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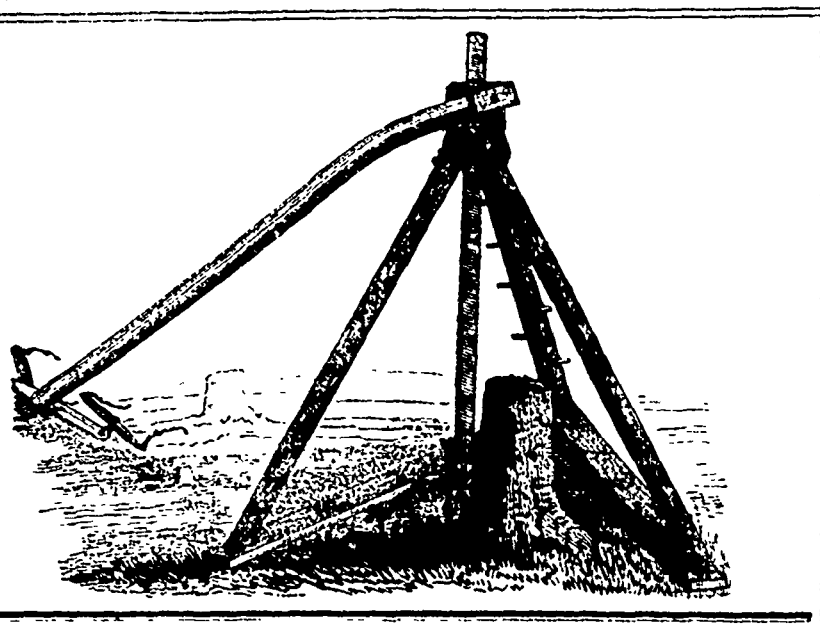

STUMP MACHINE.

As this is the season in which farmers have a little time to spare for the purpose of removing those unsightly objects which deface the appearance and diminish the value of so many farms in Canada, vulgarly called *stumps*, we present them with a Cut of a recently invented Machine for dislodging these gentry from their time-honoured residence. It requires little description, as it explains itself. It is simply a long wooden screw, at the upper end of which is a nut, to which a lever is fixed for turning it Without the frame, which any one can make for himself, the Machine can be had for about $25 or $30. It is warranted to pull up the largest stump. Mr. Edmundson, of this city, informs us that he will in two or three days have them for Sale.

MANURES.

(Continued from page 109)

OF THE ACTION OF MOULD IN CATTLE DUNG.

Here, then, we have cattle dung with its several ingredients spread out before us.

We have now to study its action. We need here consider only the salts and mould. The water is only water, and has no other action than water. The mould includes the hay, for that has by chewing, and the action of the beast's stomach lost so much of its character, that mingled with the slime and bile, &c., it more rapidly decays than fresh hay would, placed in similar circumstances. During this act of decay, as you have already learned, the volatile parts of the mould are given off in part. These escape as in burning wood, as water or steam, carbonic acid, and ammonia. In consequence of this slow mouldring fire or decay the manure heats. Here then we have three very decided and important actions produced by the vegetable part, or mould of cattle dung. First, carbonic acid is given off; Second ammonia is formed; Third heat is produced Let us now consider each of these, and their effects.

First the great action of the carbonic acid is upon the soil, its earthy parts. It has the same action on these, that air, rain, frost, have; it divides and reduces them. It not only reduces them to powder, but extracts from the earth potash, and the alkalies This is a very important act, and shows why it is necessary that decay, or fermentation, should take place in and under the soil among sprouting seeds, and growing roots, in order that they may obtain from the soil, the salts they want.

If well-rotted manure contains abundance of these salts, ready formed in its mould, then there will be less, necessity of this action of carbonic acid. But here again it must be remembered, that this abundance of salt formed in mould, can be produced only at the expense of great loss by fermentation of real valuable parts. For,

Secondly, the next great action of the mould of cattle dung is, to produce or form ammonia. This plays a three-fold part; its first action is, to render the mould more soluble; this action it possesses in common with the fixed alkalies, potash and soda. All the alkalies put a large, but undefined portion of mould, into a state fit to become food for plants. The second action of ammonia, is this, it hastens decay. It is the bellows, we may say, kindling the slow moulding fire. The third action of ammonia is, to combine with any free acids, such as vinegar, or even an acid formed of monld itself, but especially with aqua-fortis, or nitric acid which is always produced, where animal or vegetable matters decay. This is a highly important fact. The results of this action, the production of ammonia and aqua-fortis, during the formation of mould is, that a kind of saltpetre is thereby produced. That is, the ammonia and aqua-fortis unite, and form salt, with properties similar to saltpetre. But we want the first and second action of ammonia to occur, before the third takes place Consider now, reader, whether a more beautiful and effectual way can be devised, to hasten decay, and render mould more fit for nourishing plants, than this which nature has provided. The ammonia is volatile. It remains, not like potash and soda, where it is put, incapable of moving unless dissolved by water, but ammonia, like steam, pervades every part. It is expansive as steam. Heated up by the slow mouldring fire of decay, it penetrates the whole mass of mould. It does its work there. What is that work? It has already been told. But, if it finds no acid to combine with it then unites with the mould itself. It is absorbed by it.

