

## The Dairy.

### About the Centrifuge.

BY JOHN GOULD, OHIO.

While it is possible under certain conditions to make the finest of butter from open pans, it is not probable that in the hurry of the 19th century that the time will or can be profitably spared to make perfect goods by this system. If cream can be thoroughly and perfectly separated from milk in from three to five hours by modern systems, the longer time of thirty-six to forty-eight hours can not be profitably spent in waiting for cream to rise in open pans, and so we may look about to find some plan by which the rapid separation of fats and serums can be secured, and as yet we can go no farther than deep, cold setting, or the centrifugal machine, now generally called the centrifuge. It is a system probably understood by all—the rapid revolving of a body of milk, causing the lighter portions, which is the cream, to give place to the denser, or serum elements, and as these last seek the circumference the cream is collected in a body at the centre of the cylinder and is "scooped" up. There can not be a particle of doubt but that the cream obtained from the centrifuge is the most perfect ever extracted from milk. This must be evident from the fact that all bodies forcing to pure cream will by specific gravity be whirled to the point farthest from that occupied by the cream, and purity is secured, and that to a nicety; and far better than straining, settling, or heating can, singly or combined, effect. If we are to inquire into some of the superior merits of this cream, we shall find that there have been no artificial agencies introduced to affect the natural gravities of the elements of the milk, and possibly alter after conditions, but the separation takes place at once, so that perfect milk must, other things being equal, produce perfect cream. With the creameries there is a closeness, or confining of the milk, and the shutting it up with its animal heats, which is often brought up as an objection; but with the centrifuge this can not be charged, as the milk is first, last, and all the time, in direct contact with the air; and during the separation the air is forced into and through the cream, so that the oxygen of the air has met every particle of the cream, and aired or "oxygenated" it, and the cream is therefore at the start of a uniform texture, and in perfect condition for either sweet cream butter, or the higher, sharper taste of the ripened cream.

It is well to know about the economy of the centrifuge as compared with the other systems, and if we take comparisons which are the published results of painstaking investigation, we find that the centrifuge gave an average gain of over 20 per cent. over every other system, which is of high importance to know. But if the skim milk is to be utilized for skim cheese, then the pans had better be substituted, for no plan that makes skim milk thinner and poorer for cheese making should be regarded as an improvement. If the milk is to be fed, then rob it of all of its fats, for cornmeal will, if mixed with the milk, restore it to its feeding equilibrium, and in this light the centrifuge is to be ranked as a great economist. There is yet another point that can be made against the centrifuge, and that is the economy of time. The capacity of the machine is limited, and beyond 800 lbs. per hour it is not possible to go with the separation. As milk should be separated from the cream within about four hours after milking, it will be seen that the centrifuge is first either adopted only for the home dairy, or, if used in the great creamery, a number of them would have to be employed, and then the question becomes one of cost, and it is probable that, until a

machine of greater capacity can be satisfactorily constructed, it is cheaper and more expeditious to use ice as a separating agent. It may be said that milk can be churned whole and at once, and thus save the expense of either the machine or the creamery, but whole milk butter has never had a popular "ovation," and never will until it can be freed from its over-abundant "foreign" matter, though it probably comes quite as near (the centrifuge excepted) of securing all the butter fats, as any plan yet devised. As several Yankees and other inventive gentlemen are at work upon a machine of larger capacity, it is not improbable that success will at last crown their efforts, and then there can be no question but the centrifuge will be the perfect plan of securing the pure cream from the milk, and that at least expense and dispatch. Why the centrifuge is not adapted to the farm dairy, is its expense and the necessity of a small engine, so that a steady and reliable motive power can be had, but the modern creamery, relying upon water made at a uniform temperature by ice, does its work fairly well, and at moderate expense, and for the private dairy it must always take the lead, and the centrifuge will be found at the great milk-buying creameries.

