yield of milk per animal by fully 2,000 pounds per annum, and there would be a good market for it all. The great competitor of the Canadian dairy-

all. The great competitor of the Uanadian dairyman was not his own township neighbor, but the man at the other side of the globe.

Butter from Pasteurized Cream.—Prof. Dean, Mr. Ruddick, and Instructor Sprague all spoke highly of the benefits to be derived from the practice of heating cream to 158° or 160° and then cooling. Bad flavors are driven off to some extent, and by the use of a proper "starter" the buttermaker by the use of a proper "starter" the buttermaker afterwards has the development of the desirable

flavor very much under control.

Practical papers on buttermaking by Messrs.
Ruddick and Sprague, with the reports of the various instructors and the discussions which followed, made the proceedings interesting and profitable to the large number of makers present. The interest

the large number of makers present. The interest was continued up to the very last, and everybody went home feeling that the convention was in all respects one of the best yet held by the Association.

Officers Elected.—The following were elected officers for the ensuing year: President, D. Derbyshire, Brockville; Vice-Presidents—E. J. Madden, Newburgh; John McTavish, Vancamp; Alpin Campbell, Ormond. Directors—Division No. 2. E. Kidd, North Gower; Division No. 3, J. R. Dargavel, Elgin; Division No. 4, Jas. Whitten, Wellman's Corners; Division No. 5, T. B Caslow, Warkworth; Division No. 6, Henry Wade, Toronto. Auditors— Division No. 6, Henry Wade, Toronto. Auditors-Morden Bird, Stirling; F. Brenton, Belleville.

## Cheese and Butter Convention of Western Ontario.

The Butter and Cheese Association of Western Ontario held its annual convention in London on January 19th, 20th and 21st. President Alex. McLaren, M. P., Stratford, in his address referred to the happy coincidence of the past, being our jubilee year as well as our banner year in the butter and cheese trade. This Association represents both the cheese and butter industry, not only in name, because many of our cheese factories have introduced winter buttermaking. This is a step in the right direction, and needs combination makers in order to preserve the dairy industry in its highest form. He regretted that many joint stock companies have not asked the assistance of the cheese instructors, but shouldered off the entire responsibilty of turning out the best product upon the makers. It was recommended that more inspectors be employed in order that the system be made more uniform and modern, so that the name Canadian will stand for excellence and uniform We must not be satisfied with past successes, but continue to improve by means of our dairy schools, agricultural papers, etc. The Babcock tester and weighscales were also pointed out as valuable educators when applied to the selection and maintaining of the animals in our herds.

Mr. McLaren pointed out that education has enabled many to make as much out of one cow and one acre as was made out of two cows and two acres twenty years ago. have room for advance in our cow-keeping, care of milk and in many other ways. Farmers should go and learn the methods of those who are making more money than themselves. Many stables need more light, ventilation and comfort, which will as soon as introduced increase our Common faults were pointed out which occur in box-

ing cheese, such as an absence of top and bottom scale boards, boxes not the proper depth, of bad timber, etc. Every maker should demand a gool equipment. Members of ioint stock companies were advised to take an interest in the details of the factory, its surroundings and appearance. INSTRUCTORS' REPORTS.

Messrs. T. B. Millar, Guelph; James Morrison, Stratford; A. F. Clark, Stratford, and Mark Sprague, Ameliasburg gave reports upon their season's work. A summary burg, gave reports upon their season's work. A summary of Mr. Morrison's report appeared in the FARMER'S ADVOCATE of December 1st, 1897, issue. Mr. Millar's territory was that part of Western Ontario north of the main line of the Grand Trunk from Sarnia to Toronto, and as far north as Georgian Bay—enough for three instructors, there being in that district 155 factories. One hundred and twenty-eight visits were made, and devoted chiefly to instructions in cheesemaking and in testing milk. The richest sample found tested 4.6% butter fat, and the poorest 1.2—the bulk containing between 3% and 4% fat. F.ve factories pay for milk according to qua ity, the patrons of which were generally well satisfied with the method. Eight patrons were fined for tampering with milk. Out of 82 thermometers tested only 36 were correct. Each factory should have one correct one to test others by. Fourteen factories fed whey at the factories, and twenty returned it in the milk cans to the patrons. This latter practice was referred to as the great evil of the cheese business to-day. Many whey tanks are kept positively dirty. They should be cleaned once a week. Almost every factory has some dirty patrons who do not strain the milk before sending it to the factory. Makers must demand that all milk received be clean and of good flavor. The sanitary condition of many factories was alarmingly bad, poor floors, no drainage, and poo's of rotten whey under the floors. Sanitary inspectors should be appointed and given power to close such factories till made right The heating of curing rooms by furnace was advised. Both temperature and degree of moisture were found wrong in many instances. Mr. Millar recommended the appointment of more instructors, and that some experimental work in cheese factories be carried on.

