

2.—LIGHT.

Without light, heat would merely expand the parts of plants; light must elaborate the sap into pulp. Plants that are excluded from light become drawn and weak, as under the shade of trees or walls, and in dwelling-rooms. Even grass, which is endowed with such a wonderful power of life, dies under the thick shade of trees. Plants naturally turn to the light and grow towards it, their tissues becoming more elaborated and contracted on the side from which light is supplied; hence their feebleness and one-sidedness. If plants be placed in a warm cellar, where light is only supplied from a single aperture, they will always grow in that direction if the rays can reach them.

There can be no fruit or flowers without light, because none of the parts of plants can be fully and properly matured; and the flower or fruit-bearing process is the result of light, the last stage of maturity. Greenness and all high colours are the result of light; leaves have only a sickly yellow hue without it. But it must be remembered that flowers, once developed, will fade sooner when subjected to strong light, which will rather throw them into fruit. When flowers, therefore, and not fruits are desired, a little shading, after the first blossoms have expanded, will prolong their beauty.

The exclusion of light produces *blanching*, as in the familiar case of lettuce, endive, and celery; but it gives additional succulence and crispness, and tenderness, as with the sea-kale. All vegetables, therefore, that are used for their juiciness, or eaten raw as salads or in which much fibre would be a defect, should be grown quickly, with plenty of warmth and comparatively less light.

Want of light is often the real cause of evils which are popularly ascribed to want of air, though both combined may occasionally be acting. Light may, however, be prejudicial to plants in certain stages, as after fresh planting or potting, when it stimulates them more than their crippled roots will bear. Dull weather is, therefore, best for both potting and planting, and a little shade after either process may often be beneficial.

3.—AIR AND GASSES.

Air is as necessary to plants as to human beings, since they both exhaust it from its health-producing influences, and probably both vitiate it to some extent, as far as themselves at least are concerned.—There can be no general healthiness or robustness without fresh air. The roots of plants require to be within reach of it; consequently, where they are tolerably near the surface, and in porous soil, the plants are much more fertile. Very deep soils, which attract the roots away from the influence of air, tend only to the production of leaves and branches. Air fills the soil as well as the atmosphere, and exists in plants in little cells, which appear provided expressly for it.

It is said to be valuable as a mechanical agent in agitating the different parts of plants, and keeping them healthy and hardy, in helping off their watery evaporations, and in removing impurities. But it is most useful in conveying gasses to them, as a very considerable quantity of gaseous food of plants resides in the atmosphere, and is communicated to them directly through the pores, or through the soil to the roots: besides being precipitated upon them, or forced into the ground for them by rain, snow, &c. Oxygen and nitrogen, the food of plants, are the chief constituents of the atmosphere. Carbon, also, which is essential to plants, is derived both from the air and the soil. It exists most abundantly where population is densest, and the various processes of life most

thickly carried on. Plants and tress in large towns must, therefore, tend materially to improve the air, by relieving it of its carbon.

A close frame or hand glass, where little or no fresh air is admitted to dry up the juices, and that which it contains is kept slightly moist, is the best condition for newly potted plants or cuttings. Quiet moist weather is likewise always best for planting, as winds seriously dry the roots of plants during the operation, and assist in abstracting too much of their juices after they have been removed.

Plants convert the oxygen and carbon which they receive from the soil and air into carbonic acid, which they exhale at night. This being a deadly and dangerous gas to human beings, plants or flowers are not considered healthy in a sitting or bed-room during the night. In the day they give off oxygen, especially in the morning, which is reputed to render the morning air so fresh and exhilarating. They are very useful in absorbing from the air the carbon which is so injurious to animal life, and they purify stagnant water in the same way.

PROTECTING FRUIT TREES FROM MICE.

MR. EDITOR:—I should be glad to get some information from yourself, or some of your horticultural correspondents, on the best method of protecting fruit trees from the depredations of mice which constantly gnaw off a large ring of bark, and thus destroy the vitality of a tree which we have perhaps been carefully rearing for a number of years. Mr. Downing, in the first edition of his work on Fruit Trees, recommends the use of tar, but in the late editions I find this statement is altered, and other more mechanical contrivances are advocated, such as treading down the snow, forming hillocks of earth round the base of the tree, or even using lime. In a late number of the *Horticulturist*, too, the use of tar is deprecated, unless employed with care.

As the injurious effects of the tar can only arise from its coming into immediate contact with the outer bark, by which a portion may possibly be absorbed into the plant, and having a number of young trees in my garden, some of which suffered rather severely last winter from the nuisance above mentioned, I have tried the following expedient, on the efficacy of which I should like to have your opinion.

I prepared a number of slips of coarse canvas, 18 inches by 10 or 12, and wrapping them round my young trees close to the ground, fastened them with a few twists of twine. I then besmeared each with a good coating of coal tar. The bark is thus preserved from actual contact with the tar itself, and the clothes, which are put on with very little trouble, such as no one would grudge to a few pet trees, can easily and readily be removed in the spring.

The plan may seem a little troublesome, but each tree will not take five minutes in covering and smearing, not longer than would be required for the other processes recommended; and, if we can prevent the injurious action of the tar on the trees, I have no doubt that it will be found the most effective preservative.

When the proper time comes, I will send you an account of the result of my experiment.

Yours truly, H. C.

Toronto, Feb. 21st, 1852.