

SCIENCE APPLIED TO AGRICULTURE.

Chemistry has been styled "the secret process of the matter—that from which the forms of things originate." It is a science as universal in its operations as the combination of different simples in forming compound substances. Hence, the air we breathe, the earth we walk upon, the rain that cometh down from heaven and watereth the earth, the food we eat and the raiment we put on; in short, every thing, not only those which render our existence comfortable, but those which form its enjoyment, are the result of its operations and subject to its laws. Even ourselves, "fearfully and wonderfully made," a curious compound of undefinable, enduring mind, and perishable incongruous matter, come within its sphere, and possess enough of its "subtle agencies" to invite the research of the most persevering to an occupation for life. In fact, we live in a grand laboratory, where chemical action is continually going on, not a single set of them, but in a stupendous whole, and where it will continue to go forward, until the mass of matter on which it operates shall, by a grand explosion, be thrown back to chaos. Mind truly may escape the catastrophe of ruin, and the clayey crucible in which it experienced its remodeling and assimilations;—but in all things else the amalgamation must be completed.

Can it for a moment be imagined that a science of so general operations and such visible effects, can be so unimportant to a farmer? Take his soils; they are the result of a chemical combination of earths, say the disintegrated parts of rocks and vegetable matter in a decayed or decaying condition. Now all rocks, as the sciences which claim more particular kindred with them will determine, are not composed of the same material, consequently the earths which collect around them must differ in proportion as the sources from which they originate; and the early productions of vegetation are such as the peculiar nature of the earth most naturally excites, and these again are possessed of different constituents in their decay, both of plants and leaves, and when the parent stock has fulfilled its maturing process from soils of varieties differing from those which are the effects of different circumstances. Thus a soil on which the hemlock sheds its deep foliage, differs from that which sends the towering pine majestically high; that of the maple differs from the ash; the oak from the elm, and so on.

Soils in high regions have usually less depth and contain a proportionably greater amount of earthy matter than those of a lower territory, from the fact that vegetable matter is easily brought down by the thaws of spring and rains of autumn, and deposited in places which nature seems to have provided for its reception. These soils are usually of the most fertile character, yet they must in some degree, vary in proportion with the mountains and forests whence they originated. Thus we see the valley of one river more fertile than that of another—a circumstance which chemistry can obviate, by determining what the *lacking* quality is, and how it may be provided, or introducing plants adapted to that peculiar soil. The analysis of soils, sufficient to determine their productive qualities, is a very simple process, and soon passed through. In order to perform it, the farmer need not be at expense for an extensive apparatus, nor restrict his operations to drams and pennyweights. His business is of a *wholesale* nature: his observation can mark the changes of soil, and by analysing a small portion of a particular one, the character of the *whole* is sufficiently determined for general purposes.

Soils which, in a state of nature, are sometimes of a character that renders them worthless, by a chemical process are rendered fertile. Take our swamps, which are found to be in almost every town, some of which have bottoms as deep as western prairies, and as "rich as mud," yet in a state of nature they are almost as worthless as the desert of Sahara for Agricultural purposes. How are they to be made the most profitable of the farmers' domains? They must be cleared and drained, to be sure; but when all this is done, there is yet one thing lacking, for they are as barren as an ash heap. What is "the one thing needful?" We respond, not only to show that *Chemistry* has a remedy, but also to assure those who pretend that our State surveys are useless operations, by giving an anecdote.

Somewhere in Massachusetts, (we could tell where,) an old gentleman, who had tilled the earth carefully and labouriously, until his "three-score years and ten," had nearly vanished, pointed the Commissioner of the geological survey to a piece of very deep rich muck land, and complained bitterly that with all his industry, he could make it produce nothing but weeds. With his usual tact, the Commissioner assured him the only reason why his labors were not requited was, that his land was *too rich*. "Too rich!" said the veteran farmer, "it can't be; we wish to make our land as rich as possible, and labor incessantly to promote this object." Had he been acquainted with the beautiful operations of agriculture, he might perhaps have saved himself much labor, and a rich harvest from his land through many years. More, by the same labors, he might have increased the value of his surrounding fields, by bartering from them their sterility, and repaying load for load from the rich deposit from his muck-bed. This was all that was necessary to scatter fertility all around him—simply to carry off this rich vegetable matter which had been accumulating for ages, and replacing in its stead his sands or loam, or whatever that savored of barrenness.

Lands from mismanagement may acquire a diseased and sickly, as well as an exhausted state.—They may become too sour, too bitter, or some other of the evils which bad management induces, may attack them. Then are they like a diseased stomach, totally out of order. Usual applications will have no effect. They, like the sick man, must be dealt with according to the disease. And here we ask leave to introduce another anecdote, in support of our sentiment, that chemistry is an important science to the Farmer. One of that ancient and honorable fraternity was one day heard to complain, by a son then in College, that such a piece of land produced but "leete." "Lime it," said the son. "Lime it!" said the old man;—"you, when you have not done a day's work on the farm in three years, came from the College, and to repay your father's toil in your behalf, undertake to teach him how to farm it." "Lime it," said the son—"the soil is too sour; and alkali will neutralize an acid, and your field will be productive." The father at length tried the experiment, and saw a good effect, and so thoroughly was he convinced of the utility of this science in agriculture, that he said his sons might all go to College to be farmers, if they all give assurance of similar acquisitions.

Chemistry in agriculture, applies itself in a thousand ways, and produces a thousand good effects. Nature is a great workshop, where she is continually carrying forward her operations. Economy is a universal law in all her dominions. She forms nothing in vain, and where the purposes of its formation are answered, and it moulders back to de-