

employed, though the mason thinks an old drainage scoop would be better. A day after mangers were completed a pure cement wash was applied with a whitewash brush.

Door sills were constructed at convenient seasons while other work was in progress, and, for double-door standard at east end of stable, a mortise was cold-chiseled out of cement before it had set too hard.

LITTER CARRIER.

During the winter a litter carrier was purchased, but its installation was not completed until a period of moderate temperature in February. By means of a swinging pole on the south side of the barn, we are enabled to run the machine out and dump it on the horse-manure pile on the side of the barn opposite the dairy and dwelling. The cost of the carrier, as supplied by the manufacturers was \$60 cash. To this must be added \$1.50 for pole, and \$4.42 for iron plates to reinforce center sill where cut to keep track well up, giving plenty of head room, and also the main plate, where guy-wires are attached. The labor of installation amounted to 84½ hours, worth \$14.33, so that the total cost may be computed at \$80.25. As a matter of fact, it was a little more, for a new door, elsewhere specified, was necessitated by the carrier. Perhaps \$85 would cover the whole. The carrier is, however, a great improvement, saving disagreeable labor and promoting sanitation. It is especially appreciated on Sunday afternoons.

STANCHIONS.

The swinging steel stanchions give first-class satisfaction, allowing the cattle more freedom than most chain ties, and keeping them comparatively clean. We hesitated for a time whether to put in the pipe partitions, but decided it would be a wise precaution against possible injury by cows stepping on each others teats and udders. The steel stanchions puzzled the cement contractor, who had never installed them before. He spent about a week tinkering at them, and for most of this time we reimbursed him, thus adding to the cost. At the time he was working at them we had too many other irons in the fire to render any assistance.

SPECIALLY DESIRABLE FEATURES.

In connection with this stable floor, special attention is directed (1) to the contour of the gutter, which is more convenient to clean, and in our opinion otherwise preferable to any square gutter; (2) to the mangers, which have no corners, being thus easy to keep clean, also rendering it easy for a cow to reach all parts, and yet providing a flat surface on which to set a pail. If changed in any particular, we might have the mangers four inches wider, as cows sometimes drop meal over the edge, although this is very easily brushed down. The stall platforms are fairly well judged as to width and length. The longest stall is a trifle too short for the comfort of our largest cow, an extra-long Holstein, and the shortest stall a little too long to keep the shortest Jersey clean; but, for an average herd, the range would not be easy to improve upon. The adjusting devices which may be had with the stanchions help to regulate the length of stalls. The gutter should have been made with a depth of 2½ inches, as intended, instead of 2 inches, as the contractor got it. Otherwise, the stable is one of the most satisfactory improvements we have accomplished on the farm. Another hundred dollars or so in flooring and partitioning loose pens, and providing ventilation outlets, will give us an exceedingly satisfactory and convenient stable, capable of accommodating between forty and fifty head of cattle; but this, of course, will mean a new horse stable.

MATERIALS AND COST ITEMIZED.

Material for floors only:

Cement, 27 barrels, at \$1.65 per barrel.....	\$ 44.55
Gravel, 16 loads, at 26c. a load	4.16

Material for ventilator inlets, two man-holes, rebuilding basement wall where doors were moved, etc.:

Cement, 7 barrels, at \$1.65	11.55
Gravel, 2½ loads, at 26c. a load	.65
Perforated steel plate to protect opening behind cattle	2.45
Steel stanchions and partitions for 19 stalls	79.00
Litter carrier and fittings, iron plates, etc.	64.42
Pole for litter carrier	1.50

Material for four doors (double doors at east end, storm door on north side, and litter-carrier door on south side of basement)	10.17
Material for one new window	1.75

Total cost for all material

LABOR.	
Hauling 16 loads of gravel for floor	\$ 18.88
Hauling 27 barrels cement, at 94c.....	2.50
Hauling 2½ loads gravel	2.95
Hauling 7 barrels cement	.65
Cutting, excavating, ditching for water system, making doors, and general rearrangement of stable (mostly unskilled labor), 308 hours	57.37
Mason's charge for flooring stable, at 2 cents per foot, outside barn measurement	32.00
Mason's board while working by foot	10.80
Mason's time at miscellaneous jobs, such as moving doors, casing manholes, setting stanchions, etc., cost, including board	41.41
Installing litter carrier, pole and track, 84½ hours	14.33

Total labor cost

Total cost of remodelling and equipping stable to date	\$401.09
Cost of straight flooring—material	48.71
Cost of straight flooring—labor other than excavation	64.18

Total cost of straight flooring

Total area of straight flooring, 1,525 sq. feet. Cost per foot of straight flooring, 7½ cents. Number of feet of straight flooring per cord of gravel, 286.

Number of feet of straight flooring per barrel of cement, 56½.

Cost of installing litter carrier, \$80.25.

Note.—Several hundred feet of lumber have been used for dividing loose pens. This portion is not yet completed though in use.

Danger from Lightning.