There can be no question but that the butter made from the centrifuge must, by its perfect separation from all foreign elements possessing a heavier specific gravity, be very pure, and if it is afterwards freed from the buttermilk by brine washing,—the only perfect plan in any case or system—a very long keeping butter must result. This cream is, in several respects, superior to any obtained by other systems, and can by different "ageings" of the cream give as results the delicate aroma of sweet cream butter, and all the other gradations of ripe, sour and "bitter" cream butter; just as the dictates of the consumer may order. This is accomplished in the start by the thorough and uniform airing of the cream, by forcing the air through it by the rapid whirling of the machine, a condition that our scientists now affirm is the true reason for the flavor or distinctive aroma of butter, rather than due to the action of acidity of the cream, which we will next consider.

### Establishing Cheese Factories.

BY L. B. ARNOLD.

"What is the best mode of establishing and operating a cheese factory in a locality where a pretty large number of farmers own a few cows each, their main business being grain growing?"

There are two principal modes of establishing cheese factories.

One way is to form a joint stock company for the purpose of a site, erection of buildings and managing the business, making the amount of stock equal to the estimated cost of the plant. This stock is divided into shares, the same as is done in other stock companies, and the shares taken by those who are to patronize the factory, according to the amount of patronage they respectively propose to furnish. Officers are selected to represent the company and conduct its affairs, but the business of managing the factory is usually entrusted to an executive committee of three or five of the principal stockholders. This committee erects the buildings, employs a manufacturer and looks after the concern generally, keeping things in working order, and making all needful regulations. The company generally employ one or more salesmen, who sell all the products and distribute the net proceeds according to the milk furnished in producing them.

Another mode of establishing factories is, for one man, or a very few men, to build and own the

factory and the site, and to operate the same. When such a mode is adopted, the farmers of the neighborhood generally bind themselves to furnish the milk of a certain number of cows for a stated number of years, in order to secure the owner or owners of the factory against loss, or, at least, to share the risk with him.

Which of these modes is the better one depends largely upon the parties who enter into the undertaking. If the stock company contains a few large dairymen, who are active, intelligent and enterprising, and interested enough to look closely to the well working of the factory, the business can be carried on with less expense than in any other way, as it saves to the patrons all the profits of a middle man between the producers and purchasers. Generally, if one man who has a considerable interest in the enterprise, and is capable of managing the business, is made an executive committee and salesman, the stock company will be run with the least friction and expense. When the whole direction of affairs and responsibility all rest on a single, interested individual, he will, if he is not hampered with restrictions, execute the business of the company more promptly, and with better effect, than it can be done when a number of men are employed to do the same work and share the responsibility. What is everybody's business is nobody's business, and the larger the number concerned in the management of a factory the poorer that management will be. This has been the universal experience in stock companies run by large committees, and, as a consequence, about four-fifths of the stock companies are run in a shabby and unprofitable manner. The work may be distributed and distinct parts assigned to different men, but the responsibility for conducting each distinct part should rest wholly upon one man. One man only should do the selling, another man look after the condition and operating of the factory, another be treasurer, &c. Let each one understand distinctly what is expected of him, and he will appreciate the trust reposed in him, and he will execute it much more efficiently and faithfully than it would be done by a number of individuals, each one of whom feels that very little of the trust is resting on him. Though a stock company, when properly and skillfully managed, can be operated to the best advantage and with the least expense, the results of my observations in this line have been that, in nine cases out of ten, the factories owned by a single person have proved more profitable, both to the owner and the patrons, than have stock companies. As the owner of a factory depends on the farmers of the neighborhood for patronage, his interest lies in studying their welfare, and in pleasing them as far as he possibly can, and the farmers appreciating that the existence of the factory is a source of profit to them, will, in turn, be stimulated to give it aid and encouragement. How the two modes generally succeed is illustrated by the fact that factories owned by stock companies are very often sold out to a single individual, but a sale by a single proprietor to a company seldom or never occurs. When a single proprietor cannot make a factory pay, a company would have no hope of success.

The most common mode of operating a factory is for the owner or owners to manufacture the cheese by the hundred, that is, for a certain price for making 100 lbs. of cheese, the manufacturer furnishing everything besides the milk. The proprietor of the factory is not usually a cheese maker, but he agrees to make the cheese for, say \$1.25 per 100 lbs., and sub-lets it to a manufacturer for, perhaps 90c. per 100, the latter furnishing every thing but the factory and its tools and machinery. As the actual cost of making and furnishing, as