

life, except where man has occupied and impoverished them by improvident cultivation.

The most exhausting systems of agriculture were practiced in this State, from its earliest settlement, for more than two hundred years. The soils in many of the counties were supposed to be exhausted almost past recovery, and in former years many of our farmers and planters bid adieu to their homesteads, and sought the virgin soils of the South and West.

Improved systems, however, came into use, at first slowly, but soon rapidly prevailed, so that at this time, in some of the counties, the crops are supposed to have doubled in amount with twenty or twenty-five years, and the value of the lands has increased in a still greater ratio.

Before leaving this branch of the subject I shall call attention to the instructive experiments of Prince Salm Horstmar in reference to the inorganic matters of plants.

He planted oats in artificial soils, in each of which one essential inorganic constituent was omitted.

The results were as follows:

Without silica the plant vegetated, but remained small, pale in color, and so weak as to be incapable of supporting itself.

Without lime it produced its second leaf and died.

Without potash and soda it grew to the height of only three inches.

Without magnesia it was also incapable of supporting itself.

Without phosphoric acid it was weak but upright.

Without sulphuric acid it was normal in form, but weak and produced no seed.

In each case the plant doubtless died as soon as it exhausted the mineral matters from the seed, not contained in the artificial soil.

These among other experiments prove that plants will not thrive if any of their essential constituents be absent from the soil.

We are now prepared to ask why it is that lands once highly productive gradually become less so under cultivation, until in many instances the yield of crop did not pay the cost of raising it?

Were they entirely deprived of their elements of fertility, or only in part? If a part only, it is necessary to know which are absent or deficient.

In pointing to the origin and chemical composition of soils in a previous chapter, it was shown that besides alumina (not a constituent of plants) soils contain silica as sand, and chemical combinations of this substance with potash, lime, soda, magnesia and oxide of iron called silicates.