Country people are in more danger from lightning than are the people of the cities, according to J. Warren Smith, Professor of Meteorology in the United States Weather Bureau and at the Ohio State University, who states that lightning kills 2½ times more farmers than the railroads do. He points out that, in Ohio, where they have an average of 35 thunderstorms annually, and statistics show a greater number of deaths in that section of the country than in others. The property loss from this cause is enormous. The greatest danger during thunderstorms is under trees, in strong drafts of air, near wire fences, wire clothes-lines, wires attached to poles, etc. Barns are struck oftener than houses, and houses oftener than churches. Buildings with wooden roofs, when struck, are more likely to be burned than those with metal roofs. Good lightning-rods, properly put up, are an efficient protection, but poor rods are worse than none. Professor Smith states that iron rods kept painted are better than copper, and are much cheaper.

Objects of Crop Rotation.

Rotation provides for growing crops that extract different foods from the soil. All crops do not use the same amount of the various plant foods found in the soil. Some are shallow feeders; some are deep feeders. Some crops use up the nitrogen in the soil, while others have the power to store up nitrogen in the soil. Rotation allows or assists nature to repair her waste places and incidentally facilitates the war with weeds.

In experiments at Rothamsted, England, conducted by Lawes and Gilbert, potatoes were grown on a piece of land continuously for a long series of years, until it finally refused to produce potatoes. But when it was sown to barley, it yielded a crop of seventy-five bushels to the acre. This was, in part, at least, because different plants select different food from the soil. Potatoes are potash-lovers, and in the years they had been grown on the land they had so reduced the potash content in it that potatoes could no longer be grown; but there was still enough to produce a fine crop of barley, the food requirements of which are different. There are sound reasons for a wise rotation of crops, but in this particular case other factors, such as the bacterial or mechanical effects on the soil of the long-continued potato-growing, may have materially affected the results.

"My experience has been," said R. S. Stevenson, when discussing alfalfa at the Ontario Winter Fair, "that, when we have broken up a stand of alfalfa, we have got excellent results in subsequent cropping. In seeding, we have best results from following a fall-plowed field and sowing about the second week in July."

80 Bushels from 300.

I have only taken your paper for one year, and I may say that I did not know before that anyone was farming but a few neighbors and myself. In years past, once through the fanning mill would do for seed grain, and, in fact, we would go in to see if the grain wouldn't do as it came from the cleaner. Last spring I put the seed through four times. This winter I put through three hundred bushels of grain to get 80 bushels for seed. A. W. DAWSON.
Lincoln Co., Ont.

"Whatever you do, do not go back on red clover," was a timely injunction by Prof. G. E. Day during a debate on alfalfa at the Winter Fair, at Guelph. "When you get a piece of alfalfa, leave it, sowing clover in rotation. One of the greatest drawbacks of agriculture in this country is that we do not sow nearly enough red clover."

THE DAIRY.

By-Products of the Dairy.

In dairying there are two great sources of income. The first is the steady income directly from the dairying process, and the second is the profit derived from the by-products. These together make dairying the most profitable line of farming. Dairying in itself usually turns in a fair profit, but when we consider the added profit derived from the various by-products or side-lines to dairying, we find a greatly-increased revenue.

In the successful management of any manufacturing plant, the use of the by-products often spells success. Not infrequently, the income derived from this source is sufficient to carry on the overhead expenses of the plant. The realization of these by-products by one man, when another neglects them, is what distinguishes between the successful and unsuccessful manufacturer.

Conserving the natural resources are frequently talked about, but are made possible by the advent of dairying. Dirty, impoverished farms can be cleaned, and fertility added to the soil, by the judicious use of manures provided by the dairy herd. Where the cows are kept, and only the butter-fat sold off the farm, the land can be built up, and its productiveness increased every season. Fertilizer, then, is the first by-product of importance. Any farmer dislikes to hear his farm spoken of as a dirty, impoverished, useless place, which his sons do not care to possess. Even the most slothful prefers to hand down to posterity land that will yield a living for forthcoming generations. To do this, the farmer must study how best to replace the elements of plant life that are taken out of the soil by each crop that is harvested, always leaving a little more plant food in the soil than is taken out. Sometimes, on farms where dairying is not practiced, it is necessary to buy commercial fertilizers, the bills for which eat a big hole into the profits and leave little for the man's work. Hence, dairying offers a by-product in the form of soil fertility that would amount to a great deal in cash, if it had to be purchased and applied to the land to keep up its productiveness. This by-product alone is sufficient in many cases to establish the industry, regardless of anything else.

Some dairymen establish an industry for the breeding and sale of pure-bred stock in connection with dairying. This is perhaps a side-line, but can justly be called a by-product of the dairy. Pure-bred stock are always in demand, and good long prices can be had for the sale of first-class breeding stock. But even when only grades are kept, the profit from the sale of heifers and cows often amounts to a considerable sum of money. Thus comes the sale of dairy stock as by-product number two.

The third by-product of importance is skim-milk. Of course, in some cases this milk is sold, but on many farms there is a great surplus over what is needed for rearing the young dairy stock. Pigs and chickens can be raised fairly successfully without this skim milk, but the most practical poultrymen or hog-raisers assure us that these can be raised much more profitably when they have it.

To sum up, we find that the by-products of dairying make it possible to raise better crops and enlarge the earning capacity of the farm by realization on side-lines that otherwise would not be possible on the average farm. Dairying in itself is fairly profitable, but certainly the dairy by-products are well worthy of consideration.—[Farmer's Advocate and Home Journal, Winnipeg, Man.]