

tibly, although but slightly, over the sea and in the interior of continents, according to local conditions or to the seasons of the year. We may easily conceive that changes in the oxygen held in solution in the sea, produced by microscopic animal organisms, may be attended by alterations in the strata of air in immediate contact with it.* The air which Martins collected at Faulhorn at an elevation of 8767 feet, contained as much oxygen as the air at Paris.†

The admixture of carbonate of ammonia in the atmosphere may probably be considered as older than the existence of organic beings on the surface of the earth. The sources from which carbonic acid‡ may be yielded to the atmosphere are most numerous. In the first place we would mention the respiration of animals, who receive the carbon which they inhale from vegetable food, while vegetables receive it from the atmosphere; in the next place, carbon is supplied from the interior of the earth in the vicinity of exhausted volcanoes and thermal springs, from the decomposition of a small quantity of carbureted hydrogen gas in the atmosphere, and from the electric discharges of clouds, which are of such frequent occurrence within the tropics. Besides these substances, which we have considered as appertaining to the atmosphere at all heights that are accessible to us, there are others accidentally mixed with them, especially near the ground, which sometimes, in the form of miasmatic and gaseous contagia, exercise a noxious influence on animal organization. Their chemical nature has not yet been ascertained by direct analysis; but, from the consideration of the processes of decay which are perpetually going on in the animal and vegetable substances with which the surface of our planet is covered, and judging from analogies deduced from the domain of pathology, we are led to infer the existence of such noxious local admixtures. Ammoniacal and other nitrogenous vapors, sulphureted hydrogen gas, and compounds analogous to the polybasic ternary and quaternary combinations of the vegetable kingdom, may produce miasmata,§

* Lewy, in the *Comptes Rendus de l'Acad. des Sciences*, t. xvii., Part ii., p. 235-248.

† Dumas, in the *Annales de Chimie, 3e Série*, t. iii., 1841, p. 257.

‡ In this enumeration, the exhalation of carbonic acid by plants during the night, while they inhale oxygen, is not taken into account, because the increase of carbonic acid from this source is amply counterbalanced by the respiratory process of plants during the day. See Bous-singault's *Econ. Rurale*, t. i., p. 53-68, and Liebig's *Organische Chemie*, s. 16, 21.

§ Gay-Lussac, in *Annales de Chimie*, t. liii., p. 120; Payen, *Mém. sur*