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REPORT OF THE COMMITTEE ON MANURES.

In breaking up old pasture or mowing ground, therefore, the soil may be regarded as manure enough for an oat crop; next year may come a hoed crop with a good dose, say 20 tons of manure per acre; this will enrich, pulverise and clean the land, and still leave enough of nitrogen and phosphates from the manure for another grain crop of a different kind, say wheat, rye or barley, in the third year; if clover and grass seeds have been sown with last year's grain we will have a good crop of grass in the fourth year; during the fifth and sixth the grass may be cut for hay, provided it has been top-dressed (with say ten tons of manure) in the fifth; in the seventh or fall of the sixth year the land may be again ploughed for another kind of grain crop to be followed by another kind of root crop. For the average light upland soils of this country the above course which affords two doses of manure every seven years may be called an improving one for the land; by striving to get more crops of grain or hay in succession the farm must at length become impoverished, and the farmer too; it is quite possible, however, be it observed to get a succession of almost any kind of crops from good land by high manuring, for a great length of time, but in the ordinary upland of this Province, and with the ordinary supply of manure made on the farm, it is impossible. The practical inference, therefore, is to reserve our manure for the hoed crops chiefly (which can hardly be over manured in fact) and for top-dressing to the grass land, if the grass land is to be cut for hay at least and sold off the farm: the importance of green crops in the rotation and their value as a means of increasing our stock of manure can hardly be overstated; the land generally allowed to one cow, say two or three acres may thus readily be brought to nourish three or more, and the manure of well fed cattle will go much farther in causing the fermentation of straw or bog earth.

The most important source of manure is the barn yard, seeing that the materials thence derived can supply plants with all the elements which they require except those derived from the atmosphere, but how often have we seen it carelessly or ignorantly planned, so that it very imperfectly fulfilled its purpose:—the barn itself a cold comfortless shed, and the yard a mere enclosure *sheltered* from the biting blasts of winter by a rail fence and drained into the nearest brook or highway. The enlightened proprietor and contriver of these arrangements will not hesitate withal to tell you that this is a poor country for farming, and that "*he cannot fix it up no how.*"

A barn should generally be built upon a side hill, in a dry and sheltered place and made quite tight and secure against the weather; warmth is as food to cattle, and if we can save hay inside by the application of boards or battens outside, the economy is obvious; the main barn should have a southern aspect, and if there be not other shelter sheds or barns on the east and west sides, there ought to be a yard made open to the south and surrounded by a close fence six feet high and perfectly weather tight; this fold yard should be made hollow in the centre sloping gradually to a depth of about two feet: this may be readily done by the plough and spade, and the bottom ought to be rendered water tight if possible, by means of clay, &c. If the yard be, say fifty feet square, the sides to a breath of, say ten feet ought to be nearly level; on some one of these sides, the manure or compost heaps may be made up in the spring, and if a slight roof could be fixed in any way so as to shield the whole or part of it from sun and rain it would be economical in the end; the surface water and the water from the roofs ought to be carefully led away so as to prevent the leaching of the manure, for liquid manure may be so diluted as to become almost worthless; if drains from the kitchen sink could be made to pass through the vault, and then to end in the main yard, very much valuable materials might in this way be economised: but if from any cause the liquid materials should be so abundant as to drench the solid ones in the yard there ought to be drains contrived to carry away the moisture before it overflows, and sinks or catchpools to receive the liquid portions which are often quite as valuable as the solid.

This barn yard should be laid with a foot of half dried peat or muck or saw-dust in August or September, after that let the droppings of the cattle accumulate within it, let all garbage from the house, all soot, sweepings and lime rubbish, all litter, potato tops, raspberry bushes, ferns, rushes and weeds from the fields, the refuse of gardens, and of the cider press. all oat husks, bran, corncobs, and buck wheat chaff, much from the swamps, leaves and soil from the forest and the roads, pondweed from the ditches, sea weed and eel-grass from the shore, &c. be thrown in as they come to hand.

