AGRICULTURAL.

DEEP CULTIVATION.

The advocates of deep cultivation will read with satisfaction the following remarks made at a recent meeting of the Maidstone (England) Farmers' Club :

Mr. Barling said he should confine his remarks chiefly to the principle of ploughing. Ploughing was a mechanical action, which was to bring about another action—a chemical action. A remark had been made that evening to which he attached much weight. It was possible to cultivate well without ploughing—that was, that by moving the soil sufficiently they could bring about fertility without ploughing. It was thus brought about: The organic matter within the soil was capable of being dissolved and brought into a soluble condition if it be sufficiently exposed to the oxygen in the air, but if they kept that organic matter sealed up by earth—it might be kept as many generations as they like—they would get nothing from it. The more they broke the soil and let in the oxygen of the air, the quicker would the organic matter which they, or perhaps their grandfathers had placed in the soil, become soluble and the food of seeds which had been placed in that soil. The question of steam ploughing as against horse ploughing seemed to come to this—it did not matter how they ploughed, whether by animal force or the force of machinery. They might plough by turning over the sod or by breaking it up, but whatever they did, their object was to let in the air. In advocating deep cultivation, Mr. Barling said that if they broke the soil low down—he did not say turn it over—they altered the condition of that soil; they render it warmer upon the whole. If they laid the thermometer on the land, it would be found that the better and the deeper the soil was broken up, the warmer would be the land, and temperature was one of the elements favorable to the life of plants.

Mr. Paine has remarked that they could not get rid of the water by deep cultivation; but it would be better distributed, and land that has been thoroughly and deeply worked would, generally speaking, be moist, but not surcharged with water. Moisture was one of the elements upon which vegetable life so greatly depends; an excess was, however, harmful, but a certain quantity was needful. The land being warmer and moister, must, on principle, be greatly changed by deep cultivation.

OPEN DITCHES ARE NOT DRAINS.

The fact intimated in the title of this article may be a startling one; it is nevertheless true, and it must be within the experience of multitudes of the readers of the *Rural* that it has been demonstrated over and over again. Who has not walked through a meadow which some one, perhaps the reader himself, has endeavored to drain with open ditches, treading close to the edge of the ditch in the almost vain hope of finding firm ground and dry walking where the ground should be free from water, if anywhere? Was it found? No, certainly not, if the ditch was an old one—possibly, if it had been recently cleared out; and most likely, if the ditch had been newly dug, the ground was dry everywhere in the vicinity of it.

As soon as warm weather comes on after a ditch has been dug, and the earth becomes somewhat heated, the water from the oozy ground is of a decidedly higher temperature, and green scum appears upon the surface and covers objects lying in the water or moistened by it. Innumerable masses of fungus growths, mold and lichens will be distinctly visible to the close observer, starting up and creeping over stones and soil, and sand, wherever the warm moisture prevails. They penetrate the soil where these conditions exist, namely, warmth, water and air.

The lowest portions of the sides of the ditch are first filled and made impervious to water. It being thus dammed back, it overflows a little ridge of impervious earth, and the ditch is still effective, but it drains less surface.

The encroachment continues, and the "Agarios and fungi add mildew and mold," alternately moistened into life and dried into hard cakes with each shower, creep higher and shut off more and more water from the ditch, which in a few weeks, or months, at furthest, is absolutely useless except to carry off the surplus surface water. If the sides be pared off the water will flow freely for a while. This takes place more or less when the ditch is cleaned out, and so this operation becomes a frequent necessity. —*Moore's Rural New Yorker.*

MAKING MANURE ON THE FARM.

Every farm should furnish its own resources for manure; for, although near cities the wise farmer avails himself of whatever waste matter he can get that is convertible into manure, the crops there cultivated are generally of an exhausting nature and fully sufficient to carry off the extra fertility so added. But only a comparative small number of farms are situated near enough to cities so that their owners can avail themselves of this source of increasing the crops, and therefore the great number are obliged to fall back upon the resources of the farm itself.

It is an English maxim that "a good farm is like a good joint of meat that only requires basting with its own dripping." Translated, it means that a good soil contains within itself all the resources of increased fertility. It is true the joint of meat must have been first made good, and so must the farm.—Man must feed the animal to get the good joint; nature originally fed the soil ready for man.

