

position of the land in reference to salt water, as the vapor from it contains an appreciable amount of chlorine, which, by winds and storms, are carried to the neighboring land.

These comprise all of the necessary constituents of plants, all the necessary constituents of soils. The particular combination of each which will give the greatest yield, has not yet been determined. This can only be done by many careful analyses of fertile soils, in order to see what quantities are present in them, and, by the analysis of soils, which are unproductive, and then to determine, by the application of the necessary manure, the smallest quantity which will produce the greatest benefit. The *experiments* hitherto made determine nothing but the mere fact, that some particular manure has acted well on some particular soil. As long as we remain in ignorance of the composition of the soil, so long we can learn almost nothing. I deeply regret too, that men, from whose reputation and knowledge better things might have been expected, have sanctioned the empirical course of endeavoring to obtain a knowledge of the best manure by its *mere* application to a soil, without any reference to the composition of the soil experimented upon.

The experiments made with so much care, and reported with such commendable exactness in the journal of the Royal Agricultural Society of England, are incomplete, and those recommended by Professor Johnston, as well as those reported by him, are valueless, except to the particular individuals who made them. All others would have to go over the same or other experiments, before they could tell whether the manures used successfully would be equally efficacious in their hands, for if they failed, being ignorant of the causes of failure, no plan would be suggested to ensure success on a second trial. There would be a constant groping in the dark, because the light afforded by an analysis of the soil was neither furnished nor recommended.

It may to some seem presumptuous, that I thus condemn the course followed by men of high reputation and acknowledged ability; but neither of these is a safeguard from error, and neither "the shadow of a great name," nor any authority, however imposing, should be blindly followed. The science of agriculture like all other sciences, has fixed laws; many of these laws are hidden at present from our view, and the veil which covers them will never be lifted, unless they be studied in a rational and philosophical manner. Each known fact in agriculture, to be useful, must have revealed with it *all* of the causes which led to its production. A successful or unsuccessful application of manure is a fact of no value, unless the composition of the soil upon which it was used be determined. Then all of the causes influencing its action will be manifest, and each experiment made will lead us onward to a perfect system; every trial of a manure will teach us how it should be used, and when rejected with profit.

In obedience to the law, I commenced the discharge of my duties in the first gubernatorial district, comprising eight counties,