

and you will perceive that salts produce different effects, according to the nature of their acid. Now this may be illustrated thus: you take every day, probably, with your every meal, common salt, that is, soda, a base united to muriatic acid. Your digestion and health are all the better for it. You give your cattle a little salt. It does them good. Suppose you change the acid of that salt, leaving soda its base, in the same quantity you daily take. Instead of the muriatic, suppose you use saltpetre from Peru, instead of common salt. You need not be told, that you would poison yourself and your cattle by so doing. You can drink, I dare say you have, cream of tartar punch. You feel the better for it. It is refreshing, cooling, opening. Now cream of tartar is a salt of potash; it is potash and tartaric acid. You have a fever. Your doctor gives you a sweet with Silvius's salt, that is, acetate of ammonia, a salt composed of that and vinegar; or you take, perhaps, an effervescing draught, formed of lemon juice and pearl-ashes. All does you good. But suppose now you change these cooling vegetable acids for a mineral acid, say oil of vitriol. You may not take potash, united with a dose of oil of vitriol equivalent to the tartaric acid in the cream of tartar, without serious injury. So is it, reader, in farming, the acids of some salts are not only harmless, but beneficial to plants; others are actual poisons. In the first case, salts help to nourish plants, as common salt help to nourish yourself; in other cases, they poison plants, just as they would impair your constitution, perhaps kill you. But it is to be remembered, as in our own case, even those that poison, in a small dose become medicines, so, in plants, a small dose is not only good, but truly essential. Now if we divide the acids into two classes, the nourishers and poisoners, such will also be the nature of the salts. When we therefore attempt such a general division of the salts, it may be said that all the acids derived from the vegetable kingdom are harmless; so are the acids called mineral, yet whose components are, in part, like those of the vegetable acids; for instance, aqua-fortis or nitric acid. But the true mineral acids are poisonous; such are oil of vitriol and spirits of salt. One thing is here to be borne in mind. It must never be out of sight, in trying to understand how salts make plants grow. You cast your salt upon the ground, it lies there no action occurs. It rains; your salt is dissolved and disappears; seems to do good. Cast your salt now among sprouting seeds and growing roots; here is life. Well now life is just as much a power or force as electricity is. It exerts its force, no matter how; that is quite another consideration. It says, life exerts its force here to separate the acid and the base of a salt, just like a chemical force. We can and do separate the components of salts by other substances; nay, we do it by electricity alone.

This is all that is necessary for you to

know, and understand about this action of plants upon salts; it does disunite the components of the salts. What is the consequence? The alkali, earth and metal act as such, the same as if no acid was present. The acid acts by itself; if it is a poisoner, it hurts it. It produces either a healthy, green crop, the effect of alkali, or a stunted, yellow sickly plant, the effect of acid. Now neutralize this acid, kill it. You see your crops start into luxuriance, and reap where you have sowed. So much for illustration. Let us now apply this view of the action of salts to those contained in cattle dung. In the first place we have salts of potash, of soda of lime; these are the most abundant and active; then we have salts of iron manganese, of clay and magnesia. These last substances, existing only in small proportions, may be thrown out of the account, bearing in mind, however, that, though we set these aside, a plant does not; they enter equally with others into its composition. Let us begin with the salts. It is found combined in cattle dung, first, with a vegetable acid; the acid of mould. It is a nourisher of plants. Secondly, with sulphuric acid or the acid of sulphur, called oil of vitriol. This is one of the poisoners, existing only in small proportion in cow dung; it ministers to the wants of a healthy plant: The same is true of the common salt, or the muriate of soda of dung. If it existed in larger quantities, it would poison the plants to which it might be applied. The next salts are those of lime, phosphate, and sulphate of lime, or lime united to sulphuric and phosphoric acid, forming plaster and bone dust. The acids here, if abundant, would have a decided bad influence, they are poisoners; but the carbonic acid, in the carbonate of lime, is a nourisher. Now from the small quantity in which these all exist in cattle dung, they act only beneficially. But if you apply a great excess, even of cattle dung, you may be sure of an unfavorable result; it will be produced by the acids of those salts which we have called poisonous. To continue our remarks on the acids of salts of dung it is to be observed, that they act also upon the soil.

They decompose that. That is, they extract from the soil alkalies, or other substances, like those in the original salt. Now though applied, as they must be, in very small doses in cattle dung, yet because of their decomposing action on soil, they continually renew themselves, they last till their acid is taken up to supply the wants of growing plants. Let us now, reader, if you understand how the acids of the salts of dung act, turn to the bases or the alkalies and metals and earths of these salts. What is their action? What purpose do they serve in dung applied as manure? First they enter into and form a part of the living plants, they form a part of its necessary food, as much as do the constituents of mould. Secondly, when these alkalies and metallic bases are let loose, by the disunited power of a growing plant, then they act as alkalies

upon mould. They hasten decay, render mould more soluble, fit it to become food for plants. This account of the action of mould and salts in cattle dung may appear to you, readers, long and hard to be understood. I do request you not to pass over on that account. A patient reading, perhaps some may require two or more readings, will put you in possession of all you need know to understand the why and the wherefore of the action of mould, and salts of whatever manure may be used. What has been said of the action of mould and salt in cattle dung is equally applicable to all manures. If, then, you bend your bones to this subject, and master it, your labor of understanding the action of other manures will be reduced to the mere statement of the several substances which they may contain. We therefore proceed to point out other manures, composed of the droppings of animals.

### SECTION SIXTH.

#### Of Night Soil, Hog Manures Horse and Sheep Dung.

These have not all been analysed with the same degree of care and as often as his cattle dung; some, as for instance, night soil, has been examined thoroughly but once. Now is it not quite fair to base our reasoning upon these single analysis, and say that this or that manure contains this or that salt in great or less quantity than another.

The quantity and kinds of salts are materially affected by several circumstances, which will be considered in the next section. An analysis, made when the animal is fed and worked one way, will vary from the result which would be obtained when the circumstances are varied. It is, therefore, quiet useless, in the general consideration of the composition of manures to enter upon the details of each. General results, general expressions of facts, are sufficient for understanding the nature of animal droppings. It is well ascertained, however, that all these droppings, of various animals, contain essentially the same salts as does cattle dung. They all contain portions of each of these substances which form plants. It will be enough for the purpose of this Essay, to present to your eye, reader, a table, showing the proportions of water, mould, and salts, which the dung of yourselves and your stock presents.

	Water.	Mould.	Salts.
Night soil and Hog			
Manure, . . . .	75.30	23.50	1.20
Horse dung, . . . .	71.20	27.00	.96
Sheep dung, . . . .	67.23	22.50	3.06

(To be Continued.)

**Hoarseness.**—One drachm of freshly scraped horseradish root, to be infused with four ounces of water, in a close vessel, for two hours, and made into syrup, with double its weight in vinegar, is an improved remedy for hoarseness; a teaspoonful has often proved effectual; a few teaspoonfuls, it is said, have never been known to fail in removing hoarseness.