moistening it with water, so that I do not cover it completely, but still allow it to be in contact with air. Now this water I must return several times, and whilst this is being done I will show you what are the tests for this other form of oxygen, or this antozone, which is also produced in common cases of oxidation. Whilst the ozone unites with the zinc, I hope to be able to prove to you also that there is antozone, or this other form of oxygen. Now let me show you what is the test for this antozone. Antozone, the other allotropic condition of oxygen, is soluble in water, and it forms with the water a solution which we know as the remarkable body—peroxide of hydrogen. Here is some of this peroxide of hydrogen ready formed, and I add to it first distilled water, and then a solution of starch, and iodide of potassium. Now, nothing takes place when I add that, because antozone has not the power,—is not strong enough to liberate the iodine. If I convert it into ozone by a peculiar action, by putting sulphate of iron upon it, the sulphate of iron having no action upon iodine, you see that a deep blue results, because I have converted this antozone into ozone, and the ozone has produced the blue colour by liberating the iodine upon the starch. Now, with that knowledge before us, let us return to our zinc experiment. The ozone having joined the zinc, its companion, antozone, ought to be found in the water. We will just see whether we can detect it in the water, if not we must pass it through three or four times, and ultimately it will be present. Now, I apply some of this test, iodide of potassium, and I will add a little of the test, sulphate of iron. It becomes a deep blue. Look what a beautiful experiment this is; the oxidation of the zinc in presence of air and water has liberated one of the conditions of polarised oxygen. One form of the oxygen is found in the water, which now contains peroxide of hydrogen. But now I want to try another experiment, which is still more delicate, and with which I will not promise success, but we will do our best to ensure it. I want to show you ozone in the air and antozone in the water. I will show you that by adding a little ether, and shaking this ether up with water. We will heat this piece of platinum over gas and plunge it into this ether, first allowing it to cool sufficiently, so that it may not set the ether on fire. Now I am producing ozone in the air of the bottle; but I want to show you, if I can, that I have also antozone in the water. I can show you both perhaps, showing that the common oxygen of the air is gradually formed into ozone, and that its companion, the antozone, exists in the water. Now we will try it; perhaps I have not got enough yet. We will now put this starch-paper in, and see whether we can detect any ozone present in the air. I find that it is there abundantly. There is proof that our ozone, at all events, is present in that air. There is the blue colour produced by this action, so that I have got ozone in the air. Now let us try whether we can find any antozone in the water. In this case I will apply the chromic acid and ether test so as to prevent confusion. If there is sufficient peroxide of hydrogen produced, if we have waited long enough, you will see a very beautiful polarisation,—not only that we have got ozone, but that its companion antozone also comes. You observe how beautifully the deep blue appears as a solution in ether. Now, in this case we had a complete polarisation of the oxygen; the oxygen separated into two forms, both of them very active,—one as it exists in peroxide of hydrogen, and the other as it exists in ozone. Now, this constantly occurs in the atmosphere. Whenever any organic substance is oxidised in the air it polarises the oxygen, and causes the air to oxidise it, and get rid of the body from the air.

Having explained these elementary points, I will show you their application to the process of disinfecting or deodorizing. Our knowledge of these has extended considerably within the last ten years, and the subject is well worthy of our attention. Let us, first, get rid of the term "deodorizers," and fix our attention on disinfectants. The word "deodorizer" is a more agreeable one to polite ears than the word "disinfectant," and we had better define them both. A *deodorizer* is something used to mask a smell without destroying it. A *disinfectant* is something which either prevents the smell or destroys it when it exists. When we read that in ancient Capua whole streets where devoted to perfumers' shops, the conclusion is obvious that ancient Capua was a very dirty place, and that these perfumes were used to conceal its smell. I allude now only to perfumes used to mask that which is disagreeable, and not to their use as a luxury; for from the time that Moses was commanded to offer a perfume on the golden altar until now, the odour of perfumes has been grateful to man. Only in a very modified sense are perfumes true disinfecters. Perhaps I can best illustrate my meaning by two quotations from the "Odyssey," which will explain to you what a deodorizer is and what a disinfectant is. You recollect that when Eidothea aided Menelaus and his three companions to circumvent her father, the old sea-god, she flayed four seals and dressed them in their hides, so that the sea-god might mistake them for part of his sea-flock. Menelaus, however, groans under the disguise of these odorous garments as follows:—

> "Dire was the ambush and the stench severe,
> Who could a rank sea-beast at such close quarters bear?
> But she delivering us a great help planned,
> And placed Ambrosia near the lips of each,
> Which in our nostrils breathed an odour bland,
> And the sea-monster's stench did overreach."

It is clear that Eidothea was a deodorizor. She did not understand disinfection. Ulysses, however, did; for after his terrible slaughter of the many suitors of Penelope, he used an excellent disinfectant. We read,—

> "'Bring sulphur straight, and fire,' the monarch cries.
> She hears, and at the word obedient flies.
> With fire and sulphur, cure of noxious fumes,
> He purged the walls and blood-polluted rooms."

In this case sulphurous acid was produced, and it is an effectual disinfectant. It causes the liberation of ozone by uniting with antozone, and the former battles with the putrid odours and destroys them.

Now, when we consider disinfectants, we divide them into two classes: first, those substances which act as ozone does—by destroying, or burning, or oxidising the organic matter, which is the way in which ozone acts; and second, those which act by preventing putridity, or preventing putrefaction taking place, do not allow decay to go on.

We will take the first action. I will illustrate this by the action of the soil on putrid matter.