

position by weight and by volume of the atmosphere. This was in 1781. It is supposed that Cavendish made no less than 400 analyses of the air. The mean result of his labours was that 100 volumes of air contain 20.83 parts by volume of oxygen.

Since that time Gay-Lussac and Humbolt, Davy, Thomson, Kupffer and, later by more accurate methods, Regnault, Bunsen, Lewy, Stas, Dumas, Boussingault and others, have carefully analysed the air. Their results serve practically to corroborate those of Cavendish.

It is now well known that the amount of oxygen in normal air varies at different times and in different localities, but the work of all the most careful investigators goes to show that the limit of variation lies within 20.9 and 21.0 volumes of oxygen per 100 of air. Considering this, we may well marvel at the high degree of accuracy of this quantitative work of Cavendish—more especially when we think of the apparatus and methods of his day.

For more than a hundred years then, it has been thought that the atmosphere consisted chiefly of a mixture of the elementary gases, oxygen and nitrogen. We have also for many years recognized as present in the aerial ocean that envelopes our globe, small and variable quantities of carbonic acid [3 to 4 volumes per 10,000] and vapour of water. Under artificial circumstances, traces of sulphuretted hydrogen, ammonia, nitric and other acids, organic matter, etc., are noticed.

We now have to chronicle a further step in our knowledge of the atmosphere's composition.

Lord Rayleigh, the eminent English physicist, and William Ramsay, professor of chemistry at University College, London, at the meeting of the British Association held in Oxford in August last, surprised the world—scientific and lay—by the announcement that they had discovered another atmospheric constituent.

To give you some idea how these scientists came to make the discovery of this constituent—which the weight of the proof indicates to be an element hitherto unknown—I shall make free use of an abstract of a paper read by them before the Royal Society on the 31st of January of the present year. Priestley had discovered oxygen by chance; the present discovery was the result of an elaborate