

which possesses the power of arresting the spread of infectious diseases ; but it is so common a practice to speak of those substances which destroy the offensive products of decaying organic matter as disinfectants, that I shall for convenience sake, rank them as if they were one and the same thing ; indeed, in point of action, they are precisely similar, for they all act as oxidizers, or, in plain English, burners up and destroyers of both the poisons by which the infectious diseases are propagated and the foul-smelling organic matter and its noxious products with which the atmosphere of crowded, ill-ventilated, or ill-drained localities is invariably charged.

The disinfecting and purifying properties of the atmosphere are solely due to the oxygen it contains, which constitutes about one-fifth of its bulk. Common atmospheric oxygen, however, is not in itself a very active oxidizer ; but under certain conditions, such, for instance, as electric discharges, it acquires increased chemical activity. In this condition it is known as ozone, and is supposed to be the principal agent by which Nature purifies and disinfects the atmosphere. Ozone may be considered to be oxygen in a state of condensation, Sir Benjamin Brodie having recently shown that it is one and a half times denser than ordinary oxygen. Next in potency is that condition of oxygen known as antozone, or peroxide of hydrogen. It is only within the last few years that the presence of oxygen in this state has been recognised in the atmosphere. Schonbein, the discoverer of ozone, considered that antozone exists in the form of peroxide of hydrogen ; but as it has not yet, like ozone, been isolated, I shall speak of it throughout this lecture as peroxide of hydrogen. This substance was discovered by Thenard, 1818, who named it oxygenated water. It is now commonly known as peroxide of hydrogen, although its more modern name is hydrogen-dioxide. It is remarkable for the facility with which it gives up half its oxygen, and this property constitutes it a powerful deodorizer and disinfectant. Its great value, however, for these purposes is only just beginning to be understood. Indeed, so little have its nature and properties been studied, that Professor Roscoe, in his well-known "lessons in Elementary Chemistry," published in 1871, states that hydrogen-dioxide is a substance which does not occur in Nature. Now, I claim to have discovered its presence, spontaneously generated, in a vast number of substances which are in almost every-day use, such as all fats and fatty or expressed oils, nearly all perfumes, most, if not all essential oils, kerosene, gasoline, and benzine, and certain kinds of wood.