and that a pint of human urine or four quarts of that of the cow, or one quart of that of the horse fed on grain, contain nitrogen enough to supply 60 lbs. of wheat, we may begin to understand something of the money value of this animal product. But mind this suggestion. Nothing is sooner lost than the hartshorn in an open smelling-bottle, or a large share of the ammonia in free urine in a warm atmosphere. Charcoal and gypsum will absorb it in large quantities, and give it out at the roots of plants as their wants require. In feeding plants, great judgment should be exercised. At least one-half of the food fed out to them in the shape of stable and barn-yard manure, is entirely lost. It escapes into the air, or is dissolved prematurely, and carried like the potash in water running through a leach, beyond the reach of your hungry, if not starving plants.

I have just separated a half pound of wheat-flour into its proximate elements of starch and gluten. The gluten I have in my hand. It is nearly identical with animal muscle. It forms from 7 to 35 per cent. of bulk of wheat kernels. The more gluten flour contains, the more good bread a given number of pounds will make. A barrel of flour rich in gluten, will make 10 per cent. more of bread than one which is nearly all starch. Gluten will bear far more water than starch. The quantity of this meat-forming principle in wheat, depends in a good degree on the quantity of nitrogen in the soil where the wheat is grown."

From the London Gardiners' Chronicle.

THEORY AND PRACTICE OF MANURING LAND.

Under this head I propose to discuss the best means of retaining or increasing the fertilizing properties of manures.

Plants, having no power of locomotion, must have their food supplied to them upon the spot where they grow. Now, as from nothing it is clear nothing can be made, so is it equally certain that the grain, leaves, straw, and roots of a stalk of wheat must have derived the materials of which their fabric is composed from the earth, in which the straw, leaves, and grain grow. Now, we have only to apply the same truth to different parts of which a plant is composed, and instead of saying that as a whole it derives its material from the earth or air, we prove that it must have carbon and the elements of water for its starch and sugar, an addition of nitrogen for its gluten or albumen, phospate of lime and magnesia for the husk of its seed, and silicate of potash for its straw; and we have only further to prove that these element must be present for one crop, and with variations or omissions are essential for another, and also that by the addition of individual elements, we can increase the quantity of individual produce, as azote for gluten, carbonaceous matter for starch,—we have only to prove this, and we arrive at once at the foundation of Agricultural Chemistry, at the basis of those great principles which must ever guide the scientific farmer, in a judicious application of measures—the food of plants. A moment's reflection, too, will convince any one who thinks it worth while to consider the subject at all, that cause of failure, which we so often hear of in the application of manures, arises from the want of attention to these principles.

Let us take an ensample:—A farmer is anxious to try a certain manure: we we will say nitrate of soda or potash. He applies it to his land according to the prescribed rules of so much per acre.

Now the nitrate acts as a manure principlly, if not entirely, by supplying the the alkali, soda, or potash to the soil. The Cerealia (wheat, barley, &c.) exhaust the soil of alkali, because a union of it with silicic acid is necessary for the stiffness of the stalk; and this, I may observe, *en passant*, is the cause of the green, rank appearance of the grain crops to which the nitrates are applied.

But it my happen, and does frequently happen, that there is no deficiency of alkali in a soil. Now in such a case it is obvious that the application of the nitrate must fail. Another farmer applies it where the alkali is deficient, and it succeeds: hence the discordance in experiments, of which we hear so much.

I will take a second exemple:—A crop of turnips, or mangel-wurzel, or potatoes, is manured, in part, with guano and azotised manure, and the crop from the last named is the best. Another crop of wheat, barley, or beans, shall be manured in a similar way, and that from the guano succeed best. Now in these cases the results are strictly in accordance with chemical facts; and yet the experimenter who fails on the turnip crop, rejects the guano as a useless expenditure.

There is another source of apparent failure and consequent disappointment in the use of guano and artificial manures, which cannot be too strongly dwelt upon: I mean the fallacy of judging the effect of manures by appearances. If what is manured with rotten stable manure and guano, or urine, the plants from the stable manure will have the freshest, greenest, and strongest appearance; but notwithstanding this, the grain from the guano will be the best sample, superior both in quality and quantity to that in the other experiment.

Experiment, sound co-operative experiment, is the means by which these principles can be proved true or false; but no good results will ever be obtained by putting a bushel of this or that manure at random upon the first crop that comes to hand, and judging of the result from mere appearances; on the contrary, much mischief may arise, and a certain retardation of one of the most interesting and important of the sciences to Agriculture. Mr. Pusey was, to a certain extent, right when he stated that the experiment of the Duke of Richmond was the first real contribution of Chemistry to agriculture. But this was not the fault of the science, but of those who have undertaken experiments An experiment, as Liebig has observed, is the expression of a thought; and whether this thought is that of the chemist or the farmer, it is quite impossible to prove its soundness unless the minutest details are attended to.

C. R. Bare.

A GOOD ORCHARD.

Every farmer who is not in posession of a good orchard, should set about planting one. The profit and convenience of an orchard are almost invaluable to the farmer—good fruit will always sell if he happens to have a surplus, and a plenty of fruit takes away the appetite for intoxicating drink—this is a fact which cannot be too often repeated.

To him who has a great plenty of land and great variety of surface, I would advise for an orchard, a valley between hills if possible, so that the wash from the land surrounding may always tend to the orchard—and the winds may be impeded, by the hills, from visiting the orchard too roughly.

There has been great diversity of opinion upon the distance of planting trees from each other—some have contended that the distance should be four rods, that the sun and air may have full influence on every tree, and every part of it—others have contended that a distance much less is better. My own experience and observation is in favor of close planting, so that by the time trees have got to their usual size, the limbs of them shall meet and interlock each other, and the ground underneath will be perfectly shaded. Trees thus growing will produce larger and finer fruit, and ground thus shaded will not be likely to be sapped with the growth of grass or weeds, nor parched or dried by the sun.

A young orchard should always be kept under cultivation—it will make an excellent potato field for many years provided it is well manured—and when it has become so shady that potatoes will not grow, then keep it for a summer retreat for your hogs. The hogs will keep in good health upon the poor apples that fall from the trees, and the worm that calculates on a resurrection in the form of a curculio, finds nought but annihilation in the jaws of swine. Therefore the result is, after a few years, fine fruit without wormy apples.

Although the last season was a very good one for fruit, yet there was not enough raised in our State to supply the demand, and 15,000 barrels were brought down on the western railroad to supply the demand in Boston.

We never need fear raising two much fine fruit—for when such a contingency happens, by the aid of steam we can seek a market in the islands of the ocean, or across the Atlantic, where American fruit is always cheerfully and well received. *Massachusetts paper.*