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too, being present in the rain, dissolves matters which the pure water would have left untouched. Thus, in process of time, holes are formed in the rock, and these become larger and larger, exposing fresh surfaces to be acted upon by renewed supplies of rain.

And now the most mighty agent of the three sets to work. Frost, God's plough, as it has been aptly termed, finds a hole in the rock filled with water; as this water expands by cold it increases in size, and the particles of wet rock are pushed apart to make room for the water which is freezing. When the thaw succeeds, the rigid bands relax, and parts, sometimes large sometimes small, of the rock fall off, and, the same agency continuing, are gradually broken up and pulverised. Thus water, with its associated gases, and frost, abrade our hardest rocks; the lowest forms of vegetation, finding food prepared for them, seize upon the opportunity, and their rootlets, penetrating the newly formed soil, immediately proceed to perform their duty of offering this food to the digestive powers of the plant. Dying, when its course has been run, the original plant is succeeded by others, which in their turn die, and thus, by a species of green manuring, decayed vegetable matter is added to the soil; which by degrees becomes fitted to supply the wants of the higher forms of vegetation.

But, though rocks are almost invariably, the primary source of soils, we must not imagine that they have been allowed to remain where they were first formed. Were that the case, there would be little difference between the soil and the underlying rock, except that the condition of the former would be finer, or more broken. Many a wonderful change has taken place on the face of our globe: soils have been washed away from their parent rocks, and, mixed with the constituents of other rocks, have been deposited far from their original site in some distant valley. These are the alluvial soils, and fortunate is the man whose farm is situated on one of them.

Peat is about the only exception to our general rule. It is formed almost entirely of vegetable matter which has grown and decayed in the place where it is found. Peat often contains as much as 97 opo of vegetable matter, consisting of aquatic plants and mosces, and is generally found in hollow places where the water is dammed back. Growth succeeds and dies away, its abundance depending upon the supply of water; decaying matter accumulates, and at last the bed of peat begins to show its head above the water; then, tougher, woodier plants establish themselves on the top of the peat, giving that deceptive hard-looking surface to the bog which has led so many men to a sudden death. (1)

Mechanical division of soils.

The classification of soils is simple enough: sands, clays, and loams; with their subdivisions, as sandy loams, clay loams, and the peculiar ones, as chalk soils, which need not trouble us here, as we have none. I wish we had, for they are very jolly soils to farm; never too wet to plough, never so dry as to parch the crops, and they suit sheep to a nicety.

If any one should wish to make a mechanical analysis of his soil, he may proceed as follows: With a sieve separate the coarser part, stones &c., and dry the finer part carefully. Take, say, 200 grains of this and mix thoroughly with a halfpint of water, shaking well for a few minutes. Let the mixture repose for a minute, or so, to give the sand a chance to go to the bottom, and then pour off the muddy water into another vessel—pour quickly, and if you think some clay remains with the sand, wash again and proceed as before You have thus got the two substances in two vessels, and

(1) In 1841, I had to be dug out of a peat-bog, in South Wales, on which I had imprudently ventured when out trout-fishing.

when the super-natant water, which will soon clear itself, is poured off, you may dry and weigh both sand and clay.

The subjoined tables show in what proportion the two materials, sand and clay, are generally found in our soils : Name of Soil

	I orocurage or bana
Sand	80 to 100
Loam	40 to 60
Clay	40 to 20
Again, for the discrimination of loa	ms.
Name of Soil	Percentage of Sand
Sand	80 to 100
Sandy Loam	60 to 80
Loam	40 to 60
Clay Loam	20 to 40
Clay	20 to 20

I do not think that on this side of the Atlantio we have any real clays; at least, I have never seen any thing stiffer than a clay loam, which, in my opinion is the most valuable of all soils, as with proper dunging and cultivation it becomes tender and friable, very retentive of manure, and will grow anything you like to ask it, if, only, you ask in a proper manner. Our Oxford clay, in ploughing which I have seen four powerful horses "stuck," has no equal here.

You see, then, that what we have been in the habit of calling *light land* is heavier than we have thought it; clay being light takes longer to subside in the experiment we have been trying than the sand, which sinks immediately. Thus, when the course of a river is suddenly interrupted by any barrier, we find along its banks, at the highest part, gravel, lower down, sand, and lowest of all, clay, as you may see any day at Chambly tracing the Richelieu from the Bassin up to "Yule's Bridge."

Chemical Analysis of soils. This is a very different sort of thing, and I do not intend to trouble my readers much with it. My own opinion is that its study will, eventually, be of the greatest possible use to agriculture, but, at present, there is clearly something wanting which nobedy seems able to supply, viz. the difference of plant food in an active or passive state. For instance I do not believe any ohemist can tell, from an analysis of a particular soil, whether *potash* will, or will not, benefit that soil. However, numbers of the best men are working away at the various questions involved, and they will sooner or latter, arrive at a conclusion.

We all know that soils consist, of two parts : one part which can be burned, and the other that won't burn. The part that is burned does not go out of existence by any means, it is only sent off in its gaseous form; this is the organic matter, the remainder is the inorganic, and remains behind as ashes. Inorganic Matters in Soils.

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Silica.	Lime.	
Phosphorie Acid.	Ammonia.	
Carbonic Acid.	Potash.	
Sulphuric Acid.	Soda.	
Chlorine.	Magnesia.	
Alumina.	Oxide of Iron.	
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There are other inorganic matters found in the soil, but the above are sufficient for our present purpose.

Silica. or silicic acid, plays a very important part in the soil. It forms a great proportion of sandstone, and enters largely into the composition of granite and other crystallino rocks. With soda and other alkalies, or with an alkaline earth, it forms silicates. Clay is a silicate of alumina, and the fertility of clay soils depends very much upon the presence of a peculiar form of silicate of alumina which I will try to explain, though in the absence of the numbers of the journal of the Royal Agricultural Society in which Professor Way gave his discovery to the world, I fear I shall make a mess of it : To the best of my recollection it was this : There exists a