It has been claimed by many scientists, and even by experimenters that nitrous oxide when breathed, had the power of hyperoxygenation of the blood; drawing their conclusions from the fact that it is composed of one part each of oxygen and nitrogen; while atmospheric air is of the proportion of one of oxygen to four of nitrogen; and losing sight of another important fact, that it is a *chemical combination,* forming a new compound instead of a simple mechanical mixture, and that the blood possesses no power to decompose it. Recent experiments by Dr. E. Andrews, of Chicago, go to show that an admixture of pure oxygen with nitrous oxide will give continued vitality to the blood, while it will not detract from the anæsthetic quality of the gas; and thus make a prolonged anæsthesia comparatively safe. He uses one volume of oxygen to three of nitrous oxide.

After an ordinary expiration the lungs still retain a large volume of air, variously estimated—most writers say about 120 cubic inches. Lindenar estimates that there are 2642 superficial square feet, and 6,000,000 of air cells in the lungs. Each inspiration takes in about thirty cubic inches. It then will take four respirations to change the whole volume of air in the lungs. As we respire twenty-three times in a minute, this change will take place about six times. From these calculations, and the immense surface of cellular tissue, we can judge of the rapidity with which all anæsthetics may be brought to act on the blood, though it is not claimed that all the oxygen in the blood is disposed of in any case; if so, death would instantly ensue.

Nitrous oxide—protoxide of nitrogen—is of equal parts of oxygen and nitrogen (N.O.), is produced by the decomposition of the salts of nitrate of ammonia by heat at about 400 °. Its specific gravity is nearly one and a-half. At zero, under pressure of 30 ° atmospheric (540 lbs.), it is condensed into a clear liquid, and at 125 ° below zero it is crystalized into a clear transparent body. The liquid would be a convenient form for keeping it for any length of time, or of transporting, as is recommended by Dr. Evans, of Paris. It is reduced thus about 400 times in bulk; a pint bottle will hold enough to make fifty gallons of gas. The bursting force on the bottle would be 750 pounds to the inch.

Nitrous oxide was first discovered by Sir H. Davy, in 1799, who also demonstrated its anæsthetic properties by inhalation. From that time it was only used as a matter of amusement, until 1843, when Dr. Horace Wells, of Hartford, conceived the idea, and demonstrated upon himself, that it might be of great benefit in mitigating