

successfully to disprove the leading points of the doctrine; nor to show either by experiment, or prove by argument founded on them, that the mineral constituents are not of prime necessity in soils, that when deficient or absent they must not be supplied; nor does the boldest assume to know a priori which are deficient, save by the use of manures of known composition, by watching their effects and noting the results—thus offering costly, uncertain and slow experiments to the cheap, certain and speedily ascertained results of analysis.

The experiments made by Mr. Lawes, a gentleman of ability and great industry, prove entirely too much. If they prove any thing, they prove that ground bones, those which are dissolved, and various phosphates, including those of lime, magnesia, potash and soda, are entirely useless, and finally that the ashes of 14 tons of farm-yard manure are worse than useless, and that too “on land exhausted for the purpose.”

Below I give his experiments:

	Bushels of Wheat per acre.
Unmanured,	16 $\frac{3}{4}$
700 superphosphate, (bones dissolved).....	16 $\frac{3}{4}$
8 lots of various phosphates, average.....	16 $\frac{5}{8}$
Ash of 14 tons of farm-yard dung,.....	16
14 tons of farm-yard dung,.....	22

These prove, if any thing, that the ashes of farm-yard dung are worse than useless—that is, that alkaline and earthy phosphates, magnesia, potash, soda and lime, are worse than useless on an exhausted land. Thousands in England have proven to the contrary by using those very substances and in some instances by their doubling their crops, in those instances where there were no mechanical obstacles and where the substances applied were either absent or deficient.

Mr. Lawes, to make his experiments subject of proof, should have had his soil analyzed, and if then with a deficiency of phosphates, the dissolved bones had done no good, there might be some grounds for supposing that mineral constituents were of no avail; certainly there would have been, if all the other substances were present in the proportion found in good wheat soils. If this were the case, then the mechanical texture of the soil was at fault, and could not supply the requisite quantity of organic matter. Experiments of this kind, in which every possible agency to produce a crop is not taken into consideration, are worse than useless. An experiment in some particular locations might show that Peruvian guano is not so valuable for a first crop even as a hundred bushels of lime. But if general conclusions from this were drawn and acted on, how often would it happen in other places that no benefit would be found from lime, whilst guano would, if used, have produced an abundant crop.