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Agricultural Journal.

From the Boston Cultivator.

ECONOMICAL FARMING.

As most farmers pursue their business as a means of support for themselves and families, or for profit, it is of the greatest importance to study economy in order to accomplish these desirable objects. All the industry and the most skilful management, in other respects, will not avail to make farming a good business without economy in every department. We have particular reference to economy in labor, not in regard to the amount to be performed, but to the manner of performing it, in order that there may be the least possible expense.

Two farmers may pursue nearly the same course in raising crops,on farms that are similar, and each may get about the same amount of produce, one making it a profitable business, while the other will lose. The produce of one will cost twice as much as the other, though both had the same advantages in the beginning. One will raise corn at 50 cents a bushel and make it a good business, while the other expends a dollar in rasing the same quantity.

One farmer will improve his tillage by removing all obstructions to the plough, and draining, or adding sand or gravel when it is too wet, and adding mud and clay to light lands, and supplying various manures to suit the texture of the soil, so that not only far less labor will be required to the same extent of land, but much larger crops will be obtained.

Some farmers will use four oxen and two hands to plow the same land which another would plow equally as well in the same time, with only half the team and hands.—In some cases the principal difference is owing to the ploughs that are used, for some plows require only about half as much draught as others, to perform the same work. In planting too, there is a difference of one half in labor. One will spread a part of the manure, and then furrow, or dig holes with the hoe, and apply the remainder of the manure in the hill. When land is prepared and highly manured, there will usually be as good a crop by spreading the manure, and sometimes it will be better, and the soil will be more improved than by putting it in the hill, and there will be less waste by the escape of gases in fermentation, and the manure will be more equally mixed with the soil.

In hoeing, one half the labor is saved by having the land well prepared and the corn planted in such a manner that most of the work can be done by the cultivator and plough; and the free use of these implements will improve the crop. By having the land well prepared and highly manured a large crop may be obtained, at little more labor than is requisite in going over the same land in poor condition, and obtaining a small crop.

In harvesting corn, nearly half the labor may be saved by cutting it up at the ground when well glazed, instead of cutting the top stalks, and afterwards gathering the corn, and then cutting up the buts, as the fashion once was, and now is with many. For a number of years we have recommended the improved mode as we have found from experience that it is attended with many advantages as to saving the crop of corn and stalks with much less labor, and having the land clear for a crop of turnips, for sowing rye, or for any other purpose.

It is the same with other crops. We have known many cases of farmers who would give the amount of the seed sown in payment for reaping the grain, because neither they nor any of their hands were willing tobend their backs tothe use of the sickle. How would farmers in the West succeed in raising grain if they expended as much in harvesting it as the estimated cost of this operation in this section? In some parts of the country grain is not worth much more than farmers here would reckon the cost of harvesting--for instance, corn at 12 1-2 cts per bushel in seasons of plenty. Some years ago we were in the West and worked at harvesting grain which was done mostly with the sickle. The neighbors changed work, and arranged matters so as to have 12 men together in a field of grain, who reaped, bound up, carried together, and shocked 12 acres in a day. With the same despatch in rasing our grain we shouldnot estimate the cost of corn at a dollar a bushel and wheat at two dollars.

We believe that corn may be raised in New England at from 60 to 75 cents per bushel, and wheat at 100 to 135 cents per bushel; and our grain is worth these prices on an average, as southern grain sells in New England. Though we may find it most profitable to import a part of our bread stuff, while we can obtain it from other sections in exchange for other productions, yet we think that the farmers of New England can compete with the South and West in our markets.

From the same.

AGRICULTURAL CHEMISTRY.

Not long since, I heard a person who possessed some knowledge of agricultural chemistry, telling some farmers and others that a large part of the solid substance of trees, and other vegetable productions was derived from the air, or rather, that part of the atmosphere called carbonic acid, and that this acid, or gas, was precisely like that which issues from a barrel of fermenting beer or cider. After the man left them, they began to express their doubts about the truth of his theory. Says one, 'tis all nonsense, the visionary dreamings of a book farmer. Yes, says another, if his doctrine is true, what's the use of manure, muck, and composts that he talks so much about. A third one observes, when he can make me believe that the moon is made of green cheese, I shall believe his story about trees being made out of the steam that flies out of the bung-hole of a barrel, when the cider is *working*.

