

the old arbitrary "rule of thumb," which still holds sway over too many of ours, has entirely disappeared, and a philosophic treatment, based on sound scientific principles, is the rule and not the exception. The experiments quoted testify to its advantages. The dairy now, instead of, as of yore, being the abode of ignorance and often too of superstition, is the centre of an enlightened and regular manufacture, where certainty replaces chance, and where the waywardness of the dairymaid is checked and controlled by the daily account she has to give of the produce committed to her, while her skill and attention are encouraged by the registered returns. When Mr. Friis showed me his "Dairy Register Sheet," I expressed my fears that any such attempt to introduce such an elaborate system of analysis into the dairy farms of this country would have a very serious mental effect upon our dairymaids, which would at once stop our proceedings. He replied that on first showing it to his own head dairymaid she burst into tears, and continued in a very distressed state of mind for a full week afterwards. As she regained her composure, a few figures were scer chalked on the board; these rapidly increased, until they reached the last column, when she acknowledged freely the value of the daily details, which testified to her own skill while recording her dairy returns, and declared that she would never take the management of any other dairy unless she had the comfort and protection of a similar arrangement. From that day the success of Messrs. Friis and Segelecke's "Dairy Register" was assured, and it is now finding its way into all the best dairies of the country. In our ordinary manufacturing establishments, even where there are none of those elements of disturbance which always exist more or less where primary organic substances are manipulated, as in butter and cheese making, such analyses of results are sought for and valued. Would it not be well, then, for us to introduce them (in modified form, perhaps suited to our different requirements) into our own dairies, where too commonly practices are quite independent of principles, where figures are eschewed, and the "reign of law" all but unknown.

The farm establishments of the larger proprietors form quite little colonies in themselves. The dwelling-house is necessarily of capacious size, and is replete with every comfort and convenience, while the same roof shelters not only the

master and his family, but also his numerous dairy and farm dependants. The single men live in the house, the married have cottages at the homestead, and in most cases have certain daily rations of food allowed to them. Those who live in the house have meat four days in the week, and about 1 lb. of butter and 1 lb. of cheese per week each. Beer is given at the rate of about 150 gallons per head per annum. The annual cost per head depends mainly upon the house-keeper, and ranges generally between 100 and 120 r. d. per annum. In addition to their keep, they receive from 60 to 70 r. d. for their labour. The head dairymaids live in the house, and receive from 120 to 150 r. d. a year; they are allowed also to take one or more pupils, according to the size of the dairy, with each of whom they receive a fee of 20 r. d. which is paid by the Royal Agricultural Society. These pupils superintend the milking, and take part in all the dairy manipulations. The milking, cleaning, and general labour of the dairy is done by a staff of women helpers, at the rate of one for each 20 cows in milk. The cows are kept for the six winter months in the byres, and for the rest of the year (May to October) in the field. The general practice is to picket them singly over the field, shifting them from three to six times each a day, as the keep may render necessary, and leading them to water twice or thrice a day. On some farms, as at Ourupgaard, they are kept picketed until September, and then allowed to run loose; but very rarely indeed is the practice which I saw at Gjeddesdals followed, of allowing them to wander over the pastures and graze at will; and yet that would appear the more rational treatment, as a forced exposure to the sun and blasts of a variable climate without shelter or the means of protection from insect annoyances, must more or less affect an animal's comfort, if not its health, and thus disturb its natural secretions. In either case, whether picketed or loose, they are always attended by the herdsman, who has the entire charge of them.

The cows are milked for about 10 months after calving; the milking takes place twice a-day, at about 4.30 A.M. and 4.30 P.M. The calves are sold as soon as dropped, at an average price of 2 r. d. each; a few of the best bred being retained to keep up the stock. In the winter, the milk is allowed to stand from 24 to 26 hours, it is then skimmed, and the butter made from the cream. In the summer, the milk is churned fresh, and always gives a better return both in regard to quantity and flavor of butter than when made from cream. It is usually tubbed at from 18 to 24 hours after it is made. Cheese is made from both the skimmed and the churned milk, the refuse portions being conveyed to the hog pens. It is generally made twice a day in sum-

mer, and once in winter; and in winter, both the cheese and the butter are colored with annatto. The cream or milk for churning is generally set at 56° to 57° Fahrenheit in summer, and at 61° to 62° Fahrenheit in winter; the increase in temperature during the operation is about 4° in summer, and from 2° to 3° in the winter.

The quality as well as the quantity of the milk is a matter of consideration to the farmer. In Mr. Tesdorpf's returns is shown the practical bearing of the latter in the classification of the cows according to their respective yields. The tabulated returns of the Lillerup and Ourupgaard dairies during a continuous period of 26 months, show the variation in the quality of the milk at different periods of the year, and also the proportion of milk required for each pound of butter produced.

Until within the last few years, the dairy management in Denmark was much the same as it existed a century ago. The whole subject, however, in its theoretic as well as practical bearings, has recently been submitted to the test of experimental inquiry, which has rescued it to a great extent from the darkness and uncertainty attending its operations. Foremost in this good service were Mr. Friis and Mr. Segelecke—the former testing and proving practically at Lillerup the value of the principles laid down and explained by his friend and fellow worker. Thanks to these enlightened men, the thermometer has now the post of honour assigned to it in the dairy, for the dairy farmer knows well the important bearing it has upon his breeches pocket. In a pamphlet recently published by Mr. Segelecke,\* on the Theory and Practice of Dairy Husbandry, it is shown that—

1. The quantity of butter obtained by churning is dependent on the temperatures used.
2. The temperature that gives the best result, differs according to the quality of the cream (more or less old).
3. At any temperature, higher or lower, the proportion of butter obtained is diminished.
4. A considerable percentage of butter, which otherwise might be obtained, is lost when the churning is not so regulated. This loss may often be very large, as a difference of only 2° F. may result in a loss equal to 4 per cent, whereas where the thermometer is not regularly used, the temperatures frequently vary to the extent of several degrees.

The quality is also directly affected by the temperature at which the cream or milk is set, and its increase during the operation of churning.

(To be continued.)