from the ploughman was followed by instant obedience. Other teams again were, just as clearly thickheaded and stupid, treading on the plowing with a callousness of conscience that showed their education to have been neglected.

"'The match yesterday had unusually interesting elements, as it was more than local. Among the competitors were at least two prize plowmen from the land o' cakes, who showed splendid command of their weapons, but still had to succumb to the native talent. Scarborough men are excited enough about their plowing now, but they will not be satisfied until there has been a grand international match, where they can show the world what they think of themselves is true—and they are quite satisfied that they could send the world home with a bee in his bonnet. The native horses have reason to be quite as complacent.'"

Manures and Their Value.

SOMETHING OF THEIR INFLUENCE UPON SOILS AND VEGETATION.

In all new countries containing a rich soil, manures hold but a small economic value with the farmer. Soon, however, as the soil becomes worn, attention is turned to its re-fertilization. The first means used is the application of barnyard manure. The farmer is often surprised that the result does not answer his expectations.

Why?

Perhaps the manure is the accumulation of years, sodden and bleached with rain, and weather beaten until its intrinsic value is, ton for ton no more than so much worn soil. The volatile parts, constituting its chief value, and half its original worth, has been dissipated into the air, and carried hundreds, perhaps thousands of miles away, to be re-absorbed by the soil or ocean.

As a matter of fact, we may here state that it has been established by accurate observation, that about one-half by weight—the range being from 46 to 62 per cent.—of all the dirty matter absolutely free from water, consumed by animals as food, is deposited in the dung; and, also, that stable manure lying until it heats, loses 20 per cent.; and is gradually reduced thence to at least 50 per cent. of its original value.

Heat, air and moisture decompose all organic substances, and by the progress of the decomposition the greater part of the heat is generated, which carries this decomposition to destruction. So manure thrown into a pile, being moist, the moisture permeates the mass, fermentation ensues, and if not assisted by the interposition of some material as muck, loam or clay, the gasses quickly pass into the air and are lost.

Manures, as we have lately stated, unless in a state so they may become soluble in water, cannot be taken up by plants.

Decomposition renders manures soluble, and this, whether by rapid fermentation in heaps, with some interlying substance to fix the gases, or by the slower pressure of decay in the soil. The gardener who uses horse manure as bottom heat in his forcing pits, finds it at the end of the season in a uniform state of black mould, if the fermentation has been properly carried on; and, in this state, it is true compost, with all its valuable properties intact, save what has passed into the growing plants; for, the layer of soil on top has arrested and fixed the volatile gases. Thus he has served a two fold purpose—assisted the crops grown in the hot-beds; and, these sold, he has a supply of compost for out of door crops.

In former articles we have shown something of mechanical and other effects wherewith the application of manures to various soils, that compost tends to bind light soils, and long unfermented manure opened, and rendering more disintegrable stiff clays. So these mechanical means operate in directly opposite ways, and continue so long as the manure remains active; or, until its whole substance is exhausted. It sometimes, however, becomes necessary to apply compost to clay soils for particular purposes. For instance, when it is required to act quickly, as in the case of garden vegetables, wheat and other small grains. Thus, in making the compost heap, the absorbent materials should be different in the one case from what they are in the other.

For clay soils the manure should be alternated with hay, earth, the scrapings of ditches, leaf mould, or other light absorbent materials. When material is plenty, equal parts of manure and absorbents, or even two of mould to one of manure may be used. If the same absorbent be used in the stable to take up the liquid manure, so much the better.

For light or sandy soils, the compost heap should be alternated with manure and clay, the latter made friable by the action of frost, or by swamp muck, or strong loam, always kept dry for the purpose Whatever absorbent is used, the heap finished, it should be covered with earth, and if it prove so dry that a slow fermentation is not induced, it should be made moist—not wet—with water.

Plants are composed of four simple substances, which go to make up the bulk of their organism. These are, carbon, oxygen, hydrogen and nitrogen; the inorganic portions of plants—ash, is only about three per cent. of their substance. House plants, forming the chief food of man and herbivorous animals, contain nearly 50 per cent. of carbon. The sap of plants, and the water of the flesh of animals, contains eight pounds of oxygen to every nine of water. Hydrogen, the lightest substance in plants, is taken up by them in connection with nitrogen, as ammonia. Nitrogen, the great flesh-maker, forms a large per cent. of the air we breathe, and, in the form of ammonia, is the great stimulent of growing plants. Ammonia, as before shown, is largely formed by the decay of plants and animals; and, escaping into the atmosphere, is, with other floating gases, washed down from time to time into such soils as are capable of receiving and absorbing them, and stored for the use of growing plants, or held for prospective ones.

Earthy or concentrated manures are especially needed, and greedily absorbed by plants while young; for their roots have penetrated and ramified but slightly in the earth. As they expand their mass of foliage, the roots become more numerous and stronger, and always in due proportion to the foliage; for the greater the foliage the stronger the roots, and the richer the soil the darker the foliage, when exposed directly to the light.

So the more thorough the cultivation the stronger and ranker the crop.

Why?

