

Agriculture.

Advancing Agriculture.

To our Inventors and Patent-Right Men:—

Horace Greeley attended the Vermont State Fair, and, as it was made known, a very large crowd attended from the surrounding towns and country. He gave a long practical address that was listened to with much attention. We copy two extracts from it by the *Richmond Guardian*:

1st. WIND.—For at least five thousand years wind has played a leading part in navigation; why not also in cultivation? Does nature afford any reason for regarding wind as inherently tractable and serviceable on water, but not on land? Men have ground grain by wind power for at least a hundred generations; why not thresh it as well? Nay, why should it not press cheese and turn the grindstone, and saw wood, and pump water, and even ultimately plough fields? Who dreamt that the inventions of the past bear any proportion to those of the imminent future? We have at length learned that such is the elasticity of air, that a wind mill running throughout the night may thereby accumulate power to be expended during the ensuing day or days. Can you suppose that we shall much longer allow this enormous aggregate of power, which has hitherto thrust itself into our very faces unregarded, or at least uncomprehended, to expend its energies in topping our chimneys and blowing the apples from our trees? I tell you that this is not possible. I have nothing to say of A's or B's or C's contrivance for utilizing the power of wind in the service of agriculture. If you insist that all these are fantastic and absurd, I shall not contradict you; I shall only insist that the power is there—that it sweeps over every field on almost every day, and that the means of utilizing it, if not yet discovered, soon will and must be.

2nd. WATER.—A hilly, woody country, naturally abounds in springs and brooks—in rippling streamlets and dashing cascades. All these are reservoirs of power—for the most part unused, unregarded power. Our water falls, whether natural or artificial, will yet be employed to create (I should say transfer) power, in the shape of compressed air; and this power will in time be used at long distances from the point at which it was pressed into the service of man. Especially in regions like this, where considerable streamlets often fall a hundred feet in a mile, will water be made to play an important part in the creation or utilization of power for the farmer. William D. Kelley, arguing to a Southern audience the impolicy of slavery, asserted that a dozen men and dogs had often followed for days on the track of one lame negro, while water power equivalent to the muscular force of 1,000 negroes ran to waste unregarded beside them. We smile at the folly thus forcibly exposed, but might not the smile be broadened into a laugh and turned against ourselves? If we lack the brain power to stop this monstrous waste, I feel sure that our grand-children will possess and exercise it.

ABOUT LIME.

Every inhabitant of the ocean which has a shell derives the materials of which that hard covering is composed from the water. Each time an oyster draws water through its gills some of its lime, which is held in solution, is taken possession of by appropriate vessels, and goes directly to the living membrane, which deposits it, and thus the shell grows. It is assumed that a single drop of sea water contains only about the ten thousand six hundredth part of a grain of lime. But the incessant respiration of the dwellers, in one or two years, makes a house weigh, in some cases, many pounds more. When the animal dies, most of the shells gravitate and

aggregate at the bottom, where, becoming broken and impacted into solid masses, mixed in earthy deposits under hydrostatic pressure and chemical forces, become marble. All marble quarries are supposed to have thus originated in the abyss of primitive seas, and were afterwards elevated to where they are found by upheaval forces.

Where did the sea obtain such vast accumulations of lime? From primitive rocks, set free by running water, by which it is transported to the ocean through the intervention of rivers. Upheaval action raises enormous beds of sedimentary strata to the surface again at vastly remote intervals. Thus, there are limestone regions. By various processes in nature, it is slowly again returned to the great magazine from which it was thrown up, to reappear at distant intervals of time—periods of undefined duration. Thus, there is one senseless movement of matter. Never at rest, though apparently so, are either the organic or inorganic materials of which the world is composed.

[Lime is known to be of immense value to agriculture; but how few of us are using it. It will pay. We know of a large deposit of lime formed from shells, extending over a large space. The tract may be procured at a moderate rate.—We would most willingly become one of a company to purchase the bed of shell lime. It requires neither grinding or burning, but would require capital to work it, as draining and digging would have to be done. We feel sure it would return a handsome profit and be of immense value to farmers.—ED.]