The cattle will, of course, remain there most of the winter and feed out of racks or sheds appropriated to them; during the winter season this year should also be littered twice a week with straw, and if convenient, sprinkled occasionally with plaster; in spring it may be cleaned out, and its contents made into heaps three or four feet high, with or without plaster, and brought to a wholesome state of fermentation before laying it on the land.

In addition to the main yard or general compost ground above described, there ought to be either a stone cellar under the cattle stalls which is on the whole the best, or a long, narrow and shallow pit about two feet deep covered above with a roof and puddled or lined in the bottom in such a way as to prevent leakage, and placed so as to receive readily the winter's dung and urine from the stables; the bottom of this cellar or pit should be laid with bog earth, loam or marl or other absorbent and occasionally also it should be sprinkled with plaster.

The rich manure of this cellar or shed may be incorporated in heaps with that from the general compost yard in the proportions of one of the forms to three of the latter and the whole thus brought into that state of admixture and decay which renders it most capable of sustaining the productiveness of the soil; a few weeks before the manure is required for the root crops it will be time enough to induce active fermentation in the heaps; after a time these heaps ought to be turned over once or twice so as to secure the full influence of the air upon the fermenting materials and effect the thorough incorporation of the whole, after this it may be hauled to the land, and, in the case of turnips it is well to sow the seed with as little delay as possible after the manure has been turned into the soil.

Having now glanced at the general principles which ought to guide the farmer in collecting, preparing and applying the elements of manures which in fact are the elements of crops, we may proceed to speak of sundry manures in detail and more particularly of such as we conceive to be within the reach of the majority of the farmers in this Province.

Stable Manure has been called the farmers sheet anchor and is the first and best of fertilisers; not only does it serve directly as food for crops but it disposes other substances to ferment and dissolve into the soluble nutriment of growing plants, by which process death and putrefaction are transformed into life and luxuriance.

This useful material consists of the dung of horses, cattle and swine mixed with the litter, coarse hay, and weeds all trampled, moistened with urine and more or less decomposed; it is made up of the products and remains of every kind of crop, and therefore contains those elements from which every kind of crop may be fed and reconstructed; chemically its composition is as complex as that of the crop itself, but carbon, water and silica always constitute its *bulkiest* portion; both its composition and its power or value is, however, extremely variable; these depend partly in the proportion of animal and vegetable matter, partly on the kind, the condition and the food of the stock, partly on the time which has elapsed since it was dropped, and greatly according as the liquids and gases envolved from it, have been allowed prematurely to escape or not.

The indifference so generally shown throughout the Province to the collection, preparation and economy of these substances is one of the great causes of the impoverished condition of the farms; in this direction therefore reform must begin, *for otherwise there is no hope;* without stable manure which is the raw material of crops, no crops can be manufactured, and the fermentable materials cannot be fermented. It is rather surprising that although stable manure has been almost the sole dependance of the farmers in this Province for the improvement of their land there should have been at the same time such utter carelessness in collecting and preserving it in its most available condition; the practice of throwing it out of the barn window from day to day, so as to expose it to snow and rain, sun and wind cannot be too strongly reprobated, for it is easy to see that great part of its value is thus destroyed, and little remains but a short straw, which may be again culled over by cold, ill-fed cattle who seem thankful even for that bite; in England it is generally admitted now that stall or shed—feeding and soiling cattle is the most profitable in every way, one cow may thus be made to produce about 9 tons of solid dung per annum, but it may be some time before we can get labor cheap enough to adopt this practice in New Brunswick; there is, however, one point which we consider to be well worthy of attention, by all who are anxious to economise in this direction; it is a frequent practice in this country at present to enclose a small piece of ground in a field near the road, and then to yard the cows from milking time in the evening until the next morning; it is quite common to see from five to 20 head of cattle thus brought together every night during the summer season, while the valuable manure which they make is left exposed to sun and rain until it becomes almost or quite worthless

