

quality made for English and more local consumption was more aromatic and less durable. He maintained that when the centrifugal system became more perfectly understood, it would supercede the ice system. In Denmark the centrifugal was not used for less than 12 or 15 cows; in Canada 20 or 25 cows would be required. He advocated the introduction of the Danish system of education into Canada.

WHAT BUTTER COSTS.

Mr. M. Moyer, Walkerton, Ont., who controls a number of creameries in the county of Bruce, gave his experience in butter making. He allowed the farmers to do their own skimming, so that they could get the milk in the best condition for their calves. He divided the patrons into companies, creating a rivalry between the latter, so that one company was led to look after the fraudulent practices of the other, thus greatly reducing the expenses of manufacture. He made the cream tests on the farms in presence of the farmers. The patrons had all found out that it was the best policy to do what was right. According to this system, dishonesty injured the patrons, not the factory. He found that he could gather the cream and manufacture butter for four cents a pound. His market was in England, where he procured 22½ cents a pound for his butter, leaving 18½ cents to the patrons for their cream. He believed there was as much profit in butter as in cheese, and the labor was no greater. Every farmer could calculate this for himself, for the milk required for one pound of butter would make 2½ lbs. of cheese. Butter making could be continued the whole year through, whereas cheese could only be made in summer, and besides calves could be raised on the skim milk, and the fertility of the soil could thus be kept up. His patrons had done well last year under very disadvantageous circumstances. The season was dry, and he had to close two factories in September, there having been no soiling crops to keep up the flow of milk. He had sent an expert to England at his own expense, and found that his butter was as good as any in the English market, even including the Danish butter, but the English entertained a prejudice against Canadian butter. He thought this could easily be removed. It did not require twenty years to establish a reputation in butter, as was the case with cheese. He repudiated the practice of coloring the butter. He contended that the whole system of private butter making was wrong; storekeepers paid the same price for all grades of butter, and there was no use in trying to change this practice without co-operation. His idea of education was for the butter makers to understand their business, and then let them show the farmers their mistakes practically. He wanted to have the butter shipped fresh as soon as made, and he thought we could soon show that Ontario, as a butter producer, was the best country in the world.

T. D. Curtis, of Syracuse, N. Y., stated that Americans did not care to push a foreign market for their butter; they wanted home consumption. There was no established system of butter making; no maker could duplicate any of his results. That great experimenter, Dr. Sturtevant, could not make any two churnings alike. There were the deep vs. the shallow,

and the slow vs. the rapid cooling systems, and he quoted Dr. Kedzie's exhaustive experiments to prove that moderation in these processes was best. (This result is supported by Prof. Arnold.—Ed.) The speaker said that this continent stood greatly in need of experiment stations, as the experiments as conducted so far were not sufficiently reliable for practical purposes. He repudiated the idea of fairness in the cubic inch system in any form. Actual churning was the only fair test.

Prof. Arnold here explained that justice could not be meted out even by analysis. Churning was approximately reliable. Breed made a great difference in the butter making power of a cubic inch of cream. When the butter globules were large and small mixed, they packed more closely than when they were all of a more or less uniform size. When the globules were mostly all large, the cream was not so solid. Even churning was not a reliable test, but when made under exactly similar conditions, it was an approximation to justice.

SCIENCE VS. PRACTICE.

T. D. Curtis, editor and proprietor of the *Farmer and Dairyman*, Syracuse, N. Y., read an excellent paper on "Some Hints on Dairying." He said no expert could force success under all circumstances; if he could there would be no use for science. Science was uniform and exact; practice had no guide. The practical man stumbled to success, and luck was his god. He dwelt on the defects of curing rooms, on rennet and its preparation, and the injustice of associated dairying. Farmers were not generally aware of the extent of this injustice, especially in butter making, and as soon as they became educated to these defects, there would be a revolution in the dairying business. He put special emphasis on the cubic inch system of measuring cream. So long as these injustices prevailed, no improvement could be expected in stock breeding and feeding.

WHAT YOU SHOULD EAT.

Prof. Arnold read an interesting and practical paper on "Dairy Products as a Food." He said the great majority of people paid no attention to their health or mental sanity; wealth and distinction occupied their whole time and energy. They left their health to the doctor, their quarrels to the lawyer, and their souls to the minister. But publications on health were now becoming more widely diffused and more broadly appreciated than formerly. The conditions in towns and cities were more favorable to the spread of disease than in rural localities. Some foods contained an excess of some constituents of the body; other foods contained a deficiency. Some foods were too heating; others were too cooling; some contained infection, paving the way for disease. Most all our ills can be traced to what goes into our mouths. The milk of every dam was a perfect food for her young. Human and bovine milks differed but little in their chemical composition, so the one could largely be substituted for the other. But milk was not a perfect food for animals of advanced age. It stood to reason that after the period of growth was completed the animal then required less mineral matter or bone forming material, and less nitrogenous or muscle forming material; only enough of these

substances to repair the waste of the system was necessary. The compounds in the food which chiefly built muscular tissue were termed albuminoids; those which chiefly went to bone were mineral matters or ash; and those which supplied heat and formed fat were divided into fats and carbo-hydrates. All these constituents must exist in the food in the proper proportion during the different stages of animal growth, maturity and decay; and if the necessary proportions could not be found in one article of food, then the diet must be of a mixed nature. If the food contained too much fat or heat producing substance, the surplus must be worked off in some way, and so overtaxed some of the organs. So it also was if the food contained too much nitrogenous matter or albuminoids, inducing a predisposition to kidney complaints, Bright's disease, etc. Milk was more nutritious than beef and was not half so expensive, but it was too liquid for adults. This difficulty was overcome by condensing the milk. The milk of some breeds contained too much fat for human consumption; that of others contained too little, so a mixture would be about right. Milk was the result of a decomposition of tissue; and it was necessary that the cow should be healthy, and her food should not be of a stimulating nature. Filtering through charcoal would rid the milk of bad odors. In speaking of cream as an article of diet, the professor said that its chief richness lay in the portion which formed the butter-milk, but the virtue of the butter fat consisted in the fat being in a more digestible form than other fats. The volatile oils of the cream being attenuated, were readily available, and so the cream was good for invalids, and was the best cod-liver oil that could be procured. Butter was a pure luxury; cream was both a luxury and a necessary, and was an excellent brain food, being more of a lubricant than a stimulant for the brain. Butter was a wasteful and worthless product. For a few cents science could replace everything that was contained in a whole pound of butter. A little education might prevent people from sacrificing nine-tenths of the milk in order that one-tenth in the form of a luxury should be saved; but there was money in it, and there the matter ended. The cheese was the bone and sinew of the milk.

The following officers were elected for 1885: President, Thos. Ballantyne, Stratford; 1st Vice-President, H. S. Losee, Norwich; 2nd Vice-President, H. Parker, Woodstock. Directors.—Division No. 7, R. Hay, Wyandotte. Division No. 8, A. Spiers, Caistorville; Division No. 9, R. Carswell, Ingersoll; Division No. 10, W. Messa, Bluevale; Division No. 11, John Wheaton, London; Division No. 12, T. Cleverden, Strathroy; Division No. 13, J. H. Masters, Cookstown.

A cow giving milk should never be fat. Either the milk is deficient in quantity or quality, often both. The best cows are never fine looking animals, except to the eye of an expert, who can see behind the rough and bony frame evidences of good milking qualities.

From the milk records of the Michigan State Farm, the average annual yield of six Shorthorns was 5,009.16 pounds; of six Ayrshires 8,525.33 pounds, and of two Jerseys 4,919.5.