It enables the plant to draw its supplies more directly from the atmosphere, and this is why the early cultivation of corn, even before it is up, is so noticeably beneficial.

Why again?

It allows the ammonia and other fertilizing matter, washed out by the dew and rain, to be absorbed by the young rootlets of the tender seedling plant. Thorough cultivation, also, while the plants are young, allows the soil to absorb the heat of the sun. The earth, that other great laboratory of nature, renders soluble the matter decomposed by the air, heat and moisture contained within its recesses. So again, if all decaying matter on the surface of the earth is a source of carbonic acid, and all putrifying matter is giving off ammonia, the intelligent reader will readily see the necessity of saving it when washed down from the air, and also will as readily see the importance of conserving these valuable elements in his manure. It cannot be done by allowing the heaps to lie about, year in and year out, exposed to sun, rain and other vicissitudes constantly present. Lucky it is the air has this power of absorbing and rendering innoxious these escaping gases, else the earth would soon be a vast charnel house, and disease and death would decimate both the human and animal races.

The English Wheat Crop.

Mr. J. B. Lawes writes a follows to the London *Times*:—

"The home wheat crop of 1874 was fairly abundant, and the ordinary requirements for consumption would probably have been satisfied with an import of about 9,000,000 quarters. Instead of this, the actual net imports were during the harvest year about 11,750,000 quarters, a quantity which has only once before been exceeded. In consequence of this superabundant supply, wheat has been cheaper than almost any other staple food, and large quantities have been used in this country as food for cattle and horses. A low range of prices has stimulated consumption in various ways, and a higher range will probably lead to greater economy. But judging of the yield of the home wheat crop in 1875 from the results of actual threshing in my own district, it is evident that to meet the ordinary requirement of consumption for the current harvest year, a larger amount will be needed from other sources to supplement our own bad crop than was required during the crop year just past. The produce of 1875 resembles very closely that of the bad years 1867 and 1873; and so far as the unmanured and the artificially manured soil is concerned, that of 1871 also. According to the estimate of the Registrar General, the population of the United Kingdom would amount to nearly 32¾ millions at the end of June, 1876; and making proper allowance for increase, the average number to be fed during the harvest year to end Aug. 31, 1876, will be close upon 33 millions. Reckoning the consumption of wheat to average 5½ bushels per head, the total quantity required within the harvest year will be about 22⅜ million quarters. I am disposed to estimate the deficiency per acre at from 18 to 20 per cent. below an average. Taking the gross produce of the kingdom at 10 million quarters, and allowing about a million quarters for seed, there would remain about 9 million quarters available for consumption as food. On this assumption, there would be required about 13⅜ million quarters to be provided for from stocks of old home and foreign wheat in hand at the commencement of the harvest year, Sept. 1, 1875, and from imports during the twelve months to end of August, 1875.

"That our demand upon foreign countries for the supply of wheat is rapidly increasing, is evident from the fact that while during the first half of the last twenty years the imports represented the consumption of 32 per cent. of the population, during the second half it was equal to nearly 45 per cent., and during the last three years to more than 50 per cent. of the total consumption."

Value of Covered Manure.

When rough sheds have been built to cover the manure heap, the crops fertilized by this pile have been increased in productiveness sufficient to pay for the shed-covering the first year. We have never seen any extra figures of the proportionate value of covered and uncovered manures, that we remember, until the following, which we find by Lord Kincaid, a Scotch land-owner and farmer. They present the best statement possible, we think, of the advantages of the plan.

Four acres of good soil were measured; two of them were manured with ordinary barn-yard manure, and two with an equal quantity of manure from the covered shed. The whole was planted with potatoes. The products of each acre were as follows:

Potatoes treated with barn-yard manure—

One acre produced 272 bushels.
One acre produced 292 bushels.

Potatoes manured from the covered sheds—

One acre produced 442 bushels.
One acre produced 471 bushels.

The next year the land was sown with wheat, when the crop was as follows:

Wheat on land treated with barn-yard manure—

One acre produced 48 bushels, 18 pounds (of 61 pounds per bushel).
One acre produced 42 bushels, 38 pounds (of 61 pounds per bushel).

Wheat on land manured from covered sheds—

One acre produced 55 bushels, 5 pounds (of 61 pounds per bushel).
One acre produced 53 bushel, 47 pounds (of 61 pounds per bushel).

The straw also yielded one-third more upon the land fertilized with the manure from the covered stalls, than upon that to which the ordinary manure was applied.—*Ex.*

POTATOES.—A trade is conducted in Europe to the extent of some millions sterling per year, in converting potatoes into farina or potato flour. Mr. Alex. S. Macrae, 45 Duke Street, Toronto, gave some information on the subject in the New York Sun and Chicago Times of the 21st and 22nd of September. The result has been considerable excitement among agriculturists and others, to know something of the actual process, and Mr. M. puts it to our discretion to publish the following details: 1. The potatoes are peeled in the raw state. 2. They are then crushed into an impalpable pulp, which is well washed. 3. The water is then evaporated, leaving a pure white residum, which is the flour or farine. Three tons of potatoes, at a cost of say $45, should make one ton of farina, of a value of $100, leaving $55 for wear, tear and profit.