

one different agricultural product not being in the soil in sufficient quantity, it cannot come out of the soil in sufficient quantity to form the building material of the trees and plants that grow upon the land. The great bulk of each came not from the soil but the air.

You will see, by-and-by, notwithstanding that it is quite consistent with this statement, that the farmer should cultivate and manure the land to make his plants grow; for, though the soil does not provide the plant with much of its substance, yet provides something which is necessary to it and without which the plant could not live. If the plowing and harrowing and manuring were of no use to the crop, of course, no one would go to any expense in cultivation. If the air provided all the food that plants need, people would not labor at their gardens; they would just sow their seed, and then pray for the wind to blow and the rain to fall, and the sun to shine, till the crop was ripe; then, indeed they might have to wake up for harvest time. But it has been so arranged that plants require our labor both at seedtime and harvest, and all the season through, in order that they may yield their utmost; and thus employment, as well as food, is provided for man.

Now let us return to the case of one tree. We have proved that its substance did not come from the soil; for the matter of wood is not in the soil in the quantity enough, and the plant cannot change one thing into another—and as air is the only other thing that the plant has access to, the inference is, that it must get its substance thence. Well, but you will say, "If the wood is not in the soil it certainly is not in the air. There is nothing solid or substantial in air like the matter of wood must be." I think I can prove to you that there is something like the matter of wood in the air nevertheless. Suppose that you cut down a tree, which you say could not have come out of the air, and set fire to it and leave it for a little while—on your return you find that it has gone—that is, it has burned up. Where has it gone to? If it never was in the air before, it is in the air now, for certain; and the clear air into which it has been converted will go to furnish the matter of wood to other trees which are still growing. The tree did not all disappear, however. It left some ashes behind it. Well, the ashes of the tree are what it got from the soil, and they are thus returned to it; and whatever of the tree will burn or rot away back into the air, just goes to the place from whence it originally came.

Plants make their growth by food from the mineral kingdom, which includes the air; and animals by food from the vegetable kingdom;

but there is constantly this contemplating process going on, that every plant and every animal that lives, eventually dies, and each gives back to the sources from whence it was obtained, the matter of which it is made. I suppose that all the plants on the surface of the globe now, if weighed, would not be heavier nor lighter than the vegetable covering in which the earth was clothed 5,000 years ago; and I dare say that the quantity of animal matter now in life is not greater nor less than the quantity which lived in any other year since the world was fully peopled. The plants take food from the earth and the air, and grow and feed animals, and these die and return to the dust, furnishing the earthy part back to the soil from whence it came, and the combustible part back to the fair from whence it came. You can imagine a farm which should be a little world by itself—large enough to maintain a family—it should provide the materials for their cottage and food for themselves; and wheat enough should grow upon it, and sheep and cattle, and flax and grass should flourish there; so that woolen cloth and linen and beef and mutton and bread might all be made from it; and thus this family need never leave this bit of land, and it would, as I said, be a little world by itself.

Now the soil furnishes its portion; that is, their ashes, to the grass on which the cows feed—and to the stems of the flax and to the wool of the sheep and to the food of the people; but there is no fear of its being ultimately impoverished by this—for it gets it all back again very soon, for the cattle are killed, and the men die—and the plants wither and the ashes of all are returned to the land whence they came—and the fuel is burned, the dung-hill rots away in the ground, and thus all the part which was obtained from the air is returned also to it. There is no difficulty now in conceiving of such a farm as this yielding so many tons of cheese or so many bushels of wheat every year without suffering. We know that this did not all come out of the soil, so as for us to be obliged to believe that there are hundreds of tons of cheese or of wood or of wheat all in the soil now to furnish future crops; and we know that it did not all come from there, so as for us to be obliged to believe that there is the matter of all the crops that shall be harvested, and all the crops that shall be cut to the end of time, now existing in the air ready to be used year by year as time passes. What we know now is this—that every year the soil contributes what may be called the mineral part of our crops—their ashes, in fact, if they were burned—and