STORING BEETS.

If the subsoil is porous, so as to give perfect bottom drainage, a broad, shallow trench may be dug, which will take in a larger amount of roots without so much covering, and will also protect them better from the cold. If the underdrainage is not perfect, select a dry spot, and make but little depression. The heap may be made four or five feet wide, and three high. There should be a thick coat of straw, covered with earth, which is to be beaten smooth with the spade to throw off rains.

The thicker the layer of straw the better, as it absorbs moisture—if eight or ten inches thick, there will not be too much, when a few inches of earth will be sufficient. If there is less straw, the earth must be thicker. The amount of covering must vary with latitude. The heap may be as long as will hold all the roots, and ventilating holes made with a crow-bar at the top, and filled with a wisp of straw, should be placed at every few feet.—*Country Gentleman*.

PREPARING THE LAND FOR GRASS.

We are apt, very apt, to overlook the fact that land intended for grass should receive more thorough culture than any other, because for years while in grass, it has not the advantages of the plow and other implements to stir the soil, but must rest and pack and get more and more in a condition to keep out the air, and let in and pass off less readily the water. We should therefore thoroughly prepare the soil. Plow as deep as may be, and subsoil well; pulverize and enrich the soil—enriching it will make it more loose and mellow, and keep it longer in that condition, as well as increase the yield. Such land will "catch" its seed, and if plentifully applied, will be certain under anything like favorable circumstances to form a thick set. A little top dressing, aided by the aftermath, which should never be fed close, will ensure good crops—two cuttings a year.

But let there be a cold, hard undersoil, and the seed put in in the usual way—little of it, and on hard and reduced soil, without manure—what can be expected of it? Just what we see: light crops, getting lighter each year till it will hardly pay for harvesting. Such land, when the plow turns it down, will be found to be hard. The soil amounts to but little, whereas, in properly tilled land, it will yield from sixty to seventy loads of manure per acre. A mellow seed-bed, deeply loosened soil well enriched, plenty of seed sown, and sown as early as possible—are the points to be secured in putting down grass lands.—*Rural World*.

APPLICATION OF MANURES.

The effort to work manures in deeply with the idea of fertilizing the subsoil, which was extensively held but a few years ago, is now pretty generally given up by most practical farmers. That idea was, if we mistake not, advanced and maintained by Prof. Liebig and others.—Now the most intelligent, scientific, as well as practical men, believe it most for the farmer's interest to keep manures near the surface.

At a recent meeting of the Farmers' Club, at London, Prof. Voelcker said, in reply to some statements made by Alderman Meehi, "Don't manure subsoil of any kind, light or heavy, manure the topsoil; and keep the manuring elements as near as you possibly can to the surface, so that the young plant may derive immediate advantage from the food prepared for it." This we take it, is the true doctrine very forcibly expressed, and we believe it accords with the experience of the most careful observers both in this country and in England.

This position does not imply that lands should not be deeply ploughed and mellowed, only that manures should not be buried deeply. We like deep ploughing. We like, in turning over the soil, to lay up to the sun and air a sufficient depth of earth and mould, to have the after cultivation easy and light, without breaking up the turf and sod. But we do not like to turn under the manure too deep, and we think a great deal of manure has been comparatively lost and wasted. If the sod is turned over deeply there is some satisfaction in manuring and fertilizing the loose and mellow earth that is turned up. This is a practical point of very considerable importance, and is worth careful investigation.—*Massachusetts Ploughman*.

FARM-YARD MANURE.

The most generally important elements in any manure are the phosphates—potash and nitrogen, with its compounds (ammonia, nitric acid, etc.) The other elements are comparatively unimportant, as they are either not much needed by the crop, or are present in most soils in sufficient quantity. Every intelligent farmer will then be interested in the question:—“How can these important substances be retained and utilized?”

There are, as is well known, two sources of loss in the management of farm-yard manure:—1st, By the action of water, commonly known as washing, and 2nd, by the volatilizing of certain elements which are given off as gases.

