knowledge,) in determining the kind of soil, *as to texture* best adapted to the various crops cultivated in our climate.

They say, "this particular soil is too light for wheat, another is too stiff for corn; this soil is well adapted to the growth of grass, another proper for tobacco;" but they cannot, without previous trial, discover whether the requisite quantity of nourishing substances, such as bone-earth, plaster, salt or potash, is present. Here the man of practice must invoke the aid of science, and of that science which determines the *quantity* and *quality* of the objects subjected to its investigation.

This science he either must apply himself, or have it applied for him by those whose study and pursuit have been such as to make them familiar with its laws and its practical operations. He must either determine the existence of the various substances by long protracted experience on his soil by the effect of manures containing them, (and for this he must trust the interpretations of chemical science,) or at once reach the object of his wishes by the same means—that is, by seeking from the teachings of Chemistry, the existence or non-existence of the *necessary* constituents of the soil.

The comparative advantages of the two systems I have before mentioned, and will not now repeat them.

The application of the principles of science to various industrial pursuits has been practiced, where the advantage derived from it is far less than that which agriculture acknowledges. If then to partial objects this application be beneficial, why not to those which are so general, so widely practiced, and of such vast importance as the cultivation of the soil, the employment of manures, and the application of the labors of millions of our citizens?

In all of our operations of an industrial kind, whether manufacturing or agricultural, we but act on and carry out the laws of nature; we are but the mere workers of its will, the executors of its commands; of ourselves we can do nothing. We may excite emulation, stimulate enterprise, and arouse a spirit of progress—but unless this spirit is directed by proper knowledge, this progress confined in proper channels, and this emulation directed by proper teachings, our enthusiasm will be expended in vain, and our labor end in disappointed hopes and unrealized expectations. Science and practice must regulate each other, practice must teach and confirm science. Science must advise, and by its investigations aid practice. In union there is strength; this is no more true as to our political system, than as to any of the industrial pursuits followed by our citizens.