Mr. Clark classified the condition of the factories in his division as follows: Two very clean, eleven clean, nineteen fairly clean, four dirty and three as very dirty. The curing rooms of these factories corresponded in condition with the factories, and the condition and appearance of the cheese much the same. Instruction with these dirty, careless fellows seems useless. A naturally dirty, untidy fellow should have no place in a cheese factory. A number of

defects in making were discovered and pointed out, often with profit. Of milk tested seven samples were found between 1 and 2 per cent, and two between 5 and 6 per cent. About two-thirds of the samples tested between 3 and 4 per cent. fat. Twelve patrons were fined for tampering with milk. Too few keep a diary of their work, which would prove a valuable educator.

Mr. Mark Sprague, the Ontario Creameries Instructor, commenced work April 12th among cheese factories that had put in butter plants.

As soon as these factories went back to cheesemaking the regular creamery inspection and instruction began. Twenty-five out of thirty-two were cream-gathering and seven were milk-gathering creameries. The daily make of these creameries at the time of first visit was 19,875 lbs., put up chiefly in suitable packages for export. The milk and cream from 6,244 different farms was used and paid for by test—gathered cream by oil test and milk by Bab-cock test. Each creamery had left with it the opinion of the Inspector as to condition of the cream room and vats, work room and appliances, storage, drainage, and sugges-tions on making and packing butter. The general condition of most of the creameries and equipments were good, although a few were in a bad state.

Mr. Sprague express a hope that Prof. Robertson's system of cold storage would be generally adopted, as where-ever he had found it in operation the best results were ob-tained. The practice of holding June butter till October is still in vogue in too many creameries, but there is a growing tendency to ship weekly to the Old Country market by the cold storage system. Deep setting of milk is the main method of separation. By test it has been found that much fat is being lost in skim milk thus found that much fat is being lost in skim milk thus skimmed. By public meetings and otherwise it is hoped that patrons will learn how to increase their profits. A DISCUSSION

upon the President's address and Instructors' reports brought out the opinion that paying for milk for cheese making by adding two per cent. to the fat reading was most nearly correct, as it gives the cheese value of milk. The whey question received considerable attention. The most generally favorable plan was to feed the whey at the factory, having the pig pen 200 yards from the factory, preferably to the north east, so that bad odors are not carried into the factory. Every factory was recommended to own waggon cloths to cover cheese while being hauled to the station. Oiled or painted cotton was recommended, which will keep off dust and also rain. The use of dirty waggons for hauling the cheese was strongly condemned There was a vigorous protestation against the use of inferior cheese boxes. Boxes should be made of good material, have strong hoops at the bottom, should have double scale boards top and bottom, and fit the cheese perfectly. This is an important perfectly. This is an important matter, as it has much to do with the condition of the cheese when it reaches the English market. The cause of moldy cheese was given as too much moisture in the cheese or in the curing room, and too little ventilation and light. The subjects of milk separation and pasteurization came up, when members separation and pasteurization came up, when memcers claimed they got closer skimming at the pasteurizing temperature of 158 degrees. This was objected to because it would injure the grain of the butter. Others claimed that no such results would follow if the cream were quickly cooled down to 50 degrees after separation. Starters were claimed to be necessary in winter creamery work, especially when the cream is pasteurized. Starters should be made from clean flavored pasteurized milk to which has been added a quantity of previous day's starter. It should be prepared in a clean can, closely covered. Mottled butter was said to be due to three causes: uneven distribution of was sait, working when too cold, and by the incorporation of specks of curdy matter. The first was discribed as mottled, the second as streaked, and the third as specked. Discoloration of cheese is due to ferments and an excess of mois-

