"The analyses of these four samples exhibit a wide range of variations, which I found in equally pure and genuine country milk. The first analysis represents the composition of a sample unusually rich in butter; the second shows the composition of milk of average good qualities; the third of poor, and the last of very poor country milk."

The richness of the first is ascribed to the excellence of the pasture in the autumn, when milk though smaller in quantity is always richer in quality. The last sample was also September milk, and the very small amount of butter yielded is attributed to poor and scanty pasture. In the same month (September) the Doctor procured samples of milk from two of the farms, on which the cows were out in grass, having an abundant supply of grass of good quality. The morning and evening milk from each farm on analysis furnished the following results:—

	1		2	
	Morning Milk	Evening Milk	Morning Milk	Evening Milk
Water	87 07	87 20	87 50	87 70
Fatty Matter (pure butter)	5 44	5 70	5 10	3.99
*Caseine (curd) and a little albumen	3 37	3 33	3 45	3 37
Milk Sugar	3 85	3 95	3 18	4 57
Mineral Matter (ash)	.77	.71	.77	.77
	100 00	100 00	100 00	100.00
*Containing Nitrogen	.53	.54	.52	.64

"These analyses do not show any great difference, and prove that the quality of the September milk was good, and nearly the same on both farms, but compared with the September milk of No. 4 in the preceeding table, striking differences manifest themselves, indicative of the influence of food on the *quality* of milk. Thus on the farms on which the cows were provided with abundance of grass, the amount of solid matter, on an average was 12½ per cent; and in the dry matter we have 3½ per cent of pure butter, and about the same quantity of curd; whereas a scanty supply of grass produced milk containing little more than 9 per cent of solid matter, and in this only 1¾ per cent of butter.'

It will be seen that the variations in the amount of curd and milk sugar in good and watery milk are far less striking than those in the amount of butter. A very good judgment of the quality of milk may therefore be formed from the amount of butter which it yields in churning, or from the amount of cream which it throws up on standing. Instruments, adapted for measuring the *quality* of cream thrown up by different samples of milk, are called creamometers. They are simply graduated glass tubes, divided in 100 equal degrees, in which milk is poured up to the division marked 0, and kept at rest for twelve hours. Although the creamometer does not furnish results which correctly represents the real amount of butter in different samples, it nevertheless affords a ready means of ascertaining whether milk is rich or unusually poor in butter, in other words, whether or not milk has been skimmed to a considerable extent. Good milk of average quality contains from 10¼ to 11 per cent of dry matter, and about 2¾ per cent of pure fat. It yields from 9 to 10 per cent of cream Naturally poor milk contains 90 or more per cent of water, and less than 2 per cent of pure fat, and yields only 6 to 8 per cent of cream, or even less.

From experiments carefully conducted on a large scale, it appears that the thickest cream does not always yield the most butter. Cream from different kinds of milk varies very much in its composition. The creamometer, therefore, is not to be implicitly relied on when samples of milk have to be tested that were produced under very different circumstances. Milk that has been subjected to agitation by its transportation from the country to towns throws up less cream than when it is not disturbed. Dr Voelcker found by experiment that one hundred measures of new country milk, after standing for 24 hours at 62° F., gave 12 per cent. of cream by measure; whilst at the same time, a little quantity of the same, after having been greatly shaken in a bottle, threw up only 8 per cent. of cream. This perhaps, is the principal reason why milk dealers in towns give a higher price for the milk of well-fed town cows, than for that sent from the country. With reference to adulteration, the Doctor observes:

"However, London milk, as generally sold to the consumer, is usually skimmed once, and diluted with about 30 per cent. of water. A good deal has been said and written about milk adulteration. Sheep's brains, starch paste, chalk, and other white substances, which are said—on what authority nobody has ever decided—to have been found in milk, only exist in the imagination of credulous or half-informed scientific men. It is difficult to understand where all the sheep's brains should come from, and how they could be amalgamated with milk; nor is it at all likely that chalk, a substance insoluble in water, and not easily kept in suspension, should be employed for adulterating milk. As a matter *of fact*, I may state that I have examined many hundreds of samples of milk, and never found any chalk nor any adulterating material except an extra quantity of *water*; and that I never met as yet with a chemist who has found any of the clumsy adulterations which popular treatises on food describe as having been detected in London milk."

The whole question of milk adulteration and means of detecting them, resolves itself into an inquiry into the character of good, bad, and watered or skimmed milk, and the mode of recognizing them with precision.

"As the result of my own experience, founded on the examination of many samples of milk produced under the most varying circumstances, and purposely adulterated with known quantities of water, I may state that milk may be considered rich when it contains from 12 to 12½ per cent. of solid matters, 3 to 3½ per cent. of which are from fatty substances. If it contains more than 12½ per cent. of solid matter, and in this 4 per cent. or more fat, it is of extra rich quality. Such milk throws up from 11 to 12 per cent of cream in bulk on standing for 12 hours at 62° F., and has a specific gravity varying from 1.028 to 1.030."

Good milk of fair average quality, contains from 10¼ to 11 per cent of dry matter, and in this about 2¾ per cent of pure fat. It yields 9 to 10 per cent of cream, and has a specific gravity of about 1 030. Poor milk contains 90 per cent or more of water, and has a lower specific gravity than 1.027. Sweet milk yields not more than 6 to 8 per cent of cream. Skimmed milk throws up still less cream, has a bluer colour, and is more transparent, and when undiluted with water has a slightly higher specific gravity than new milk. Good skimmed milk has a specific gravity of about 1.033 and poor skimmed milk 1 028 to 1.030 Milk purposely watered yields only 5 to 6 per cent of cream, and *invariably* has a lower specific gravity than 1.025. If milk is both skimmed and watered it yields less than 4 per cent of cream, and possesses as low a specific gravity as 1.025 to 1.026.

