the Division Train of the Royal Navy which operates when assisting in land manoeuvres.

"I am sending you a photo of an O. A. C. graduate who took two years from or up to 1903—Atkinson is his name and he came to Aboukir from France and is Requisitioning Officer to the 84th Brigade of the 28th Division. This photo was snapped with my camera on the shore by the ruins of Canopus. The whole neighborhood, of course, is very interesting from a historical point of view, for Aboukir Bay is close by. I have explored some old catacombs and taken ancient human bones from the vaults and found many interesting relics. Then the forts at Aboukir, containing guns made by Sir W. G. Armstrong, Newcastle-on-Tyne, in 1879, are interesting.

These are not Aborigines, but two sturdy O. A. C. men who are serving with the Royal Navy at Aboukir, in Egypt.

The scenery here is lovely. The blue sky and glorious sunsets one cannot describe.

"But I revelled most in the desert and the palm groves where the Bedouins have their tents. I used to ride along by the sea just before sunset and sit on my horse quite still as the twilight began to fall. Hardly a sound could be heard unless a Bedouin's dog objected to my presence and expressed his disapproval in the usual canine way. I would watch the Bedouin family

preparing their evening meal and gather together their earthly possessions. The tents are low and wide open all round and the natives squat just under the awning as it were. At one side might be one of the wives stirring something over the fire and squatting in her black clothes like a gypsy. Other wives would be busy at other little chores, perhaps offering grain to a camel as it also squatted at the tent entrance. The man himself would probably be looking on doing nothing at all while the work was going on. Over the sands maybe a young girl would be coming driving a little herd of goats, sheep and donkeys and a few dogs and besides carrying on her head a big water pot.

"Then when all were gathered in there would be such a collection, two or three camels, dogs, sheep, goats and rabbits, and these last skipping in and out of the tent quite tamely. And straight overhead, the big clusters of deep red dates hung by their thick yellow stalks and stood out in such contrast to the deep blue sky which showed through the palm tops.

"Sometimes I would go and speak to them and give them "bachsheesh." You couldn't help envying them sometimes because they had few cares, all the wives one wanted and food right at the door. No worries of Government or politics or any of the troubles which come with civilization. And seriously, I believe those people are doing more in this world than the class who belong to us and yet are as far from Nature as the Bedouins are near it. They are far more sincere in their religion and pray regularly and even the "cabbies" won't be interrupted in their prayers for a "fare."

Athletics

Varsity Boxing and Wrestling Tournament

On February 24th the College sent down four men to take part in the Varsity Boxing and Wrestling Tournament. Michael, Scott, Costague and Musgrave made the trip and brought back three firsts and only for a decision contrary to the ideas of the spectators, they would have brought back four firsts.

Michael had to wrestle Scott for the heavyweight title and won easily in two straight falls. Scott made away with his man in the middleweight while Costague had the toughest proposition in the lightweight wrestling. However, our little American wrestler was there and won his bout.

Musgrave boxed in the middleweight class but lost and the boys say he should have won. If he had won his bout, the boys would have brought back the cup given for the faculty winning most number of firsts. Much credit is due to Mr. Forman for the attention he gave to the training of the men.

O. A. C. Boxing and Wrestling Tournament

This was held before the basketball game on March 4th and was not up to the standard, due to some men being sick and others playing basketball and therefore not being able to take part.

There were only two championship bouts pulled off during the afternoon, with a few exhibition bouts. In the featherweight wrestling, Scouten and Gowdie of '19 went on the mat. Scouten won quite easily in two straight falls. In the other championship bout

Bryden, '16, and Algero, '19, put up a boxing bout in the featherweight class. The first round was quite fast, and caused some amusement to the crowd, but during the last two rounds both boys tired badly. Bryden won the bout.

Bird, '17, was around looking for a scrap, but could find no opposition in welter, middle or heavyweight classes. He won all on default. Musgrave, '19, finally consented to box an exhibition bout, but was not feeling well and could not do himself justice.

In the middleweight wrestling, Scott, '18, won by default, but wrestled Brown and Steckle exhibition bouts. The heavyweight wrestling was not decided owing to Michael's not being allowed to wrestle before the basketball game.

