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By M. MAC LEAN.

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AGRICULTURAL.

FROM THE N. Y. EVENING POST.

IMPORTANT DISCOVERY IN AGRICULTURE.

In the *Phalange*, a Fourier paper published at Paris, September 8th, a novel discovery is described, which, if true, will work a great change in an important department of agricultural labor. It is communicated to the Paris print by Chas. P.illard and M. Bernard, who date their letter at Brest, August, 1841. It appears that while they and some of their friends, who farm their own estates, were engaged in conversation on the subject of agriculture, it was observed by one of them that that branch of industry was suffering more from the want of capital and enterprise than any other, and that nothing was to be done without manure, which was every day becoming more scarce and expensive. This remark led to an inquiry into the properties of manure, and particularly as to what provision nature had made in those uncultivated regions where there seems to be a vigorous and luxuriant growth, without artificial assistance.

"In observing nature unassisted, or unthwarted rather, by the hand of man, in vegetable reproduction, it is found that when the seed is ripe it falls upon the ground, and then the plant which has produced it sheds its leaves, or falls itself upon it in decay, and covers and protects it from the weather until generation has commenced, and the young plant is able to grow up in health and strength and full development, to recommence the same routine of seeding and of reproduction.

"From this it follows that, in nature, every plant produces its own soil or humus, and that the earth only serves to bear the plant and not to aid or nourish it in vegetation. The nourishment of plants is thus supposed to be derived from air and water, heat and light, or electricity, in different proportions, adapted to the different varieties of vegetable nature."

With this general notion in their minds, and considering what to be, in present circumstances, one of the most important vegetable substances, they agreed to try experiments, and in October last undertook the following operations:

In a field which had been sown with rye, because the land was deemed too poor for wheat, a plot of twelve square yards, untilled and left without manure, was carefully strewn over with the grains of wheat, and wheat straw was laid upon it closely, and about one inch in thickness. In a garden, also, which had been neglected several years, a few square rods of earth were trodden over, and the surface being made close and hard, some grains of wheat were scattered on this hardened surface, and a layer of straw one inch in depth was carefully laid over it, and left, as in the former case, to take its chance without ulterior attention. And in order to make doubt impossible concerning the mere secondary functions of mineral earth in vegetable reproduction, twenty grains of wheat were sown upon the surface of a pane of glass, and covered with some straw alone, as in the other case.

The germination of the seed was soon apparent and most healthy in development. "The winter has been rigorous," say these correspondents, "for this part of the country, and the earth has sometimes been frozen in one solid mass to a depth of six inches in the garden where the wheat was sown, and this has happened several times during the winter, to the great injury of many plants and even the entire destruction of some; while the spots protected by the straw were never thoroughly congealed, nor were the grains of wheat, though lying on the surface under the straw, at all affected by the cold. During the spring excessive droughts, prolonged and several times repeated, have prevented vegetation on the common plan from flourishing in healthy progress, while our little spots of wheat have hardly felt the inconvenience of excessive dryness, for the earth, protected by the straw, has never been deprived entirely of moisture, and our blades of corn were flourishing when all around was drooping and uncertain. To conclude, then, we have thoroughly succeeded in our practical experiment, and the wheat produced is of the finest quality. The straw was more than six feet high, and in the ears were 50, 60, and even 80 grains of wheat of full development, the admiration of all who saw them, and particularly those which grew upon the pane of glass, and which were quite as healthy

and as large as those which grow upon the common earth. It must be observed also that there was not the smallest particle of earth upon the glass, and that the plants were left entirely to themselves, without being watered or attended to in any way whatever from the time of sowing to the time of reaping."

