feeding values, where the animals found something that the chemist did not, we have risen from nothing to prosperity.

It is not always what we feed but how we feed it, and the how must receive as close attention and observation as chemistry.

But then the cow and the hog are partial to some men. Some men seem endowed with a faculty to make them do their best.

THEO. LEWIS.

THE SCIENCE AND PRACTICE OF DAIRYING.

...

Fleischmann-Butter and cheese-Bacteria.

This is the comprehensive title of the latest addition to our stock of dairy litorature, and it refers to a learned freatise translated from the German by Dr Aikman and Professor Wright. The author of the book is Dr. W. Fleischmann who for a long period has crioved an excellent name in his own country and others as a scientific and practical expert in the art of dairying. He is now Professor of Agriculture and Director of the Agricultural Institute, Konigsborg University, Prussia, and is one of the voteraus of modern dairy research and reform. It is now close on twenty years since I had the interest and pleasure of paying a visit to the dairy station at Raden, in Mecklenburg, on the estate of Graf, you Schlieffen, and there it was that I became personally acquainted with Dr. Fleischmann, and with the well recognised work he was doing even so long ago as the winter of 1876-7. Dr. Pleischmann was then in charge of that important dairying establishment, in which butter and cheese were made on the most approved method of the period, and as a scientific addendum thereto the learned doctor had a wellequipped chemical laboratory in which hts experiments were conducted. There, indeed, was practice and science combined in the one man, and there were laid the foundations of the book which lies before me, and which has been handsomely published by Blackie and Son. The work goes deeply into the science and practice of cheese-making and butter-making, as well as into the treatment of milk in all the conditions through which it has to go. There is a long chapter for the benefit of those who wish to acquaint themselves with fundamental questions, on the physiology of milk secretion, and on the properties and composition of milk. But the most interesting chapter, perhaps, at the present time, now that hacteriology has begun to disclose its value in dairy work, is that on "Milk in its Relation to Micro-organisms, Dairying, and Bacteriology."When we reflect that all fermentation and dee-inposition are caused by micro-organisms, the vasi importance of this essentially scientific branch of the subject scon becomes apparent. Many years ago the necessity of strict cleanliness in dairy work was inculcated, even befone the importance of bacteriology suspected; that teaching was was sound then and is sound to-day, but the present knowledge of bacteriology has shed a flood of light on the why and wherefore of the old tuition, and we come to see now, more clearly than before, that dirt is, to all intents and

ful study of the chapter denoted herewith will prove a revelation to those who have not looked into the question, and the book as a whole may be regarded as a notable addition to the onsiderable mass of dairy literature which we now possess. Coming, indeed, trom the cultured and matured mind of a man of prolonged experience, a man whom Germany properly regards as one of her most illustrious experts of the dairy, it is well that the book should have been translated into our tongue, in order that we may reap whatever advantage we can from the lessons which it contains. The book will no doubt at once take its place in the front rank of the class of textbooks to which it belongs, and it may be added that the translators have done their work well and with considerable credit to themselves.

J. P. SHELDON.

AN IMPROVED MILKING MACHINE.

Pulsation - Valves- Teat-cups - Vacuum-Ten cows milked in ten minutes !

Recent British exchanges describe the latest form of the Thistle Mechanical Milker, which has been brought, it seems, to a remarkable degree of perfection, after many years of labor and experimenting, by Dr. Alexander Shlels of Glasgow, and which may afford useful suggestions to American inventors. The contrivance is very

with a rubber plug is also provided, which enables the vacuum to be destroyed at will.

From the receiver another indiarubber pipe is connected with the teatcups by a-five-branch motal tube called "the claw, ' all connections being made by simply slipping the rubber tube on to the end of the metal tubes. When the cow is finished, the valve on the short branch pipe is closed; the teatcups then come off easily, ... tube is disconnected, and the contents of the pail may be emptied.

The teat-cups are made of india-rubber and are most ingeniously constructed. The top rounded edge consists of a ring of thicker rubber, which attaches itself, when the vacuum is put on, softly but firmly to the cow's udder, while the underpart of the teat-cup completely envelopes the teat. The peculiarity of these cups consists of the varying thickness of the sides, and also of two loose flaps or tongues of rubber inside, which act as follows : The pulsating action of the vacuum on the toat-cups alternates between a pressure of 5 in. and 15 in. The smaller pressure is just sufficient to hold the teatcups softly but firmly up to the udder, but not sufficient to cause the sides of the cup to collapse and press against the teats. (See fig. 1.) The moment, however, the greater vacuum is applied, the two loose tongues inside the cup press the upper part of the teat (fig. 2), and the pressure gradually passes down the teat, beautifully imitating the action of the calf sucking, and somewhat resembling full-handed milking. (See tig. 3.) There are 45 of these pulsations simple in operation, and closely imita- every minute, and all four teats are



tis the action of the calf in sucking. It | milked at once. can easily be manipulated by the exercise of ordinary intelligence, and requires so little attention that ten cows can be milked by it with the supervision of only one attendant.

