saltpetre on clay walls in contact with the atmosphere, appear to have contributed jointly to the adoption of this view. The nitrous particles of the air influence, according to Mayow, the respiration of animals, the result of which is to generate animal heat, and to deprive the blood of its dark color; and, while they control all the processes of combustion and the calcination of metals, they play nearly the same part in the antiphlogistic chemistry as oxygen. The cautious and doubting Robert Boyle was well aware that the presence of a certain constituent of atmospheric air was necessary to combustion, but he remained uncertain with regard to its nitrous nature.

Oxygen was to Hooke and Mayow an ideal object—a delusion of the intellect. The acute chemist and vegetable physiologist Hales first saw oxygen evolved in the form of a gas when, in 1727, he was engaged at Mennige in calcining a large quantity of lead under a very powerful heat. He observed the escape of the gas, but he did not examine its nature, or notice the vivid burning of the flame. Hales had no idea of the importance of the substance he had prepared. The vivid evolution of light in bodies burning in oxygen, and its properties, were, as many persons maintain, discovered independently—by Priestley in 1772–1774, by Scheele in 1774–1775, and by Lavoisier and Trudaine in 1775.*

The dawn of pneumatic chemistry has been touched upon in these pages with respect to its historical relations, because, like the feeble beginning of electrical science, it prepared the way for those grand views regarding the constitution of the atmosphere and its meteorological changes which were manifested in the following century. The idea of specifically distinct gases was never perfectly clear to those who, in the seventeenth century, produced these gases. The difference between atmospheric air and the irrespirable light-extinguishing or inflammable gases was now again exclusively ascribed to the admixture of certain vapors. Black and Cavendish first showed, in 1766, that carbonic acid (fixed air) and hydrogen (combustible air) are specifically different aëriform fluids. So long did the ancient belief of the elementary simplicity of the atmosphere check all progress of knowledge. The final knowledge of the chemical composition of the atmosphere, acquired by means of the delicate discrimination of its quantitative re-

* Priestley's last complaint of that which "Lavoisier is considered to have appropriated to himself," is put forth in his little memoir entitled "*The Doctrine of Phlogiston Established*," 1800, p. 43.