

what the manufacturer professes to sell or what we want to buy. What we ask for, rightly or wrongly, is a phosphate in a quickly soluble state. If we want more bi-calcic phosphate, which may be useful to carry on the crop towards the end of the season, we can mix a little fine bone-meal with the superphosphate and thus enjoy the advantage of a both a forcing and a lasting manure.

I see the attempt is still being made in the local journals to persuade people that our *apatite* ground into fine powder is the manure. Mr Jamieson, the agricultural chemist, is continually thrust forward as approving this method of treating it.

Mr Jamieson, it is true, recommends the use of finely ground insoluble mineral phosphate as manure for crops as being cheaper than the same dissolved, and in many cases, equally efficacious; but he "wishes it to be distinctly borne in mind that, when speaking of insoluble mineral phosphate, he refers to the well known *massive* form of phosphate of lime (coprolites), and not to *crystalline* forms of phosphate of lime." "Nor will," he adds, "our Aberdeenshire conclusions apply to *apatite*, or to phosphate of alumina and phosphate of iron, our experience of which is that their action is nil, or so slight and slow as not to be regarded as having manurial value." *Jamieson's report on Aberdeen experiments, 1881.*

Aitken, the chemist to the Highland Society, says the same thing of the ground apatite: "The plot with *ground Canadian apatite* was a failure from beginning to end of the season; showing that, *even when very finely ground*, this hard crystalline phosphate is unsuited for use in the undissolved state." And now, *Senex; J. C.; W. B.*; and others are gravely bringing forward Jamieson as an authority for the use of undissolved apatite, as the best form in which phosphoric acid can be applied as a manure. Have they all mills to sell?

A. R. J. F.

AGRICULTURE.

PARIS, APRIL 22.

Maize is largely employed in France for the production of spirits and starch: in both cases, the residue has an importance as an article of cattle food at once cheap and nutritive. The flour of all cereals in addition to starch, contains gluten, fatty matters, gum, mineral salts, &c. When the maize has been softened in water, it is carried up to a pulp engine and reduced to liquid paste; by successive screenings the starch is separated, and the residue is a yellowish mass, possessing an agreeable odor, capable of being preserved in trenches, and well relished not only by cattle, but by horses, pigs, and barn-door fowls. It contains, still, 8 per cent of starch, $1\frac{1}{2}$ of gluten, $2\frac{3}{4}$ fatty matters, and 7 of sugar. It can economically replace oil cakes; as 6 cwts. of the paste at 15 fr. is as nutritive as 2 cwts. of linseed cake at 23 fr. The secretion of milk is augmented, yielding not only a quality rich, but of an agreeable flavour. In the north of France, the farmers use the refuse of the starch mills very largely.

There is a warm rivalry going on respecting the nutritive and economical value of palm and cocoa cakes; nitrogenous matters predominate in the latter, and fatty substances in the former. For pig feeding, both cakes are mixed. In the centre of France, cocoa cake is generally employed for milch cows, the milk produced on this regimen is rich, and the butter fine and well flavoured.

In Brittany, Jerusalem artichokes, 23 lbs. per day ration, are competing with parsnips in the feeding of horses; they produce a sleeker coat, and the animals relish them better: then, they remain more juicy at the end of the season, when parsnips and carrots become dry and insipid. Parsnips demand a deep siliceous soil, and if near the sea so much the

better. The white carrot with the green neck, has the drawback of not keeping well; and, last winter being mild, their conservation was very difficult. To meet the difficulty, many farmers here cultivate the white carrot for first consumption, and the long red variety for later feeding-up to May, as it keeps well, and is highly relished, perhaps from its perfume.

Professor Sanson maintains, that the native breeds of live stock of France have been so improved by judicious crossings with imported pure races, as to be chemically and nutritively, in point of meat, superior to the latter. Be this as it may, stock breeders, and judges at agricultural exhibitions, display still a weakness for pure stock. Mr Sanson has analysed portions of the prize animals' flesh at the recent Paris fat cattle show, to determine the percentage of dry matter, of protein, and of fat, deducing therefrom the comestible value of the animal. Following his tests, in the case of stock, the Limousin breed would come first, and Durhams last; for sheep, precocious merinos, a deicester cross, and Southdown lambs. In the case of three breeds of pigs, the Normand and Limousin Yorkshires are superior to the pure Yorkshire. Allowing a good deal for patriotism, it is not clear what rôle difference of age has played in the comparison.

Professor Nocard, of the veterinary college of Alfort, has remarked, that many cases of the *charbon* malady were to be traced to lands dosed with such artificial manures, as blood, refuse wool &c. It is wise to take note of the observation without attaching to it undue importance. The Pasteur vaccination preventive against the *charbon* disease is now unanimously accepted in France: many local agricultural societies undertake to repay the expenses of vaccination to farmers who allow their stock to be operated upon; there has been no cases of failure where the instructions for operating have been faithfully executed. Up to the present, two descriptions of virus or pock were necessary to be employed; Mr Roux, one of Mr Pasteur's assistants, has tried a new virus, which insures immunity by one vaccination in place of two; it has been successful everywhere. Mr Tayon has conducted experiments with the virus on asses and mules in Africa, but these animals invariably proved rebel to all attempts at "taking" the vaccine. On the 11th May, a congress will be held in Paris to deliberate on the Pasteur principle being extended to other contagious diseases to which stock are liable.

This is more urgent as peripneumonia is the order of the day; inoculating healthy animals in the tail, with a virus taken from an animal which has just expired, has only yielded mixed results: gangrene, produced from irritation of the wound, or from impure virus, attacked the tail; the remedy was worse than the disease. Mr Pasteur has stated, that the peripneumonic virus, cannot be "prepared" like that of the *charbon*. However von Dorpat, of Germany, has prepared the former free from fatal impurities, by heating it for ten minutes at a temperature of 131° F.

Efforts have been made to produce machinery capable of extracting sugar from beet, on the farm even, and by the ordinary servants. Aprin, in the neighborhood of Paris, claims to have supplied the want: practical lessons have been given, and with fair success, at their works.

Mr Marguerite draws attention to the great waste of blood, when it can render such invaluable services as a manure. A preparation of iron, one quart to 20 of blood, will convert the latter into a cake, which when dried, either by pressure or heat, will readily pulverize and contain from 10 to 12 per cent of nitrogen.

The employment of superphosphates as a complementary manure up to the present, has found but little favor among tillage farmers of calcareous soils, in the south-west of France. M. de Gasparin, the eminent chemist, has investigated the