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the Elements of Botany, with their Application to Agriculture: Volume 2

Jane Haldimand Marcet

Excerpt

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CONVERSATIONS.

ON THE MULTIPLICATION OF PLANTS.

CONVERSATION XV.

ON THE PROPAGATION OF PLANTS BY
SUBDIVISION.

MRS. B.

IT is now time to turn our attention from the preparation of the soil to the study of the plants which are to be raised in it.

CAROLINE.

After having provided suitable accommodation for their reception, and an abundant store of food for their subsistence, they will no doubt increase and multiply with rapidity.

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MRS. B.

That is not all. If we have taken so much pains to provide for the welfare of the vegetable creation, it is with the interested view of its affording us food and raiment; we shall therefore select for cultivation such plants as are best suited to that purpose.

There are two modes of propagating vegetables: the first consists in subdividing the parts of a plant, so that from one individual several may be formed; the second mode is that of raising new plants by the germination of the seed.

In order to be able in every case to distinguish these two processes, you must observe that the seed is always contained in an envelope, and that it is prepared by organs exclusively destined for that purpose. These organs compose the flower or blossom. Now the plant which results from the germination of the seed, is always of the same species as that in which the seed originated; but varying from it frequently in the quality of its fruit, and not inheriting any of the peculiarities which may have casually distinguished the individual parent-plant.

When, on the contrary, a new plant is raised by separating from the parent-stock a slip or a layer, you not only produce an individual of the same species, but, if I may so express it, a continuation of the same plant, possessing every peculiarity by which it may casually be distinguished from others of its species.

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EMILY.

When these peculiarities are of an advantageous nature, it must be desirable to raise the plant by division ; otherwise, I suppose, it is more easily accomplished by sowing the seed.

MRS. B.

But the process is much more tardy. A seedling tree of ten years' growth will perhaps not be more advanced than one raised by a slip of five years old ; then, when you are provided with a plant which bears remarkably fine fruit, you are sure that if propagated by division it will produce fruit of equally good quality. This mode affords, therefore, the most certain means of improving the species.

CAROLINE.

Reproduction by seed is the mode adopted by Nature ; that by division the invention of art.

MRS. B.

The latter is also sometimes employed by Nature, as you will see.

Reproduction by division tends to diminish the quantity of seed. The vine, which in a state of nature, bears five seeds in each grape, when propagated by this mode, has only two ; and some vines lose them entirely, so as to leave no possibility of reproducing the plant but by division.

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THE PROPAGATION OF PLANTS

EMILY.

The fruit no doubt profits by this deficiency of seed, as the sustenance which would go to ripen the seed, will be expended in enriching the juices of the grape. I have observed that apples and oranges, which have the fewest pips, are the highest flavoured.

MRS. B.

The remark is applicable to fruits in general. The sugar-cane, propagated by division, wholly loses its seed; and so do also the succulent plants of the Cape of Good Hope, after having been for a number of years transplanted into Europe.

CAROLINE.

But I cannot comprehend how a slip can strike root. That root, branch, and every part of a plant should be developed by the germination of a seed, in which it existed in a latent state, is easy to conceive; but that a root should grow from the extremity of a young shoot seems to favour the idea of casual reproduction, which is not to be met with in Nature.

MRS. B.

There is reason to suppose that germs, in some respect analogous to those which are contained in the seed, exist in almost every part of a plant, but are not developed unless placed under favourable circumstances; that these germs are of two distinct species, the one producing stems, the other roots. The former originate chiefly in the axilla of the

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leaf, or part which unites the leaf to the stem ; and which, from the analogy it bears to the union of the arm to the body in the human frame, is called the axilla : the latter shoot out roots on each side.

It has been affirmed that roots may, by exposure to the air, be converted into branches ; and branches, by being buried in the earth, transformed into roots ; and this, as I believe I before mentioned to you, has been attempted to be proved by overturning a willow, burying the head in the ground, and leaving the roots upwards exposed to the air. But what was the result ? Not that the branches became roots, and the roots branches ; for the former being unfurnished with the organs of absorption, and the latter with those of evaporation, it was impossible for them to exchange their respective functions ; but the branches being deprived under ground both of light and air, and of all the circumstances favourable to the developement of the germs of other branches, these branches do not shoot. The same circumstances being, on the other hand, particularly adapted to the developement of the germs of roots, these strike out into the soil.

In the mean time the roots, which have been compelled to change places with the branches, being exposed to the light and air, and so situated as to favour the developement of the germs of branches, and in direct opposition to that of the germs of roots, shoot out young branches from

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their naked roots, and in the course of time cover them with foliage.

EMILY.

I recollect having seen the leaf of a plant, which, when simply laid upon moist ground, struck out roots from its edges into the soil.