The cause of this success they think may be explained in the following manner:

"Straw being a bad conductor of heat, and a good conductor of electricity, maintains the root of the plant in a medium temperature, and prevents the earth from being deprived entirely of moisture. The moisture of the earth, or the substratum, being continual, facilitates the gradual and constant absorption of carbonic acid gas from the surrounding atmosphere, and hydrogen and carbon, the chief elements of nourishment to vegetables, are thus economized in regular supplies where they are constantly required, and pass in combination with oxygen from the roots up to the stems and branches of the plants in which they are assimilated, and the oxygen throws off in exhalation from the leaves. The straw decays but slowly, and thus furnishes its substance by degrees to the young plant in due progression and proportion, (such as the silicious ingredients, for instance, of the pod or capsule,) so that the decomposition of the straw corresponds to the four phases of fermentation in progressing from the saccharine to the alcoholic, the acid and the putrid states, analogous to those of infancy, bulging, youth, and senescence of the plant.

"We observe that our blades of wheat have but a very few roots, and those are short and hard, something like a bird's claw; and this agrees with the remarks of Mons. Raspail, who states that the most healthy plants in ordinary vegetation have the least exuberance of roots and fibres.

"Another important observation also, is, that weeds and parasitical vegetation are prevented by this method, for the straw chokes every other plant but that of its own seed. Many other interesting observations might be made on these experiments, but we refrain at present from obtruding on your readers; but if any of them wish for further information on this subject we shall willingly afford them every facility. The importance of the general result will easily become apparent without further comment, and a revolution in the present modes of agricultural labor is a necessary consequence of this discovery. No tillage will now be required, nor any artificial stimulants in manure and other more or less expensive combinations with regard to soil and culture. In fact, it would be tedious to enumerate the various advantages that may result in practice from this casual experiment, and therefore we proclaim it simply to the world that all may profit by it."

As this experiment can be easily tried, we hope some of our farmers will put it to the test, and communicate the result.—We shall certainly try it on a small 7 by 9 lot of ground, which is the largest that is vouchsafed to a dweller in the city.

KEEP YOUR LAND DRY.

The importance of draining is not duly appreciated, nor its practice well understood among us. Although water is indispensable to vegetation, too much of it is as hurtful as too little. It is necessary to the germination of the seed, to the decomposition of the vegetable matter in the soil—to the transmission of the food from the soil to the plant—to its circulation there—and to the maturity of the product. All these useful purposes are defeated, where water remains in the soil to excess—the seed rots, the vegetable matter which should serve as the food of the crop, remains unsoluble, in consequence of the absence of heat and air, which the water excludes; or, if the seed grows, the plant is sickly, for want of its proper food, and there is consequently a virtual failure in the harvest. It is not from the surface only that we are to determine whether land is sufficiently dry to support a healthy vegetation; but we are to examine the surface stratum, into which the roots of the plants penetrate, and from which they draw their food. If this is habitually wet—if it grows marshy plants—if water will collect in a hole sunk fifteen inches below the surface the land is too wet for cultivated crops, and means should be adopted to render it more dry. From my partial acquaintance with this country, I feel assured that much of our best land is rendered unfit for tillage, or the growth of the finer grasses, by reason of the excess of water, which passes or reposes upon the sub-soil unnoticed by the cultivator. These lands are denominated cold and sour, they truly are so. Cold, sour lands are invariably wet lands below, if not upon the surface. But if the superfluous water were judiciously conducted by efficient under drains, (for the construction of which you possess the best materials in abundance,) these lands would be rendered warm and sweet, and highly productive, and the outlay would be repaid by the increased value of two or three of the first crops. Wet lands are generally rich lands, abounding in vegetable matters, which water has preserved from decomposition but which readily become the food of plants, when

