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## The Field.

### On the Treatment of Soils.

Fall ploughing, especially on stiff land, is a practice strongly to be recommended, not merely to facilitate the work of spring, but also as a valuable means of bringing the soil into improved conditions, chemical as well as mechanical. Deep ploughing in the fall exposes a larger surface in a rough, uneven state, to the action of air and frost, renders the soil free and porous, and consequently better able to absorb and retain heat and moisture during the subsequent season of vegetable growth.

The time and kind of manuring, too, has considerable influence on the texture and properties of soils. On heavy land the ploughing in of rough dung, experience shows to be generally advantageous. The manure tends to keep open the pores of the soil, and as spring advances fermentation proceeds, bringing by degrees the manure into a condition to be freely taken in by the growing crop, and investing the soil with larger capabilities not only of absorbing and retaining heat and moisture, but also of effecting the decomposition of various substances yielding a copious supply of plant food.

Land naturally dry, or made so artificially, thoroughly cleaned and manured with long dung in the fall, can often be cropped advantageously in the spring without further ploughing; the grubber effecting all that is requisite with economy and speed. In this way, followed by the necessary surface harrowings, a fine seed tilth for turnips, mangels, &c., may be much easier and better obtained than by the use of the plough in spring. On many of the stiff clays of England, where the preparation for wheat was formerly a naked summer fallow, since thorough draining and a deeper culture have been introduced, the naked fallow has generally been abandoned, and the grubber has superseded the plough, after beans, peas, or

some other drill crop, in preparing the land for winter wheat. Mr. Mechi informed us that he never ploughs land in spring for turnips or mangels; and this, we believe, since the wider extension of efficient drainage, is the general practice of the most advanced agriculturists. Given similar conditions in Canada, such a system of management could be carried into practice here with similar results, making, of course, such modifications to meet local and varying conditions as circumstances might require.

Soils naturally light and porous require different management from such as have already been mentioned; they use up manure so rapidly that it is not advisable to apply it long before the growing crop is enabled to assimilate it; and from the extreme porosity of many such soils, the application of some mechanical pressure is found necessary in order to retain moisture and to secure a firm seed bed in which the growing plant can securely fix its roots. The application of lime or marl to such soils is generally attended by beneficial results. Indeed, a large portion of the old arable land of Canada would be greatly benefited by liming. This substance enters more or less into the composition of all our cultivated crops, and while, particularly in a caustic state, it facilitates the decomposition of organic compounds, and neutralizes acids injurious to vegetation, it tends to consolidate the texture of light soils, and, what is so much needed, to increase their capacity for absorbing and retaining moisture. For the latter object the application of plaster (sulphate of lime) is well known to be highly beneficial on many soils.

The term "marl" is popularly used to denote a combination of lime and clay, including a class of substances very variable in their composition. The clay, of which most marls largely consist, acts on the soil mechanically, changing its texture, so that it will retain more moisture, and the lime constitutes an essential ingredient in the food of crops. Calcareous marls, exposed to the action of air and frost, readily crumble when wetted; but marls greatly deficient in lime

are with difficulty incorporated freely with the soil, and their manurial value is very small. It is only such marls as freely effervesce, on the application of muriatic acid, that are worth the trouble and expense of procuring and applying. The "shell marl," which is not unfrequently found in strata of varying thicknesses in the river banks of many places in Canada, often contains sufficient carbonate and sulphate of lime to justify the incurring of a moderate expense in applying it to a certain class of soils. As such marls, however, are generally distinguished for an almost total absence of the phosphate of lime, they must occupy a low degree of manurial power in the scale of farm fertilizers, and will not repay a heavy amount of labour and expense in procuring and transporting them to long distances.

The condition in which farm-yard manure is applied, as well as the particular mode of cultivation pursued, exerts a considerable influence on the soil generally, and especially as regards its capacity for retaining moisture. A dressing of green or rough dung in spring for turnips, or other root crops, is not to be commended, especially in climates in which the weather during the earlier periods of growth, (as is often the case in Canada) is dry, and sometimes even parching. The incorporating of half decomposed substances with the soil in spring has a tendency to render it too loose and porous, and by exposing large surfaces to the action of drying winds to cause such powerful evaporation, both as to lower its temperature and rapidly diminish its moisture. For root crops, particularly, it is desirable to apply manures that will readily decompose and become solvent, so as to be freely taken up by the plant during the early stages of growth. The grand point of success in turnip growing, known to every practical man, is to push forward growth after germination as fast as possible; hence the importance of having the manure in a state at once available for the exigencies of the crop at this critical period. The horse-hoeing of crops in rows during dry weather is well known to be highly benefi-