This wasteful practice of manuring the atmosphere as well as the soil ought at once to be done away with, and in lieu thereof we would recommend either that the cattle should be put up in a well littered and ventilated stable, or in the barn yard, giving them a bedding of straw, peat leaves, or even saw dust to absorb the urine, &c., one ton of dry straw may thus by skilful treatment be converted into three tons of manure. Where the premises are sufficiently commodious the different kinds of manure should be collected and kept apart until it is considered proper to mix them together, and the greatest care should always be taken to prevent the escape of the strong smelling ammonical gas, upon which not only the fermentative but the fertilising virtue of the manure mainly depends; this may be done by using a cover or fixer as already suggested, by treading or beating the mass compactly together, or by saving the urine, and keeping it apart from the solid dung. If we save the mass from washing by rain or snow water we will likewise economise not only ammonia but many other valuable ingredients:—another important object should be to prevent the commencement of fermentation until near the time when the manure is to be applied to the soil. By covering with sods or bog earth, treading and pressing so as to prevent the access of air, and by keeping the whole cool and dry we may easily affect this, while by forking, turning, evenly mixing and moistening it (with urine if necessary) during warm weather, we readily induce and regulate the putrefactive fermentation; when once begun in the heaps let it proceed steadily, and then, after one or two turnings, apply it to the land in the spring or autumn ensuing, before the fermentation is completed, so that the latter part of the process may take place in the soil.

Long or partially fermented dung is best for clay lands, because the straw helps to open their texture: in our climate, when used on light soils it is apt to become too dry, and to stop fermenting altogether: *Short* or well rotted dung is best for light land, and particularly for root crops which germinate quickly and require a full supply of food from the beginning.

The *Hog Pen* is an important source of manure for the compost yard: from one hog properly fed and littered, we may make more than two waggon loads in a year; by using bog earth for litter and throwing in a handful of corn occasionally they will incorporate the bog earth with their droppings so as to give rise to a most valuable compost; hogs dung ought always to be mixed with other manures. Where many *sheep, fowls, and pidgeons* are kept, much valuable matter also accumulates, which ought to be saved; it will prove nearly as useful as guano. Few farmers are aware of the value of the *urine* that is suffered to be wasted on the farm, in the course of a year. Weight for weight, the urine of animals may be considered as powerful as their solid excrements, and pains ought to be taken to save every drop of it. One cow passes about 1000 lbs. of urine in a year and this is considered in Flanders to be worth £2, and to be a full manuring for one acre of land.—The urine of man and of the horse is also known to have a greater fertilising power than that of the cow. Liebig says that the urine of one man for one year will manure an acre or land, and that a pound of urine contains the elements necessary for one pound of grain. Much greater economy ought therefore to be practiced in regard to this substance which is so rich both in nitrogen and phosphates. By the proper use of mould or bog earth, much of it may be saved, while the peat itself is made to ferment and decompose thereby; a pit capable of containinging 20 or 30 loads of bog earth may be so arranged as to receive all the urine of the stables.—Another way is to build a proper reservoir to collect it, and in which it is to be allowed to ferment for a time, then mixed with water and applied on grass or other land; or in the liquid form it may be applied to manure or compost heaps so as to promote their fermentation; on this subject, Loudon says (Encyclopædia of Agriculture p. 341) "We would strongly recommend the practice of saving urine in tanks to the British farmer, and not to the farmer only but to every cottager who keeps a cow or a pig; nay to the cottager who is without these comforts, but who has a garden, in which he could turn the great accession of manure so acquired to good account. Let him sink five tubs or large earthen vessels in the ground and let the contents of the portable receiver of his water closet, all the water used for washing in the house, soap suds, slobs and fermentable offals of every description during a week be carried into one of those tubs; and if not full on the Saturday night, let it be filled up with water of and kind, well stirred up, the lid replaced and the whole left for a week. Begin on the Mondny morning with another tub and when after five weeks the whole ure filled, empty the first at the roots of a growing crop and refill. Or use two large tubs, and