The tournament might have been more interesting if the Freshmen and Sophs. had tried to see what they could do. They may not be experts at either the boxing or wrestling game, but why not start in and learn now. There is good material here and there is no reason why our meets and tournament should not be keenly contested in every event.

Winners, Wrestling—
Feather weight—Scouten, '19.
Middle weight—Scott, '18.
Boxing—
Feather weight—Bryden, '16.
Welter weight—Bird, '17.
Middle weight—Bird, '17.
Heavy weight—Bird, '17.

Indoor Meet

Our annual indoor meet was held in the College Gym. on Thursday afternoon, March 2nd, and was a decided success. All events were keenly contested and there were a goodly number of entries for every event, which has not been a common thing here in the last few meets. It is not known why, but generally men prefer to stand or sit on the side lines instead of taking part in events. On Thursday afternoon there were a good number taking part in each event.

The two junior years were fighting it out for the highest number of points. The first year tied with the second year because they made 8 points in the cross country run. In the indoor meet the Sophs. had the advantage, winning 45 points, with the fourth year second with 41 points and first year third with 38 points.

For grand champion there was a great fight between Evans and Lackner, with Evans having the best of the argument and winning the grand championship with 22 points to Lackner's 20 points.

Two records went by the boards, one in the 60-yard potato race and one in the hitch and kick. Big "Bill" Michael tore around in the potato race in 15 seconds, lowering the record by 1-5 of a second, while "Husky" Evans kicked one foot in the air to the height of 8 feet 9¼ inches, raising the record for the hitch and kick by ¼ inch.

The relay race was interesting as well as exciting. In the first run off between the Freshmen and Sophs., Wallace ran down one of the first year men and caused a spill, while in the race between the Juniors and Seniors, Hunter of the third year, fell while turning a corner and received some nasty bruises.

At the end of the meet, Miss Rutherford presented the ribbons in the dining hall, and brought to a close a very successful indoor meet.

15 yard dash—(1) Gunn, (2) Allan, (3) Newton. Time 2 1-5 seconds.
Three standing jumps—(1) Evans, (2) Bryden, (3) Wallace.
Standing broad jump—(1) Lackner,

(2) Evans, (3) Gunn. Distance, 9 feet 6 inches.

Standing hop, step and jump—(1) Evans, (2) White, (3) Whitelock. Distance, 27 feet 5 inches.

Standing high jump—(1) Lackner, (2) Brown, (3) Wallace. Height, 4 feet 1¾ inches.

Running high jump—(1) Lackner, (2) Halsey, (3) Allen. Height, 5 feet, ¾ inch.

60 yard potato race—(1) Michael, (2) Allen, (3) McEwan. Time, 15 seconds (record).

440 yard potato race—(1) White, (2) Newton, (3) Wallace. Time, 2 minutes, 11 2-5 seconds.

Pole Vault—(1) Dodding, (2) Evans, (3) Shaw. Height, 8 feet 2 inches.

Rope vault—(1) Wallace, (2) Kay, (3) Michael.

Chinning bar—(1) Welton, (2) Varey (3) Karn. 19 times.

Rope climb—(1) Karn, (2) Steckle, (3) Van Every. Time 12 seconds.

Fence vault—(1) Lackner, (2) Toole, (3) Varey. Height, 6 feet ½ inch.

Running high dive—(1) Toole, (2) Allin, (3) Musgrave. Height, 5 feet 2 inches.

Hitch and kick—(1) Evans, (2) Toole, (3) Michael. Height 8 feet 9¼ inches (record.)

Putting shot—(1) Shaw, (2). Michael, (3) Dodding. Distance, 37 feet , 2 inches.

Relay race—(1) Second year, (2) fourth year, (3) first year. Time, 1 min., 11 4-5 seconds.

Grand champion—O. C. Evans, 22 points.

BASKETBALL

O. A. C. *vs.* Western University

On March 4th our team met Western University, of London, in our gym., in the first of home and home games for the Intermediate Ontario Basketball Association championship. It was the first time for several years that the O. A. C. has gotten a team into the finals and the boys were eager to show, now that their chance had come, that they were made of the stuff that wins championships.

Our team went into the game after weeks of hard and steady practice. They were handicapped to some extent by injuries, White suffering from a badly sprained arm and Forman's knee again troubling him.

