of cows. That, crossing and selection, combined with weeding out, will effect, and that alone.

POULTRY.

In obedience to a recommendation in the Journal, I hung up cabbages in my hen house for my hens to peck, and combine exercise with the acquisition of green food in winter. They never took the slightest notice of them. Last year from December to March, I had hardly any eggs. This year, other conditions being quite similar I have had about a dozen a day, from same proportion of spring pullets.

I attribute the improvement to my having fed scraps of raw beef, obtained in the saving and cutting up of frozen meat. At least I know of no other difference in treatment between this year and last.

C. F. BOUTHILLIER.

The Dairy.

COLD STORAGE for CREAMERIES.

(By Prof. Robertson).

THE STORAGE OF ICE.

In the storage of ice, particular care is required to prevent waste by melting.

Ice is melted only when the temperature is above 32o Fahr. The increase in temperature comes from some source external to the ice. When a lump of ice is left lying on the ground in warm weather, it is melted by the heat from the ground on which it lies, and by the heat from the air which surrounds it. To prevent ice from being melted by the heat of the ground or the atmosphere, insulating materials of different sorts have been used. An insulating material for this purpose is any substance which prevents, or almost wholly prevents, the passage through itself of the form of energy known as heat. Different substances conduct heat more or less rapidly, and are spoken of as being good conductors or poor conductors of heat. Whatever is a good conductor of heat would be a very poor insulating material; and a substance is a good insulator in proportion as it is a poor conductor, or non-conductor, of heat.

For the preservation of ice during the summer, the requirements are that the ice shall be separated from the ground by some insulating substance, such as dry sawdust, dry shavings, or air in hollow spaces formed by wood and paper, or by some other insulating material. If the sawdust or other material becomes saturated with water, it loses its insulating qualities. It becomes then practically a heat conducting material, like a body of water. The ice should also be protected from the heat of the atmosphere when the temperature is higher than 30o Fahr.

An efficient form of a cheap floor for an ice-house is made by using 12 inches of cobble or broken stones, covered with coarse gravel or sand. The top of that should be covered with 6 inches of dry sawdust. The sawdust becomes an insulating layer, preventing the warmth of the ground from melting the ice. Where dry sawdust is not available, a layer of dry straw, chaff, or hay 12 inches thick before the ice is put on it, may be used instead. The floor should prevent air from getting in or out, and yet should permit ready drainage of any water from melting ice.

To prevent the sides of the mass of ice stored, from being melted by the influence of the atmosphere, it is sufficient to use a building of simple balloon frame, covered by one thickness of clapboards outside, to keep any rain from wetting the insulating material which surrounds the ice. The outside wall of an ice house is more effective to protect the contents of the building from the heat of the rays of the sun, when it is whitewashed, or painted almost white. If the inside of the studs of the balloon frame be sheeted with one thickness of inch lumber, the hollow space between the clapboards and the inside sheeting will be a flue for the circulation of air, and will prevent the sun's rays, where the building is exposed to them, from warming the inside of the walls enough to make an appreciable difference in the temperature of the insulating material which lies between the walls and the ice. Dry hay and straw when packed fairly close between the ice and the walls make excellent insulators. They do not conduct water by capiliary movement as readily as sawdust. When a layer of sawdust, between the ice and the sides of the building in which it is kept, becomes wet on the side next to the ice, the water or dampness is likely to permeate the whole of the sawdust, and thus to destroy its non-conducting properties. Fine hay and straw are preferable; but when they are used, care should be taken to have them thoroughly dry. A serious risk in the use of hay or straw is that they may contain small particles of ice, or snow. When hay or straw are used in such a way, with small particles of ice, hail or snow mixed with them, these melt and make the whole of the insulating material damp. To that extent they lessen its efficiency.

For the covering of the top of the ice a layer of sawdust, one foot thick, is sufficient, "if it be put on dry and left undisturbed." When sawdust has to be moved frequently for the taking out of ice from time to time, the warmer portion of the sawdust laying near the surface becomes mixed with the other portions and may be put back close to the ice. That causes a slight melting of the ice; and the dampness thus caused makes the layer of sawdust wet, and to that extent destroys its insulating properties. For that and other reasons, notably convenience in removing and replacing, it is desirable to use a layer of clean dry fine straw or hay 18 inches thick as a covering on the top of the ice. When the hay or straw is removed from a part of the surface, to permit ice to be taken out, it may be put back again with little waste of ice and almost no loss of the non-conducting qualities of the covering.

Where ice is covered with a layer of sawdust, or hay, or straw, to preserve it from melting, provision should be made for ventilation over the top. The covering layer might become heated otherwise; and if the rays of the sun beat on the roof of the ice-house, and there be not sufficient ventilation in the gable ends or on the roof to allow the heated air to escape, that part becomes practically a mild-tempered oven for melting the contents of the building.

Drawing No. 1 shows a simple form of construction which can be used for an ice-house. It can be made of any size required for the holding of ice for a creamery refrigerator, or other purpose. Fifty pounds of ice, when packed, may be taken to occupy one cubic foot of space. Therefore, every 40 cubic feet of capacity in a building is equal to the holding of one ton of ice. Where the wall of the ice-house is not insulated, the ice should be packed in the building 12 inches from the inside of the walls, and that space, as well as the space between the studs, should be packed full of thoroughly dry, fine hay or straw, entirely free from ice chips and snow.

