

AGRICULTURAL.

[From the New England Farmer.]

DRAINS, SWAMPS, &c.

DRAINS, for agricultural purposes, are of two kinds, open and covered. Open drains sometimes answer, not only for conveying off superfluous water, but for inclosing fields. But they make a hazardous and inconvenient fence, without the addition of a bank hedge, or railing. The Farmer's Assistant observes that "when a ditch is made for a fence, it ought to be four feet wide at the top, one or less at the bottom, and about two and a half deep; with the earth all thrown out on one side, and banked up as high as possible." Sir John Sinclair states that "it is a general rule regarding open drains, with a view to giving slope and stability to their sides, that the width at the top should be three times as much as that which is necessary at the bottom, and in the case of peat mosses, or soft soils, it should be such as to allow the water to run off without stagnation, but not with so rapid a motion as to injure the bottom."

But before you attempt to drain a piece of land, it will be expedient not only to calculate the cost, but also to ascertain the nature of the soil, which it is proposed to render fit for cultivation. If the subsoil or under layer be clay, the swamp may be worth draining, though there should be no more than six inches of black soil or mud over it, for the clay and the mud intermixed, will make a fertile soil. But if the subsoil or under stratum be gravel or white sand, it will not, in common cases, be best to undertake draining, unless the depth of black mud be as much as from fifteen to eighteen inches deep; for the soil will settle after draining, and be less deep than it was before. But the situation of the land to be drained, may authorise some deviation from the general rule.

The mud and other materials which are dug out of a ditch or drain, should not be suffered to lie in heaps or banks by the side of the ditch, but should be spread as equally as possible over the surface of the drained land. In this way the matter taken from the ditches will tend to level the surface of the swamp; will, perhaps, serve, in some measure for manure; and, in some cases it may be good husbandry to transport the earth taken from the drains to the farm-yard or hog-pen, to form parts of those layers, which good farmers spread over those places in the latter part of summer, or in autumn, to imbibe liquid manure, or to make into compost with dung. In many cases, it has been told us that the earth, thus dug out of ditches or drains, has been thought to be of sufficient value to pay the expenses in digging such ditches.

The American Editor of Sir John Sinclair's *Code of Agriculture*, has the following, among other judicious remarks on this important subject: "The most expeditious, effectual, and economical mode of making a drain would undoubtedly be to use oxen and a scraper, or ox shovel, as it is sometimes called; an instrument well known in this country in the making of roads. In some cases, this mode might not answer, as in very mucky grounds, and in lands just cleared of timber. But where lands are very mucky, if the process is begun at the outlet of the water, and there indeed, it ought always to be begun, the next adjoining portion will generally be made so dry as to allow being trodden upon in a peculiar season, and in this way a drain may by degrees be carried on towards the centre. In nineteen cases out of twenty, drains may probably be effected in this mode. Where the ground will admit of it, two men and a boy, and two yoke of oxen, will accomplish more business of this sort in a day,

than half a dozen men in the same time with spades and shovels. Wherever the labor of cattle can be substituted for human labor, policy requires it to be done. The surface of wet and mucky land is usually very uneven. If a scraper is employed in draining them, the earth taken from the drain is easily landed in any hollow spot, which needs to be filled; and if there are no such hollows, or they have already been filled, the earth may be spread over the surface in such a manner as to do the most good. If the earth is not wanted for other purposes, it is recommended to drop and spread it, if practicable, in such a manner as to leave the general surface of the land sloping towards the drain, that the water may the more readily incline towards it, and pass off. At some distance below the surface in peat grounds, there is usually found a hard stratum of earth, called in the common language of our farmers, *hard pan*. The hard pan, if ploughed into, scraped out, and spread on the surface, would greatly improve the texture of such soils. This furnishes another argument for using a scraper in draining, for in no other way can the upper earth, taken out of the drains, be so cheaply removed, and put on the adjoining land; nor in any other way can the hard pan be so easily broken up, and carried off; nor in any other way, oftentimes, can suitable earth be so well obtained for the purpose of spreading it over the surface, with a view to improve the texture of the soil. If the object be to pile the earth from the drains, with a view to composts, this purpose is completely effected by means of the scraper."

COMMON SENSE IS MUCH WANTED.—When I see a man whipping a horse, it is a sign he has not common sense.

