

danger of the scour of the stream undermining the foundations. The footings for bench and wing walls are four feet wide and about eighteen inches in thickness, made of coarse lake gravel; mixed four parts gravel and one part cement. This mixture was well mixed before putting in any water, then only enough water used to slightly moisten; then put in layers about six inches thick, and rammed solid with iron rammers. When footings foundations were finished then the walls were laid out three feet wide in the center of footings and built about four and a half feet high to the spring line of half circle arch, then wooden centers were placed in position and covered with two by four inch scantlings, dressed on both sides so as to be even in thickness, edges levelled to fit neatly the radius of circles, so when centers were removed the inside of arch was absolutely smooth, having a finish almost as smooth as a well-plastered wall. The arch and wing walls were all carried up together. The thickness of concrete wing over the arch is fifteen inches, put in sections about fifteen inches wide, on each side of arch; this was done by setting up a fifteen inch plank on edge each side the whole length of the arch. The planks were firmly braced to the wooden centers so the concrete could be firmly rammed. When the planks were filled on each side, then the wing walls were built up to the same height, then planks were moved on the arch another fifteen inches and filled again as before, until the structure was completed, leaving the planks, in all cases, not less than half a day before moving them. When the arch was turned, the wing and parapet walls on the sides were built up about one foot above the arch to retain the earth and gravel over the arch. The earth and gravel was filled up in the center about one foot above the top of wing and parapet walls and sloped neatly to the edge of all walls. All walls were built on the inside next to the earth with a frost batter; that is, sloping about one-quarter of an inch to the foot, raised so that the earth rests on the walls. In no case should back of walls rest on the earth; if so, the frost will surely destroy them, and it is always important that wing walls should be made heavy and strong to protect them against the thrust of the earth when frozen; this is an important matter, and is often lost sight of. Bridges and culverts of all kinds and sizes can be built very cheaply where good coarse gravel can be had; and where such structures are properly built, with good cement, they are the cheapest and best that can be built. They do not require skilled labor, consequently the outlay of money is small."

Timothy Roots.

To the Editor FARMER'S ADVOCATE:

SIR,—Concerning the depth to which timothy roots penetrate, I regret to say that I have no actual data on the subject. I have no doubt that Mr. Thomas Baty found the rootlets at the depth he states, but it seems to me that this must be exceptional, as all the specimens of timothy plants which I have available for examination have abundant roots close to the surface, as generally described in this plant. I do not care to say more than the above just now, but have taken a note to examine into this matter next spring, when I will write to you again. J. FLETCHER.

DAIRY.

The Export Butter Trade.

To the Editor FARMER'S ADVOCATE:

DEAR SIR,—In reply to your favor of 15th inst., we have only to say that we have been shipping butter for nine or ten creameries of this section on consignment to Manchester. We have been collecting the butter of these creameries at Stratford, making a practice of examining all the butter before it leaves us here, putting it into a car by itself so that it will get quick despatch and then ship it to the Manchester market. This butter we have had made according to our own instructions, with only half an ounce of salt per pound of butter, without any coloring at all and packed in 56 lb. square packages. On arrival in England it has been selling for very good prices; the very first shipment made early in December sold for 106s., the second and third shipments sold for 104s. for all lots that were finest. But it happened that one or two lots were not put up quite as we wished, or were in some way defective, and these lots sold for 100s. to 102s.; but in every case the price was more satisfactory to the consignors than if they had sold the butter on the local market. The lowest price realized was 19.31c. at Stratford, after all charges of commission, freight, etc., had been deducted; the highest price was 20.37c., after the same charges had been deducted, so that, as we have said, the prices were in all cases perfectly satisfactory.

In the early shipments freight rates were extremely high and rates of exchange very low, but in the more recent shipments rates of freight and rates of exchange have been more favorable, and we expect present favorable rates will continue until opening of navigation in the spring. We tried several markets, but have concluded that the Manchester market is more satisfactory; we have been able to get several shillings per cwt. more in Manchester market than in any other market that we have been shipping to, and in fact we find that this also is the experience of some others who have been shipping there. T. BALLANTYNE & SONS. Stratford, Jan. 26th.

The Ontario Creameries Association Convention.

