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978-1-108-06745-4 - Conversations on Vegetable Physiology: Comprehending
the Elements of Botany, with their Application to Agriculture: Volume 1

Jane Haldimand Marcet

Excerpt

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CONVERSATIONS.

CONVERSATION I.

EMILY.

As I wander over these beautiful mountains, and observe the variety of flowers they produce, how much I regret my ignorance of botany!

MRS. B.

It is, certainly, a science particularly adapted to Switzerland; but why should you suffer your regret to be vain? To wish to learn is the first, and often the most difficult step towards the acquisition of knowledge.

EMILY.

I should certainly like to understand botany, but I have no wish to learn it: there is such a drudgery of classification to encounter, before one can attain any proficiency to recompense one's labours, that I confess I do not feel courage to make the attempt.

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CAROLINE.

And, after all, what is it one acquires? — A knowledge of the class in which a flower is to be placed, according to the number of its stamens or its pistils; and, perhaps, after hard study, one may go so far as to ascertain its Latin name, though you may still be ignorant how it is called in your own vulgar tongue. Botany appears to me a science of rules and names, not of ideas; and is, therefore, devoid of interest. I am, for my part, quite contented to gather a sweet-smelling nosegay of beautiful garden monsters, as botanists denominate them, without troubling myself about their scientific names.

MRS. B.

I will frankly own, that, for many years, I entertained the same prejudices against botany, if such you will allow me to call them; but having had the good fortune, during a spring I passed at Geneva, to hear a course of lectures on that science by Professor De Candolle, I was entirely converted; and I am fully persuaded that no natural science is dry, unless it be dryly treated. If people will attend more to the frame than to the picture which it contains, and if they will even cut and disfigure the picture, in order to make it fit into the frame they have prepared for it, no wonder that the subject should lose its interest.

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EMILY.

None can be more likely to succeed in converting others, than those who have been converted themselves; and if you would indulge us, my dear Mrs. B., with relating what you learnt at these lectures, I make no doubt that Caroline would be tempted to listen to you, were it but from curiosity to discover whether her first opinions on the subject were correct, or whether she ought not, at least, to acknowledge that they were hastily formed.

CAROLINE.

Oh, I shall be very thankful to be allowed to remain, provided I am at liberty to depart if I find I do not take an interest in the study.

MRS. B.

I shall not be ambitious of retaining uninterested listeners; and though I was delighted with the instruction I received myself, I am very sensible that I shall not be able to communicate to you either the same degree of pleasure or of information. I will, however, do my best to relate to you what I can recollect of these lectures.

Mr. De Candolle, so far from confining himself to the classification of plants, examines the vegetable kingdom in its most comprehensive and philosophic point of view. In describing the structure he investigates the habits and properties of plants, and shows, not only how wonderfully they have been formed to answer the purposes of their

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own multiplication and preservation, but how admirably they answer the higher purpose which Nature has assigned them, of ministering to the welfare of a superior order of beings — the animal creation; and more especially to that of man. He turns his attention particularly to point out the means by which the science of botany can promote that with which it is most intimately and importantly connected — agriculture. He prepares the soil and sows the seed for the husbandman; he extracts the healing juices and the salutary poisons for the physician; he prepares materials for the weaver, colours for the dyer; in a word, as he proceeds, there is scarcely an art on which he does not confer some benefit, either by pointing out a new truth, or warning against an ancient error. Thus, throughout his course, his principal aim is to promote, by his vast stock of knowledge, the welfare of his fellow-creatures.

EMILY.

Treated in this point of view, botany cannot, I think, fail to interest us.

MRS. B.

It is rather the physiology of botany which I propose teaching you, and I shall merely give you such an insight into classification as is necessary to enable you to understand the structure and character of plants.

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Mr. De Candolle entered upon the subject by observing, that, in classing the various productions of Nature, the first great line of demarcation is that which separates the mineral kingdom from organised beings. How would you make the distinction ?

CAROLINE.

Nothing more obvious : organised beings have life, and minerals have not.

MRS. B.

Very true ; yet I should be tempted to retort upon you that this distinction is rather of names than of ideas. I believe I have before observed to you, that we know not what life is. We see its effects : they are sufficiently apparent and numerous ; and it is only by studying these effects that we are able to form any idea of that state of being which we call life. The first distinction, therefore, to be made between minerals and beings endowed with life is, that the latter are formed with organs adapted to fulfil the several functions for which they were destined by Nature. These organs differ, not only in form and structure, but more or less in the materials of which they are composed : organised beings are generally of a smooth surface, rounded, and irregular ; whilst minerals are rough, angular, and in their crystalline state of geometrical regularity.

