Society would now, no doubt, call them both "cranks." But observe what their thought has grown into through these hundreds of years, and with which our university boys have to wrestle.

Well, the air, as you know, cannot be seen. You cannot take hold of it; and yet you may experience its resistance as it enters upon different degrees of motion, while you are at rest, or *vice versa*. Some things will float *in* it; hail, snow and rain fall out of it, water is drawn up into it. It does not always remain at the same temperature; and frequently very funny things happen on account of different parts of it being of different temperatures and densities at the same time. Some of these I will describe in future numbers. The air aids us in hearing, and seeing also. Now, these are physical qualities of the atmosphere. There are others, perhaps, not so evident. This air has weight; but can you take a portion of it and weigh it? *Yes; with the use of an air pump. But suppose you have a glass tube, sealed at the top, resting in a cup of mercury, and no air between the top of the mercury and the top of the tube, and you will find under certain conditions of temperature, etc., that the mercury will stand up in the tube thirty inches above the mercury which it communicates with in the cup. What keeps it from running out at the bottom? It is the air pressing upon the mercury that prevents it. Now, would it not have to press upon it with a force equal to the weight of the thirty inches of mercury? Whatever that thirty inches weighs, that will represent the pressure or weight of the atmosphere, and it is about fifteen pounds to the square inch at the earth's surface; higher up it does not weigh so much. What else is there to be said about air? Well, this invisible thing is a mixture of two gases. They are not chemically united into an atmosphere, but in this mixture retain their separate and individual properties. Were they chemically united they would form such as laughing gas, nitric oxide, and so on, not at all like air in effect. The air supports *combustion*, that is, will enable a great many things to *burn* in it, whereas were it not present the substance would not burn. Now, if you put a candle or a lamp into a vessel and take all the air out of it, the lamp will go out; or if you put a lamp into a large vessel where fresh air is not admitted it will also, in a short time, go out. You thus see that air is necessary for a flame, but whether all of it is, or only a part of it, is another question. In the second experiment, was the air all used up? No; there is something like air in the vessel yet that offers resistance, which under the tests of science is one of the gases composing the atmosphere, unaltered in its properties, and which is not able to continue the flame. Well, now, air was necessary. One part was not used, nor any portion of it, which we are able to prove, consequently the other part *was* necessary, and no portion of it will be found remaining. Now, the part, the gas, which supports combustion is called oxygen. It is invisible, but very active, readily uniting with nearly everything else in some proportion. The part that does not support combustion is called nitrogen, an invisible gas, not possessing very active properties, separating the particles of the oxygen, something as sand would sugar. This nitrogen does not hurt us, nor does it do us any particular good, beyond diluting the oxygen, for pure oxygen is too rich for us. Nitrogen is not a poison, but we would not be able to live in it only, neither could we live in pure oxygen—we could not stand such high living. Now, the air contains about four times as much of that which does not support a flame as of that which does. Well, that is strange. Why not give them even chances? Let us see. We can obtain pure oxygen without nitrogen in it. Suppose that you have a quantity of it into which you introduce your lighted candle. The flame will burn very much more brightly. Put burning sulphur or phosporus in and you will have a flame as brilliant as the electric light. You may even take a steel watch spring with sulphur burning on the end, and the oxygen will burn up that steel completely. Now, how would you like to breathe pure oxygen?

If we try the same experiments on human beings, or anything having animal life, as we did with the candle, we will find similar re-

*Weigh a globe full, exhaust the air and weigh the globe.