of the former existence of an atmosphere highly charged with carbonic acid, at the period of the ancient coal-plants, have not sufficiently reflected on the continual disengagement of carbon, which is taking place in a gaseous form from springs, as also in a free state from the ground and from volcanic craters into the air. We know that all plants are now engaged in secreting carbon, and many thousands of large trees are annually floated down by great rivers, and buried in their alluvial deposits; but before we can assume that the quantity of carbon which becomes permanently locked up in the earth by such agency will bring about an essential change in the chemical composition of the atmosphere, we must be sure that the trees annually buried, contain more carbon than is given out from the interior of the earth in the same lapse of time. Every large area covered by a dense mass of peat bears ample testimony to the fact, that several million tons of carbon have been taken from the air, by the powers of vegetable life, and stored up in the earth's crust, a large quantity of oxygen having been at the same time set free; but we cannot infer from these circumstances, that the constitution of the atmosphere has been materially deranged, until we have data for estimating the rate at which dead animal and vegetable substances are daily putrifying, - organic remains and various calcareous rocks decomposing, and volcanic regions emitting fresh volumes of carbonic acid gas. That the ancient carboniferous period was one of vast duration all geologists are agreed ; instead, therefore, of supposing an excess of carbonic acid in the air at that epoch, for the support of a peculiar flora, we may imagine Time to have multiplied the quantity of carbon given out annually by mineral springs, volcanic craters, and other sources, until the component elements of any given number of coal seams had been evolved from below, without any variation taking place in the constitution of the atmosphere. It has been too common, in reasoning on this question, to compute the loss of carbon by the volume of coal stored up in the ancient strata, and to take no account of the annual gain, by the restoration of carbonic acid to the atmosphere, through the machinery above alluded to.*

Disintegrating effects of carbonic acid. — The disintegration of granite is a striking feature of large districts in Auvergne, especially in the neighbourhood of Clermont. This decay was called by Dolomieu, "la maladie du granite;" and the rock may with propriety be said to have the rot, for it crumbles to pieces in the hand. The phenomenon may, without doubt, be ascribed to the continual disengagement of carbonic acid gas from numerous fissures.

In the plains of the Po, between Verona and Parma, especially at Villa Franca, south of Mantua, I observed great beds of alluvium, consisting chiefly of primary pebbles, percolated by spring-water, charged with carbonate of lime and carbonic acid in great abundance. They are for the most part incrusted with calc-sinter: and the rounded blocks of gneiss, which have all the outward appearance of

* See Lyell's Travels in North America, vol. i. p. 150.