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## The Field.

### Plant Life.

ALL material substances may be divided into two great classes—those endowed with *life*, and those altogether destitute of this principle. This great distinction, life, we can study only in its effects, and are ignorant of its nature; we may discern its characteristics but cannot determine its essence, which ever remains a profound mystery, eluding all our thought and search. Among the leading peculiarities which distinguish those bodies that are, or have been once, endowed with life, we notice first, their *structure*. This is built up of an assemblage of subordinate parts, well defined and separate, but co-operating for some special end, and which we call organs. such as the roots, leaves and flowers of plants, and the limbs, the eye, ear, &c. of animals. Those larger members are themselves made up of more or less minute cells, tubes, and such like formations, which also physiologists call *organs*, and hence it is customary to designate the two great classes of which we have spoken, as *organic*, and *inorganic bodies*. The traces of this organization, often beautifully distinct, remain in those once living forms that after the principle of life was extinct, have been converted into rock, and enable the geologist to pronounce without hesitation upon their original vegetable or animal nature.

Another well marked distinction in living bodies is their *origin* from other living bodies similar to themselves—their *parentage*, in short—which has no analogy in the origin of mineral matter. The latter may be said to have been *formed;* whereas the former bodies were *produced*. Living bodies, again, pass through a process of *development*, altogether unknown in the other class of substances. They pass through successive stages from birth to maturity and death. Closely connected with this distinction is the mode of *growth*. Inorganic bodies may increase in size by the mere mechanical addition of matter externally; but living bodies grow, by the introduction and conversion into their own substance of new matter within them and throughout their own structure. This conversion of extraneous matter into their own living substance is technically called *assimilation*. And lastly, as the inevitable consequence of the foregoing changes, living bodies are limited in their *duration*, and become subject to decay and death: whereas inorganic formations, having within them no elements of waste or destruction may remain unaltered indefinitely, "and unless subjected to some foreign influence, a crystal or a rock would never change. The limestone and granite of our mountains remain just as they were formed in ancient geological epochs; while numberless generations of plants and animals have lived and perished on their surface."

Amongst living bodies themselves, all of which possess the foregoing distinctive properties in common, there is again an apparently well marked division into two other classes—*plants* and *animals*—In the fully developed and higher forms of these two kingdoms, the differences are so striking that the difficulty would seem to be not to point out these, but to discover the features of resemblance between the two. Yet in the lower forms of each division, the lines of demarcation become apparently slight and sometimes equivocal. For example, while naturalists generally rank *sponges* amongst animals, the eminent zoologist Agassiz classes them with vegetables: and other instances may be adduced where it seems extremely difficult to assign the proper place to some among the simpler forms of organic being. The chief peculiarities that distinguish plants from animals may thus be briefly stated. Plants are fixed, while animals have the power of motion—Yet even here we may observe apparent anomalies and exceptions; some animals become fixed very soon after they are produced, and so remain as long as they live. The common sea anemone is an example of this—On the other hand, some plants, chiefly aquatic species, are continually floating about. The motion of plants, however, is never governed, like the voluntary movements of animals, by the will; plants again are entirely destitute of sensibility, or the sense of feeling. The apparent exception furnished by the so-called sensitive plant, the leaves of which, on being touched, instantly fold together and droop, must be referred in part to a mechanical contrivance at the base of each leaf, and in part to a high degree of the excitability which belongs to all living beings, and by which they answer to appropriate stimulants—plants to light and heat—animals to the influence of the will and other impressions on their nervous system: A remarkable peculiarity has been observed in the *dodder*, a twining parasitic plant, which it is said will only twine round living stems, a peculiarity which though it would be extremely unphilosophical to ascribe to any peculiar sensibility or any power of voluntary motion, looks so like choice that it may be mentioned as a curious instance in plants of apparent sensitiveness not yet, we believe, satisfactorily explained. The *digestive* apparatus of plants and their *breathing* organs, both co-existing in the leaves, afford other well-marked points of contrast to the stomach and lungs of animals. The *motion* of the *sap* in plants is excited chiefly by impressions, and forces acting from without, the light and heat of the sun, and never by a propelling organ within, as the heart of animals. One other difference ought to be mentioned, because it enables us to see what plants are made for. It is this:—vegetables are nourished by the animal kingdom, that is, by the ground and the air, which supply all they need, and which they are adapted to live upon; while animals are entirely nourished (directly or indirectly) by vegetables. The great use of plants, therefore, is to take portions of earth and air, upon which animals cannot subsist at all, and to convert these into something upon which animals can subsist, that is, into food. All food is produced by plants. How this is done, it is the province of vegetable physiology to explain.

### Ho! for the Sugar Bush!

THE time is near when the exclamation above-written will resound through the land, and make the welkin ring in a thousand settlements. Maple sugar-making used to be looked upon as a kind of pastime, though in truth it involved no small amount of hard work. It was felt to be the harbinger of spring, the first job of the season, and its luscious results gave it pleasing associations. Now it is falling very much into disuse, partly from the wholesale destruction of our forests, partly from the unskilful manner in which sugar bushes have been managed, and partly, perhaps, because the clumsy appliances too often used make the work rather uninviting, for somehow people do not pitch into rough work so bravely now as they used to do in other days.

We have not taken up the pen to write a treatise on maple sugar-making. For full information on the subject, we refer our readers to our issue of March 1, 1864, (Vol. I, No. 4.) We can supply that or any other back number of THE CANADA FARMER at five cents each, or the volumes at $1 30 each. To any novice in the art of managing a sugar bush, the information contained in the number above referred to is well worth the postage of a letter, and the price of the number. Just now we have simply to drop two or three suggestions. The first is as to preserving the sugar bush. Let nobody who has one grudge it the space it occupies on the farm, or be tempted to convert it into cordwood. Woodman! spare those trees. Cut not a single one down. Next, we would drop a cautionary hint as to gashing and hacking the trees. A sugar bush will not last long on the old barbarous method of tapping. A gash four or six inches in length will soon girdle and kill a large tree. Nor is there the slightest need for this. An auger-hole from half to seven-eighths of an inch in size is as good an outlet for sap as a big, ugly gash. Plug up the auger-hole when the sap is done flowing, and it will soon be grown over, and the wound healed. A third suggestion is as to the use of labour-saving methods of sugar-making. It is well to substitute light pails of wood or tin, for the heavy troughs. Let the sugar-bush be underbrushed and cleaned up so that a horse or ox-team can get round it to gather the sap. Sheet-iron pans are cheaper, lighter, and better, than the clumsy, old-fashioned sugar-kettles for boiling the sap. These improvements not only save labour, but enable the maker to produce a much better quality of sugar.