

singling is so expensive, and the getting out of the ground so troublesome, that I dare not recommend its cultivation. Steeped parsnip-seed sown by me in 1884, on land thoroughly well prepared, was six weeks before it showed itself out of the ground.

#### CABBAGES.

Excellent food for all kinds of stock. Towards the end of April or the beginning of May, a pound, or so, of cabbage-seed—St. Denis or Savoy—should be sown in a seed-bed, in the open air, in rows 10 inches apart and thinly. About the 10th June, transplant into well-manured rows, rolled down heavily, 24 inches apart, and 12 inches from plant to plant in the rows. Books and amateur farmers recommend 3 feet each way, but long experience has taught me that the distances I advise will bring the heaviest crop to the acre, and that those who follow the directions spoken of above lose one-third of their land. To those who grow tobacco, it is advantageous to plant a row of cabbages and a row of tobacco, alternately. This leaves 48 inches between the rows of the latter: plenty of room for the man who prunes or disbuds it.

#### CAN FARMERS PROVIDE THEMSELVES WITH ARTIFICIAL MANURES WITHOUT GOING TO THE MANURE-MANUFACTURERS? THE UTILISATION OF BONES, ASHES, PLASTER, THE WASTE-PRODUCTS OF FACTORIES, &c.

I have been requested to say a few words on the preparation of artificial manures from the waste-matters generally available for that purpose on our farms, they are bones, ashes, &c. Unfortunately, I have but few things to say about their employment, for except the dissolution, so to speak, of bones by means of dampened ashes, I see no means of furnishing, from the refuse of the farm, the three necessary ingredients of a good manure: nitrogen, phosphoric acid, and potash. Never mind; I will do my best, and if the audience find my essay rather poor in ideas, it will kindly excuse it.

At the last meeting of this Association, M. Marsan addressed you on the subject of the care to be given to farm-yard dung to prevent the loss of its precious elements. Wherefore, I need not enlarge upon that subject. It is enough to say that, if the urine is kept from wasting itself, either by collecting it in tanks, or, preferably, by using enough litter in the stables and cattle-sheds to absorb it completely, the solid dung will take care of itself, provided it be not too much drenched by the drip from the eaves, and is not allowed to heat too much in summer.

As I said, just now, the three necessary constituents of a good manure are nitrogen, phosphoric acid, and potash; although the last is not always absolutely requisite in heavy-land, especially when that land has not been exhausted by a too frequent repetition of the grain-crop.

As for nitrogen, a fair dose of it would be about 40 lbs. to the acre, and it would take from 1,000 lbs. to 1,200 lbs. of bones to yield that amount: equal to 48.56 lbs. of ammonia. Among these bones will be found about four times as much phosphoric acid as is generally wanted on an acre. Thus, as you see, bones are not a well balanced manure. To the bones add a few bushels of ashes, and beside the potash therein contained you will find in them still more phosphoric acid, for hardwood ashes, especially those from the beech, contain, on the average, 5% of that compound.

What are we to do then in such a case? We must take refuge in the hope that the surplus of phosphoric acid may remain in the ground for the use of future crops.

After all said and done, it is clear we cannot afford to deal

with bones in this lavish manner. One thousand pounds of them is about as much as we can hope to collect on a farm in the course of the year, and to apply such an amount as this to an acre of land would be to waste both time, labour and money-value. Let us take 400 lbs, then, and mix with them 20 bushels of ashes—this quantity being a dose for an acre:

Place the bones on a block of hardwood, or an anvil, and smash them with a sledge-hammer; mix the bones and ashes intimately, and make them into a flat-topped heap, moistening them a little, but not making them dripping wet. As to the knee- and hock-bones, they had better be burned, as they are almost unconquerable by any other means. When burned, they can be crushed by rolling a barrel, loaded with stones, over them when spread out on the barn-floor, and turned over after every passage of the roller.

After the damp heap of bones and ashes has reposed about 3 weeks, it will have heated considerably, and when the heat is at its height, the heap should be turned over carefully, and moistened afresh. In three months from the commencement, the bones will be so softened that they can be crushed as before described.



PEKIN DRAKE.

In almost every village in the province there is a tannery. Although the spent bark is worth nothing as manure, the refuse bits of skin are very valuable for our purpose. They contain much nitrogen, and as tanners employ a good deal of lime in preparing their *liquors*, the nitrogen is converted into nitrate of lime, a fixed salt. To make the best use of tanners' refuse it should be mixed with earth at the rate of 3 loads of earth to one of refuse, and a heap made of it which should be dealt with like the heap of bones and ashes, that is, kept moist, and turned over two or three times after it has properly heated. Three loads of refuse—it is very heavy—and nine of earth, are enough for an acre.

As to the employment of bog-earth (*terre noire*), I am wholly of M. Chapais' opinion:

"We cannot advise you, as a profitable thing, to employ bog-earth as a manure on any soil. The expense of cartage are not compensated by the results obtained, which are problematical. Still, bog-earth, well dried, is an excellent absorbent in our stables and cow-sheds, to retain the urine, and to be used in this way, if you have it handy, it is both advantageous and remunerative."