"A great many experiments have led me to the conclusion that within certain limits the specific gravity is the most trustworthy indicator of quality, and that for all practical purposes an ordinary hydrometer float, by means of which the gravity of liquids can be ascertained with precision, and a graduated glass tube, divided into 100 equal degrees, constitutes the safest and readiest means for ascertaining the quality of milk so far as it is affected by the relative proportions of the normal milk constituents A set of such instruments or lactometers, one being a graduated glass tube for measuring the proportions of cream thrown up on standing, and the other a gravity float or hydrometer, with plain printed directions for use, can be obtained of Messrs Negretti & Zambra at the cost of a few shillings." It is further stated that in using these instruments no chemical skill is required and that their results are perfectly reliable.

Our readers will perceive from the before mentioned facts and reasonings, how important it is that dairy farmers should pay the greatest attention both to the *breeding* and *feeding* of their cows. As cheese making is already attracting increased notice, and are some localities is carried on upon a extensive scale, its profits will be found to depend in a great measure, on the attention bestowed on the improvement of our pastures, and the raising in sufficient abundance of the most suitable kinds of food for dairy cattle.

An Agricultural Museum.

WE request the earnest attention of our readers—especially such as are members of Agricultural Societies—to the importance of establishing a public agricultural museum for Upper Canada. Ample provision for this interesting object has been made by the Board of Agriculture in providing a capacious Hall, in the building erected a few years since in this city; but we regret to say that hitherto little has been accomplished in the way of procuring specimens. Circulars have been issued to the Agricultural Societies soliciting material, but with small success. A few individuals have sent some suitable specimens, and the Board have in their possession a pretty extensive collection of grains, in bottles, chiefly foreign specimens, but as yet they have obtained almost nothing of Canadian growth. It is hoped that the present appeal will be the means, ere long, of wiping away what cannot be otherwise considered than as a reproach.

A museum of this kind should contain characteristic specimens of farm produce from every county of Upper Canada, models of implements and machines from our own mechanics, or the articles themselves when not too bulky. The name and address of the maker, price, and claimed advantages should be inserted on a card and attached to each article, thus affording to the manufacturer a standing advertisement, and much useful information to the public. Specimens of grains and grasses, such as are comparatively new, or peculiarly adapted to special localities, should occupy a foremost position in a collection of this character. The specimens should be carefully pulled up by the roots a little before they become dead ripe, accompanied by about a pint of the grain. In this way visitors can form a much better idea of the growth and characteristics of the plant than from the mere inspection of the seed, or from any verbal description. In all European collections, grain is now invariably, we believe, shown in the straw, with the roots attached. Characteristic specimens of farm or garden root crops, whether new varieties, or old ones recently introduced into new districts, would be very suitable and desirable acquisitions; as would also such kinds of fruit that would keep for a few months. By such means, with brief descriptions of the soil climate, and culture, accompanying the productions, much useful and interesting information would be imparted. Collections of weeds and insects injurious to farm and garden crops, briefly and popularly described, would be very desirable, and might be the means of awakening an interest in some minds to inquire into the growth and habits of these pests, with a practical view of preventing or mitigating their ravages. Specimens of wool from the different breeds of sheep raised in this Province, and also from abroad, would be most acceptable contributions, together with flax and hemp, both in their natural and prepared states. The characteristic rocks from which our soils have been derived, limestones and other minerals possessing manurial properties, together with our ornamental and useful woods, would all add much interest and utility to an industrial museum.

As large numbers of travellers and emigrants annually pass through Toronto, a collection of industrial products of the field and of the workshop, if thoroughly carried out and adequately sustained, would be an object of much public interest, and the means of drawing attention to the resources of the country, and of imparting, in the most practical manner, much valuable information in relation thereto. Professor Buckland, we understand, has brought the claims of the museum prominently before the agricultural public in the meetings he has recently held in different parts of the country, with, we are happy to learn, a cordial promise of support. Without the co-operation of all the Agricultural Societies, and the aid of patriotic individuals, the fully carrying out of what we have now briefly sketched will be a perfect impossibility. *Every county in Upper Canada should be represented in a Provincial Museum*; and this might readily be accomplished *by each Society doing its respective part in the way of contribution.* We trust that a united effort will be commenced in earnest the present season, and that ere long the handsome and capacious Hall, now almost vacant, will be creditably filled with the best productions of our fields and workshops. Mr. H. C. Thompson, Secretary of the Board of Agriculture, will be happy to give information relative to this project, and to receive contributions.

The Cattle Plague in Ireland.

We learn with much regret from our recent British fyles, that the Rinderpest has crossed the Channel, and appeared among some prominent and valuable Irish herds. We have, however, considerable faith in the vigilant and energetic action of the Government, and the stock owning classes in the island for the prompt and effectual extermination of the plague. The "stamping out" process within infected "cordons' is in full operation. Profiting by the painful experiences of Britain, Irish breeders have not hesitated to resort at once to the only remedy for the disease yet discovered—the pole axe. We shall probably soon hear the last of Rinderpest in Ireland.