

farmer in the position which the genius and institutions of the land allot to him, is the diffusion of agricultural knowledge—teaching the farmer to read, and thus dislodge his mind of the prejudice which still lingers with so many, of the inutility of science, knowledge, and general learning, in connection with agriculture.

It may easily be shown that there is no single occupation or business in life, where extensive knowledge is more necessary than it is to a full understanding and proper practice of agriculture.—There is none so intimately blended with all the important branches of the natural sciences as this; none to which geology, chemistry, botany, and entomology, are such important contributors and invaluable auxiliaries. The earth, the air, are full of instruction to the farmer, the pebble, leaf, insect; the composition and decomposition of matter and its causes, are all before him, all constantly going on around him, all inviting attention as part of the processes he must produce if he is a successful cultivator of the soil. He must read and if he fails the value of knowledge himself, he will be proportionably anxious that those around him, his neighbouring farmers, his friends, should read also. A community of knowledge constitutes one of the strongest ties that can bind society together; whatever may be the topic, it is a bond of feeling and interest not easily broken or destroyed. An intelligent practical man may change the whole course of agriculture in a neighbourhood and give an impulse to its prosperity, which endure long after the cause is forgotten. We have seen a man go into a neighbourhood of farmers, respectable men, but who did not read, and felt the old fashioned contempt and aversion for those who did. This man was a reader of agricultural papers, and when an improvement was pointed out that his good judgment showed was adapted to his means, his farm, or his circumstances, he adopted it at once. He improved his farm by draining his lands, and nearly doubling the ordinary crops, by skilful cropping and rotation. He improved his stock by purchasing at great cost, superior animals to breed from. His neighbours at first called him a *book farmer*, and sneered at his management. They soon found the laugh was on the wrong side, and began to inquire the causes. If he could get a neighbour to read, his periodicals were always at their service; and if he met a brother farmer, some proposition was made or some inquiry started which he was sure would lead to useful results. Soon they found agricultural papers necessary, and became subscribers themselves; an agricultural paper has become as indispensable as a political one, and its arrival is always looked for with interest and pleasure. The prominent farmers of that neighbourhood are now *readers*; several different publications are received; and when they meet, the comparative merits of the different modes of husbandry are freely and intelligently discussed. We would wish to see such examples as this more frequently imitated.—When they become common, it will be a proud day for American agriculture, in such instances, we trace the true secret of improvement, for although the looker on may at first sneer at the reader, he is sure eventually to imitate, first the improvements he makes, and lastly his course of reading. We ask it then as a favor, of every friend to agricultural improvement to bring a knowledge of farming periodicals to the notice of his neighbours—let them be induced to become subscribers—to read, to reflect on the means of improving their cultivation, and a point will be gained, which will afford a rational hope of rapidly increasing and permanent prosperity.

#### DRAINING.

Of all operations in agriculture, none is more necessary than draining, and to practice this operation successfully, it is necessary for the farmer to have a proper knowledge of the various strata near the surface of the land which requires draining. Oozing Springs, bogs, Swamps, or morasses, on level ground near elevated lands, are the most difficult to drain. When the water filters or slides down the porous sides of high grounds, the best method of draining is that of interrupting the descent of the water or spring, and thereby totally remove the cause of wetness. This may be done where the depth of the superficial strata, and consequently of the spring, is not great, by making horizontal drains across the declivities of the hills, above where the low grounds of the valleys begin to form, and connecting these with others made for the purpose of conveying the water thus collected into the brooks that may be near.

In Ireland, I have often seen on thin layers of clay, which had underneath them sand, stone, or other porous or fissured strata, to a considerable depth, that by perforating the thin layers of clay in

different places, the water could be let down into the open porous materials that lay below them, and the surface land be thus completely drained.

The general origin of the wetness of land which it is the object of under-draining to remove, will be found to be the existence of water in sub-strata of sand, gravel, open rock or other porous substances, which either lead to the surface, or having no natural outlet, become filled or saturated, while the pressure of more water coming from a higher source, forces that which is in the lower part of the stratum upwards through the superior strata to the surface; thus occasioning either bursts and springs, or a general oozing through the soil. Any farmer who does not perfectly understand the general oozing of water through the soil, from water or moisture, in the immediate vicinity, naturally or artificially kept on a higher or equal level, may be convinced of the fact by the clearest demonstration if he has an opportunity of viewing a canal that may be so situated, and whose banks have not been secured by puddling, or the leakage through the embankment intercepted by proper and sufficient drains.

The object of under-draining therefore, is not to catch the surface water, but that which flows through the inferior strata; and, for this purpose it is necessary to make a sufficient channel, either at the lower part of it as may conveniently carry off the water, so as the pressure referred may be relieved, or the water intercepted before it reaches the surface. It must always be kept in mind then, that under-draining or surface-draining are operations essentially distinct, and every care must be used in practice not to blend them in the execution. If surface water be allowed to get into a covered drain, the sand and mud which it will carry into these subterraneous channels will soon choke them up, and occasion bursts, creating, as may be conceived, new swamps; while the expense of taking up and relaying the under drains will be very great, and the execution imperfect, the sides being found never to stand a second time so well as when first formed.

In the drainage of wet or boggy grounds, arising from springs of water beneath them, a great variety of circumstances are necessary to be kept in view. Lands of this description, or such as are of a marshy and boggy nature, from the detention of water beneath a spongy surface materials of which they are composed, and its being absorbed and forced up into them, are constantly kept in such state of wetness, as are highly improper for the purpose of producing advantageous crops of any kind. These tracts, if properly reclaimed, would be of considerable value in the climate of Canada, and should, therefore, be an object of great interest and importance to the industrious farmer who might have such lands. Wet grounds of these kinds, may be arranged under three distinct heads first, such as may be readily known by the springs rising out of the adjacent more elevated ground, in an exact or regular line along the higher side of the wet surface; second those in which the numerous springs that show themselves are not kept to any exact or regular line of direction along the higher or more elevated parts of the land, but break forth promiscuously throughout the whole surface, and particularly towards the inferior parts, constituting shaking quags in every direction, that have an elastic feel under the feet, on which the lightest animals can scarcely tread without danger, and which for the most part, show themselves by the luxuriance and verdure of the grass about them; that sort of wet land, from the oozing of springs, which is neither of such great extent, nor in the nature of the soil so peaty as the other two, and to which the term bog cannot be strictly applied, but which, in respect to the modes of draining, is the same.

When on the declivity or slanting surface of the elevated ground from which the springs break forth, they are observed to burst out at different levels, according to the difference of the wetness of the season, and where those that are lowest down continue to run, while the higher ones are dry, it is in general, a certain indication that the whole are connected, and proceed from the same source, and consequently that the line of drain should be made along the level of the lowermost one, which if properly executed may keep all the rest dry. But if the drains were made along the highest of the outlets, or place where the water breaks forth, without being sufficiently deep to reach the level of those below, the overflowing of the springs would merely be carried away, and the wetness proceeding from that cause be removed, while the main spring still continuing to run, would render the land below the level of the bottom of the drain, still prejudicially wet, from its discharging itself lower down below the surface of the ground.—It is absurd to expect that by cutting drains between the wet and