The twelfth, and probably the last, annual convention of the Ontario Creameries Association was held in St. Mary's on Jan. 13th, 14th and 15th inst. It was, by all odds, the best-attended convention ever held by this Association, there being at one or two of the sessions some 600 or over in attendance, mostly from the surrounding neighborhood, who took a deep interest in the excellent addresses given, and also took part in discussing the various questions brought up. This Association was organized in 1886, chiefly through the instrumentality of Mr. M. Moyer, now of Toronto, and Mr. John Hannah, of Seaforth, who prevailed upon the Hon. A. M. Ross, Commissioner of Agriculture, in the interest of co-operative buttermaking, to assist the enterprise, which he did by a grant of \$500. At that time our butter was a reproach to the intelligence of Canadians, but through the influence of the Association, directly and indirectly, the creamery business has been fostered until now we are on a fair way to favorable recognition in the best markets of the world by reason of co-operative effort. There are now 100 regular creameries in Ontario, and 150 winter creameries running at present. This interest has been looked after by the Ontario Creameries Association, but from this time forward will be in charge of the amalgamated associations of the Eastern and Western Dairymen's Associations and the Creameries Association into the Eastern and Western Butter and Cheese Associations, with an executive, composed of three representatives from each association, to act as a central advisory board. This new arrangement was agreed to by the dairy associations, but a number of the Creamery Association members, being somewhat dubious as to their interests being looked after by the amalgamated associations, decided not to disband, and therefore passed the following resolution: "We, representatives of Creamery Association, do hereby express our disapproval of the action of the joint committees, at Toronto, in amalgamating the three dairy associations into two butter and cheese associations, and do hereby protest against the same, and strongly advise election of a board of officers for the Ontario Creameries Association for 1897. We at same time believe that if amalgamation is desirable it would be advisable to form one association only, and put the dairy business into the hands of a dairy commissioner who will be directly under the control of the Minister of Agriculture."

The following officers were elected for the ensuing year: President, A. Wenger, Ayrton; 1st Vice-President, J. Croil, Montreal; 3rd Vice-President, T. J. Millar, Spencerville. Directors—W. D. McCrimmon, Glen Roy; A. Campbell, Ormond; C. R. Touser, Iroquois; John Sprague, Ameliasburg; A. A. Wright, Renfrew; F. L. Green, Greenwood; Jas. Carmichael, Arva; W. G. Walton, Hamilton; A. Q. Bobier, Exeter; Daniel Eckstein, Neustadt; Jas. Struthers, Owen Sound; Wm. Halliday, Chesley, and Wm. H. Snider, St. Jacob's. No doubt if the amalgamated associations do—as we suppose they will—their duty to the buttermaking interest the Creamery Association will disband, leaving the work to those whose duty it shall be to look after it.

The President's address made reference to the wisdom of the Provincial Minister of Agriculture in assisting the dairy associations and in establishing the best dairy schools on the Continent for the proper training of butter and cheese makers. Reference was also made to the excellent work accomplished by Prof. Robertson and by the Hon. Sydney Fisher, the Dominion Minister of Agriculture, who has promised refrigerator cars and apartments on steamships for placing our creamery butter on the British market safely, speedily and cheaply. Our exports of creamery butter have more than doubled again this year over last. Before concluding, Mr. Derbyshire made a strong appeal for the production of more milk of better quality and at less cost. To do this a longer milking period is a necessity. A cow cannot earn a living in six months no more than a man. We must arouse to keep only dairy cows, to grow plenty of corn, to build silos, to feed liberally a balanced ration, and to take all the milk to a creamery or cheese factory; to be energetic and watchful, then our business will flourish.

Food Cost of a Pound of Butter.—Prof. Dean under this heading referred to the necessity of keeping only good dairy cows, comfortably, and feeding them wisely with food adapted to the production of milk. In the College herd an effort has been made to ascertain the food cost of butter. The food used was mixed grass pasture in summer, and silage, mangels, hay, and chop in winter. The cost of feeding the cows of this herd was from \$24 to \$30, an average of \$31 per head for one year. They gave from 120 to 424 pounds or an average of 244 pounds of butter per year. The worst cow was fed at a loss of \$26, and the best at a profit of \$47.30 for the year. The best cow was dry three weeks, but her food during that time was charged against her. She produced butter at 8.8 cents per pound; 13.9 cents was the average cost of the butter from the entire herd. By weeding out poor cows, and by feeding more wisely, Prof. Dean hopes to reduce this cost very materially. In June the butter cost 4 cents per pound, and in December 18.8 cents. The average food cost for the year, not including the time of their being dry, was 12.1 cents per pound of butter. The daily ration fed in winter was 40 pounds of silage, 10 pounds of hay, 25 of mangels, and 10 pounds of a mixture of ground

oats and peas and oil cake. This was considered as much as was profitable to feed.

