The science of agriculture in Europe has advanced but a few steps compared to what it must attain; here it has done much less. It has been supposed that the soil of Britain could be made to produce nearly double the quantity of produce now obtained from it. If this be anything near the truth, in speaking of perhaps the highest cultivated land in the world, how much more correctly might it be said of the soil of Canada, reclaimed for the most part from a state of wilderness, within the last quarter of a century.

That the progress of scientific agriculture in Canada should be much advanced by the writer of these pages, he has no right to expect; but the effect will be good, and his labour amply repaid, if he does but aid in stimulating inquiry,—the materials for forming a good agricultural education are by no means scarce; it is the desire to obtain and profit by the information that appears to be lacking.

It is proposed to consider the subject under the following general heads. 1. The nature of soils. —2. The manner of treating them, rotation of crops, &c. 3. The nature and use of manures; and lastly, of grain crops, and their diseases.

The first knowledge necessary for the guidance of the agriculturist, is that by means of which he may discover the nature and capabilities of the soil upon which he intends to employ his capital or labour, and from which he hopes to derive his support—this he must understand before he can gain a proper idea of the method of making his property available.

Our first consideration will then be, of the *nature of soils.*

The soils consist of those substances which having been washed from the higher rocky parts of the earth, and modified and increased by the action of spontaneous vegetation and its decay, rest at various depths upon the substrata.

The various descriptions, or parts of soils, are, first, clay, which in its pure state, is a compact substance, retentive of water, and more impervious to the air than any other kind of soil, consequently the most difficult to bring into cultivation. Secondly, sand* or gravel, which is of an opposite character to clay, being loose and incohesive, and consequently allowing moisture to pass through without producing much fertilizing effect; by itself, it is from this and other causes, comparatively barren, as clay is unproductive from opposite reasons; mingled together, they form what is commonly called loam, (a term that may comprise nearly every cultivable soil,) their union bringing into action the virtues, while it corrects the defects of each. The third element of the soil is lime, or calcareous earth. This substance as it exists originally in the soil, acts an useful part in assisting to blend the two just mentioned; according to the chemists it is also of service in fixing the carbonic acid which is generated by the decomposition of vegetable matter in the soil, or which floats in the air; this valuable gas passes with the moisture into the roots, and becomes an important agent in the nourishment of plants. Lime, after having been exposed to the action of the fire, more easily absorbs moisture, and, as is well known, is of great value as a manure; being a powerful decomposer of animal and vegetable matter, and thus rendering them fit to promote vegetation. These three substances then, clay, sand and lime, together with magnesia, which exists in smaller quantities than the others, form the ingredients of all soils; and the fertilities of the soils, as well as their capability of producing various kinds of plants, depend upon and are influenced by the relative proportions of such ingredients. By means of chemical analysis, the exact state of the soil, that is to say, the proportionate amount of its component parts, may be ascertained. To those who may be inclined, and have it in their power to avail themselves of this highly useful means of forming a correct judgment as to the nature and best manner of treating their land, the numerous works on agricultural chemistry will be an efficient guide; the experimentalist, however, must bear in mind that in order to obtain anything like a correct idea of a field, (to say nothing of a farm) he must take specimens of soil from many different places, and form his conclusion from the various results. Unless he does so his experiments cannot be depended upon, especially when the land has not been in cultivation during a number of years, in consequence of the various portions of the soil not having become sufficiently amalgamated. When, however, as in England, and in the more early settled parts of this province, fields have become equalized as it were, and capable of complete tillage, chemical analy-

* These kinds of soil are distinguished by the terms siliceous (from the Latin, silex, a flint,) sandy or gravelly; and argillaceous or clayey, from the Latin, argilla, white clay.)