Now, Messrs. Editors, I cannot think any of your readers are so ignorant, but still some of them may not have taken pains to investigate the subject as they ought, either from a belief that it is not necessary for a "common farmer," or that chemistry is too intricate a study for the tiller of the soil to trouble his head about.

To while away an evening, and perhaps, to throw a little light upon the subject, I forward you the following, with the hope it may in some measure stimulate farmers to a more familiar study of agricultural chemistry; of its importance there can no longer be any doubt; it is a matter about which there "are no two ways."

The atmosphere we breathe and in which plants grow and live, is compounded principally of a mixture of oxygen and nitrogen gases, in the proportion very nearly of 21 of the former to 79 of the latter. It also contains as a constituent necesary to the very existence of vegetable life, a small per centage of carbonic acid, on an average of about 1-2599 part. At first view it would seem impossible that this apparently small amount of carbonic acid could supply about one half the solid substance to all plants that annually grow upon the whole face of the globe—but when we recollect that the atmosphere not only entirely surrounds the earth, but extends in every direction about 45 miles—"and if the whole acid were collected in a stratum or bed occupying the lower part of the atmosphere, such a stratum would have a thickness of thirteen feet;" and this would be spread over the entire waters of the oceans, seas, lakes and rivers, the deserts of sand, the frozen regions of the poles, and in fact every part and place of the globe that does not yield a vegetable growth, and by the wisdom of the great Contriver, this gas is, in innumerable ways, returned to the air as fast as abstracted; here then our wonder ceases. Now, from 40 to 50 per cent by right, of all trees, plants and vegetables, and in fact all the parts of plants which are cultivated for the food of animals, or of man, consists of carbon, and unquestionably most of this is derived from the air—although there can be no doubt that a small portion is taken in by the roots, mixed with water, and some of the inorganic substances that are in solution--but this was also derived from the air.

The leaves of plants are their lungs, and they have the powers of taking in or absorbing from the air the carbonic acid, and in daylight this gas is decomposed, but much more rapid and energetic in clear sunlight. This gas is composed of two proportions of oxygen and one of carbon, and when decomposed in the leaf, the oxygen is set free and escapes into the air—the carbon is retained, and in obedience to those mysterious laws of chemical combinations, is made to form a moiety of the endless variety of wood, fruit, seeds &c. &c., that grow upon the earth.

In proof of this, I will offer the following illustration. We know, if we take a given quantity (by weight) of well seasoned wood and distil it in a close vessel, or burn it in heaps covered over so as to exclude the free access of air, wood-charcoal is left behind. When this process is well performed, the charcoal will weigh from 40 to 50 per cent as much as the wood did. The charcoal consits of carbon, with a slight admixture only of earthy and saline matter which remains behind when the coal or carbon is burned in the open air. When this charcoal (or carbon) is burned in the open air, it combines with the oxygen (which is separated from the nitrogen) of the air to keep up combustion, and the whole of the coal enters into combination with the oxygen and forms carbonic acid—or, in other words, carbonic acid consists of oxygen with a quantity of charcoal *dissolved* in it, and this is precisely the gas that escapes from a barrel of fermenting beer or eider, and in this condition it is *fitted* to be again taken in by the leaves of plants and reconverted into wood, fruit, seeds, &c.&c., and this process has been going on without intermission from the first morn of time down to the present day.

