class?) "The process of respiration constantly alters the composition of the air. . . . The laws of the diffusion of gases soon produce an equal division of any effluvium that may happen to be floating in a room. There is no disturbance in the air from the laws of diffusion. A cause of the unpleasant condition of the air is, that, by the partially-exhausted state of the House, it is vitiated from foreign and unprepared sources. . . . Chloride of lime is used to correct smells. The chlorine partly acts on sulpherets, but it seems to act on the principle of one smell overpowering another. Witness does not know practically of any process to cure air of its impurities." He said, "Glass cools the air in contact with it very rapidly, and it falls as a plate or sheet of cold air. The warm air is overpowered by the falling sheet of cold. The descending particles of air call after them other particles which fall in with the current. The whole increases as it descends, and forms a large descending plate of air. One sheet having come down is followed by another sheet, which is equally cooled against the glass, and comes down, and so continually follow. . . . Carbonic acid expired from the lungs will fall in a still atmosphere, though not if the atmosphere is disturbed. The skin as well as the lungs gives out carbonic-acid gas." I have quoted thus largely from Sir G. Gurney's evidence, as nearly all of it is singularly applicable to the House of Representatives, and because he was a distinguished English chemist, and made many valuable discoveries in that science. In 1839 he introduced a new mode of lighting the House of Commons, and was subsequently intrusted with the lighting and ventilating of the new Houses of Parliament. His opinions are therefore of great value.

Dr. Neil Arnott, author of the "Elements of Physics," &c., before the same Committee, said, "A perfect system of warming and ventilating a building required—First, means of moving through the building steadily the definite quantity of pure air known to be necessary; secondly, means of fully distributing this air to the different rooms and compartments; thirdly, means of properly diffusing the air in each room; fourthly, fit means of discharging the vitiated air from the room; fifthly, means of giving the air the fit temperature; and lastly, means of giving the air the fit moisture. The more the apparatus is rendered self-regulating, or independent of the constant watching of the attendants, the better it is likely to be, both as to the performance and economy. A hundred years ago"—this was said in October, 1852—"nobody on earth knew that there was such a substance as oxygen in nature, now called vital air, which is one of the elements of our atmosphere, but which constitutes also four-fifths by weight of the solids forming the crust of our earth. In respiration the oxygen which enters the lungs takes from the blood there some carbon, and returns as carbonic-acid gas, which cannot safely be breathed again, and therefore has to be removed by ventilation. The natural ventilation of persons is produced by the warmth of their breath and the wind. The poisonous hot breath, being lighter than the surrounding air, is buoyed up, and the wind carries it away. Walls and roofs of houses, however, by preventing these natural movements, soon made men aware of the necessity of ventilation. Therefore, even of old, when crowds had to meet, they did so in the open air. Smaller numbers could meet under cover and be comfortable for a while if they opened the doors or windows."

In looking over these old extracts I met with the following in the *Civil Engineers' Journal* for July, 1853: "Dr. Reid's claim for £10,250 on account of services in the ventilation of the new Houses of Parliament was cut down to £3,250, just £7,000 less than the doctor claimed. The arbiters were Dr. Forbes and Mr. Forsyth, who held upwards of thirty meetings before they settled the award." This seemed to me so noteworthy in its way that, as a curiosity, I include it here.

From this date I have not been able to get much more information on the ventilation of the House of Commons until of recent years. In the absence of this, I have ventured in this place to insert a few extracts, selected from the *Builder* and other magazines, tending to show the amount of attention this science is now receiving from scientific men, and the advance it has made in late years from the crude beginning of Sir Christopher Wren. Premising that by them I hope to prove that there is every possibility of ventilating and heating the House of Representatives in a perfectly satisfactory manner, and that the solution is only a question of expenditure, and not want of information.

At Parkes's Museum of Hygiene, Margaret Street, Regent Street, Mr. George Godwin in the chair, on the 6th February, 1884, Mr. J. P. Seddon, F.R.I.B.A., said, "There is not, in my opinion, any great difficulty in ventilating theatres or other public buildings. It has been, in my opinion, in consequence of half-measures that failures have occurred. What is wanted is simply a plentiful supply of fresh air forced into every part of the interior of a building, and not to the auditorium only, together with the extraction of the foul air from the several parts where it collects. The great essential for theatre ventilation is that the whole structure, from basement to roof, should be completely filled throughout by mechanical means with pure air, regulated in temperature as required. He (Mr. Seddon) advocated strongly the plenum system of ventilation, and instanced many theatres and other buildings in America that had been successfully ventilated by this system."

As theatres have had the greatest influence in the development of the science of acoustics, so have they had with the kindred science of ventilation. As an example, I may instance the new Opera House at Vienna, which at the time it was built excelled all others, not only in its acoustic qualities, but in the purity of the atmosphere. But the new theatre at Nice now excels it in efficiency and simplicity, and, as a consequence, in economy, and is well worthy a short description:—

Builder, London, 19th September, 1885, page 387: "The ventilation is based on the principle that the air must not be supplied irregularly and from particular points, but should be admitted in horizontal layers, which, rising gradually from the centre surface of the floor, travel slowly up to the roof, without occasioning any currents likely to disturb the spectators. But, further, the air must be so prepared as to be in a proper condition for breathing before it is admitted into the theatre. In other words, it must be warmed in winter and cooled in summer.