its name suggests, a natural law of force, and in a most strikingly effective manner. There are already several of these separators, wholly disparate in character and appearance, but employing the same principle—that of centrifugal force—in the separation of the cream from the milk. And the application of this natural law is, in this case, uncommonly simple and effective, working perfectly, quickly, and continuously. A hollow vessel, made of great strength—resembling an exaggerated orange in form, in one of the machines—revolves at a great speed; the speed, however, varies from 1,500 to 6,000 revolutions per minute, in the different machines. The milk is made to run into the vessel in a stream, like the stem of a clay pipe, and instantly responds to the motion. The effect of the motion is to separate the cream from the milk—the lighter from the heavier portion—whereupon the latter gravitates to the outer, and the former to the inner, circumference of the rotating vessel, tubes being arranged to conduct them away as fast as they separate. The amazing simplicity of these machines, and their efficient action, has made them, in the short space of six to seven years, to assume the position of a thoroughly practical instrument, and their permanence is distinctly assured. I saw the germ of these machines—the idea from which they have been evolved—exhibited at the International Dairy Show in Hamburg in 1877, and since that time they have been simplified and improved to a degree which seems to exclude the desirability of much further alteration. The advantages fairly and justly claimed for the centrifugal separator are these: that perfectly fresh cream and skim-milk are produced, that less cream is left in the skim-milk than under any other system, that fewer vessels and utensils are needed in the dairy, that the risk of having sour milk and cream is entirely removed, even in the hottest weather, and so on. The advantage of having fresh cream and fresh skim-milk, where both of these are sold, is of course abundantly obvious; and, even in the domain of butter-making, it is advisable to have the cream severed from the milk before any acidity has developed, even though the cream may afterwards be kept until it has soured more or less. On this point I shall have more to say later on.

The centrifugal machine, however, is too costly a thing, and too elaborate in its accessories, to be suitable to small dairies. Unless water power is available, an engine is required to drive it, for horse power is too unsteady to be relied on, so that the cost of the machine itself is not all, or nearly all, that has to be considered. I consider, notwithstanding, that a butter making farmer who milks from thirty to fifty cows may employ one with profit and advantage, particularly when he has the chance of selling his skim-milk. At the same time it must be allowed that on the ancient open-pan system of raising cream the best of butter is made, wherever the system is intelligently and carefully carried out. The leading and fundamental requirement in this system is a properly constructed dairy, well drained and ventilated, and whose temperature can be so regulated as not to vary very much. Providing the room is cool enough in summer, the regulation of the temperature in winter is a simple matter enough. A room with double walls and an air space, with a ceiling at the square, and an "air-cushion" between it and the roof, and lastly, a felt roof a foot or two above the hard one, and an air space between them, the air circulating freely, will, I have reason to believe, secure inside the room a temperature which will seldom rise above 65 degrees in any weather to which we are subject in the British Islands; and this immunity from excessive heat is all the more probable if the dairy has a northern aspect, and is shaded by a large tree or two from the sun's rays. A room so constructed will also be dry, in which event the gases of the milk will pass off into the air, and there is no atmospheric moisture to speak of, no vapors, sweet or otherwise, to condense on the surface of the milk as it cools.

Milk does not become unmanageable if the temperature of the room does not rise above 65 degrees in the middle of the day. It must be borne in mind always that this question of temperature, closely followed by those of cleanliness, watchfulness, and industry, is of very considerable importance in a dairy. No dairy equipment is complete without a thermometer. The colder the room, especially in summer, the faster the cream will rise, and the more thoroughly. This is the result of natural laws. Water, of which milk is chiefly composed, shrinks sooner than fat does under the influence of cold, as also it expands quicker under the influence of heat. This is because it is a better conductor of both cold and heat than fat is. And the result of milk being placed in an atmosphere much colder than it is itself at the time, or in much colder water, is seen in the comparatively rapid ascent of the cream. This is simply because fat, being a slower conductor of cold than water is, retains its buoyancy all the longer, and so rises to the surface quicker in a falling temperature of the milk than it does in a stationary one. And it rises all the quicker, within limits, the more rapidly the milk is cooled. This, indeed, is well observed in the Swartz and Cooley systems of milk-setting—the former operating in ice water and the latter in a current of cold water, and both of them in troughs or boxes containing the water in which the cans of milk are placed.

Some persons attach importance to the heating of milk to 130 degrees or so, soon after it is taken from the cow. Intelligently pursued, this practice is a sound one. In the first place, heating will expel the animal odor—the "cowey" smell—from the milk; it will, for the time being, checkmate the action of fermentive germs that milk may naturally contain, or that it may have absorbed from the air; and it will tend to the dissipation of the peculiar flavor which some kinds of food—turnips, for instance—impart to milk that is produced by their aid. But it must be remembered that milk at a high temperature is all the more liable to go sour from the formation of lactic acid, so that, especially in warm weather, and unless it can be placed in a cold room, it should at once be cooled down to 70 degrees or so, after which the cooling may be allowed to proceed more leisurely during the time the cream is rising. During the rapid cooling from the high temperature the milk should be stirred, or an albuminous skin will form on the surface, and this is objectionable. Milk heated and cooled in this way will remain sweet longer than with cooling from its natural temperature only, and the cream will rise the quicker. The heating is said to enlarge the cream globules by coalesence and the larger the globules the sooner they rise—a fact which has been microscopically ascertained in milk whose globules vary in size, which, indeed, is the case in all qualities of milk.

A cool dairy, then, is specially valuable in summer time, hastening the rising of the cream and keeping the milk from souring. In order to produce the finest-flavored butter, pure and delicate in aroma, it is essential, I consider, to prevent all approach of sourness, and to churn sweet cream. Acidity in milk is incipient decomposition, and it is the more delicate flavoring oils which suffer first from among the fats of which butter is composed. Butter made from perfectly fresh cream is of course pure in flavor, but there is not a full flavor in it; and if a full-flavored butter is desired, which is generally the case, it is necessary to let the cream "ripen" by keeping it some days, but keeping it sweet all the time. Some persons prefer the cream to be slightly sour when it is churned, and the souring will make a tough and keeping butter, somewhat less attractive in flavor, and which is more easily churned as a rule. But, at the same time, a more admirable butter is made from ripened cream that is still free from perceptible acidity.—*From the Canadian Breeder.*