Prof. J. W. Robertson, in an address, pointed out that while we have made great advances in dairying, more diffi-culties are facing us year by year. It is much easier to control flavor and fermentation in a new dairy section than in an old, for the reason that bacteria peculiar to milk increase very rapidly where milk is to any extent exposed In new dairy sections, in Manitoba, for instance, milk will remain sweet for several days, even when the weather is warm. Therefore, the older dairy sections require greater care and cleanliness. In Sweden, where a superior dairy product is made, the milkers always wear a long linen garment, entirely covering the body, while at work, and the cows' sides, hips and udders are carefully brushed or wiped with a damp cloth. Referring to the Agricultural Department, Prof. Robertson pointed out that it was to help those who help themse'ves. We have land, cows and markets, and the desire of the Agricultural D-partment is to assist in getting the most out of these. In this age mental clearness counts for more than muscular labor. We need more co operation in order to collectively take advantage of the Government's efforts in our behalf. Each man cannot provide cold storage in which to convey his products to England, but he can by co-operation appropriate the Government's efforts along this line. Each man can, however, by exper ments find out the best cows, best foods, best stables, The Department has taught much by the travelling dairy, travelling sprayer, and in many other ways. dentally the curing of cheese was mentioned, and the Professor pointed out that he had seen Canadian cheese sold in London, Eng., for 42 shi'lings per cwt., while Scotch Cheddars were selling just across the way at 60 shillings, the difference being due to a heated flavor in the Canadian product. New cheese has no flavor, but contains the germs that produce it, which cannot work at certain temperatures. About 65 degrees is best for the curing of cheese. Butter should go into cold storage as soon as made. In the Northwest May butter has been held in good condition till October. He argued strong y in favor of having "Canadian" stamped on all cheese, the stamp being deeply impressed into the cheese. The English people follow fashion, and just now it is fashionable to have Canadian

things, and now is our time to take advantage. should co operate to have a regular supply of cheese, butter and bacon going forward to insure a steadily growing demand.

MISS ROSE, ASSISTANT INSTRUCTOR at the Guelph Dairy School, told in an intertaining and vivid manner what she saw in two English dairies in 1896. Before referring to the dairies she elaborat d upon the beautiful landscape of England and the happy leisure of the people. The first dairy described was built of stone, and had a thatched roof, which acts at a temperature modifier. The milk is strained into leads 5 feet by 21 feet, by 3 inches deep. It is skimmed four times at regular intervals of twe ve hours each after milking. The butter was churned by horse power, and came in one large lump. A few handfuls of salt were added, which was worked in by hand, no attempt being made to preserve the grain. Finally, the hands were dipped into warm water and the butter was rolled into Oxford prints, the only form sold in the local market. The pigpen was disgustingly near the dairy in many instances. The second dairy described made use of an Alexandra separator. The walls and floors were of blue and white tile, the latter having gutters of running water. The tab'es were of marble, and everything was scrupulous y

OUR AGRICULTURAL WEALTH

was the subject of an address by Prof. C. C. James, Deputy Minister of Agriculture for Ontario. It is estinated that \$10,000,000 or \$12,000,000 will be brought out of the Klondyke in 1898, about \$2 a head of population, over which the country is going wild. In 1897 the value of the grain crops of Ontario from eight and a half million acres of land was estimated at \$40,000,000. If by better seed and better farming the yield could be increased one bushel per acre we would have a gain of \$8,500,000. At the Ontario acre we would have a gain of \$8,500,000. At the Ontario Experimental Farm selected seed produced of wheat 18.4 bushels per acre, against 14.7 bushels per acre from ordinary seed; of oats, 50½ bushels, against 44; of peas, 38 bushels, against 26 grown under similar conditions. A little special effort in the direction of better selection from the best varieties would increase our '98 grain value by \$10,000,000. our '98 grain value by \$10,000,000.

our so grain value by \$10,000,000.

We have extraordinarily favorable fruit-growing facilities, both in soil and situation. We can grow more varieties to perfection than any other country. We have about 6,000,000 bearing apple trees, which do not exceed 50 cents per tree of return per annum, while \$2 per tree is not too much to expect if the best varieties were grown and given proper care we have an annual Klondyke in it. In 1897 our 60,000 cheese factory patrons received an average of \$200 each. By better cows and better methods there is room for a great increase. A little development all along dairy lines would mean millions of dollars increase to the Canadian people. Prof. James showed that a very little better work on the part of each and every producer would bring to Canada and distribute among our people quite \$20,000,000 increase over 1897—a Klondyke indeed, in which no sacrifice of life need occur.

