It is true that every plant has these kind of matter: one somewhat like starch, and the other nearly similar to gluten. Now this starch—the one portion of organic matter—consists of three elementary substances. In this part of the country (in the north of England)it is hardly necessary for me, for the instructing of the inhabitants of the town, to make them acquainted with these three elementary substances; but I do it at the request of the council, and I shall, therefore, for a moment or two draw your attention to them. Gluten, then, consists of carbon, hydrogen, and oxygen. Of these t ree substances, the first of them, carbon, is most familiar to you under the name of charcoal. This black charcoal which you see here is carbon, with a very trifling foreign mixture. The next two substances consist of different kinds of air. Now, it is impossible for us, by the senses, to perceive the difference of these two kinds of air—oxygen and hydrogen. But it is very fortunate that we are not bound by our senses, that we possess intellect, which can discover what the senses cannot, and hy the application of which the Deity has enabled us to make discoveries which twenty senses would never do. Now, I take this simple instrument, this lighted taper, and place it in the bottle containing hydrogen; the taper is extinguished, and the hydrogen takes fire and burns. If I put the taper into this other vessel containing oxygen, we perceive at once the difference between these two elementary substances, which our senses would not enable us to do. The taper does not refuse to burn; on the contrary, it burns with far more brilliancy than in common air. Now, of these three substances—of these two gases, hydrogen and oxygen, and of carbon —this charcoal, this starch, exists in all the vegetables you reap; in all the vegetable food which is used for the support of our bodies, there exists a large proportion of those snbstances which consist of those three elements only. But I have told you there exists in all vegetables a substance called gluten. Now this gluten—besides the three things to which I have called your attention—contains a fourth called "nitrogen," and a very small quantity of sulphur and phosphorus. Now the senses of sight and smell will not tell you that this is anything but common air. The same little instrument which we used before, however enables me to tell you that there is something besides common air, and oxygen, and hydrogen. When I put in the taper, it is extinguished as it was in hydrogen; but you will recollect the hydrogen took fire: this does not. Here, then there is a clear distinction between hydrogen, and oxygen, and nitrogen. Now these four—carbon, hydrogen, oxygen, and nitrogen—with a little sulphur and phosphorous, exist in all plants; and also in all plants, I must beg of you to remember as a point which before I close, will be of great importance, there is a sub ance called "gluten," or some substance which r..embles it in containing nitrogen. I now come to the inorganic matter or ash. What does this ash consist of? Potash, soda, lime, magnesia, oxide of iron, manganese, phosphoric acid, sulphuric acid, chlorine, and silica. Now it would require a whole lecture to explain the properties of these ingredients of the ash, and I will not, therefore attempt to do so: with most of them you are familiarly acquainted, as the common pearl ash, the soda, and lime; oxide of iron is the rust of iron, and oxide of manganese is very like the oxide of iron; phosphoric acid is the substance called phosphorous, which I hold in my hand, and which commonly ignites when placed against a piece of warm iron; the sulphuric acid is the common oil of vitriol; chlorine and silica are the two remaining ingredients of the ash which I mentioned. Now these exist in all plants; and having explained that to you, et me tell you further, that every plant you grow obtains a certain portion of its substance from the soil and a part from the air. Now the substance which is got from the air all plants may get, although I do not say that they always do; but the substances out of which is formed gluten are got from the soil. I have now explained what a plant consists of, and where it gets the substance of which it does consist; and allow me to tell you that the plant lives on its food as we do (laughter and applause). It draws its food from the air and the soil, and that which it draws from the soil must contain those things which form gluten. If, gentlemen, the soil contains the whole of these things, then it is naturally productive; if it does not contain them, it is not a naturally productive soil. We must then add those things of which the soil is deficient, and those things which it does not contain at all (applause). This is the way in which I wish you to act. In feeding your stock you give them plenty of that food which you know is good for them, and if you give them plenty of good food you know that they will grow fat and large, if not they are starved and stunted (Hear, hear). Now you must just do the same to your crops (laughter and applause). You must put plenty of suitable food in the soil; previous care being taken to know what is required (loud applause). Now, gentlemen, I come to the other division—to another question which here arises. If these be the ways in which manures act, and if their action is of so great consequence to the crops, you will naturally ask in what way the manuring can be more generally secured throughout the country (Hear hear). In what way can it be more generally adopted, introduced, and practised? In the first place, many of you are aware, as was remarked by a gentleman who came in the railway with me yesterday, that a great and unnecessary waste takes place in the farm-yard, and in the management of the farm generally (Hear, hear). We find a ready method by which a high manuring can be secured, in the adoption of means for husbanding what is not allowed to run to waste. I know there are persons here who understand this part of the subject much better than I do, and will be better able than I am to direct your attention to it; but if you refer to the table exhibited you will see the composition of the liquid part which runs away in the first place from the byers in which the cattle are kept, and secondly from the manure heap itself. You will see that whilst the liquid manure contains phosphoric acid, and that the liquid that runs away from the dung heap contains phosphoric acid; therefore, there is not only a loss of the liquid, but also of the liquid which is allowed to run from the dung heap and go to waste. This is a point, however, to which I hope some other person will draw your attention. Then there is another method by which high manuring may be secured, and that is by saving the waste of our large towns. You all know what the waste of large towns consists of, and that the waste of large towns such as Newcastle and London can be collected and applied to the land, and you know that a much larger amount of corn would be produced from the land to which that manure is so applied. That is a point to which I will but briefly allude. It is one surrounded by great difficulties. There is, first, the difficulty of collecting this; and then there is another difficulty to which scientific men have not turned their attention, namely, how it is to be disposed of? You must not only collect the substance, but you must find a market for it. You know very well that the manure of London is purchased at the mouth of the Tyne for a shilling a ton; and the waste of Newcastle