How many who have opened new farms on virgin soils have left them as good as they found them? The history of all countries answers, Very few. Man first impoverishes, and then, by the most laborious and costly means, refertilizes the worn soil. How quickly the farmers of the West are bringing their land to that state when this refertilization will be the all-important question, the decreased and constantly decreasing averages of grain per acre will tell. We do not mean by this that the time has yet come in the West when it has become imperatively necessary that an elaborate system of making manure and compost should be followed, although it might easily be demonstrated that in many sections such a course would be profitable. Nevertheless, the time has come when it will pay a heavy interest on the investment to save carefully and give back to the soil whatever manure is made from the feeding of animals; and this brings us to the point we wished to make.

The growing of clover and the grasses lies at the foundation of profitable farming throughout the temperate zone. These furnish the cheapest food for stock of every kind, exclusively so in summer, and are the main dependence of stock animals in winter. No crop is so constant in growth, early and late, under all kinds of treatment; no other crop is so well adapted to a variety of soils, wet and dry, heavy or light; none other furnishes so great a burthen to the soil in its tops and roots for plowing under, or the decomposition of which will better support successive crops of other growths; none so ameliorates the soil and renders it capable of furnishing the best conditions for promoting the best results from such crops as are grown for sale.

Again, he who raises plenty of grass, has resources for the feeding of stock and for making large quantities of manure. In the summer the manure is dropped where the animals feed. Plowing under the sward produces large crops of corn and other grain to be sold or fed to stock. If fed as it should be, it gives an increased amount of the richest manure, for it must be remembered that the value of manure is just in proportion to the value of the food consumed by the animal. If the animal be fed straw only, the manure is but the refuse of straw, as the animals so fed are but the skeletons of their types; and the farmer who feeds his farm from the manure of ill-kept stock, is sure to have a soil producing more straw than grain. High feeding makes high manuring possible, high manuring makes fat land, and fat land makes rich farmers.

In this we do not propose to overturn the generally recognized systems of feeding in the West. If we were at present engaged in fattening cattle in Central Indiana, Illinois, Iowa and other sections of the great corn zone of the West, we should follow, in a measure, the usual plan of feeding cattle in the fields in good weather, and allowing swine to glean the droppings. Thus, scarcely anything is lost, and, provided the animals are kept secure from storms, there is no questioning the economy of the method, when corn is cheap and labor scarce and high. The question of how to feed, every farmer must decide for himself, and this every practical, thoughtful man will naturally do. The man who makes grain farming his exclusive business, with a view to selling the grain and burning the straw or feeding it to cattle, always ends in impoverishing his farm and ultimately himself. He is drawing constantly upon his principal. The first few years, it is true, this must often be done. If followed up, it must ultimately end in disaster. And yet, how many men in the West think this the perfection of farming!

We might go on and fill pages in showing the various resources that might become available on any farm in the making of manure—the inexhaustible beds of muck everywhere found, peat, the scrapings of ditches, ashes, lime and plaster; the liquid manure of stock, really the most valuable, and usually entirely lost; the slops of the kitchen and the water used in washing; the contents of privies, accumulations of bones, waste animal and other matter that litter yards, befoul store rooms or decay in cellars, giving rise to miasma that often ends in disease and death to the possessors and their families. The *Western Rural* has heretofore spoken upon this subject, and it is not necessary now to more than call attention to it, with the especial object of pointing out the importance of grass as a principal source of increased fertility to already worn out farms.

We acknowledge that "all flesh is grass;" let us also remember that all grass is manure. Nature fertilizes the earth by the direct decay of vegetation. It is the province of the good farmer, while reaping the reward of his well-bestowed labor, to see that the refuse of the farm—manure—is faithfully applied; it may not always be done to the best advantage by the direct application of grass as manure. He has been endowed with intelligence to convert grass into flesh; returning the manure to the soil, he repays to nature only the proper interest which she demands.

SICKNESS OF THE SOIL.

From the Mark Lane Express.