When I see a man load up his team so heavily that his axle-tree breaks down, it is a certain sign he does not possess common sense.

When I see a man driving a horse as poor as a crow, it is a sign he does not feed him well.

When I hear a man telling how fast his horse will trot, it is a sign he's more fit for a jockey than a man of business.

When a man puts poor window glass in a house, it is a sign he is no judge of his own interest.

When a man leaves his horse untied, he frequently has to pay pretty dear for the whistle.

When you see a farmer's door-yard cluttered up with rubbish, it is a sign of indolence.

When you see a yard in the rear of a house filthy, and old things rotting for the want of a little attention, it is a sign of a sloven.

SCIENTIFIC GARDENING.

GARDEN CHEMISTRY—CONTINUED.

Upon trying, by means of chemical tests, the materials taken up by plants from the soil they are found to consist of water, with which are mixed carbonic acid gas, and nitrogen or azote, along with a few other principles, usually in small proportions, which it may be well to examine separately.

Water.—From experiments made by Van Helmont and Boyle, who reared plants in earth previously dried in an oven, and by Du Hamel and Bonnet, who reared others upon sponges and moss supplied only with water, it was concluded that water alone is the food of plants; though the inference is faulty, in consequence of overlooking what might be contained in the water before it was used, and also what it might afterwards derive from the atmosphere as well as from the earth or the sponge. That water, indeed, is not all the food necessary, was proved by the plants so treated not remaining healthy; and it is well known, that though hyacinths and other bulbs

will flower in glasses containing nothing but water, yet they never in such cases form seed; and if thus kept for a few months, they will infallibly die, as other plants do when placed in calcined or roasted sand, and watered with distilled water. The hyacinths in glasses, moreover are not found to thrive unless the water is frequently changed, indicating, that it is not the water alone, but something in the water which has become exhausted, or at least deteriorated, by the slimy matter thrown out by the roots.

The materials, which water holds or may hold dissolved, are therefore important to be ascertained, and this may be partially known by colour, taste, or smell, but more correctly by chemical tests. It is only, however, requisite for gardening purposes to discover the materials which may prove useful or hurtful, and these for the most part, are but few in number.

Among the substances useful to vegetation dissolved in the water of soils, may be reckoned atmospheric air, carbonic acid gas, hydrogen gas, humic acid, and a small portion of the salts of lime and potass.

Among the things hurtful are most of the acids, the salts of magnesia and iron, metallic substances in general, and stagnant water.

It is also important to bear in mind, that the purest water is not a simple substance, but composed, as discovered by Cavendish, of eight parts oxygen gas, and one part hydrogen gas, or two volumes of hydrogen and one of oxygen, the correctness of which composition is proved by exploding, or burning these proportions of the two gases together, when the result is pure water. Plants seem to have the power of decomposing the water which enters into their system from the earth or the air; that is, of separating it into its component parts, oxygen and hydrogen.

Atmospheric Air.—All water openly exposed contains more or less of the air of the atmosphere, which consists of two gases, namely, twenty-one parts, by measure, of oxygen, and seventy-nine parts of nitrogen or azote with, in general, about one thousandth part of carbonic acid gas. It is chiefly owing to the atmospheric air, and a little carbonic acid gas, that common water, though said to be tasteless, is agreeable to drink; for when these are expelled by boiling, it tastes vapid and unpleasant.

That the air contained in the water which enters into plants is important to vegetation, appears from water being found beneficial, in proportion as it has had opportunities of becoming mixed with air. When meadows accordingly are laid under water artificially in the process of irrigation, it is found rather hurtful than beneficial if the water is not kept in motion, but allowed to stagnate.

It is on this account, that the water of rivers which run a long course, is much better for watering than that of springs or lakes, whose waters contain but a small portion of air, though this does not apply so well to the stagnant water of ponds or ditches, whose deficiency as to the atmospheric air is compensated by the greater portion of carbonic acid and other substances usually abundant in such places.

The best water, however, with respect to quantity of atmospheric air, is rain, which falling in small drops, often tossed about by the wind, has an opportunity of collecting a large proportion of air during its descent to the earth, and hence, the smaller the bore of the holes in the rose of a garden watering pot the better.

As water becomes mixed with air by exposure and agitation, so does the air become mixed with water by its rising in vapour, and the driest air accordingly always contains