

## SCIENTIFIC.

## REPLY TO MR. SOTHAM'S INQUIRIES.

Mr. Editor:—In compliance with your request to assist you in answering some of the inquiries of your thoroughly practical correspondent Mr. Sotham, I will now proceed to make a few remarks on some of the questions proposed, premising that I only intend answering those to which a satisfactory reply can be given without having recourse to any of those hypothetical assumptions to which Mr. Sotham so strongly and so properly objects.

I will not make any remarks on Mr. Sotham's tirade against science and its cultivators; firstly, because I happen to be one myself; and, secondly, because there is a great deal of truth in Mr. Sotham's assertions, although perhaps they are carried a little too far. If we find that certain chemists or philosophers have been led away by some of their own theories, and have thus promulgated errors which become palpable when put to the test of practice, we must not thence conclude that science is useless as applied to Agriculture, any more than when employed in those numerous arts and manufactures which of late years have been thereby so materially improved. The very fact of such questions being proposed by so excellent an Agriculturist as Mr. Sotham, is sufficient proof of the value of a little science.

Earn yard manure is one of the best if not the very best of all manures for general use, inasmuch as it restores to the soil exactly those substances which have been taken from it—at least to a very great extent. The straw, hay and other vegetable matters which abound in it, will of course restore to the fields exactly those bodies which were removed from them during the growth of the crops, while the excrements of the horses and cattle contain that portion of the same substances which escaped assimilation during their passage through the intestines. A considerable quantity of those bodies called by chemists nitrogenized compounds, is to be found both in the litter and the excrements; and these compounds, soon undergoing fermentation or decomposition, give off among other substances a pungent gas called ammonia: this evaporates into the atmosphere, and, although there are other bodies which also escape, this one is by far the most important, and the one which the practical farmer should most zealously endeavor to retain. This substance, and more especially its combinations, are frequent in guano, night soil, hen manure, &c., &c.; and, as Mr. Sotham justly observes, they must be weakened by admixture of other substances, such as plaster, moulds, &c.;—lime [burnt lime], however, must be carefully avoided, as it possesses the power of

destroying the compounds of ammonia by driving this latter substance out of the mixture in which it may have been contained.

Ammonia [which of itself has a pungent but not disagreeable smell, but is powerfully so when mixed or combined with certain other matters] must be considered as a powerful fertilizer, and it is pretty generally allowed at the present time that many manures owe their chief value to the presence of this substance. It should therefore be retained in the manure heaps by all possible means, among which may be mentioned the use of plaster, clay, charcoal or dilute acids. Fresh urine contains very little ammonia, but a large quantity of certain substances which yield it by their decomposition. These substances, if directly applied to plants, will act as poisons, whether from properties inherent in them, or from their being used in too great quantities; but if the urine be mixed with the soil at a distance, it rapidly undergoes decomposition, ammonia or its salts are formed, they are dissolved by the water contained in the soil, and can now be taken up by the roots of plants not only with impunity, but also with essential benefit.

In answer to the question contained in the last paragraph, I would reply that ammonia is absorbed by charcoal, clay and other mineral substances, in large quantities. The ammonia evolved from decomposing animal or vegetable substances, is generally combined with carbonic acid, forming what is called carbonate of ammonia, and this compound would also be absorbed and partially retained by the above mentioned bodies as well as by gypsum. Their fertilizing powers will thus be increased, for not only will they afford to the plants those substances which they previously contained, such as lime, sulphuric acid, &c., &c., but also the ammonia or its salts which, as already mentioned, are so essential to the vigorous growth of almost all vegetables. Charcoal possesses the property of absorbing an enormous amount of this gas, and it is very probable that the beneficial effect of charcoal in promoting and assisting vegetation is owing to this circumstance, joined perhaps to its great porosity.

Ammonia does not cause the decomposition of green crops when ploughed in, but it is a result of their decomposition, although not formed in such large quantities as from excrements or putrifying urine.

I am scarcely vain enough, Mr. Editor, to hope that the above answers which have been written very hurriedly, will be perfectly satisfactory to your correspondent; but, if not, I may perhaps have an opportunity of explaining myself more fully at some future time.

Yours, &c., H. CROFT.

University, Toronto, April, 1852.