

The following remarks on Clay Soils, are from the "Penny Cyclopædia," and correctly apply to much of the soil of Canada:—

"Clay is an essential component part of all fertile soils. A clay soil consists of a large proportion of alumina, united to silica, of various degrees of fineness, and frequently also a portion of carbonate of lime. When the silica is very fine and intimately mixed with the alumina, the clay although stiff in appearance, is fertile in proportion to the humus which it contains, or which is artificially added to it. It then forms the class of rich wheat soils which produce successive abundant crops without change or manure. It has a strong affinity for water, which prevents the plants that grow in it being injured by drought; and it has a sufficient degree of porosity to allow superfluous moisture to percolate without making it too soft. All that is required for such soil is a porous substratum of rock or gravel; and where this is not the case, sufficient drains must be made to produce the same effect.

When clay soils are well drained, and when the effect of noxious salts has been removed by liming, burning, and frequent stirring, it will be found that a much smaller quantity of manure will produce a certain return in grass or corn, than on any light soils. The great difficulty is to choose the time when stiff clays are to be worked; and here it may be observed, that ploughing sometimes does more harm than good. When clay is wet, especially in the beginning of summer, and it is ploughed in the regular process of fallowing, the tough moist slice cut out by the plough is set on edge, and the sun bakes it into hard mass like brick. In this state it is not improved by exposure to the air, which cannot penetrate this hard substance. It would be much better to plough out deep water-furrows with a plough made on purpose, and wait until the moisture is reduced by gradual percolation and evaporation; so that the plough should raise a slice ready to break and crumble as it is turned over. This should be done immediately before winter, and then the frost will so divide and mellow the soil, that, provided it be kept free from superfluous water by drains and water-furrows, it will have the appearance of the finest mould when worked with the harrows in Spring. To plough it again would be to spoil all. It should have received the necessary manuring in Autumn, and be ready for the seed to be sown on this pulverized surface. The horses which draw the harrows or the sowing machines should be made to walk in the furrows, which should afterwards be deepened out with the spade, or by a plough constructed for the purpose. A free course and outlet should be formed for all surface water; for no maxim is more true than this, that stiff clays are never injured by a continuance of dry weather, unless they were in a wet state imme-

diately before. The driest clay contains sufficient water to supply the roots of plants for a long time; but wet clay, in drying and shrinking, destroys the texture of the roots by mechanical pressure. This may be of use when weeds are to be eradicated, and in that case a different mode of proceeding may be recommended; but when good seed is sown, the clay should be in such a state as to crumble under the harrows, and it should not be too moist. Experience has taught the ploughman that clay soils should be laid in round lands or stitches; and much of the produce of a field depends upon the skill with which this is done. It is not only the surface which should lie in a rounded form, but the bottoms of the furrows should lie in a regular curve, without small ridges or inequalities between them; so that when heavy rains penetrate through the whole thickness which the plough has raised, the water may find its way into the intervening furrows, without being retained by the small ridges left by an unskilful ploughman. It is seldom that a common labourer can be made to perceive the consequence of his carelessness. The slightest inclination of the plough to either side makes an inclination in the bottom of the furrow. An inequality in the depth does the same. The usual method is to increase the depth of the ploughing from the crown of the stitch or ridge to the outer furrow. If the land has been cross-ploughed or dragged level before the last ploughing, this may answer the purpose; but if the stitches are only reversed, and the centre of the new stitch is to be where the water-furrow was before, it requires twice ploughing to bring the stitch to its proper form, and this is not always done for fear of trenching the land too much. Hence it is always preferable, where it can be done, to lay the land flat by cross ploughing and harrowing, before it is raised in stitches or ridges. The narrower the stitches are, the drier the land will be. The most convenient width is five bouts, as it is called, that is, five furrows on each side of the centre, which allowing nine inches for each furrow, makes seven and a half feet, leaving 13 inches for a water-furrow, which is deepened into a narrow channel in the middle.

Clay land will bear a repetition of the same crops much oftener than lighter lands; but every scientific agriculturist knows the advantage of varying the produce as much as possible making plants of different families succeed each other. The cereal grasses are one family, which is the reason why wheat, oats, barley, &c. do not succeed so well after each other as after leguminous plants or clover."

The foregoing remarks will give a very good idea of the best method to manage strong clay lands. By summer fallow, one year's crop is lost certainly, but the second year the land may produce a crop that would be more valuable