The Old and the New Methods of Raising Cream. was also discussed by Prof. Dean, who has found from investigation in 30 dairies in the vicinity of Guelph that from 1 of 1 per cent. to 2 per cent. of fat is being left in the skim milk. That is in many cases 25 per cent. of the entire butter in the new milk. It was here mentioned that the butter that was made on the farms usually sold at a low price. The cream separator was referred to as the most economical means of separating cream. It should be done at a temperature of from 85 to 95 degrees, and 130 degrees was spoken of as better still, because bad odors would then tend to pass off should they be present, as they often are in winter milk.

"Dairy Ideas" was the subject of an address by Hon. W. D. Hoard, of Wisconsin. At the end of forty years' experience with dairying it pained him to realize how shallow and ignorant he was with regard to his business, but it pained him still more to see so many men not pained at all with these things. Many will give a gelding better care and feed than a maternal cow. They will feed a hog to the verge of cholera, while the cow is living at the straw stack.

The value of a well-bred sire was emphasized. Certain breeds of dairy cattle have been bred along certain lines for a long time, so that the rope of prepotency has become stronger and stronger as the strands of pedigree have been woven in. By breeding, weeding, care, and feeding, Mr. Gooderich, a successful Wisconsin dairyman, increased the average annual production of his herd since 1882 from 175 pounds of butter per cow to 353 pounds per cow in 1894. Dairying must be conducted more intelligently if we are to succeed in it. Fine butter and fine cheese are sought by people of refined tastes; there is, therefore, no money in producing an article of ordinary or inferior quality. In grain farming a fool can get as much for his product as the more intelligent, but not so in dairying. Every big market can supply tons of poor butter at from 3 to 5 cents per pound, while the good article brings from 20 to 25 cents per pound. The cow end of the question must be considered. If we have the right sort of cow, feed her properly, and make the butter as it should be, the market will take care of itself. Many cows are running their owners into debt. A little attention to testing the cows will find these out. It is unprofitable to leave cows out in the cold, as they use the fat that should make butter to warm their bodies. We can not afford to warm cows with 20-cent butter. A cow that gives only 150 pounds of butter in a year will owe her owner from 25 to 30 pounds at the end of the year for her board, without considering the labor of caring for her. Usually cows milk too short seasons. From 10 to 11 months is not too long. One Mr. Wright, from Renfrew County, claimed that he never allowed his cows to go dry at all before their calving, but used the last month's milk to feed back to the cows, calves, and pigs. He asked, could we afford to rest our hired men several months in the year while we are paying them? Cows too must work all the time. Where cheese is made in summer, the milk must be made into butter in the winter. He therefore pleaded for winter creameries. He advised that one central factory be fitted up for buttermaking, and surrounding factories be used as separating stations. Better butter will then be made at less cost than if more factories are used. To keep cows milking the heifer should be milked twelve or fourteen months after her first calf. Several members claimed better results from allowing their cows to go dry six weeks of each year. Mr. Hoard advised that cows should come in during September and October, because there is a tendency in every cow to fall away in milk at the end of six months, which comes with the fall cow about the time of spring pasture, which will tend to carry her over that usual shrinking period with an increase in her milk flow.

Cold Storage was discussed by Prof. J. W. Robertson, Dominion Dairy Commissioner, who claimed that the price of our produce in the British market is governed more by its condition in freshness and appearance than by any other factor. We make good produce and can sell it right when it reaches the consumers in first-class condition. Cold storage at the factories, on the railways and on the steamboats is what is needed to gain us the desired end. All civilized countries send their surplus food to Great Britain, and Canadians must either succeed or fail in the competition for that market. Denmark has succeeded with her butter by using cold storage. Canadian wheat, flour, and cheese stand well there because they are not perishable to an extent to be injured in transportation from here to there. We supply them nearly two-thirds of their cheese, but of the \$60,000,000 worth of butter they purchase we send only some \$500,000 worth. We therefore have a great opportunity to swell our share of butter to them by supplying a desirable quality in fine form. Our egg and poultry trade with England would much increase if we had a good system of cold storage. The cold storage system was explained, in which the practical points to dairymen were brought out as set forth in our Jan. 15th issue in an article upon "Storage of Ice."

The Hon. Sydney Fisher claimed that he chose the business of dairying because he considered it the highest branch of agriculture. When we sell butter we sell skill and no fertility. Butter, too, is cheaply transported because it is of little bulk. The speaker claimed that the eastern counties of Quebec, in which his farm is situated, once had the lead in