produce a great improvement in any soil, but mixed with any other substance, directed by Dr. Dana, it must be much better suited to produce improvement. Moss soil made into compost will be suitable for all soils that are not moss, and sand or clay, will answer for compost intended for moss land:—

And so among your first attempts at improving your worn-out lands, always supposing you have not a barn-cellar, hogs, and swamp-muck, so aptly called by one of your own self-made practical men, the "farmer's locomotive," I presume you may like to know the proportions in which you may mix swamp-muck and alkali. You can hardly go wrong here by using too much; the great danger is, you will use too little alkali. But calculating on the proportion of mould in fresh-dug swamp-muck, or peat, it may be stated as a rule, grounded on the quantity of quickening power in a cord or stable manure, that every cord of swamp-muck requires eight bushels of common ashes, or thirty pounds of common potash, or twenty pounds of white or soda ash, to convert it into manure equal, cord for cord, to that from your stable. Dig up your peat in the fall, let it lay over winter to fall to powder, calculate your quantity when fresh dug, and allow nothing for shrinking in the spring; when your alkali is to be well mixed in with the mould, and, after shovelling over for a few weeks, use it as you would stable manure.

These quantities of ashes and alkali are the lowest which may be advised. Three four times this amount may be used with advantage, but both the quantity of alkali, and the number of loads per acre, must and will be determined by each for himself. It is a question of ways and means, rather than of practice. But supposing the smallest quantity of ashes or of alkali to be used which we have advised, then at least five cords of the compost should be used per acre. This may be applied to any soil, light or heavy. But there is another form of this same swamp-muck and alkali, which should be used only on light, loamy, sandy soils, to produce its greatest benefit, though even on heavy soils, if not very wet, it may be used with great advantage. This is a compost of one cord of spent ashes to three cords of swamp-muck. This is decidedly the best mixture which has yet been tried. We have in this all that mixture of various salts and mould which plants want, and both by the action of the mould and by that of the air, the alkali of the spent ashes, which no leaching would extract, is soon let loose, and produces all the effects of so much clear potash or soda.

I have thus, reader, given you a few of the ways by which you may convert your peat bogs and swamps into manure, when you have neither cattle nor hogs. I have not thought it worth while to go into this subject further, and give you directions for lime and salt, or other matters which might be used. I have given you the most common, and those well known and at hand. All you want, then, to apply these principles of forming composts, is to give them that little attention which will enable you to understand them. And the rest must be left to your practical common sense, without some share of which, farming, like every thing else, would be vanity and vexation of spirit.

I would here take my leave of you, and in the hope that we may again meet to have another talk. There are a great many other points relating to manure, which can be understood only after we have made ourselves somewhat acquainted with the chemistry of soil. Then, having explained that, before the full action of manure can be understood, we must proceed a step further, and consider what changes take place in growing crops, and the effects of these growing crops upon soil and manure. The quantity and kind of salts they extract, and how soil is exhausted. This would lead to the consideration of the quantity and kind of manure to be applied to different soils, and the value of different manures. But there is one other very important thing belonging to our subject. Crops exhaust land but fatten animals. Now this last properly belongs to that part of our subject relating to the changes occurring in vegetables and their power of exhausting the soil. It will be seen, therefore, that the whole covers the ground called Agricultural Chemistry. This essay is only its first part. If it meets your acceptance, I trust it may encourage its author to draw up its second part on soils, and its third part on the effect of crops on soil, and their value as food for animals.

ON FERTILIZERS.

By Cuthbert W. Johnson, Esq., F.R.S., Editor of the "Farmer's Almanac and Calendar," the "Farmer's Encyclopædia," &c.

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Our object in calling the attention of our readers to this admirable volume, will be at once perceived by all who are interested in the cultivation of land, particularly by those who are aware that a manual such as this before us, which treats of each *fertilizer* separately, and in a truly comprehensive manner, was much wanted in the present day. We do not wish to depreciate any of the works on chemistry, as applied to agriculture, or as applied to the manures for the earth; many are deserving the highest praise for industrial research, and their developement of new powers for the improvement of vegetation; but many—very many—were too complicated, and required a knowledge of chemistry to be as requisite to understand them as it requires a knowledge of good farming to produce rent-paying crops.

The application of science to the useful arts, in the great departments of chemistry, has been as close and untiring as its results have been extraordinary; but its terms have been a sealed book to the farmer for any useful purpose, unless he received the education of, or studied chemistry, and in the following passage which we quote from the first chapter (the "History of Manures,") our view will be borne out, as to those mysteries of chemistry which every one conceives he has discovered, but which, as yet, no person has been able satisfactorily to explain.

"These difficulties with regard to vegetable chemistry and the phenomena with which it abounds, are, in fact, not few in number: they meet us in every investigation, from the period when a seed first begins to germinate, through its growth, its ripening, its decay; and, finally, when the putrefactive fermentation, by reducing the whole mass of vegetable matter to its constituent earths and gases, puts an end to every trace of vegetable substance, we are still obliged often to content ourselves with examining and noting the phenomena we cannot chemically explain. These mysteries were observed at the very dawn of modern chemistry: that the same mass of earth, the same water, the same atmosphere, could, at the same time, produce the flour of the wheat, the opium of the poppy, the oxalic acid of the sorrel, the vegetable poisons of the hemlock and the nightshade, the sugar of the beet root, and the timber of the forest, none of which are contained in either the soil, the water, or the atmosphere, were matters of serious and undivided attention; and although the ablest chemical philosophers have investigated these vegetable mysteries, the harvest they have