

bought at a reasonable price. The quantity of potash used on the land here, is almost none at all, and it can not answer to import kainit, when we export our wood-ashes to the States. In England, kainit, guaranteed 23%, is worth \$10.00 a ton of 2240 lbs. = \$9.00 for our ton, and the last States quotation I saw of the same article, quality not specified, was \$20 00 1

In applying potash in any form to light soils, care must be taken not to overdo the dose—the crop, whatever it be, might be burnt up.

Phosphoric acid.—The chief sources of this manure are bones, coprolites, Carolina rock, and our own apatite; all composed of phosphate of lime, mixed with other matters. Phosphoric acid is formed of phosphorus and oxygen :

Phosphorus.....	31
Oxygen	40

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In *phosphates*, the phosphoric acid is the active part, in superphosphates there is present a portion of sulphate of lime (plaster) as well as the phosphoric acid. Of the different sources of this invaluable acid—the parent of swedes—bones are the oldest in use; next, come coprolites, and then Carolina rock and our own apatite.

Every farmer should make his own bone-superphosphate, by saving all the bones from meat used in the house, breaking them with a heavy hammer, and dissolving them in a mixture of sulphuric acid and water. Quantities : To one hundred pounds of bones take 40 pounds of *brown acid*: twice the *bulk* of water as of acid should be first thrown over the bones. In a few days, the bones will be reduced to a pasty mass, which may be dried up with wood-ashes, fine mould, &c.

As the bones contain about 3½% to 4% of nitrogen, this will be found a very powerful manure for all kinds of crops. Four cwt. of it ought, if all the cultivation is well conducted, to produce from 14 to 18 tons of swedes to the acre.

The Carolina rock, coprolites, and apatite, requiring to be finely ground before mixing with the acid, had better be left to the artificial manure maker.

The best way of using the superphosphates, however, is to give half a dose of them to the land with half a dressing of dung. The superphosphate will start the young germ into active growth, and the dung will carry the plant on to maturity. Where really pure bone-dust can be had, a dressing of 2 cwt. of superphosphate and eight bushels of bone-dust will prove satisfactory. It is a remarkable fact, that beyond 16 bushels to the acre, the addition of any quantity of bone-dust is ineffective : I mean, of course, in its action of the crop of the year ; its effects are to be seen in the following seasons.

The price of superphosphate in England to-day, for 26% to 28% of soluble phosphate of lime, is \$12.00 a ton. Here, it is sold—in very small quantities I fancy—for \$26.00!!!

Plaster.—Really, this is not a proper name. Plaster, rightly so called, is sulphate of lime deprived of its water by being raised to a temperature of about 250° F. Our land-plaster is the unburnt rock ground into a coarsish powder. In neither the burnt nor the unburnt states has it much effect on well farmed land, as there is-always an abundance of both lime and sulphuric acid present in such land. But here, where land is frequently left for a dozen years without a sight of the dung-cart, its effects, on certain soils, are really marvellous. In England it has never paid for its use; but where lime is never applied to the land in any other form, as in this part of the world I should be inclined to make it a part of all manurings. By the bye, an idea prevails that it will fix the ammonia in dung-heaps. This is a mistake : it will fix the ammonia in liquid or semi-liquid matters, but not in dryish matters.

Farm-yard dung.—Last of all comes our old friend, farm-

yard dung, the constituents per cent of which, as far as we are concerned, are as follows :

Mixed stable dung..	Nitrogen.	Phosphoric acid.	Potash.	Lime.
	416	176	492	1046

Of course the contents vary very much, according to the food the animals producing the dung receive, and I fancy the above analysis by no means errs on the favourable side. It is by M. Ville, whose whole book, of nearly five hundred pages, is written to prove the infinite superiority of artificial manures to farm-yard dung, he himself being a dealer in the various articles recommended. Never mind; in spite of everything, there are some sound truths to be picked out of his writings, if one has the patience to look for them.

And now let us lay out our experimental plots, as we proposed at starting. They should, I think, be six in number for grain and the same for roots; as thus :

1	2	3	4	5	6
Farm yard dung 600 lbs	Manure containing nitrogen, phosphoric acid, potash, plaster.	Manure containing nitrogen alone.	Manure containing phosphoric acid, potash, plaster.	Farm-yard dung 300 lbs. and half-dressing of no. 2.	No Manure.

Each of these plots are supposed to contain four rods, the fortieth part of an acre, and the proposed dose of artificial manures, per acre, would be 160 lbs. of sulphate of ammonia, 400 lbs. of superphosphate, 400 lbs. of kainit, and 200 lbs. of plaster; consequently the dose for each plot would stand as below.

No. 1.	lbs.
Farm-yard dung.....	600
No. 2.	lbs.
Sulphate of ammonia.....	4
Superphosphate.....	10
Kainit	10
Plaster	5

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No. 3.	lbs.
Sulphate of ammonia.....	4
No. 4.	lbs.
Superphosphate.....	10
Kainit	10
Plaster	5

25

No. 5.	lbs.
Sulphate of ammonia.....	2
Superphosphate.....	5
Kainit	5
Plaster.....	2½

14½

lbs.

Dung..... 300 (1)

This is a most elastic plan : the quantities and proportions can be varied at pleasure. For instance : potash is of doubtful utility, therefore add two more plots and try nitrogen and potash on one, and nitrogen without potash on another. I applied last summer, in addition to the usual dose of dung, twelve bushels of good hard-wood ashes on the half of an acre of potatoes, the other half receiving only the dung. A very

(1) That is : half dung and half artificials.