the water is drawn off. Let me imagine a case, which I am sure will be found to exist in many parts of your country. There is a slope of a little hill, half a mile in extent, terminating in a flat forty rods wide, through which a brook meanders. The soil on this slope and in this flat is of a light, porous quality, six to twelve inches deep, reposing on a sub-soil impervious to water, as clay, rock, or hardpan. By soil, I mean the upper stratum, in which vegetable matters are blended with earthy materials, and which constitutes the true pasture of plants. Near the top of this slope, all along on a horizontal level, or perhaps lower down, spouts or springs burst through the subsoil, a thing very common in hilly districts, the waters from which finding an easy passage through the loose soil, spread and run down the slope, and upon the sub-soil, and through the flat, till they find their level in the brook. A thermometer plunged down to the subsoil, will indicate, at midsummer, a temperature probably not greater than sixty degrees, whereas to grow and mature many of our best farm crops, we require a heat in the soil of seventy or eighty degrees. How shall we remedy this evil, and render this land profitable to the occupant? Simply by making an underdrain or drains, in a gently inclining direction; a little below those spouts or springs, and, if practicable, somewhat into the subsoil. Those will catch and conduct off the spouting waters, and by laying the lower plane dry and permeable to heat and air, develop all its natural powers of fertility.

I will suppose another case—that of a flat surface, underlain by an impervious sub-soil. This is rendered unproductive or difficult to manage, by stagnant waters. The rain and snow waters, penetrating the soil, are arrested in their downward passage, by the sub-soil, which not having slope to pass them off, they remain and stagnate, and putrefy, alike prejudicial to vegetable and animal health. The mode of draining such grounds and rendering them productive and easy of management, is, first to surround the field with a good underdrain, and to construct a sufficient open drain from the outlay to carry off the waters. Then with the plough, throw the land into ridges of twenty to thirty feet in breadth, according to the tenacity of the soil, in the direction of the slope, and sink an underdrain in each of the furrows between the ridges, terminating them in the lower cross drain. The materials of the underdrain, which are generally stones, should be laid so low as to admit of the free passage of the plough over them. The superfluous water, by the laws of gravitation, settle into these drains, and pass off, and the soil becomes dry, manageable and productive. An acquaintance called upon a Scotch farmer whose farm had been underdrained in this way, and being informed that the improvement cost sixteen dollars an acre, tile having been used, remarked that it was a costly improvement. "Yes," was the farmer's reply; "but it cost a deal more *not to do it*," which he illustrated by pointing to an adjoining farm, like situated, which had not been drained, and was overgrown with rushes and sedgegrass, and then to his own fields teeming with luxuriance and rich in the indications of an abundant harvest.

I have dwelt upon the subject of draining with more detail, because I have personally realized its benefits, and am sure it may be extensively gone into with certain prospect of reward.

Judge Buel.

FATTENING.

We copy the following excellent rules for fattening animals from the Albany Cultivator. We would only add to them the requisition of comfortable quarters, good straw beds, and cleanliness, with occasional irritations of the skin. Close attention to these directions will ensure success.

"1st. *The Preparation of Food.*—This should be so prepared that its nutritive properties may be all made available to but appropriated with the least possible expenditure of muscular energy. The ox that is obliged to wander over an acre to get the food he should find on two or three square rods—the horse that is two or three hours eating the coarse food he would swallow in fifteen minutes; if the grain was ground, or the hay cut as it should be—the sheep that spends hours in making its way into a turnip, when if it was sliced it would eat it in as many minutes—the pig that eats raw potatoes, or whole corn, when either cooked, could be eaten in one quarter of the time now used, may indeed fatten, but much less rapidly than if their food was given them in a proper manner. All food should be given to a fattening animal in such a state, that as little time and labor as possible, on the part of the animal, shall be required in eating.

"2d. *The food should be in abundance.* From the time the fattening process commences, until the animal is slaughtered, he should never be without food. Health and appetite are best promoted by change of food rather than by limiting the quantity. The animal that is stuffed and starved by turns, may have streaked meat, but it will be made too slowly for the pleasure or profit of the grower.

