

## DAIRY.

## Cheese and Butter Association of Western Ontario.

The 32nd annual convention of the above Association was held in Guelph on January 17th, 18th and 19th. While the Royal City is not the center of a dairy district, there were at each of the sessions a good attendance of those who, by their earnest attention and expressions of satisfaction, indicated their appreciation of the addresses delivered. One of the chief reasons for bringing the convention to Guelph was to afford the cheese and butter makers an opportunity of seeing the Dairy School in operation, which they did, at the invitation of the Hon. Minister of Agriculture and the President of the College, on the forenoon of the closing day of the meeting. It is hoped that what they saw will not only stimulate them to do better work in their respective factories, but will also impress on many of them the importance of taking a course at the School at their first opportunity.

The Dairy School is being well patronized—having some eighty-odd students in attendance, most of whom are taking the full three-months course in cheesemaking, buttermaking, milk testing and separating. There are included in the class several ladies, some of whom are taking the full course, while others are confining their attention to the home dairy department under the conduct of Miss Laura Rose. During our visit the entire equipment was in operation by the students, under the supervision of the several instructors. Milk received from the neighboring district, which is a beef-raising one, is almost all from turnip-fed cows, which necessitates the pasteurizing of the cream after it comes from the separators. This is done in a centrifugal pasteurizer, which heats it up to about 160°. The heated cream then passes over a cooler which quickly lowers the temperature before it enters the ripening vat. While every department of the School afforded interest, this pasteurizing process demanded the special attention of the visitors.

**Directors' Report.**—The report of the Board of Directors of the Association made reference to the necessity of reducing the number of factory instructors from three to two, for lack of funds, and of employing an instructor for summer creameries in Western Ontario instead of having one creamery instructor for the whole of the Province. It was decided to increase the cheese factory fees to \$15.00 for three visits of one day's duration each, instead of \$10.00 for four visits of one day's duration each; and to pay the instructors such fees, together with a small salary to cover the whole of their time and travelling expenses. While it was felt that more instruction is needed in both creameries and cheese factories, in order to keep the standard of our butter and cheese to a high pitch, the directors feel that the money of the Association should only be expended to assist those who are willing to help themselves.

**Instructors' Report.**—Mr. T. B. Millar, in his report, urged the directors to make the divisions smaller and employ more instructors. He made regular visits to 33 factories and had to refuse a number of applications. He tested 3,032 samples of milk with the lactometer, and 595 samples with the Babcock milk-tester. The milk tested from 1.6 to 6 per cent. fat. Eight patrons were prosecuted for tampering with milk sent to factories. Five had added water and the others taken cream. While he found a few dirty factories, there has been a decided improvement in this respect during the last three years. The temperature of curing-rooms varied from 60 to 88. The system of returning whey in the milk cans is still common, but more attention is being paid to the whey tanks. Gassy curds were attributed in some sections to Alsike clover pasture. Silos are increasing and resulting in better milk and more of it.

Mr. James Morrison reported that thirty-eight factories return whey in the milk cans, but the tanks are better looked after. The underground ones, however, are usually in a filthy condition. Many factories have been fixed up during the past year, and a number have put in buttermaking plants. Too many factories have poor floors and bad drainage, with the result that wash water lies under the buildings, causing bad smells in hot weather. More sanitary inspection was recommended. Many using ice in the curing-rooms allowed the temperature to get too high before putting it in. Some makers were found using too much starter in the milk to make first-class cheese. Others were careless in other ways. Patrons too often send unstrained milk to the factories. All such milk should be returned. Five factories paid for milk on the basis of the fat test. Some good advice to patrons and makers was given in connection with this report.

The report of James Struthers, instructor of summer creameries for Western Ontario, showed that while many of the creameries visited were in good condition, and doing good work, a number of them were in great disorder. Occasionally buttermakers were found running their churns too fast, or were making other mistakes. These men were put on the right track as far as possible. At all the creameries, except two, the drains were fairly good. Four of the creameries were provided with excellent cold storages, built on the Government plan, registering at the time of Mr. Struthers' visit, 35 degrees. Four creameries disposed of buttermilk to farmers, and two fed it on the premises. One of these had upwards of 100 hogs—too near the creamery for the good of the odor in the building.

Instructions were given to change their location. Some makers were found using too much salt in the butter, and some were not working it in uniformly. The instructor, in such cases, gave an object lesson in salting one or two lots.