The principle is the application to the cows' texts of india rubber teat cups, in which the action of suction is produced by pulsation.

The machine consists of a single action vacuum air pump running at about 67 revolutions per minute, which exhausts the air from a cylinder fixed in any convenient position. Valves are sttached to the pump, which open and close 45 times per minute, causing the pulsation, the vacuum in the pipes alternating between 5 in. and 15 in. From the cylinder a pipe runs along the cowshed over the heads of the cows; short branch pipes, with valves attached extend downward between alternate cows. When beginning to milk each cow, an india-rubber tube is slipped on one of these branches, the other end being attached to the glass milk receiver, which is placed on top of the pail, and hold in position there by the vacuum.

While the machine is working, the pull stands near the cow's fore legs. The pail is a rm milk pail with a fixed cover, made especially strong. A fiting is provided in the cover on which purposes, misplaced material. A care- the glass receiver rests. A small hole caten

The advantages of the "Thistile" milking machine are many. The first is, economy of time and labor. A man or a lad can with it milk sixty cows in half an hour, or ten cows in little over ten minutes. The machine also milks the cows clean. The second great advantage is cleanliness. The milk passes direct from the udders into the pail, without coming into contact either with the human hand or the outer air. The milk is thus kept free from impuritnes. The milk being extracted in a vacuum is free from germs, and one usor states that he obtains a botter price for his milk on account of the cleanliness which the machine ensures .- "Country Gentleman."

Household-Matters.

Christmas Cheer. Many people complain every year of the great labour of preparing for the usual Christmas festivities, why this should be so I fail to see, unless overything is left till the very last moment, then of course there must be a great rush of work to get through overything in time.

Every body does, or ought to know that mince meat is much better for being made some time before it is

Eaten as soon as made one can taste every article in its composition.

Packed tightly in jars or bottles well covered, the whole blends together and forms a most dellelous flavour, no one thing is too pronounced but forms a delicious whole which helps to make the traditional Christmas Mince-Pie. November is not one bit toe soon to make this and you will have the satisfaction of knowing it is done and getting better every day and only waits' your convenience for using it ; keep it in a moderaltely cool place.

A few words about the pudding. This, like the mince, is just as good made and well boiled when there is time to spare, as left till the last day.

Many old fashionable people make 2 or 3 puddings at once; one for Christmas another for New Years day, keeping the last till Easter, and if well made. and cooked the last is as good as the first. Those for keeping are of course, left in the cloth they were boiled in and hung up till wanted to a cool place. See that the tie is all right before rewarming, and boil long enough to warm through.

PLUM PUDDING

Two pounds and a half of raisins, ene pound of currants, 2 pounds of the finest moist sugar, two pounds bread crumbs, sixteen eggs, two pounds fluely chopped suct, six onnees of mixed candied peel, the rind of two lemons, one cunce of ground nutmeg, one ounce of ground cinnamon, half an ounce of pounded bitter almonds, one quarter of a pint of brandy, one pound of flour. Mode: Stone and cut up the raisins, do not chop them; wash and dry the currants; cut the candied peel into thin slices; mix all the dry ingredients well together; and moisten with the eggs, which should be well beaten, and strained; then stir in the brandy; and when all is thoroughly mixed, add butter and flour, and put the pudding into a stout new cloth; tie it down tightly and closely; boll from six to eight hours, and serve with brandy sauce. This quantity may be divided into two or three puddings.

MINCE MEAT

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Three pounds of beef, three pourds of apples, chopped flue, two pounds sugar, one of citron, 11/2 pounds of ralsins, 1½ pounds of currants, half a pound of suct, tublespoonful of salt, one autmeg, one tablespoonful of ground cloves, one of allspice, one of cinnamon. When used, enough sweet cider should be added to make the mixture quite moist.

GARNISHING THE CHRISTMAS DISHES.

SEEING that even the common, inexpensive dishes of our ordinary everyday fare can be rendored most pleasing and attractive-looking by being tastefully dished up, while the most costly, delicately flavoured items fail in affording the looked-for measure of satisfaction if their appearance is unsightly, it must surely be worth our while, as practical, efficient house-wives, to carefully study and constantly practise the art of artistic garnishing, which is, after all, a very simple business indeed. But especially is this advisable about Christmas time, when, of course, we all wish our tables to appear to the best possible advantage without incurring more outlay than we can help. A few