"3d. *The food should be given regularly.*—This is one of the most essential

points in feeding animals. If given irregularly, the animal indeed consumes his food, but he soon acquires a restless disposition, is disturbed at every appearance of his feeder, and is never in that quiet state so necessary to the taking on of fat. It is surprising how readily any animal acquires habits of regularity in feeding, and how soon the influence of this is felt in the improvement of his condition. When at the regular hour, the pig has had his pudding, or the sheep its turnips they compose themselves to rest, with the consciousness that their digestion is not to be unseasonably disturbed, or their quiet broken by unwonted invitations to eat.

"4th. *The animal should not be needlessly hurried between the hours of feeding.*—All creatures fatten much faster in the dark than in the light, a fact only to be accounted for by their greater quiet. Some of those creatures that are the most irritable and impatient of restraint while feeding, such as turkeys and geese, are found to take on fat rapidly when confined in rooms, and only fed at stated hours by hand. There is no surer proof that a pig is doing well, than to see him eat his meal quickly and then retire to his bed, to sleep or cogitate until the hour of feeding returns. Animals while fattening should never be alarmed, never rapidly driven never be fed at unseasonable hours, and above all things, never be allowed to want for food."

AGRICULTURAL RESOURCES.

In surveying the vast extent of our national domain, we can hardly fail to be amazed at the amount of its agricultural resources. Stretching through various degrees of latitude, and exhibiting a soil which is warmed by a temperate as well as a tropical climate, it yields nearly all the grains, grasses, and vegetables that are required for the substantial comfort of man, as well as those more luxurious fruits that administer to his tastes and tend to pamper his appetites. Taking the six states of New England, which are limited in their territory, we find that although the soil is of primitive formation, and much broken by hills and ledges of rocks, the common grains, such as rye, corn, buckwheat, potatoes, and most of the garden vegetables, are produced upon its hill-sides and in its valleys to a considerable extent, which may be much increased by improved methods of culture, although a large portion of its surplus population is annually drained off to the more productive lands of the new states of the west. Agriculture, in this portion of our country, is not, however, prosecuted in that scientific and improved form which prevails in England, and by which the crops of that portion of Great Britain are quadrupled. The common and ordinary means which were formerly used for the cultivation of the soil, are now too generally retained; and the necessary consequence is, that the amount of agricultural produce raised is not sufficient for the support of its population. In the State of Massachusetts, however, which has exceeded all the other New England states in the point to which it has carried the agricultural interest, a better form of husbandry exists. Not only has greater attention been paid to this interest as a science, but the influence of that improvement is experienced in the greater abundance and the superiority of its crops.—Passing to the State of New York, we find the advantages furnished by the interest of agriculture most signally displayed. In that wide alluvial soil, stretching away from the banks of the Hudson to the Shores of Lake Erie, the surface of the territory, throughout nearly its entire extent, is chequered with prosperous farms, tilled by an agricultural population which is probably exceeded by that of no other portion of the country in the independence and solid comfort which they enjoy—a condition that is principally, derived from the cultivation of the soil. In that condition, indeed, we perceive the benefits which might be diffused throughout the whole country were this species of enterprise more widely extended. The production of wheat alone in this state, yields a vast revenue to its producers; and the flour which is poured out from its mills, and the quantity of beef, and pork, and other products of stock-husbandry, as well as grains and vegetables, which fill the channel of the Hudson, supply the wants of the villages upon its banks, and the great metropolis at its mouth. Passing towards the south, we reach the territory of Western Pennsylvania, cultivated with pains-taking thrift by Dutch farmers, a source of no inconsiderable wealth to the state. Arriving in Maryland, we enter upon a soil which, while it produces most of the grasses and grains of the north in as great abundance as even the state of New York, yields also the tobacco; and from that state, through Virginia, North Carolina, South Carolina, Georgia, and Florida, we have a territory which stretches away in plain and valley, inviting the labors of the plough, and giving in return, not only the vegetable products of the north, but also those great staples, rice, tobacco, and cotton.