Our boys started with a rush. Their signals ran as smooth as clockwork and in a very few minutes the score was 17-2, Capt. Rowland doing the heavy scoring. The London boys soon came back to earth though and the game settled down into a fast and close checking contest, the whole of which was a splendid exhibition of basketball. At half time the score stood 25-16 for the O. A. C.

The second half was no less strenuous than the first, both sides playing fast and clean. London appeared weak in the shooting as the Western boys missed several easy baskets. The scoring was fairly steady on both sides and the game finished 46-29 in favor of O. A. C.

The score just about indicates the play. Michael and Raymond at guard played hard and steady games, clearing nicely time after time. Forman was heavy scorer for the O. A. C., scoring from anywhere and everywhere, which is no uncommon thing for Forman to do. Smith and Kingswood played good games for Western.

Line-up:

Western University—McKay (8), Kingswood (8), forwards; Pritchett (6), centre; Smith (5), Ritchie (2) guards; Elgie, spare.

O. A. C.—Forman (21), Rowland (12), forwards; White (9), centre; Raymond (4), Michael, guards; Bissette, Carncross, Zeigler, spares.

Return Game with Western University

O. A. C. Wins Intermediate O. B. A. Championship

By holding London to a score of 31-24 on March 10th, O. A. C. won the rounds in the finals for the Intermediate O. B. A. Championship and for the first time in history brought an Ontario Basketball Championship to the College.

Withe a 17 point lead from the game on March 4th, O. A. C. felt confident of winning. The team had trained faithfully and well and were, to say the least, in great condition.

London opened the game in splendid fashion and for awhile O. A. C. were lost. The former found the basket about at will while our boys seemed unable to score. Their play was loose and when the first half finished with a score of 15-3 in favor of London, O. A. C's. chances looked very slim. However, the second half saw the real game begin. Our boys showed a remarkable "come-back" and until the finish of the game played rings around "Mel Brock's quintette".

Forman and Rowland found the basket with surprising regularity and their thin line of O. A. C. rooters fairly raised the roof, yelling.

"Bill" Michael's playing at guard in this half was a splendid exhibition. He broke combination after combination of the London forwards and smothered every man who tried to shoot.

Raymond at "running guard" also played a good game, while Art White covered the floor from one basket to the other in fine style.

All things considered this game was probably one of the fastest and cleanest ever seen on the London Floor.

The game ended with a score of 31-24 for London, thus giving O. A. C. the round by 10 points. Too much credit cannot be given to Captain Rowland, Manager Baker and the members of the team who had worked so long and faithfully in bringing this signal honor of the basketball world to their Alma Mater.

	Line-up—
Forwards	Forman & Rowland
Centre	White
Guards	Michael & Raymond
Spares	Bissett & Carncross

Two Methods of Study

A student is told a myriad of facts dealing with one subject. The entire idea is to set forth a mass of information to be learned by heart. The more important facts are emphasized by the amount of time given to learn them. He is then tested to see how many abstract facts he may have retained. Such training may well be considered "Quantitative Education."

There is another way of learning, far more interesting and valuable. This way enables the student not only to grasp the subject but also to retain his knowledge of it. Here the purpose is not to fill the mind with facts, but carefully to select some parts and see how, moulded together, they complete the whole. The logical way these facts hinge upon one another shows their relative importance. Such a method can be considered "Qualitative Education."—*The Review of Reviews.*

The Red Cross Fete.

The third Red Cross Fete undertaken by Mrs. Fuller and the girls of Macdonald Hall, and helped on to success by the willing assistance of the O. A. C. men, was held on Saturday, March 4th.

The decorations of the various booths and the pretty caps and aprons of the girls gave the place a very festive appearance. The booth in the library was beautifully decorated with flowers, which found a ready sale. The drawing room, where cakes and candies were sold, proved more attractive than the library to some, especially those who were fond of guessing. We might state here—in spite of the incredulous nature of the men—that it was one of the girls who guessed correctly the weight of the cake. To the ardent fishermen the Japanese fish-pond proved a source of amusement. The ring game caught the eyes of the men and showed their skill in throwing. A table of dolls found favor with those who have little sisters and nieces. Pictures of the Hall and Institute sold rapidly, the only hindrance being the small number available. The most novel booth was the one containing a doll's house furnished as a military hospital. Afternoon tea, ice cream and cake were served in the dining-room, which was arranged as a tea-room, music being played there all afternoon.

