mosphere containing water, or mingled oxygen and hydrogen gases, and would immediately undergo the same decomposition that takes place when the vapors of common salt are diffused through a potter's kiln, or, as in Mr. Gossage's new soda-process, are passed with steam over red-hot flints. In both cases silicates of soda are formed with separation of hydrochloric acid.

These considerations lead to the conclusion that after all the more fixed elements were precipitated, the whole of the chlorine would finally remain in the partially cooled atmosphere as hydrochloric acid, and the whole of the sulphur as sulphurous acid, together with a large proportion of oxygen, since we find this element in the form of sulphate and not as sulphite in the sea-waters. Mr. Forbes does not, it seems, believe that an excess of oxygen could exist in an atmosphere highly charged with sulphurous acid, and elsewhere (in the *Chemical News*), he tells that it is, "if not impossible, at least, highly improbable that such a heated atmosphere containing sulphurous acid, hydrochloric acid, with oxygen and aqueous vapor could exist," the elements being in his *opinion*, incompatible. He is aware that at certain temperatures sulphurous acid and oxygen unite, in the presence of water, to form oil of vitriol, but he forgets that at a higher temperature this compound is again resolved into water, sulphurous acid and oxygen; and that one of the best processes for preparing the latter gas on a large scale, is by this decomposition of sulphuric acid, and the subsequent removal of the sulphurous acid from the cooled gaseous mixture. In the *opinion* of Mr. Forbes, as set forth in the *Chemical News*, the sulphurous and hydrochloric acids would decompose each other, in the presence of watery vapor (though every chemist's experience teaches him the contrary;) another reason for holding that my supposed atmosphere was impossible. Unfortunately for his *opinion*, however, it happens that large quantities of precisely such an atmosphere are disengaged from various volcanic vents. To cite one among many examples examined by Charles Deville and Leblanc (Ann. de Ch. et Phys. [3] LII. pp. 5–63) a *fumerolle* of Vesuvius yielded in June, 1856, a mixture of highly heated steam, hydrochloric acid, sulphurous acid and air containing 18.7 per cent of oxygen. The sulphurous acid was equal to 2.6 per cent. of the air, and the amount of hydrochloric acid was about five times as great. Traces of sulphuric acid were found in the water condensed from this steam, doubtless formed by the slow combination of the sulphurous acid and oxygen, and I may state for the information of Mr. Forbes, that it was doubtless by a similar reaction that the sul.