Nor are the agricultural advantages of this portion of our territory, however great, equal to those furnished by the soil of the west. The valley of the Mississippi, or that domain which extends from

the head of Lake Superior to New Orleans, watered by about three thousand miles of that great river, spreads out a more fertile territory, as has been justly remarked by a recent French traveller, than that of any other portion of the globe. The oak-lands, extending through Michigan to the borders of the lakes, the prairies of Illinois, the deep mould which stretches from the southern borders of the lakes beyond both banks of the Ohio, the forests of Kentucky, and the numerous states organized along the Mississippi, the Illinois, and the Missouri, from the rugged cliffs of Lake Superior to the cotton and sugar plantations of Louisiana and Alabama, develop a field for agriculture which almost bewilders us by its magnitude.

The enterprise of our countrymen, discerning the resources of the soil, has kept pace with their development, by marking out important channels of trade through which the agricultural products of the interior can be most conveniently transported to their respective markets. The long lines of canals and railroads that have been projected and partially carried out, both at the north, the south, and the west, are designed not less to provide the conveniences of personal travel, than to furnish the means of transportation for their agricultural products. Connecting the principal commercial marts of our country, and making up by art what nature has left undone, these improvements, while they accommodate the public in its hours of mere amusement, have a direct tendency to stimulate the labors constituting an electric chain through which will vibrate the opinions as well as the trade of the country. Added to this, we are supplied by nature with some of the noblest arteries of internal navigation that are to be found in the world, and which furnish the safest means for the transportation from the interior through the artificial public works to which we have alluded, that are designed to run to the navigable waters of the rivers which partially penetrate the interior, or they may be conveyed coast-wise from state to state even to the mouth of the Mississippi. In New York we find the Hudson coursing, perhaps, the most densely populated portion of this State from Albany, its largest interior city, to the great metropolis at its mouth; while the agricultural productions of Pennsylvania and Maryland find a ready market at home, and those of the south, which are required to be exported, are provided with an ocean pathway to any port. The navigable advantages of the west are, perhaps, more extraordinary than those that are found in the eastern portion of the country. New York, Pennsylvania, Ohio, Michigan, Illinois, and Wisconsin, have harbors upon the great lakes which are stretched thousands of miles through the forest of our northwestern territory—a territory that is more prolific of agricultural resources than any other portion of our wide-spread empire; and when we consider the advance of population in that territory, and the measure of production with which it has already attained, we cannot fail to be convinced that it will soon become, in point of strength and influence, the most important part of our republic. From the shores of Illinois we have also a continuous line of navigation through the states bordering on the Mississippi, which annually pour out a vast amount of products to the great commercial mart at its mouth—the city of New Orleans. Such are the agricultural advantages of the country, and such the navigable arteries and public works which furnish channels for the transportation of its productions.

In this country, extraordinary motives, are held out for the exercise of agriculture. Besides the constitution of the country, and the laws of the several states, which guaranty to all its citizens a participation in the national legislation, a further inducement is held out by the low price of lands. In the new states of the west, it is well known that an abundance of the most fertile soil can be procured at the low price of one dollar and twenty-five cents per acre, with the best title; a soil, too, which furnishes in great abundance most of the comforts, and many of the luxuries of life. When to this is added the fact that by the advance of population, and the necessary growth of the country, this soil, thus purchased at a low rate, will gradually augment in value as the settlement of the surrounding territory is increased, little additional motive could be urged for its cultivation, especially to that body of men who might linger in the large cities of our older states, dependent upon the chance opportunities of labor which might present themselves, and who would be cut off entirely from these opportunities when a sudden mercantile revulsion should, as has frequently occurred, sweep away the bulk of the business population in one common wreck.

