in combination with that matter for which they have a natural affinity.

To speak of the constituent parts of plants in a more methodical phraseology, it may be said that nine-tenths of the vegetable structure is composed of Carbon, Oxygen, Hydrogen, and Nitrogen, and these four elementary substances afford food for plants in the compounded forms of carbonic-acid, water and ammonia. Eighty to ninety per cent of the constituent parts of all vegetables is carbon and oxygen. Iron and silica (flint) are also absorbed and carried into the vegetable structure. Phosphorus and sulphur are also required to the full development of vegetable life, as are potash, soda, magnesia, &c. But though their presence is perhaps as indispensible as the more predominating constituents, their proportions are comparatively insignificant. It is hardly necessary to observe that all matter absorbed into the system of plants from the soil, must be in a state of solution. Lime is found to be a constituent in all those plants with which the farmer has to do. Clover and the cultivated grasses containing a very large proportion.

Now, as by her undeviating laws, nature performs no work of supererogation, it is but reasonable to infer, that all we find by research or analysis is requisite to the organic structure of the plant, without which its perfection would be retarded, the functions of its organs imperfectly performed, and a stunted and feeble development the result.

Having thus very briefly and imperfectly noticed the primary agents of germination, and the mode and sources of vegetable life, it may be well perhaps to consider, how by deduction, an enquiry of this nature may become of practical utility to the farmer. In order to aid us in this important consideration, most invaluable assistance will be found in the analyses and deductions of Grisenthwaite, Leibig, Madden, Johnston and others.

If careful analyses, repeated by skilful manipulations with similar results be worthy of credence, the constituent parts of plants, the elements of which their structure is built have in very many cases been pretty accurately ascertained. From these results the farmer learns that the grain of wheat contains 1-50 part, or about 2 lbs. in every 100 of its weight of mineral ingredients, as flint, lime, &c., which being in solution in the soil are taken up by the roots; that wheat straw has the same components in the proportion of eight or nine to the 100, and the records of analytical enquiry shew, that a good crop of wheat, say thirty to thirty-five bushels to the acre, will remove from the soil on which it grew, from 150 to 180 lbs. weight of flint alone. The smooth, shining and transparent appearance of the covering of the stem need be no subject of wonder when it is found the materials of which it is composed are exactly identical with these from which glass is manufactured. Wheat is essentially a flint crop—old-fashioned English farmers are accustomed to say they prefer to have "a few stones on the wheat ground;" ask them their reason and they tell you that from experience "they know wheat does best when there is some stones upon the land," and this simple answer affords a marked illustration of the utter ignorance in which one of the most important and universal operations of life—the manufacture of the great staple food of man has been and still is carried on—the actual stones form no part of the advantage derived, save that which is obtained from their imperceptible crumbling affected by the action of air, by the endless continuation of which process silica is rendered into impalpable powder capable of solution, and eventual absorption by the plant. So, in truth may it be said, that stones are useful to the wheat crop; but the wherefore, it is to be feared has scarcely been enquired about with that diligence, that so important a matter would in any other trade than that of the Agriculturist have long since commanded.

The stem or stalk of wheat is that portion of this plant which is most nearly allied to woody fibre, whose principle constituent is carbon and the aqueous fluids; it may not be irrelevant to notice in common with this assimilation of Carbon to woody fibre, that the familiar production of sweet sap from which such quantities of maple sugar is annually made, is formed, or generated somewhat in this wise: in the fall of the year starch is formed in the woody fibre of the tree, and remains unchanged during the dormant state of winter, but as soon as the aqueous fluids begin to ascend in Spring, they carry with them to the starch the diastath elements of its decomposition or rather its conversion, and the starch becomes sugar; to make this more clear, and to mark the beautiful simplicity with which Nature effects her operations, it should be borne in mind that the elements of sugar and Starch are identical, the simple difference being the arrangement of their proportions; that is to say—any given