MRS. B.

This is the Bryophyllum: the flower is the only part of a plant which is incapable of developing either a root or a stem, except through the medium of the seed, the production of which is its sole and exclusive function.

There are three modes of multiplying plants by division: —

The first by layers;

The second by scions, or slips;

The third by grafts.

When you intend to multiply by subdivision, you place that portion of the plant which you intend to separate from the remainder under such circumstances as are requisite to enable it to develop the organs in which it is deficient, and which are necessary to its independent existence. If it be a branch, the organ wanting is a root; if it be a root, the organ necessary to be developed is a stem. How is this to be accomplished?

EMILY.

You must, I suppose, bury the extremity of the

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branch in moist ground, to favour the development of roots; and, in the other case, train the roots above ground to encourage that of branches.

MRS. B.

Exactly. It is the cambium, you must recollect, which, in its retrograde course through the liber, and partly through the alburnum, nourishes these germs; if, therefore, you propose to develope them in any particular part of the plant, you must accumulate the cambium in that spot. This may be done in several different ways. In the first place, you may make an annular incision in the bark or rind, and, by thus impeding the descent of the cambium, accumulate it in the upper section, where it will produce a swelling or protuberance of the bark. The germs situated in the neighbourhood of this rich magazine of food, if in other respects favourably circumstanced, are developed; that is to say, if the annular incision be exposed to light and air, the germs of branches will shoot; if below ground, those of roots will strike into the soil. Indeed any casual interference with the descent of the cambium is almost immediately followed by the sprouting of a bud. In order to make a layer, you bend down a pliant branch without separating it from the plant, and fasten it in the ground; sometimes a slight incision is made at the spot in which it is confined. — Now, what follows? The cambium, descending through the branch, finds some difficulty in re-

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turning to the stem : this obstacle is sufficient to occasion a small accumulation, and the shooting out of several germs of roots.

There are some creeping plants which propagate themselves in this manner without the aid of man. Their lower branches, trailing upon the ground, are often partially covered with earth washed over them by the rain : if, in this operation, they are slightly wounded by friction, or the contact of any hard substance, such as gravel or pebbles, the free passage of the cambium is interrupted, roots strike out, and the branch which connected them with the parent-stock, being in a great measure deprived of its nourishment by the young roots, rots and perishes ; the separation is thus made, and the requisite organs being developed, the layer becomes a new individual plant.

CAROLINE.

I have seen carnations and ranunculuses thus propagated ; and I am delighted to hear the explanation of an operation I have often witnessed without understanding it.

MRS. B.

Laurels and most evergreens are also propagated by layers ; and it is the regular mode used in vineyards. A branch of vine is laid under ground, and the extremity of it raised up above the soil in that spot where you wish to produce a new plant. If the branch be long and pliable, several plants may

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be made to spring from it. This is called a serpentine layer, because the branch takes a serpentine direction, being made alternately to sink below and rise above ground, as often as it is intended that new roots and stems should shoot from it.

Layers are sometimes made in arches by burying the extremity of the branch only; the separation is afterwards made when the branch has struck root: this mode is particularly suited to the raspberry and every species of bramble.

CAROLINE.

I have heard that there is a tree in Senegal called the Mangrove, or Rhizophora, whose branches, descending to the ground, bury their extremities in the soil, and strike root, thus forming beautiful natural arcades around the parent stem.

MRS. B.

Several fig-trees in the East Indies grow and propagate in the same manner. The ancients sometimes twisted the branch at the spot where they wished a root to strike: to this process we have substituted the more gentle mode of strangulation by ligatures, which injures the branch less, and yet arrests the cambium sufficiently to produce an accumulation.

Another mode of making layers consists in slitting the branch from the bottom upwards, and drawing the portion slit on one side, so as to form the figure of a Y reversed, the branches being of

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unequal length. The portion of the cambium which descends into the slit, finding no vent, accumulates and strikes root.

EMILY.

I have seen the gardener propagate the *Magnolia*, and other rare and delicate plants, by gently bending some of their most pliant branches to the ground, and covering every part of them with earth excepting their extremities; by this means a considerable number of layers may be obtained at a time.

MRS. B.

Layers are also sometimes made completely above ground, though, it is true, this cannot be done without the aid of the soil; for it is necessary that the branch should be surrounded with moist earth, which may be contained either in a flower-pot or a small basket, having an opening sufficiently large to admit of the branch passing through it.

CAROLINE.

The germs then strike root in this soil. I have seen the *Oleander* propagated this way.

MRS. B.

M. Humboldt, the celebrated naturalist, when travelling in America, provided himself with strips of coarse pitched cloth, which he substituted in the place of a basket, to confine the earth round branches from which he wished to make layers. He adjusted them round the branches of trees, in