

arrangements of the vegetable kingdom. The upper sides of the leaves of vegetables give out a large portion of oxygen during the day, while they absorb the nitrogen. By this reciprocal action between animals and vegetables, the purity of the atmosphere is maintained, the oxygen given off by plants combining with the nitrogen expired by animals. When we consider the large amount of carbonic acid that is thrown into the atmosphere by animals, we cannot but feel delighted with the provision for its decomposition by vegetables; and this fact, connected with that already mentioned, gives as strong an evidence of the exquisite skill with which material agents have been arranged to subserve the wants of life in its various gradations, as any in the whole range of philosophy.

There has been some difference of opinion as to the manner in which the gaseous principles of air are united together. Some philosophers have maintained that they are merely in a state of mixture, while others considered them to be chymically united. It is a law in chymistry that bodies combine in definite proportions. Now it has been determined that the oxygen and nitrogen of atmospheric air are in the proportion of one volume of the former to four of the latter, and it was therefore very natural to suppose that they must be chymically combined. But although the oxygen and nitrogen of atmospheric air are united together in proportions adapted to form a chymical compound, yet, from the experiments made by Mr. Dalton, it is probable that they are only mixed, or, in other words, that the particles of the one are diffused among those of the other. It is known that gases possess a principle that may be called a self-repulsive power, that is to say, particles repel those of the same kind, though they have neither an attractive nor a repulsive influence over those of a distinct character. For this reason gases, when mixed together, do not arrange themselves like liquids, according to their specific gravities, but the particles of each kind are diffused throughout the whole space that is occupied by the fluid. This theory is supported by the results of M. Dulong's experiments, by which he has proved that the refractive power of the atmospheric air is precisely equal to the sum of the refractive powers of its elements.

This constitution of the atmosphere is of the greatest importance, as adapting it to purposes it was intended to