**Preservation of Manure.**—Prof. Frank T. Shutt, chemist at the Central Experimental Farm, gave an extended talk on the results of some recent experiments in the preservation of manure. Eight thousand pounds of fresh manure at the end of three months weighed 2,960 pounds when protected, and 3,903 pounds when exposed in an open yard. The extra weight came from the accumulation of rain. Of organic matter, however, there was a balance of 109 pounds in favor of the protected manure. Of this, there were six pounds more nitrogen, seven of phosphoric acid and 17 of potash. When the manure was fresh it contained 25 pounds of phosphoric acid, and at the end of 12 months the protected lost one pound and the exposed four pounds. The chief loss was in potash. There was no fermentation without a loss in organic matter, with some loss of nitrogen. While there is much loss from protected manure heaps in this way, it is vastly less than when the pile is subjected to leaching and washing as well as fermentation. It was estimated that about one-half the plant-food in the manure on many Canadian farms is lost through exposure.

**Address by President Mills.**—The Principal of the Agricultural College referred to the College having its hand on all the dairy schools of the Province. He expressed his anxiety to assist the dairy industry by giving the patrons and makers more light, that our product may hold its own in competition with that of other countries. The British consumer is getting more cheese to choose from than ever before, which makes him more fastidious. The President desires to see every maker take a course in one or other of the dairy schools where first-class free instruction is offered. The owners of factories should employ only good men as makers, pay them a fair wage, and hold them up to the mark. The reputation of our goods demands it. He advised makers not to work according to the pay they receive, but do their best, no matter what the pay may be, then they will be more likely to rise. Dr. Mills strongly favored industrial education, that boys and girls may be taught to do things, instead of their education confining them to simply knowing about things.

**The Status and Work of Experimental Stations.**—Prof. W. H. Jordan, Director of the New York Agricultural Experiment Station at Geneva, referred to the history of U. S. Agricultural Experiment Stations, which had its foundation laid in 1862. These stations are getting at the working of things by rigid scientific investigation, which is enabling students to deal with fundamentals leading up to a thorough understanding. The function of these stations is not to make business men, but rather to furnish business men with facts with which to conduct their business. By the aid of science farmers have been taught to gather nitrogen from the air into the soil for their crops by the growing of clover. It has also taught that much economy of food can be effected in the use of the balanced ration. It has also taught that a cow does not require to consume fat in order to produce fat in her milk. Reference was made to a cow having been fed for 90 days on practically fat-free food. In this time she consumed only seven pounds of fat and gave 70 pounds of butter, while her body fat also increased. It was remarked that much good work is being done, but also much poor work. Too many technical, elaborate bulletins have been issued, but now these are being boiled down and edited into popular form before being sent out. The Professor showed that scientific education enables a man to control his business. Man does not exist because of the farm, but the farm because of the man. Men need not be slaves to their farms, if they will only acquire a knowledge of the fundamental principles of agriculture. The need of the technical training of girls was also dwelt upon, taking the ground that education should touch the home life as well as the farm life and business life.

**Address by C. C. James.**—The Deputy Minister of Agriculture for Ontario, in order to make clear the value of dairying to a county, pointed out that the County of Oxford exported within a year over \$1,000,000 worth of dairy produce, while Wellington sent out only \$158,000 worth. At the same time Oxford shipped within \$150,000 worth of as much beef as did Wellington. In the course of Prof. James' address it was shown that by proper tillage and growing the right sort of crops farmers can practically control the weather influences. The average summer drought has no effect on a wisely-conducted farm.

**Hon. Sydney Fisher,** in a pointed address, referred to finding out in England that Scottish cheddars are taking the market away from us by reason of their increasing excellence. He cautioned dairymen to be very particular to improve the quality of all cheese exported. The curing-rooms must be improved in order to prevent cheese from becoming heated. He dwelt upon the opportunity we have to expand our butter and bacon trade in much the same sort of an address as he gave at the Eastern Dairy Association meeting, which is reported in this issue.

**Observations in Creamery Work.**—Prof. G. L. McKay, of Iowa Agricultural College, a former Canadian cheesemaker, deplored the fact that American buttermakers have to compete with oleo, and other imitation products which are difficult to detect from dairy butter. He made a strong plea for better qualified men to take charge of large

creameries, and assured his hearers that skill will command corresponding remuneration. Prof. McKay drew attention to the fact that Kansas creamery owners are sending out expert feeders to visit the patrons, instructing them how to produce more milk at a greater profit. In this connection, it was pointed out that an account was kept at the Iowa Experiment Station with each cow of the herd, and it was found that some produced butter at a food cost of four cents per pound, while others consumed 14 cents' worth of feed for each pound of butter given. Some cows gave a profit of \$54 per annum, while others returned a profit of \$2.50 during the same period.