One of the principal functions these organs have to perform is nutrition. Unorganised matter may,

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in the course of nature, be enlarged or diminished, either by mechanical or chemical changes; minerals may be augmented by the addition of similar particles, or by chemical combination with substances which are dissimilar, but they have no power to convert them into their own nature.

Organised bodies, on the contrary, are increased in size, by receiving internally particles of matter of a nature different from their own, which they assimilate to their own substance.

EMILY.

That is to say, that the food by which they are nourished is converted into their own substance?

MRS. B.

Yes; organised beings have also the power of reproducing their species: — minerals may be broken into fragments, but they are alike incapable of receiving nourishment, of growing, or of reproducing.

Let us now proceed to enquire, what is the principal distinction between the two classes of organised beings, the animal and the vegetable creation.

CAROLINE.

Animals are endowed with a power of locomotion, whilst vegetables are attached to the soil.

MRS. B.

It would, perhaps, be more philosophical to begin

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by ascertaining the cause whence this difference arises. Animals are provided with a cavity called a stomach, in which they deposit a store of food, whence they are continually deriving nourishment. This organ is essential to animals, as they are not constantly supplied with food: they find it not always beneath their feet; they must wander in search of it; and were they not furnished with such a storehouse, in which to lay it up, they would be frequently in danger of perishing.

EMILY.

Are we, then, in want of continual nourishment?
And should we die if our stomachs were quite empty?

MRS. B.

No, not immediately; for though the system requires constant renovation, Nature is so careful of our preservation, that she not only affords us the means of subsistence, but provides resources in cases of accidental interruption of the supply: after having consumed, or rather, I should say, assimilated the food contained in the stomach, the fat of animals is made to contribute to the nourishment of their organs, and the support of life. In some, such as the dormouse and the polar bear, this provision is carried to such an extent, that they pass several of the winter months in a state of inanition; during which period, the only sustenance their system receives is from the abundant provision of fat which they had made during the

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summer ; and when they are roused from their lethargy by the return of spring, they are lean and ravenous.

The food of animals is conveyed from the stomach to the various parts of the body by the function which is called *digestion*. The food passes through small absorbent vessels into the blood, and is thence circulated throughout the system.

CAROLINE.

But, Mrs. B., one would think you were going to give us the history of the animal rather than the vegetable creation.

MRS. B.

Only so far as to enable me to point out the distinction between them.

Vegetables have no stomach ; they do not require such a magazine, since they find a regular supply of nourishment at the extremity of their roots : with them, therefore, there is no occasion for accumulation. In order to conceive an idea of the form in which plants receive nourishment, you must represent to yourself a very delicate cobweb network, of such extreme tenuity as to render it invisible until the interstices are filled and distended by the nutriment lodged within them. The food of plants is not like that of animals, of a complicated nature ; but consists of the simplest materials, — water, and the solid and gaseous matter contained within it.

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The second distinction between the animal and vegetable creation is, that the latter are not endowed with sensibility.

EMILY.

But the mimosa or sensitive plant, Mrs. B., when it shrinks from the touch, wears a strong appearance of sensibility.

MRS. B.

Yet I should doubt whether it is any thing more than appearance. Some ingenious experiments have, indeed, been recently made, which tend to favour the opinion that plants may be endowed with a species of sensibility; and seem to render it not improbable that there may exist in plants something corresponding with the nervous system in animals.

CAROLINE.

The sensitive plant would then, no doubt, be a nervous fine lady at the court of Flora. But, pray, of what nature were these experiments?

MRS. B.

There are certain vegetable poisons, such as nux vomica, laurel-water, belladonna, hemlock, and several others, which are known to destroy life in animals, not by affecting the stomach, but merely by acting on the nervous system. These poisons were severally administered to different plants, either by watering them with or steeping

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their roots in infusions of these poisons. The universal effect was, to produce a sort of spasmodic action in the leaves, which either shrunk or curled themselves up; and, after exhibiting various symptoms of irritability during a short time, became flaccid, and the plant in the course of a few hours died.

EMILY.

I should have been curious to have seen an experiment of this nature tried on the sensitive plant.

MRS. B.

It was done. Two or three drops of prussic acid, which, you know, is a most powerful poison, were poured upon a sensitive plant: the leaflets closed and opened again at the end of a quarter of an hour; but they did not regain their sensitiveness for at least six or eight hours. When we see plants thus acted upon by vegetable poisons, which are known to be incapable of destroying the animal fibre, or of injuring the frame but through the medium of the nerves, we may be led to suppose, that certain organs may exist in plants with which we are totally unacquainted, and which bear some analogy to the nervous system in animals.

It is certain that plants possess a power of irritability or contractibility; for it is by alternate contractions and dilatations of the vessels that they propel the juices which rise within them. Here is a slip of elder: when I cut it in two, the fluid continues oozing from both of the separated