For the filling of the ice-house a slide of strong planks may be made, and a rope passing through a pulley inside the ice-house can be used for pulling up the blocks of ice. It is important that th ice should be packed as closely as possible. Any spaces between the blocks should be packed full of broken ice in order to prevent the presence or circulation of air around the several blocks.

Drawing No. 2 shows a form of ice-house and refrigerator which may be attached to any ordinary creamery. In this plan the ice-house is insulated by the use of building paper and hollow spaces in the wall. The hollow space underneath the clapboards may have a small opening at the lower clapboard and another around under the eaves.

This forms a flue for the circulation of air and prevents the rays of the sun, where the building is exposed to them from warming the inside of the walls enough to make an appreciable difference in the temperature of the insulating material which lies between them and the ice.

(To be continued)

TURNIP FLAVOUR IN BUTTER, may be avoided, as we have often mentioned, by making the butter Devonshire fashion, and we see, in the English papers, that Mr. James Davies, of Shewsbury cures turnip-fed separator cream on the same principle by raising its temperature to from 150o F. to 160o F. The process is conducted on the "bain-marie" plan; two vessels are used; one is in direct contact with the fire and contains boiling water, the vessel containing the cream being placed within it. It is only necessary to keep up the heat for a few minutes, when the high temperature drives out all the unpleasant flavour, however strongly the cream may have been flavoured by the use of turnips or swedes. After the operation is finished, the cream should be cooled as rapidly as possible. To this we would simply add that turnips should be fed as soon after milking as possible, to give the digestion powers an opportunity of doing their share of the work of freeing the milk from the nauseous flavour.

COWS, fed on hay with a moderate allowance of either crushed linseed, 1 lb., or linseed cake, 3 lbs., have seldom been attacked with "milk-fever." A noted Yorkshire grazier always gives his down-calvers seven pounds of molasses, dissolved in warm water, daily, for three or four days before parturition. Said Prof. Arnold, of New-York, some years ago:

"The use of milk by milk-giving animals is perfectly adapted to reconstruct milk. It is decidedly an albuminous product, and consequently contributes to swelling the flow. It contributes to making milk rich in butter. Like other foods rich in albumen, it does this in an indirect way. One source of fat in animal bodies lies in the destruction of bodily structure. The more structure there is built up, the more there is to be dissolved for the evolution of fat. Milk, like other albuminous matters, is active in building up the structure, and hence also in the production of fat, of which the newly-formed milk gets a share. When fed back, cows utilise every atom of the fat. Milk is a highly nitrogenous food, and should be fed with those that abound in unctuous (oily) matters and starch and sugar."

We tried it, in 1870, and found it answer well. Mix it up with a little corn or barley-meal and a pound or so of crushed flaxseed.

THE LAST DROP.—A correspondent wishes to know the reason "why the last drainings from a cow's udder are richer in fat than the preceding milk." In reply, we beg to say that, in some experiments made to test this, it was found that, in the first drawn milk, there was only 1. 2 per cent of butter-fat, while in the strippings there was 10 per cent: As for the "reason why," we can only give the unsatisfactory answer that, up to the present time, "nobody knows."

FARMER'S INSTITUTE.

This association met at Lancaster, on the afternoon of December, 28th, and was highly successful. The government deputation was composed of Prof. Dean and Capt. Sheppard, of Lincoln, Ont.

Prof. Dean lectured on "The by-products of the dairy," skim-milk, whey, and butter-milk.

Skim-milk is often richer in butter-fat than it ought to be. Shallow pans as well as deep-setting pans cause waste, especially when the temperature is low and the skimming imperfect. For hogs, barley or pea-meal, and shorts, should be added to the milk, with clover in the summer. Better to cut the clover green and cart it to the pigs than turn them into the field; this is what the Danes do. (And the English too.—Ed.) Calves need oilcake (Linseed, not cottonseed cake.—*Ed*) with whey or buttermilk.

Mr. D. M. Macpherson, M.P.P., spoke of the "Dairy-cow." A balanced ration for her in winter would be: 60 lbs. of corn-silage, 15 lbs of hay, and 8 lbs. of bran and pease-meal, half and half. When the best summer food, namely, grass, runs short, give tares, corn and bran.

Capt. Sheppard gave an address on "Country Roads."

In the evening, Prof. Dean spoke on "Domestic economy," mentioning particularly the general waste of food in cooking.

The deputation held meetings at Alexandria on Saturday afternoon and evening. Mr. R. R. Sangster presided. Prof. Dean gave in the afternoon his address on the "Dairy cow, how to know her and how to get her." The profitable dairy cow, he said, is one which is a great eater with strong digestion, strong constitution and large milk production. The indications of vitality or constitution are depth of heart and lung region, easy and regular breathing, mellow skin and oily hair. A cow must also have nerve force to drive her complex machinery. This is indicated by a large full eye, prominent backbone and a large forehead. Good digestion is indicated by large mouth, strong lips, spinal processes sharp at the withers, large space between hipbone and ribs, and depth from hip downwards. Ability to secrete milk is indicated by a large udder covered with soft mellow skin and hair, large milk veins and milk wells, teats of good size and well placed, and the fore ribs