**Bacterial Infection of Cheese.**—Dr. Connell, of Queen's University, gave the same paper as at the Eastern convention, a report of which appears elsewhere in this issue. Following Dr. Connell, Mr. F. C. Harrison, Bacteriologist of the O. A. College, by the use of lantern slides showed sections of various species of germs which are known to produce certain ill effects in cheese. To get rid of these, it was pointed out that cleanliness in the stables, factories, etc., must be effected. Foul air is laden with foul bacteria, and bad water is a fruitful source of contaminating influences. Reference was made to certain cheesemakers having had trouble in getting milk to coagulate properly with the usual amount of rennet. An investigation of the trouble brought out the fact that the water of a well had become contaminated, and to purify it fresh lime was put into it. This rendered the water alkaline in action, which had the same effect on the vats, pails, etc., washed with it. Mr. Harrison recommended the use of charcoal instead of lime in such wells. During the discussion which followed, it was advised that persons who are not sure of the condition of their water supply should send a sample to one or other of the experimental farms for analysis. This is done free.

**Curing Rooms.**—Prof. H. H. Dean described the sub-earth duct, which is referred to in the report of the Eastern dairy convention, and also by the use of charts showed the advantage of curing cheese at a temperature between 60 and 65 degrees together with about 82° to 85° of moisture. Not only will the best flavors be secured, but there will be a minimum of loss by shrinkage. He described and advocated the use of the dry and wet bulb thermometers in order to determine the degree of humidity.

**Ice in the Curing Room.**—Mr. A. T. Bell, of Tavistock, described his ice box, which is three feet square and six feet high. It stands in the center of the curing-room, and has a galvanized-iron bottom and outlet for the melted ice. Resting on the galvanized bottom is a scantling rack upon which the ice rests when used in hot weather. This should be filled before the room becomes heated, when its value will be much increased. Mr. Bell has noticed a difference of 20 degrees between the temperature near the floor in front of the ice box and near the ceiling. Mr. Bell considers the ice-cooling system quite satisfactory in a well-insulated curing-room. In a large room two boxes would give better satisfaction than one.

**The Present Status of Feeding Valuations and Standards.**—Prof. W. H. Jordan gave a valuable and exhaustive paper upon the above subject, which we regret we cannot give the space due its importance. The question of what food is, how it does its work, and what is the relation of food to product? is the task given the scientist to solve by the intelligent dairymen and stockman. Agricultural chemists are constantly and persistently interrogated regarding two lines of inquiry, which may be typified by two questions: 1st, What is the relative value of corn meal and cotton-seed meal; and 2nd, What is the best ration for milk production? Prof. Jordan asserted that the majority of agricultural chemists are agreed that to neither of these questions can a direct, unqualified answer be given. While the relative values of various fertilizers, the contents of which are definitely known, can be fairly arrived at, it is not the same with food products. Simply because existing conditions render it impossible. The dry matter of cattle foods is made up of ash, protein, carbohydrates and fats, and we base the value of a food upon the content of the last three named ingredients. We cannot buy and feed any one of the compounds separately and learn its value, so that all have to be secured and fed in conjunction, so that exact values of either cannot be arrived at; and not only that, but different foods have varying physiological values. True, the heat- or energy-producing values of the different compounds in food can be arrived at with almost definite accuracy, but food has other functions besides the production of heat. Building of the body has to be done, but the relative values of these compounds for constructive purposes are not yet definitely known, nor can they be, since the varying digestive apparatus of animals have an important influence. The advice Prof. Jordan gave to feeders was to base their judgment of the value of digestible stuffs primarily upon the proportion of digestible dry matter which they contain. It must be remembered, however, that comparisons of this kind can be instituted only between feeding stuffs of the same class. The relative values of oil meal and corn meal cannot be ascertained in this way, neither can those of timothy hay and corn meal. Neither can the carbohydrates of timothy hay and corn meal be given an equal value, since the former demands extra energy from the animal in masticating and digesting it. It has been calculated that the chewing of a pound of hay exhausts 76 calories or units of heat, while a pound of oats during mastication exhausts 21 calories, and a pound of