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## The Farm—A Chemical Manufactory.

The proposition that a farm is a chemical manufactory may appear somewhat startling to some of our readers, yet it is nevertheless true. In proportion as this truth is understood by practical men, will the pursuit of agriculture be advanced, and a higher and more rational interference in conducting rural affairs. From the earth the farmer raises the living plant, on which subsists the living and moving animal. We comprehend the parts taken by the soil and respectively in the growth of plants, constitute the only reliable foundation on which to build a true and enduring system of agriculture. The atmosphere which everywhere surrounds us not only contains the food of plants, but it is the key to the rich storage of nourishment which exists in the soil. As a late writer has remarked:—

The mineral part of the plant—its ashes if burned—are as necessary to its growth as carbon and the water are which it obtains from the air; but this mineral part is locked up in the soil; and unless access be given to the soil where it will remain inaccessible and useless. It is on this fact that the fertilizing influence of manure depends. Growth, like combustion, is a chemical process depending to a great extent on spheric action. Poke the fire and you promote the activity of that chemical action which is called combustion; stir the ground and you promote the activity of the chemical action which is called vegetable growth. If a bit of solid platinum be held in a jet of hydrogen gas it will be unaffected; if a bit of the same metal in a spongy form, in which an immense increase

is given to the surface of the metal, be held in the same jet, it soon becomes red hot. There is the same kind of difference between a clod of clay and a handful of well-tilled loam as there is between the solid and the spongy platinum; and the great part of the explanation of the fertility conferred by tillage is of the same kind as that which explains the differing relations of the gas to the solid and to the spongy platinum. These relations do indeed differ only in degree. The attractive power of the metallic or of the earthen surface is in proportion to the quantity of that surface. Multiply it by making that spongy, open, porous, which had been solid and impervious, and all the effects due to these attractive powers will be similarly multiplied.

It is this attracting surface in the midst of a soil that enables it to retain its moisture, and to hold, as in a strong box, various manuring substances, as well as the products of their mutual decomposition within it; and which also pulls together into close enough contact the various ingredients of air and soil whose constant chemical action on each other is necessary to fertility. In a well tilled soil every particle is thus wrapped round by food for plants, or by that which is extracting this food from it; so that, while the subdivision of these particles within a given bulk of soil is increasing the quantity of surface yielding food for plants, it is equally efficient in increasing the power of the soil to hold free from waste. It is obvious that this latter power is essential to the economy and the profit of cultivation.

The quantitative character of growth is indeed a truth which ought to be impressed upon the mind. Growth is a real building up of the actual atoms supplied to plant or animals as food. As Mr. Morton has said in one of his Essays in the Journal of the Royal Agricultural Society:—

“Agriculture is an art which by its plants and animals enables us to gather up and assort those