The partial failure of the wheat crops for the last three years has led many persons to conclude that the land of England has become sick of such grain, and that it will never recover, except by a protracted fallow; in other words, by laying it down for pasturage, or by resuming the triennial course of husbandry, which consists of two white crops and a fallow. The present year will be enough, one would suppose, to dissipate the idea of sickness of the soil through any other known means than injudicious cultivation, or starvation, by the withholding of manure. There is no doubt that, like working horses or any other animals, hard labor and scanty feeding will have its effect, whether upon sensitive animals or insensible plants, Dr. Hooker's theory notwithstanding, which, literally speaking, gives plants the power of swallowing and digesting their food. If the farmer neglects, or is too poor to cultivate his land in the proper manner, he must expect the certain consequence—a short yield and poor quality, as the inevitable result. This complaint of sickness of the soil is no new one, but the rather very old—say as the Christian Era itself. Did not Columella during the first century write on the subject, in reply to those who just discovered the same mare's nest? He has a whole chapter about it, but we shall be content with a paragraph: "It is not, therefore, from weariness, as very many have believed, nor from old age, but indeed from our own slothfulness, that our cultivated lands do not so bountifully answer our expectations as formerly; for we might receive a greater product if the earth were refreshed and cherished with frequent seasonable and moderate stercoration."

Arthur Young, whose opinions were ever founded on facts, made a series of thirty-six experiments of a six-year's course of cropping or rotation, the results of which were published in the 23rd volume of the *Annals of Agriculture*, of which he was the editor. The experiments were made on a piece of old pasture of many year's standing, the soil a sandy loam, with a clay subsoil, and his deductions were as follows: That potatoes, as a fallow crop, were more exhausting than any other without plenty of manure, and that barley, beans and oats succeed better than wheat after potatoes. That beans are the most valuable crop on new land, and that the fertility of such land depends for its continuance greatly upon the number of bean crops planted on it, and that the oftener they were grown on the land the better were the succeeding crops of wheat, whatever kinds of produce, and that three successive crops of beans were followed by as large crops as any ordinary produce of wheat. He also found that successive crops of white corn were highly destructive of fertility, and that three successive corn crops will reduce the land to a foul and unprofitable condition. He also ascertained by the experiment that beans and barley, alternately, and beans and wheat, also alternately, were the two most profitable rotation courses; and lastly, that five crops of grass, and one of wheat not only yielded the largest profit, but left the land in the very best condition.

On new land, also, as is well known to every farmer of any intelligence, beans yield the most profitable crop that can be grown. On the other hand, turnips, cabbages and potatoes are declared to be the most unprofitable in any course of cropping. But yet, what would the farmers of such rich lands as those of Norfolk, Suffolk and others of the Eastern Counties, do without the four-course husbandry? And how could the supply of animal food be provided without green crops? The number of cattle and sheep kept in Arthur Young's time was much smaller than at present, but the farmers had learned to know the value of green crops, although they were chiefly used as substitutes for the bare fallow, the materials of which, with the help of stock, manure is manufactured, besides keeping the land clean by hoeing. There is an improvement in this respect, in the value of beans and green crops from the increased consumption and enhanced value of meat, indeed, of animals of every kind on the farm, by which the profits of breeding as well as of fattening are rendered more remunerative. A good deal of land is now withdrawn from the cultivation of grain produce, and laid down in grass, especially in Ireland; but this is quite irrespective of any decadence or diminished fertility of the soil, and is in consequence of the increased value of pasture land and the high price of butcher's meat; but in Ireland this arises from the climate being more adapted to dampness, to pasture land and the rearing of cattle, than for the cultivation of grain to produce. Ireland shows a decline in the number of land sown yearly; and while meat is dear, and the transit of cattle from Ireland difficult, and therefore limited to the adjacent countries on the continent, the supply of corn crops cannot increase.

CAPABILITIES OF AN ACRE

J. M. Smith a market gardener of Green Bay, Wis., furnished the *Horticulturist* interesting statements of his experience in high culture. He has found the soil variable, and not a single exception, but that the more he has spent in cultivation and manuring, the greater have been the profits per acre. Last season he cultivated fourteen acres, and began with a more thorough and expensive cultivation than ever before. The result was, although there was a "terrific drought"—one of the dryest seasons ever known in that region—after spending $3,986, or $384 per acre, he had a better balance than any previous year. He appeared to regard constant cultivation, especially through drought, in connection with copious manuring, as all important. Stable manure is the standard; but the use of superposphates, plaster, lime, and other manures as experience and good sense point out. "After you have learned how to spend money to the best advantage," he says, "a larger profit may be made by spending $300 per acre than with less. The second year, if your land does not pay all expenses, taxes and 10 per cent. on the acre, there is something wrong somewhere. I have some acres of land that did pay all expenses for two years, but for a few years past have not failed to pay $2,000 per acre. I have a whole garden to do more than