The mould holds it fast; it stores it up against the time when growing plants may need it. Now it is only where the abundance of ammonia produce satisfies these actions of hastening decay, making mould soluble, and filling its pores without combining with it, that the formation of saltpetre takes place. So where animal matters, which are the great source of ammonia, decay, there we may expect all these actions to occur. How important, then, is that action of mouldring, which produces ammonia. If, reader, you will reflect upon the consequence of this action, you will at once, see that if the mould is in too small a quantity to retain the ammonia, it will escape. If by a wasting exposure, you allow your mould to dissipate itself in air, as it certainly will, you diminish at the same time, the chance of keeping the ammonia which has been formed. No doubt all cattle dung exposed to air, forms more ammonia than it can retain. Hence the necessity and the reason of forming composts with this substance. Keep what you have got and catch what you can, must never be lost sight of in manure. The third action of mould is, the production of heat. Little need be said upon this. That a slight degree of heat hastens the sprouting of seeds, you well know. That different manures produce different degrees of heat; that some are hot, some cold, you well know, and adapt your seed and manure to each other. The degree of heat depends upon the rapidity with which decay occurs. And this is affected by the quantity of ammonia which each manure can afford. The great point, to which your attention should be directed when considering the power of mouldring to produce heat, is, that it shall not go so far as to burn up your manure, just as hay will heat and take fire.

OF THE ACTION OF THE SALTS OF CATTLE DUNG.

Here it is we find ourselves thrown on a sea of opinions without chart, compass, or pilot. if we trust to the conflicting theories which have been set up for landmarks and lighthouses. Let us therefore, reader, trust to ourselves, aided by the little chemistry we have learned from the proceeding remarks about the composition of salts.

I have endeavoured to impress on your memory, that the term salt is very comprehensive. But then to encourage one, it is also to be rembered, that salts are compounds of alkalies, earth, and metals with acids. Now the earth, alkalies, metals may be united to each of the known acids,(and their name is legion,) yet you may not, by this change of acids, alter the the nature of the, earth alkali, or metal. That always remains the same; every time you change the acid, you alter the character of the salt. Thus soda may be united to oil of vitrol and form Glauber's salt, or to aqua-fortis and form South American saltpetre, or to muriatic acid and form common table salt. The soda, is called the base or basis of this salt, that is always soda, you do not change its character by changing the acid. To give another example, lime may be united to carbonic acid and form chalk, or marble, or limestone, or it may be united to oil of vitrol and from plaster of Paris, or to phosphoric acid and form bone-dust. Now, in each case, the base of the salt that is, the lime, remains unchanged; but changing the acid, we change the nature of the salt, and of course its effects will be different. Now it is plain, that where the base of the salt remains the same, that will always act the same, but different effects will be different acids. Each base acts always one way, but each has an action similar to every other. Each acid acts also one way, but each has an action distinct from every other; impress this on your mind. Reflect upon it a moment, 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 now you change the acid of that salt, leaving soda, its base in the same quantity you daily take. Instead of the muriatic, suppose you substitute the nitric acid, or, what is the same thing, 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 sweat 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 are not only harmless, but beneficial to plants; others are actual poisons. In the first case, salts help to nourish plants, as common salt helps to nourish yourself; in other cases, they poison plants, just as they would impair your constution, perhaps kill you. But it is to be remembered, as in our own case, even those that poison, in a small dose become medicines, or, in plants, a small dose is not only good, but truly essential. Now if we divide the acids into two classes, the nourishers and the 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; it seems to do no good: Cast your salt among sprouting seeds and growing roots; here is life. Well now, life is just as much power or force no matter how; that is quite another consideration. I say, 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

Now this is all which is necessary for you to know, and to 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 also acts by itself; if it is a nourisher, it helps the plant; if it is a poisoner, it hurts it. It produces either a healthy, green crop the effects of alkali, or a stunned, yellow sickly plant, the effect of acids. Now neutralize this acid, kill it. You see your crops start into luxuriance, and reap where you have strewed. So much for illustration. Let us now apply this view