We perceive in the habitudes of agriculture many advantages possessed by no other form of occupation. The cultivation of the soil by its own proprietor, while attended with hardships, is, in a great measure, relieved from those vexatious cares which disturb the population of large cities. In the first place, he is not confined to the counter of a narrow shop, the attendant upon every purchaser who may enter in on business. He is not obliged to spend wearisome days and

nights in toiling over a desk, and has no visions of bankrupt debtors, or protested notes, to disturb his midnight slumbers. Nor has any uninsured ships upon the ocean, at the mercy of the wind and waves. On each occurring season he sows his fields, with a calm reliance upon the bounty of an allwise Providence, that in due time sunshine and shower will ripen them to the harvest. He is troubled little with the derangement of the currency, for he knows that should all the banks fail, his own children will not want for bread. He possesses a freehold—a tract of land which, under ordinary circumstances, will yield him the means of subsistence; and, with this conviction, if he sows his crops with labor, he reaps them with joy. He looks out upon his domain, and feels that he has an interest at stake in his country, for his own freehold in a part of its territory. Should the market for his products be contracted, he experiences no alarm, for the profits of his sales would only be required to furnish a few additional articles of taste. He feels, in fact, as a freeman always should feel, the lord of his own domain.

Few more beautiful pictures have been painted for us than those of agricultural and pastoral life, that may be found in the *Eclouges* and the *Georgics* of the ancient poet Virgil. In those parts of his works we have not only the most delightful scenes of such experience, but a treatise, learned for that day, upon the most approved forms of agriculture. And, indeed, how can we fail to believe that such forms of rural taste, such quiet scenes of agricultural simplicity and contentment were men disposed to exercise the means? And these means are obvious. Instead of employing the science of agriculture (we term it a science, because the application of chemistry to the subject has made it one,) as a mode of making money alone, could we not exercise it with greater advantage as a matter of taste as well as profit? In order to be convinced of the influence that might thus be produced upon the state of agriculture, by bending taste with utility, we require only to visit some of those gardens in the vicinity of some of our large cities, where taste has been sought as well utility. Even in these private establishments, laid out for the most part, to gratify private taste, we perceive in their beautiful decorations—in their groves of shells washed by cool waters—in their hermit's cells covered with mouldering moss—in their artificial lakes of silver and golden fish—and in their marble statues, disposed in becoming decency along their shaded walks, as well as in the various species of vegetation that furnish refreshing shades, and the variety of flowers which bloom upon different portions of their areas,—scenes, which, if not envied by a Shens-ton, might almost vie with his classic and rural retreat.

Independently of those quiet beauties which belong to the more tasteful science of horticulture, how intimately might it be blended with the more substantial labors of agriculture! How easily might flocks of grazing sheep and cattle upon the hill-side overlook the broad wheat or corn field, and the artificial pond, and the droves of cows, which, refreshed, return to their stall to replenish the dairy, breathe the fragrance of roses from the flower garden,—and earth thus be made like a second paradise!

That a new era is dawning upon the prospects of agriculture in our own republic, we think there can be little doubt. The deep interest which the subject has recently excited in various parts of the country, and the motives which almost everywhere exist to extend its operations, point to a marked improvement in this department of labor. Almost every one engaged in the bustling scenes of trade, has pictured to his mind a day when he shall retire from the dusty track of business, and spend his remaining days in a quiet agricultural retreat. Hence it is that most merchants engage, with all the ardor of manhood, in the acquisition of wealth; and after the prime and vigor of youth are spent in such toils, the desire of accumulation increases with the acquisition itself until, purchase, death finds them, like the dray-horse, dead in the traces. Such, we doubt not, is the history of thousands in our own country, who, in the absence of this ardent thirst for gain, might have enjoyed much happier, purer, and longer lives, had they more early devoted themselves to the invigorating and noble pursuit of agriculture. How few there are who adopt this pursuit as one of taste and inclination! With the example of the father of his country before them—for Washington was but a farmer—they toil on in marts of trade with untiring assiduity, until a fortune shall have been acquired, which, in most cases, eludes their grasp, without due attention to the cultivation of other qualities which might enjoy it if acquired; or some commercial explosion wrecks them, stranding them like a shattered hulk upon the shore, blasted in their hopes, and cast down in