Perhaps it may seem somewhat mysterious to many *or* all, how this elastic invisible gas can be converted into wood or other solid substances, but it is no more wonderful than many other of its combinations. Every 100 lbs. of pure marble or limestone taken from the quarry, contains in round numbers 44 lbs. of this very gas; by subjecting the marble to a strong red heat, this gas is driven off, and leaves but 56 lbs. of lime. In this town there is a pearl-ash factory. In every 100 lbs. of pearlash, the manufacturer sends to Boston, there is 32 lbs. of this gas combined with 68 lbs. of caustic pearlash, or to place it in another point of view in sending 70 lbs. of pearlash, 22 lbs. of it is carbonic acid. The pearlash is taken to the distillery, and a current of carbonic acid is made to pass through it, when another portion of the acid is made to combine, and the 70 lbs. of pearlash come out 92 lbs. of salæratus,—that is, 22 lbs. more of this gas is fixed in the pearlash. At the distilleries this gas is disengaged from the molasses and water while fermenting, preparatory to its being distilled into spirit. Now can any one tell how this 44 lbs. of gas got combined with 66 lbs. of lime, so as to form 100 lbs. of marble? or how 44 lbs. of carbonic acid entered into combination with 48 lbs. of caustic potash to make 92 of salæratus? If a pound of charcoal is burned in a close vessel of oxygen gas sufficient to keep up combustion till the whole of the coal is consumed, there is neither gain nor loss in the weight, the pound of charcoal is *dissolved* in the oxygen and the gas weighs a pound more than it did before combustion commenced, and what is still more strange the volume or bulk of the gas is not increased by the addition of the pound of charcoal or carbon. The quality or nature of the gas is materially changed—being converted into carbonic acid. Perhaps no one can tell, or perfectly understand the "modus operandi" of the above, but of the truth of the statements we are as confident as we are that two and two make four. It is well known that lichens and mosses will grow and thrive upon the solid rocks. Aaron's rod and some other plants will flourish and gain in weight suspended in the air. The roots of a hyacinth, when the bulb is placed over a glass vase of water, will descend into it, the leaves and flowery stem will upwards, and in a few weeks an abundance of beautiful and fragent flowers are produced; during this time the water is not changed nor any manure added, one perhaps the whole plant when in bloom will weigh twice as much as it did when placed in the vase. Now from what source do these plants draw their growth but from the air? But some may say this is on too small a scale to satisfy them; then we will take it upon a larger one. We know, if we take crop after crop from a given piece of land, without returning any thing in the form of manure, it is yearly impoverished till at last will scarcely produce any thing.—The reason of this is, we carry from the land all that is derived from the air, and all that is drawn from the soil, *the inorganic parts of plants*, which are just as necessary as the carbon; the soils thus becomes destitute of it—part of the funds necessary to carry on the co-partnership—but the air is alway solvent, ready to meet its engagements at sight, and contribute its full quota in proportion with the other part of the joint concern, and no farther. But if this impoverished soil is sown with the seeds of some kinds of trees and they vegetate and grow, the longer they stand and the larger they grow, the richer and more fertile the soil becomes. If this growth of trees had derived its whole food from the soil, it would have been poorer than when it was planted; but as that is not the fact, we can come to no other conclusion than that the *food* for the carbon of the trees was drawn from the carbonic acid of the and the other organic substances from the air—water and the soil.

The inorganic matters that enter into the composition of plants, silex, lime, potash soda, gypsum, &c. are drawn wholly from the soil, gradually supplied by the mineral constituents of the soil, which generally yield them as fast as required for the growth of forest trees, without the aid or application of them by the hand of man. But not so with our cultivated crops, they are annually carried from the land, and to keep up the fertility of the soil, the inorganic matter must be returned in a more soluble form than they exist in the mineral constituents of crops which do not decompose fast enough to supply annual crops of corn and grain for a very long series of years.—Please excuse the length, and repetitions in this; my object is to be understood by that class who are not familiar with "agricultural chemistry."

Yours truly, Levi Bartlett.

From the Same.

IMPROVEMENT OF STOCK.

Although I have been a subscriber for your excellent paper but a few weeks, I have in that time been led to think considerably of the importance of attending to our *native breeds* of animals. It was in this way, that the English farmers brought theirs to such perfection. Three hundred years ago, English farmers brought theirs to such perfection. Three hundred years ago English cattle averaged but about 400 pounds; now, says Mr. Meighs, they frequently weigh 4000. At that time they imported all their poultry from Flanders: now, they can supply themselves and have a large surplus for their neighbors. I know that many have a fancy for imported breeds; it sounds grand to speak of "my Saxony Merinos," or "my full blooded Denton short horns," or "my swine crossed with the pure Berkshire and imported in the last steamer." I care not how many are imported by those who are able to do it.—Indeed I say let them come; the more, the better, because attention to the subject is called in this way. But my object was to say that in my judgment, it is of great importance to attend to our own native breeds. We occasionally *happen* to have a very fine cow;—every calf of such a cow ought to be raised, let the butchers offer what they may.—So of swine. The drovers often have, and without knowing it, stores equal to anything perhaps ever imported. Farmers who are fortunate enounh to buy such, ought to keep them for breeders at all events.