Upstairs in the sitting room four gypsies held sway in the fortune-telling booth. In the gymnasium, where the carpenters had fitted up a very pretty stage, a Cinderella pantomime was given several times. The little play brought back to us the days when we believed in fairies, as well as showing a decided talent for acting, among the girls.

The Rink Committee kindly offered to give the proceeds of the afternoon's skating to the Fete. Besides this the men very generously contributed, through a collection taken up by some of the flower girls during the basketball game with Western University in the O. A. C. gym. during the afternoon.

A short dance at night, which President Creelman so kindly allowed us, ended the Fete and at ten o'clock, though very reluctantly, all visitors departed.

The proceeds of the Fete amounted to a little over $168.00—$150.00 of which was sent to the Guelph Red Cross Society, $18.00 to Mrs. Creelman for her Red Cross work, and the remainder placed with the funds at the Hall.

Mrs. Fuller and the girls wish to take this opportunity of thanking all those who helped to make the Fete such a success.

—*Nellie Wells.*

Athletics

This term has been a busy one for the Athletic Association. Although the conditions of weather and the rink made hockey an impossibility, there have been numerous other activities. Two picked teams played an exhibition game of Captain Ball for the Rural

Conference which proved both entertaining and instructive.

The teams were:

First—Helen Turner, Captain; Eleanor Hopper, base; Marjorie Williams, base; Reita Penhorwood, guard; Florence Shannon, guard; Frances Beven, guard; Mary Birkett, rover.

Second—Doreen Woodyatt, captain; Frances Thompson, base; Edith Elliott, base; Adah Wells, guard; Elizabeth Langford, guard; Marion Shannon, guard; Florence Cooke, rover.

Dorothy Chown acted as referee.

The Shadowgraph, "Mary Jane," and the burlesque on "Lord Ullin's Daughter," which formed an enjoyable part of the programme of the last meeting of the conference, were under the direction of the Athletic Association, the leading parts being taken by members of the executive. Helen Easton made a splendid "Mary Jane" and Kate Percy delighted the audience as Lord Ullin's daughter.

MACDONALD LOCALS

Freda Grenside (in the Biology class room)—"Why is this room always so warm?"

Kate Percy—"Because our Professor's a Baker."

Mr. Leckie, when giving English notes to the Homemaker Class was, talking a little too quickly.

Ted Hewson—"What comes after —falling in love—?"

Mr. Leckie (after a short pause)—"You sometimes fall out again."

Professor John Dewey, the psychologist, believes that children's impulses should be led in the right direction rather than suppressed. Therefore, when his little son decided to call him John, he was allowed to do so. One day the boy conceived the bright idea of sailing boats in the bath tub. He was a little careless, however, and allowed the water to overflow. His father arrived on the scene in time to see the water oozing out under the door. With a very angry countenance he threw open the door but his son took in the situation in a moment and exclaimed: "No time for words now, John. Get the mop."

Therefore am I still a lover of the meadows and the woods
And mountains; and of all that we behold
From this green earth; of all the mighty world
Of eye and care—both of what they half create
And what perceive; well pleased to recognize
In Nature and the language of the sense
The anchor of my purest thoughts, the muse,
The guide, the guardian of my heart and soul,
Of all my moral being.

—*Wordsworth.*

Locals

COLLEGE SONGS

"Oh Where, Tell Me Where, Has My Streptococcus Gone?"

"Gone is the Daze," or "The Night after The Morning after The Night Before."

(Speaking of Judging Stock)—"Believe Me, if all Those Endearing Young Charms Were to Fade," (you'd go last).

"When the Lights Burn Low"—(Whenever you hear this ditty, hide your oil can, or fill it with water. Either method is good.)

"Thou Art the Flower of My Heart" (Gamosepalous, Pentandrous, Epigynous, etc.).

"Blest be the Ties that Bind" (especially if they do so when the car is due in three minutes).

"Too Late" (the car's just gone.)

"Just A'wearyin' for You" (speaking of a certain cat which pays nocturnal visits to Grub Alley.)

