not solely to rely upon this source, but to take care, besides, of keeping the soil itself well supplied with it, by means of artificial applications of such manures as are capable of producing it,—it is for reasons which are founded upon the same principles that have been discussed already in their relation to the supply of carbonic acid.

An experiment on the production of plants under given conditions for the solution of certain questions, is altogether different from the practice of producing crops, and the conditions under which it can be most satisfactorily effected. In the one case, we investigate to what extent plants can be forced to live on a partial supply of the necessary elements, and judge from the more or less perfect development of all their parts, whether we have to decide in favor of the one or the other doctrine; in the other case, we are anxious to offer to the plant an abundance of its elements, by opening the most various resources for its supply, and estimate the result, not from the fact that the produced plant shows a root, a chaff, and bears seeds in a normal way, but by the quantity of grain and straw which the acre has actually yielded, and thus reduce it to a mere question of dollars and cents. This difference in object and success of two practical pursuits of similar character, is the more necessary to be observed and fairly to be distinguished as their identification has principally originated the apparent but erroneous contradictions that have been supposed to exist between the results of practical experience and the laws of scientific agriculture. A soil which contains all the requisite nutriments for plants but ammonia, or such matters as are capable of producing ammonia, is, as to its productiveness, equal to a soil which contains all the nutriments without exception, but its mineral constituents in a state of combination which makes them unfit for ready action. Plants growing upon the one are solely referred to the supply of ammonia from the atmosphere, and the progress of their development must therefore be in a strict ratio to the quantity of ammonia thus furnished to them; whilst the growth of the plants upon the other soil, rich in ammoniacal compounds, must necessarily depend on the advancement of the degradation of its mineral constituents, and is consequently in proportion to the quantity of soluble salts, which become liberated by this process. Now, if direct experiments have shown that the plants on both soils will once reach maturity and become normally formed, it certainly proves that there is enough of ammonia in the atmosphere to support vegetable life, and that beyond doubt, the ammonia of the atmosphere takes a specific part in the nutrition of plants generally. But there is, at the same time, no reason to suppose that this result of observation, because true in itself, should dictate the rules for practical operations unless scientific agriculture be con-