moist fertile soils, and in rain and well waters; the roots of plants during their life absorb moisture, air, and carbonic acid. Light by its chemical action fixes the carbon of the carbonic acid in the plant; when the light ceases to act during night, the carbonic acid absorbed with the water by the roots passes from the plant *unchanged;* hence plants growing in humus exhale more carbonic acid than those which grow in dry situations, and they throw out more in rainy than in dry weather. The cause of this has just been explained. Many experiments have proved that plants yield much more oxygen to the air, than they extract from it. The evolution of oxygen from the leaves and twigs of plants is observable in those which grow in the bottom of pools and ditches. When the surface of this water is frozen with clear ice, small bubbles of air can be seen rising from the bottom and floating beneath the ice. These are pure oxygen, disengaged from the carbonic acid dissolved in the water, which is absorbed by the plants: the water receives a fresh supply of carbonic acid from the decaying vegetable matter in the soil. The oxygen thus evolved is not again absorbed by the plant; shewing that it must receive its supply from some other source.

Careful experiments have sufficiently proved that the *Carbon of plants is derived from the atmosphere.* Humus evolves carbonic acid, and thus makes an atmosphere of it around the roots of plants by which it is absorbed, while the leaves absorb it from the atmosphere surrounding themselves.

The functions of a plant during its life must be constantly in action, therefore the roots and other parts possessing the power of absorption are constantly absorbing water and carbonic acid, either in the shade during the day, or in the night in the absence of the solar ray: "But the assimilation (*or the digestion*) *of Carbon* and the exhalation of oxygen commence from the instant that the solar ray strikes them; thus, as soon as a young plant breaks through the surface of the ground, it begins to acquire colour from the top downward; and the true formation of woody tissue commences at the same time.

"The proper, constant and inexhaustible sources of oxygen gas are the tropics and warm climates, where a sky, seldom clouded, permits the glowing rays of the sun to shine upon an immeasurably luxuriant vegetation. The temperate and cold zones, where artificial warmth must replace deficient heat of the sun, produce on the contrary carbonic acid in abundance, which is expended in the nutrition of tropical plants. The same stream of air, which moves by the revolution of the earth from the Equator to the Poles brings to us in its passage from the Equator the oxygen generated there, and carries away the carbonic acid formed during our winter."

The various currents of air, storms, and tempests, all contribute to produce a healthy state of the air, by mingling the oxygen of purer regions with the carbonic acid of those in which the evolution of oxygen is less. "The objection has been urged," says the American Editor of Leibig, "that towards the end of autumn, and through the winter and early spring, the air in our climate must become impure from the absence of leaves, that the oxygen must diminish, and carbonic acid increase in the atmosphere. But the different parts of the atmosphere are constantly mixed together by the winds, which when strong, move at the rate from 50 to 100 miles an hour." "The air from the vast forests of tropical climates passing over the ocean arrives uncontaminated, and the constituent parts of the air are mingled by constant agitation and motion."

But even in our cold regions, if oxygen is evolved from the ends of twigs, as Leibig has observed in those under water, our forests must supply our climate with a constant supply of oxygen, independently of that