

a very important constituent of the soil, a constituent which was amongst the least widely diffused, which was only reproduced, if he might say so, very slowly indeed, and yet was essential to the process of cheese-making, and that was the phosphates.

One or two words on the composition of milk from a cheese-making point of view. He did not speak of cheese-making as an art in any sense, but he might briefly refer to the composition of milk from a cheese-maker's point of view, as it was important for the object he had to lay before them. Milk might be considered briefly as a fluid holding in solution, or in a state of imperfect solution, something called casein. The substance in which the casein was held in that state of diffusion contained certain soluble constituents, namely, sugar, and certain salts. They need not consider the sugar, and the only salt they need consider was the phosphates. If the phosphates were removed from the milk they could get no curd fit for cheese-making at all, and on the relative value of the phosphates, and the extent to which they were combined with the curd, depended its stability for cheese making purposes. There were strong curds and weak curds, or strong forms of curd and weak forms, and by strong form he meant a curd which possessed in a high degree the two properties, tenacity and elasticity—the ability to hold together, and at the same time to expand and contract, and especially to contract. They were all of them in the habit of using a press as an adjunct to cheese-making, and he ventured to say the worse the cheese-maker the more use he made of the press, and the better the cheese-maker the less use he made of it. And the reason was that a well-handled curd possessed the property of contracting on the whey it contained, as to very largely eliminate it by the process of spontaneous contraction, so long as the curd was maintained at a proper temperature, and that therefore lessened, if not abolished, the necessity of the press. There were some cheeses of a certain size which were made without any press. A strong curd, by possessing the properties of tenacity and elasticity, could be handled during the whole process of cheese-making in a way to produce an eminently satisfactory result. On the other hand a weak curd, which was just devoid of those properties more or less, produced a cheese which had very little power of spontaneous contraction, and however much they might use the press they could not eliminate the whey, except at an extravagant loss, and they made a cheese which was liable under unfavourable conditions to all those fermentation changes which constituted the difficulty of cheese-making, or cheese-curing he should say. The absence of phosphate of lime from the curd made a weak and unmanageable curd, and hence, unless the milk contained a due proportion of phosphates, it was in that proportion unfitted or badly fitted for cheese-making. The process of continually cropping pastures must necessarily tend to the removal of the phosphates, which were among the scarcest of the constituents of the soil, and of which the soil would, therefore, be sooner or later robbed, unless they were systematically replaced. (1) That replacement of the phosphates had been to a very large extent neglected, and that even where it had been supposed, and had to some extent been carried out by the introduction to a limited extent of farmyard manures. The effect was far less than had been generally assumed, from the fact that the composition of farmyard manure was a very uncertain thing. In the great majority of cases phosphates were allowed to escape from it, and even under the most favourable conditions the replacement was not nearly so effective as it should be.

What, then, might be asked, was the remedy? It was the systematic application of phosphates in an artificial form, that

was in the shape of artificial manure. He proceeded to point out that of the several phosphates which were available, that which was lately come into use in this country and on the continent, namely, basic slag, presented very great advantages in its relative cheapness and in the readiness with which it gave up the phosphates to the plant. He referred to the results of the work of Professor Wagner, of Darmstadt, and the experiments recently made by Mr. Archibald, and the action of basic slag, showing by the results which had been obtained the high power which it possessed of supplying those constituents that were essential to the growth, not only of the plant as a whole, but suitable to its fruiting element, which is so indispensable to the production of milk.

WINTER BUTTER-MAKING.

SPLENDID RESULTS OF THE EXPERIMENT AT THE OXFORD CHEESE FACTORY.

Woodstock, April 28.

The East and West Oxford experimental creamery, which was started by Prof. Robertson, of Ottawa, some months ago, has been closed for the season. Mr. J. A. Ruddick, who has had charge of the creamery, returned to the east this evening. At a meeting of the patrons, held the other night, it transpired that the total number of pounds of butter made was 11,663, a much greater quantity than was expected. *The creamery was started on the cream gathering plan*, but, by the 26th of March, the business had increased so much that it was found necessary to introduce a centrifugal cream separator. The result was most satisfactory, inasmuch as from 15 to 25 per cent. more butter was obtained, especially from the milk of *stripper cows*. The milk was paid for according to the Babcock tester, each patron's milk being tested every day. The average percentage of fat in the different milk varied from 4.00 to 2.93. The result of the Government experiment in the creamery line here has been more than satisfactory. Several of the leading patrons gave it as their opinion that they had made double as much out of their cows as they otherwise would. Before the meeting closed the following resolution was unanimously carried: Moved by Joseph Blow, seconded by J. W. Chambers,

That we, the patrons of the East and West Oxford Experimental Creamery, established by Prof. Robertson, dairy Commissioner of the Department of Agriculture, Ottawa, and under the immediate direction of J. A. Ruddick, desire to give expression to our hearty appreciation of the efforts so put forth to introduce and foster winter butter-making under the creamery system; and further, that by the introduction of winter butter making a much larger return from our cows will be realised than has heretofore been obtained.

It was unanimously decided to operate the factory as a creamery again next winter.

(From *The Empire*.)

A First Prize English Middle-White Sow.

This picture (reengraved for the *Country Gentleman* from the London Live-Stock Journal) shows one of the very best "Middle-White" swine living, the sow Holywell Beauty 2d, bred by and the property of Mr. Sanders Spencer, Holywell Manor, St. Ives, England. She was exhibited at the Suffolk and Bedford shows with a litter of twelve fine pigs, and won first prize.