case demands a new analysis ; one field may produce a forage five times more nutritious than another.

A popular error exists, that Boussingault asserted forage plants take nitrogen directly from the air—even his latest experiments demonstrate the exact contrary. Then the attempt has been made to explain the restitution of nitrogen to the soil by the agency of meteors and rain. It is a fact, that ammoniacal salts and nitrates, are constantly present in the air, and conveyed, along with other saline and dust matters, to the soil by the rain. But the latter falls on the just and unjust alike : upon all cultures indistinctly, not upon any particular rotation, and not specially on forage plants. It is assumed, but not proved, that electricity nitrifies the azote of the air in the interior of the soil by a union with hydro-carbonaceous matters , or effects a similar end in the interior of plants by their starch, sugar etc. We know, however, that the azotous matters in the soil can be nitrified, but that is not an augmentation of richness ; also, Cavendish has shown in 1784, that an electric spark traversing an atmosphere enriched with oxygen, can produce nitric acid. Now, if electricity makes ammoniacal salts and nitrates in the atmosphere, that intervention is for all rotations and crops alike.

It may be laid down as an axiom, that every system of culture, which does not bring, from an outside source, the materials—whether nitrates, phosphates or potash etc., rare in a soil, and carried off by the produce, must ultimately suffer in fecundity. There is a necessity, apart from these food considerations, to rotate crops : the plan affords the means for extirpating weeds, for cleaning the ground, and of destroying insects, since if the latter, peculiar to a distinct crop, be deprived of its special food for one or two years, it must die of starvation. To keep a soil rich, depend upon manures, rather than upon the air.

The extent of vineyards in France is 4½ million acres : one-quarter of this area is invaded by the phylloxera, and the new ravages of the insect are estimated at the rate oft 200,000 annually. Three official remedies are recognised ; sulpho-carbonate of potassium, and sulphuret of carbon ; submersion, and American stocks for grafting on the affected vines. To these must be added a relatively high manuring It has been found that purely nitrogenous manure as wool-clippings, horn parings, dried blood, oil cakes etc ; develop the vine at the expense of the fruit ; but farm yard manure, or a composition of potash salts, soluble phosphates, and a proportionate dose of azotous matters, have the opposite effect. A high authority ; M. Rommier, recommends a new and cheap insecticide—bi-sulpho-carbonate, he also recommends the summer floodings of vineyards. He doubts the efficacy of autumnal irrigations, because at that period the insect is prepared for its hivernal sleep ; is encased in a kind of wax waterproof, and has a sufficient provision of air to guard against being drowned. Even M. Faucon, to make the submersion process more certain, has had to prolong the floodings to 45 consecutive days. Some persons of late disolve the insecticide in the water intended for irrigating the vines.

In several parts of France, and notably in the southern wine-making districts, the residue of the grapes after being pressed or distilled, is conserved in cement cisterns for cattle feeding , the layers, of 12 inches, are dusted with salt, the whole, when pressed down, being covered with puddled clay occasionally the latter is represented by a thin sheet of weak brine. Some people take the stalks out of the residuum, as the mass then keeps better. Stock relish the feed from its alcoholic flavor,and it is given similarly to beet pulp. In the district of Mont-d'Or, famous for its cheese,—prepared from sheep's milk, the sheep are house-fed all the year round ; in summer etc. on the leaves of the vine, and in winter on the residue of the wine presses. In Germany, brewer's grains are similarly preserved as the grape residue, save, that the cistern has a cover battened down on the grains, being itself covered by a layer of water 8 inches deep.

The beet crop has been attacked by the same fungus this year as in 1852 , it is a species of mushroom that settles on the leaves, producing a kind of nest. In some cases, all the leaves had been destroyed, in others, new leaves had succeeded . on analysing the root, it was found to have suffered to the extent of 3 per cent in richness, as compared with healthy roots.

Water-distributing flexible pipes are generally lengthened, or joined, by the additions screwing together. M. Reaume simply arranges that one end of the pipe passes into that of the other, the union being secured by a lever, which locks : an india rubber ring prevents all leakage.

French farmers are becoming also manufacturers : thus the distillation of molasses, of maize, and of beet, has been improved by employing the electrolyseur, which sends an electric current into the mass, that decomposes the water : the liberated oxygen then displays an affinity for foreign products of objectionable taste, and burning them. It is thus that beet brandy has been freed from its bad flavor ; the first shot distillatiou yields 85 per cent. An electrolyseur will produce 4,000 gallons of brandy in 24 hours.

Generally, the harvest is regarded as satisfactory ; the number of sheaves is great, but when threshing commences, the quality of the grain will be better estimated. France, and perhaps the Continent, will not have to inport any grain the year. The beet promises well : forage, fair.

A farmer writes, that he has effectually got rid of couch-grass by cultivating buck-wheat.

This system of co-operation is rapidly extending among farmers, for the purchase of seeds, manures, and implements of the first quality ; the members of the society bind themselves individually to guarantee the payment of all orders given.

## Water for Bees in Winter.

EDS. COUNTRY GENTLEMAN.—When bees are rearing brood, they need water. What beekeeper has not noticed with what eagerness they seek it upon their first flight in the spring ? Honey that has remained in the hive all winter is often very thick, containing little water, and in some instances is candied, or partially so. It is no wonder, therefore, that the bees need water with which to thin such honey, when preparing food for their brood. Within a few rods of my apiary is a small brook, and, during the first warm days of spring, its banks are fairly alive with bees busily engaged in sipping water from the moist earth. Last spring a correspondent of *Gleanings* said that his bees were so "crazy" after water the first day that he took them from the cellar, that they would not even notice honey when offered to them. On the second day, when offered honey, they did not refuse it. Bees are never seen bringing water from brooks or moist places when honey is coming in plentifully, as, when first gathered, honey is thin, containing a superabundance of water that requires some effort on the part of the bees to remove, preparatory to sealing up the honey. Let the flow of honey cease, and the bees will soon be found visiting watering places ; and if the dearth of honey should occur during a drouth, as is often the case, and there are no streams or bodies of water near a large apiary, the bees will become a nuisance at pumps, watering troughs, etc. To remedy this, the bee-keeper should furnish his bees with water near home ;