

in 1553, had noticed the increase of weight that accompanies the oxydation of lead, and, perfectly in accordance with the idea of the myth of Phlogiston, had attributed it to the escape of a "celestial fiery matter," causing levity; and it was not until eighty years afterward that Jean Rey, a remarkably skillful experimenter at Bergerac, who had investigated with the greatest care the increase of weight during the calcination of lead, tin, and antimony, arrived at the important conclusion that this increase of weight must be ascribed to the access of the air to the metallic calx. "Je responds et soutiens glorieusement," he says, "que ce surcroît de poids vient de l'air qui dans le vase a été espessi."*

Men had now discovered the path which was to lead them to the chemistry of the present day, and through it to the knowledge of a great cosmical phenomenon, viz., the connection between the oxygen of the atmosphere and vegetable life. The combination of ideas, however, which presented itself to the minds of distinguished men, was strangely complicated in its nature. Toward the close of the seventeenth century a belief arose in the existence of nitrous particles (*spiritus nitro-æreus pabulum nitrosum*), which, contained in the air, and identical with those which are fixed in saltpetre, were supposed to possess the necessary requirements for combustion; an opinion which, obscurely expressed by Hooke in his *Micrographia* (1671), is found more fully developed by Mayow in 1669, and by Willis in 1671. "It was maintained that the extinction of flame in a closed space is not owing to the oversaturation of the air with vapors emanating from the burning body, but is the consequence of the entire absorption of the *spiritus nitro-æreus* contained in the nitrogenous air." The sudden increase of the glowing heat when fusing saltpetre (emitting oxygen) is strewed upon coals, and the formation of

* Rey, strictly speaking, only mentions the access of air to the oxyds; he did not know that the oxyds themselves (which were then called the earthy metals) are only combinations of metals and air. According to him, the air makes "the metallic calx heavier, as sand increases in weight when water hangs about it." The calx is susceptible of being saturated with air. "L'air *espaisi* s'attache à la chaux, ainsi le poids augmente du commencement jusqu'à la fin: mais quand tout en est affablé, elle n'en sçauroit prendre d'avantage. Ne continuez plus votre calcination sous cet espoir, vous perdriez votre peine." Rey's work thus contains the first approach to the better explanation of a phenomenon, whose more complete understanding subsequently exercised a favorable influence in reforming the whole of chemistry. See Kopp, *Gesch. der Chemie*, th. iii., s. 131-133. (Compare, also, in the same work, th. i., s. 116-127, and th. iii., s. 119-138, as well as s. 175-195.