"When Cares My Heart Bissett" (a very mournful dirge, sung only on special occasions by the Waldo-Skinner Co.)

A peculiar thing about bachelors is, that they refuse to change their quarters for a better half.

Mr. Unwin (English lecture)—"We find many of the Canadian authors on the "bang the trumpet, blow the drum style."

Will the person who found a castor between here and "Mac" Hall kindly return the same to me.—W.J.B.K.

We all notice how prominent athletics have become since the training table was instituted.

"Doc." Stone—"Is Mr. McGuinnery here to-day?"

GREEK MEETING GREEK

Mrs Sullivan and Mrs. Lynch were friends and neighbors—rivals only when it came to expatiating on the merits of their respective sons. Mrs. Sullivan's boy was one of the cheaper clowns of a circus.

Mrs. Lynch's hopeful was an itinerant printer. Both ladies carefully concealed these facts.

"Oi jist had a letther from me bhoy, Mrs. Sullivan," said Mrs. Lynch one morning. "He's gettin' to be a great man, so he is. He wrote me that he was edither av a paper away out beyant Milwaukee somewhere. Oi fergit th' name av th' place—but Jimmy is a wondher; some day, like as not, he'll be Prisidint."

"Ayah!" responded Mrs. Sullivan. "Sure, it's only this mornin' Oi got a letther from me own bhoy. He's away off in Rome, Georgia."'

"What would he be doin' in Rome?" interrogated Mrs. Lynch with some acidity in her tone.

"What would he be doin' in Rome, is it?" responded Mrs. Sullivan proudly. "It's me that's the happy woman, Mrs. Lynch. Oi suppose he's down there playin' cassino wid th' Pope ivery avenin'."

How to Prevent Co-operation

If the farmers in your neighborhood want to co-operate in the shipping of their produce, never ship with them, but immediately notify the largest speculators what is going on, so that they may buy your produce at a little better price and enough of your neighbor's stock to make co-operative shipping impossible. By doing this you will be doing your community a good turn, because the speculator is usually one of your citizens, and you must assist him in building up his business. Anyway, the extra money that your neighbors would get by co-operative shipping might cause them some embarrassment.

If this plan does not commend itself to you, then agree to ship with your neighbors; but at the last moment sell to the old-time speculator for a little more money than you think you will get co-operatively, and in that way prove to the community that co-operation is all a humbug, and that it pays well to be a traitor.

If the co-operative organization happens to sustain some loss on one of their shipments, due to unusual circumstances or conditions, evenly if absolutely unavoidable, get all the information possible and make it your special business to see everyone you can and tell them all you can about it.

In this connection very telling work can be done by careful exaggeration, double or treble the quantity of goods concerned, paint it very black, make it very much worse than it actually is, because the fact that there may be a little truth in it will enable you to carry that class of campaign a very long way successfully. Pretend to sympathize with the co-operators and pretend that you could have handled the business better; that will make them dissatisfied.

Incidentally you should be careful not to mention that you have yourself met with much worse luck on various occasions in the past. This method of procedure has much to recommend it. Your neighbors will consider you very much interested in their welfare, and therefore a real good fellow.

—*Canadian Horticulturist.*

To The Hen—Oh, Lovely Hen

Alas, my child, where is the pen
That can do justice to the hen?
Like Royalty, she goes her way
Laying foundations every day
Though not for Public Buildings, yet
For Custard, Cake and Omelette.
Or, if too old for such a use
They have their fling at some abuse.
As when to censure plays unfit
Upon the stage they make a hit,
Or at elections seal the fate
Of an obnoxious candidate.
No wonder, child, we prize the Hen,
Whose egg is mightier than the Pen.

—*Farm and Ranch Review*

The Hygienic Bards

(*By our own Leigh Hunt*)

Jenny kissed me when we met,
  Hygienic counsel scorning.
Curse the woman! To forget
  All about the doctor's warning!
I, the healthiest of men
  All the germs of grip had missed me—
Thought myself immune—and then
    Jenny kissed me!

(*By our own Alfred Tennyson*)

Kiss me no more; bestow they labial wealth
  On such as may a week or two devote
To having grip; but I'm a careful pote
Wherefore I beg thee, as I love my health.
    Kiss me no more!

—*Canadian Farm.*