BLACK MUD.

To Editor Journal of Agriculture:

Sir,—At the risk of being tedious to a portion of your readers, I have now undertaken to treat upon a topic in agriculture in such a manner as may be found interesting and profitable to the minds of an inquiring few.

It is only after some experience in dealing with the dark and mysterious material which composes our swamps, that I have arrived at certain conclusions as to its nature and properties, and more profitable use and application as a manure. And I may say in the outset, that in certain important qualities any specimens that I have noticed in this country entirely differ from the peat moss of the old country that is in any way used for fuel. We read of mosses or swamps, the material of which would appear to be charged with some preservative or antiseptic quality by which their character remains for lengthened periods unchanged, though exposed to the elements of air and water, and it may be to fire also. To some extent our black muck bears this same common characteristic. But I have observed that in the case of vast areas of this substance in Nova Scotia, comprising innumerable patches of wet, black, and miry swamp, the character of what appears to be of leading importance to the agriculturist is the presence of certain mineral salts, among which sulphate of iron holds predominance. Persons of a philosophical turn of mind may just here and now enquire, how did such a combination get there? The answer would comprise what might be found a very interesting study in chemistry, mineralogy and geology through all its ages. Perhaps there is room here for me to say that the underground portion (which is a very important portion) of this country contains a prodigious quantity of sulphur and iron locked up. Sulphur or sulphuric acid, must have been at one time in the world's history, perhaps several hundred thousand millions of years ago, a very common element in the circulating system or systems of this planet; this circulating system perhaps including many streams, inland seas, lakes, volcanic fires, and hot vapors. At any rate, nearly the half of this Province is composed of various systems (strata) of rock, formed, as they must have been, by igneous deposition. [Should any one be unacquainted with the full meaning of these terms he will have to get a dictionary—there are more of them to come yet] Now, these rock systems, generally the quartzite, the lowest, and the slate, just above, are mainly composed—in ascending order—of silica, silicate of alumina, and this latter, comprising minute quantities of manganese, and very minute quantities of alkaline material; but the whole of these formations contain, especially in the planes of superposition, in the aggregate a vast amount of pyrites, consisting of sulphide of iron; but, and this particularly in the inferior member of the group, and in its extreme lowest part, where the gold leads occur, a considerable show of soft and dark mineral, which largely consists of arsenic and lead, in connection with the sulphur—always with the sulphur. Next above these, moving across an unspeakable gap in the world's geology, we in Nova Scotia find, very frequently in close position to the aforementioned, the sulphuric acid in a particular and altogether new connection. And we thus find it definitely compounded, unmixed, prodigiously massed, elevated mountains high, in enormous quantity, in hills and fields, and cliffs and reefs, to a sure and certain extent soluble in water, and everywhere showing where it has been immensely dissolved; and the percolating waters everywhere, as in some degree in all sulphate districts, carrying downwards and onwards, over land, and through swamps, to the rivers and sea, these sulpho-salts in a state of solution, or dissolution; for they form new combinations by the way, and re-combinations, the full account of which would no doubt form "a more marvellous tale" than space here is to recount. And that is how and by what means the decayed vegetation of our swamps has become charged with pyritic salts, in a very finely divided state.

Next, let us see what we can do with this black muck, to make a manure of it; because in its natural swampy condition it is very slow of decomposition; indeed, from causes that I intend referring to further on, there are very few substances that we can connect it with (in their native condition) that will decompose it, and these only sparingly and slowly. We shall have to apply to it something containing an excess of the alkaline principle, that shall be so far decomposable as to combine with the sulphuric acid, to the exclusion of the iron, or whatever base this acid is connected with, or otherwise something that has been deprived of oxygen, as burnt earth, &c. I have in another place referred to the value of the prepared gypsum as a manurial agent. For anything I can see to the contrary, those who have a black muck swamp of the right kind near at hand are about as well off for a manurial constituent as if they had a plaster quarry.

I have in the foregoing described very shortly the principle of decomposing the ferruginous salts contained in the muck. Burnt lime is a very efficient agent for this purpose. So are soap suds; hence the advisability of a good back-door compost heap of black mud. Soda in I suppose any form will decompose the muck. But there is probably nothing better than ammonia. This is our old friend of the manure heap.

About all the nitrogen we get on the farm comes either out of the atmosphere or the dung-pile. We have it here in a loose but definite compound with hydrogen, termed ammonia; and this ammonia again is combined with carbonic acid, forming carbonate of ammonia. Ammonia is, therefore, an alkaline substance, capable of forming a salt in connection with an acid, and of re-combining with other acids and forming other salts; and when sulphate of iron, in the finely divided form in which we have it in the muck swamp, comes in intimate contact with the fresh manure, the result is a sulphate of ammonia. This is a more convenient and suitable condition in which to apply the ammonia (or nitrogen) to the soil, than perhaps any other, in this country at least.

So far so good on the part of the ammonia. Let us get back for a little to the black mud. This contains plenty else besides pyritic substances. In most instances the elements of common table salt are present. Moreover, we often find incrustations of limestone, in a crumbled and honeycombed form,—the carbonate of lime,—or bog limestone. This has resulted from the decomposition of the gypsum, as this in its turn gave up its sulphuric acid. In some districts in the country we find magnesian salts in the swamps, streamlets and mineral springs.

These aforegoing are perhaps the most important of the substances that have come into the swamps by water circulation. In addition, we have whatever is contained in the decayed or partly decomposed vegetation of which the muck is mainly composed. And here we may observe on the very face of it, or rather on the top of it, that out of a well drained and well cultivated swamp, without any manure at all, but well seeded, we get a good crop of timothy for I know not how many years, but probably as long as the bottom part of it can be taken out of the ditches and cast occasionally over the top of the ground. This shows that the muck must be well supplied, from some source, with phosphoric acid, because there is enough phosphate of lime in one ton of timothy, if I recollect right, to make the whole skeleton of a cow.

I wish here to state, for the edification of the ignorant, that this pyritic muck surpasses anything perhaps in the known world in the condensation of atmospheric vapors into water. It is a substance, which, if undecomposed, never dries. It will be found in numerous places full of water to the top; and persons who see these wet places think they behold a