## MR. DANIEL DERBYSHIRE,

President of the Eastern Ontario Cheese and Butter Association, said a good word for our dairy schools and agricultural college, and stated that by making more use of these our profits will increase and our lives be brightened. We need not fear an overproduction so long as we continue to improve. Education is our great hope, as there is always prove. room at the top.

BACTERIA IN THE DAIRY

was well discussed by Dr. Connell, of Queen's University. Bacteria are one-celled microse seen with the naked eye except in colonies or clusters. The doctor stated that one billion could be contained on a fivecent piece. There are many species, and found everywhere. They multiply very rapidly under favorable conditions. The presence of organic matter, moisture and a suitable temperature are necessary conditions for growth. Different forms require different temperatures; e.g., disease microl es do best at 98° or 99°—the heat of the body; others 65 to 80, and those common in the dairy from 50 to 60. At 45 degress their growth almost ceases. At the freezing point microbes lie dormant, but frost does not kill them. begin to die, however, at 130 to 140 degrees, and at 158 degrees most species are killed, hence the value of pasteuriza-tion. Sunlight too is an important destroying factor, it is therefore well to admit plenty of light into the stables and into the dairy.

The many changes that go on in milk are due to the influence of bacteria. Souring is caused by bacterial fermenta-tion, breaking down certain products and producing lactic acid, which throws down the casein in the form of curd. In the ripening of milk or cream for cheese or butter making, by proper temperatures, cleanliness and treatment the desirable forms are given the field, whereas much trouble may be caused by the admission of filth, etc. Good bacteria are always present, and find in milk a suitable field for development. Bad sorts or propagated in uncleanliness in the stable, whey tanks, improperly washed cens, etc. The sort that causes pin holes and floating curds originate in the manure of cows, and when these become dry they float everywhere, hence the importance of keeping mi k covered, not only in the stable but on the road to the factory. The cause of discoloration in cheese was found to be a reddish slime existing in a factory gutter. When the gutter was thoroughly cleaned the trouble ceased. Factories in which slimy tanks, floors, sinks, sink cloths, gutters or other places exist will continue to have difficulty in avoiding trouble. The same principles hold good in buttermaking. CURING CHEESE.

Mr. J. A. Ruddick, superintendent of Kingston Dairy School, addressed the convention on cheese-curing He has found that the curing is influenced by moisture and temperature rather than rennet. A well-made cheese can easily be ruined in a poor curing room. Very material changes

in values can be effects and moisture. The room is from 60 to 65 c taining the proper ten curing room. The bes sulated walls and floor six ply of building pa strips of wood and a d an underground dust opening into the atm the ground. This she wing, is kept facing t should have a cement PRESENT

FEBRUARY 1, 1898

At this juncture medals, given as prem Industrial and Lond sor Salt Co., were pre their representatives. ter and two for crea Windsor salt. The v Marion Burk, Bowm grave, the latter a gr medal for the creame P. Bearmion, Desbor was not pr sented o rightful ownership. TH

Prof. H. H. Dear stated that milk is formed part y by th while the milking i while the milking is udder of a slaughter ease a cow remains give. The yellow of called lactochrome, have a special pow see the time when cheese or butter ma only to deceive the more fat if milked twice, for the reason lates secretion. In be thrown away, bacteria which have elean the hind quar pers in the fall an trimmed off. Man in the course of the

was the subject of perimental Farm C of well water sent taminated. Natur free from organic gerous to their use most convenient, situation without Leaching from pri poi oning of the water, be they lo diphtheria, indige frequently due to is not necessarily its distance from least ten times as tenacious clay a case the slope of ern the location o SUMMER AND

was talked of by dress was largely ly in the commer experience Mr. Cocheese and butter conditions for ma extremely hot we usually good, and pure. Instances bad flavors in be or the herd havin trouble from suc can be traced b separately up t odors contained. traced to the pa arrivel at. In v and may be due Moldy chop fee The speaker sta made from good is supplied from long churnings buttermaking pr followed in Cana of the tablet ac every day. A discussion pointers: Crean

> Prof. J. W. per cold storage tory to the Bri buy deteriorate ting. The poor than ever befor grade food pro good prices only

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