The phosphates and potash being soluble, may be washed out, and not only they, but much of the nitrogen may be lost in the same way. The enormous loss occurring yearly thus can scarcely be conceived. Thousands of dollars are spent yearly in the purchase of super-phosphates, mainly in order to get the phosphoric acid which they contain. Now we lose, by the washing of farm-yard manure, many times the amount of this valuable element which is bought in commercial fertilizers.

By the other source of loss, viz., gaseous evaporation, only nitrogen is carried off.—This evaporates as carbonate of ammonia. It is the salt which forms the odor of the manure heap, as also that of smelling salts. Although we can generally discover its escape by our olfactory organs, the matter may be tested by dipping a feather in vinegar (acetic acid) and holding it over the manure heap. The formation of a white cloud on the feather shows that ammonia is escaping, and is deposited on the feather as an acetate. The prevention of these losses is a matter of great importance.

In regard to the first, it is plain that shelter from rain will accomplish the end; but it is almost impossible for many farmers to keep all their manure under cover, nor is it absolutely necessary to do so.—Dr. Voelcker, one of the highest authori-

ties, has proved that very little loss is sustained if the manure be exposed only to what rain falls directly upon it. If then, the farmer has good cavetroughs for his buildings, and prevents the running of a stream of water through his barn-yard, having it at the same time sloping a little to the centre, he will not need to provide a roof for it.

The other source of loss may be prevented by keeping the manure moist and allowing free access of air. It is only in putrefaction that the carbonate of ammonia is formed and escapes. By allowing free access of air, decay takes the place of putrefaction—the nitrogen being then oxidized to nitric acid, which is not volatile, and is one of the most valuable elements of plant food.

It has been strongly recommended to add gypsum (sulphate of lime) to the manure heap, in order to fix the ammonia.—The best authority, however, considers this as of little use. A sprinkling of sulphuric acid in the stable is the best agent for this purpose, as it converts the carbonate of ammonia into the sulphate, which is not volatile.

If it could be done, however, it would save trouble and loss to apply manure in a fresh state. It has been proved by most careful analyses that, weight for weight, fresh manure is more valuable than that rotted in the ordinary way. Even if manure is well managed and carefully rotted, a ton of it is but little more valuable than fresher. It is certainly quicker in its action, but the trouble of caring for it counterbalances this advantage.

Therefore, we would say apply manure fresh, if possible, and use it as a top-dressing.

COVERING MANURE.

It is remarkable that more attention is not given to the subject of covering manure from the weather, and especially from too much rain. Those who have given the matter particular attention have found that manure so protected is worth double that which is left out in the open air.—Two loads for one is a profit few farmers can afford to lose. There is no question which so vitally concerns the farmer as this one of manure. Much that he does has reference to it. Straw is not to be sold, because it makes manure. Stock is fed through the winter for the express purpose of manure making. Articles which will scarcely pay to send to market are, nevertheless, taken to the city in order that manure may be brought back as a return load; and yet the whole of the manure made remains all the season exposed to the sun, wind and rain, until it is diminished in value to so great an extent as it is.

The trouble is probably that few really believe that exposed manures undergoes this loss. But the matter has been too thoroughly tested to admit of a doubt.—We know first-class farmers who did not themselves believe it, until by actual experiment they found out its truth. In arranging farm buildings it will pay well to look as much to the preservation of the manure as of the hay or grain, and those who have their buildings already finished without these manurial arrangements, will find that twenty-five or fifty dollars spent on boards for a covered shed will rank among the best investments ever made.—*Germantown Telegraph*.

Where agriculture is carried on in the greatest perfection there is always the greatest demand for manure. Thus it is in England. The area of that country, as compared to the great extent of such nations as the United States of America, is very limited, not much greater than the single State of Pennsylvania; yet she consumes annually not less than 800,000 tons of commercial fertilizers, which is a much larger amount than is used in the whole United States.

ITS VALUE

If the farmer has enough, this are all the properties of such quality. With its action on sour soils, he may extend, and manure question. If, in the the portable so far as manures must be good quality animal or vegetable enough to afford to render roots can be freely, and cast that which Hence, the ly manipula itself of co feeder of pl soils—making to cultivate somewhat p is true of m

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