

formed, but no grain; even sugar and starch may be produced, but no *gluten*," which is the substance forming the nutritious part of wheaten flour. The production therefore of nitrogen in a form capable of assimilation or digestion is the most important object of agriculture.

Every part of the organization of a plant contains varying proportions of nitrogen, but it abounds in the seeds and roots. The atmosphere furnishes nitrogen to a plant in quantity sufficient for its own growth and reproduction; but plants constitute the food of a large proportion of animals, and by a wise adjustment they have the remarkable power of *converting to a certain degree all the nitrogen offered to them into nutriment for animals.*

An increased quantity of nitrogen enables a plant to attract with greater energy from the atmosphere the carbon which is necessary for its nutrition, when that in the soil is not sufficient. It fixes the carbon of the atmosphere in its organism. There is but little nitrogen in the excrements of black cattle, sheep and horses: it is more abundant in human feces: it varies however in these; for it is less in the feces of persons living in the country, or upon potatoes and bread, than in persons living in a town, and eating animal food. All excrements have therefore a variable and relative value. Thus the dung of cattle and horses is of great use on soils consisting of lime and sand, and containing no silicate of potash and phosphates; it is of less value on argillaceous earths, or on soils formed of basalt, granite, porphory, clinkstone, and even mountain limestone, which all contain potash: on these human excrements are extremely beneficial.

There is only one other source of manure, which acts by its nitrogen, besides the feces of animals—namely, the urine of man and animals, which may be employed either in its liquid state, or combined with the feces. It is the urine contained in the feces which gives them the property of

emitting ammonia—a property which they themselves possess only in a very slight degree.

According to Burzelius, 1000 parts of human urine contain—

Urea, - - -	30 10
Free lactic acid, lactate of ammonia, and animal matter not separable from them, - - -	7 14
Uric acid, - - -	1 00
Mucus of the bladder, - - -	0 32
Sulphate of potash, - - -	3 71
Sulphate of soda, - - -	3 16
Phosphate of soda, - - -	2 94
Phosphate of ammonia, - - -	1 65
Phosphates of magnesia and lime, - - -	1 00
Siliceous earth, - - -	0 03
Water, - - -	933 00

1000 00

It is the muriate, the phosphate, and the lactate of ammonia, which enable the soil to exercise a direct influence on plants during the progress of their growth, and not a particle of them escapes being absorbed by the roots. The existence of carbonate of ammonia in putrified urine suggested the manufacture of the sal-ammoniac from it, which was thoughtlessly carried on by farmers, when that salt commanded a high price, but the impropriety of such a wasteful practice is apparent, when we state, that the nitrogen of 100 lbs. of sal-ammoniac (which contains 26 parts of nitrogen,) is equal to the quantity of nitrogen contained in 1200 lbs. of the grain of wheat, 1480 lbs. of that of barley, and 2755 lbs. of hay.

The ammonia emitted from the putrefying urine of stables, &c. is always in combination with carbonic acid. The escape of this volatile salt is an immediate injury to the eyes and lungs of the cattle and horses in close stables, and an eventual loss of a valuable ingredient as manure to the farmer. Both of these evils are readily remedied by strewing the floor of stables with some powdered plaister of Paris, which immediately corrects the offensive smell in the stable, decomposes the carbonate of ammonia, converts it into a sulphate which is not volatile, and retains it in a condition serviceable as manure.