

summer, soils of this description crack in all directions, and the liquid manure then runs through the cracks instead of being equally diffused through the land, or it moistens the soil but very imperfectly. Much of the manure is thus lost, and injury is done by the insufficient proportion that is absorbed by a thin layer of the surface soil, for it causes at first a more rapid development of the young plants, which receive a sudden check as soon as the small quantity of moisture is all evaporated.

From what has been said, we may make the following deduction: that neither the physical nor chemical characters of heavy land are favourable to the system of liquid manuring; and as by far the greater part of the cultivated soil of our province is of this description, I feel sure that liquid manure will never be generally used by our farmers.

In England, it is true, there are a few large landed proprietors who profess to have employed liquid manure on heavy land with much profit; but it must be remembered that its application has always been preceded by, or accompanied with, draining, subsoling, clay-burning, and lining, each of which processes is well known to effect radical changes in the constitution of heavy land, so, it is very difficult to say whether the improvement visible is due to the application of liquid manure, or to the beneficial effect of one or all of the above-named processes.

*On the mode of disposing of liquid manure.* And now we arrive at the practical part of our subject: what are we to do with the liquid dejections of our cattle? I shall neglect, in answering the question, any reference to pipes, steam-engines, &c., feeling that such matters are quite beside our subject, and confine myself to a consideration of means that are within the power of an ordinary farmer of the province of Quebec.

On this Lincoln College Farm the matter is simple enough: the cattle stand on a slightly inclined boarded floor, the liquid and solid excrements fall together into a trough six inches deep—wide enough to admit an ordinary shovel—where they find a quantity of dry sawdust capable of absorbing all the liquid, and the whole is carried twice a day to the dung-heap. Thus managed, there is no loss at all incurred, and the mixture of the excrements of the different kinds of stock is easily carried out, the pigs being supplied with sufficient straw to soak up all their urine, and this is removed to the heap as often as seems necessary. All farmers, however, are not within two hundred yards of a sawmill, and few farmers, notably in the Townships, have sufficient straw to keep their animals properly littered—many still soil their straw. There are great difficulties looking us in the face, but I think they can, in the majority of cases, be obviated. If there are only a few hundred gallons of liquid manure produced, it clearly won't pay to lay down pipes and build an expensive tank; whereas, on the other hand, where large quantities are expected, it might pay very well. Again, unless it is known whether fattening stock, which-cows, or young cattle are kept, or whether the farm produces much or little straw, it is difficult to solve the question: each farmer must be guided by the requirements of his own individual case. Disclaiming, therefore, the intention of laying down fixed rules for the management of liquid manure, I will point out, by way of examples three modes of disposing of the liquid excrements of animals on the general run of farms to be met with in our part of the world:

1. Where the urine of animals is completely absorbed by litter in feeding-boxes.

2. Where the urine and draining of stables, cowhouses, and pigsties are collected in a small tank close to a covered manure-pit.

3. Where the urine of cattle, the sewage of dwelling

houses, drainage water, and every kind of animal refuse matter are collected together in a water-tight tank of larger capacity, situated, as in No. 2, close to the manure pit.

Of course, in both cases, No. 2, and No. 3, there must be a pump, by means of which the liquid from the tank can be spread over the heap of solid manure, as occasion requires.

Under no circumstances would I ever apply the liquid collected in the tank alone. Manure ought to be used entirely in a liquid form or in a solid state, and for this reason: the solid manure contains considerable proportion of soluble and insoluble phosphates, which are very deficient in liquid manure. It is decidedly a bad practice to employ separately the solid and liquid excrements of animals.

On farms where no young stock is kept, and where just enough straw is produced to serve for chaff and the bedding for the animals, I believe the best plan of disposing the liquid and solid excrements is to make the manure in boxes.

The construction of feeding-boxes is simple in the extreme. I used them for many years in England, and I consider them to be the most perfect receptacle for cattle that can be conceived. They may be made eight feet square, or even less will do for the ordinary Canadian cattle. I have fattened big Shorthorns in as small a space with success. The first thing is to dig out the bottom two feet deep; the divisions may be made of rough poles, four in number and sufficiently far apart to admit the heads of the cattle with ease—I lost a fine fat beast once by his getting his head through the bars and not being able to get it back again. The manger should be movable, so that as the dung rises in the box, the manger may be raised; and a rack for straw may be placed against the wall. The boxes are best built with an alley running between the rows, and, if not thought too expensive, a small tram and a tram-cart will make the work of the feeder lighter. As an animal will never lie down in the dirt if he can find a clean place, cattle leave the boxes when fat without a speck on their coats. A very small quantity of litter, used judiciously, will keep them perfectly clean; they can lick themselves and each other, so no currying with the hair-extracting comb is necessary.

Many people, who ought to know better, fancy that this system of box-feeding must be unwholesome. It is not so; the fermentation that takes place is so slow and stealthy (*cremation*), that no ammonia is evolved, and the only smell perceptible, even when the boxes are full, is the pleasant odour of linseed—always supposing that that indispensable food is employed.

When well managed, box-feeding prevents any waste by drainage of the most valuable portion of the manure; there is no loss by evaporation of ammonia, the manure ferments regularly and slowly, and liquid and solid excrementitious matters, which are neither of them perfect manures when applied separately, are preserved together in the most admirable manner.

But on many farms the whole of the manure cannot be made in boxes, on account of the scarcity of straw. On the majority of our English dairy-farms, where not more than 4 0/10 of the land is arable, the state of the cattle in winter is far from what it ought to be; and in the Eastern Townships of this province the case is much the same. At Compton, and all along the Coaticook valley, there is hardly any bedding given even to the fattening beasts, and the waste of manure thereby incurred is sad to see. In such places a tank and its appendages would be very useful, and the supply of sawdust from the numerous small mills in the district is, practically, unlimited, so that the absorption of the urine would be easily managed. Here, care should be taken not to admit any water from the roofs of the cattle buildings into the tank; a very small quantity of sulphuric acid—say, 10 lbs.,