

that which is so constantly under our notice. Some gentlemen have got an idea that animals have a mysterious power—of what nature it is impossible to say, but they imagine that it really exists—a mysterious power, by means of which they can change a turnip, or a quantity of oats or greens, into a superior manure for land; and that food must have passed through the animal before it can be really useful on the land. That is the idea entertained on this subject by ninety-five farmers out of a hundred. I must proceed this evening to disabuse your mind of that erroneous notion; I must inform you that the manure obtained from animals is always dependant, as regards its value, on the food, which the animal eats; and that the excrements of animals are always less valuable, and less powerful in manuring principles, than is the food consumed by those animals whilst producing the manure; that green food, ploughed into the land, will give more manure to the land than the food eaten by animals. Not that I would recommend you, as a rule, to plough in your vegetables; but I wish you to remember that your sheep can deposit nothing on the land but what they have first received from the food; and that, under all circumstances, the amount deposited will be less than that received. Now let us look a little at this point. You know that in one of our ordinary fire-places, when coals are put in the grate and a light is applied to them, an action takes place which makes the air above differ from that below the fire; without any mention of the name of a single chemical element, you have only to apply your plain common-sense in order to be aware that an action takes place between the air and the coals, producing heat, and that the air above the coals (in the chimney) is very different from the air below the coals, which enters at the grate. Now you give an animal a certain amount of food; that food is taken into the system; the constant action of the lungs, which inspire and expire the air, has the effect of bringing into the system a large amount of air. This air acts upon the food which is taken into the system. By the combustion or burning of a certain amount of that food animal heat is produced, which keeps up the temperature of the animals, so that they get a higher temperature than the surrounding atmosphere. The expired air contains the result of that combustion, and resembles in composition the air of the chimney; another portion of food not used for producing animal heat is laid upon the bones, forming muscle, or fat; and what the bullock itself has no use for, is cast out of the system. Now, you observe at once that the animal, by acting in this way on the food, actually deprives it of certain constituents, and at the same time makes it less in amount; so that, in fact, the only real action is one which takes away certain portions of the food and renders the others more quickly soluble. All the

soluble parts of the food are passed out in the urine, and all the insoluble parts in the excrements. There is a regular process performed in the laboratory of the stomach, the effect of which is what I have thus described. Now, the same thing takes place in the decomposition of vegetable matter. You lay down a large quantity of straw, and you let the water fall upon it, as well as the excrements of animals. You all know what takes place. The heap gradually heats, and this gradual heating is nothing more than the effect of the gradual action of the air upon it. Certain portions of the vegetable matter thus acted upon by the air are consumed and taken away, and the bulk becomes less; so that, even in the process of acting on vegetable matter, you lose a portion, and it goes off into the air, just in the same way as the solid parts of coals pass into the air by means of the chimney. You all know that the solid parts of coal disappear and leaves nothing but ash behind. The two cases are, in fact, identical. I may refer you to the case of a hay rick put up in too damp a state. In that instance, an immediate action takes place from the contact of the air with the moist hay, and that action continues increasing, until, at last, the whole bursts into a flame. Now, gentlemen, in either case, in the making of manure there is a diminution and a loss. You must have seen the reek going off from the dung-heap, and there are other circumstances which also disappear in the air which you cannot see. If what I have stated be true, you will draw the conclusion for yourselves, that vegetables ploughed at once into the land, furnish a greater amount of the substances adapted for the vegetation of plants than they would supply if passed through the stomachs of animals—that is to say, to give a plain, practical illustration of my meaning, if you chop up an acre of turnips, making them sufficiently small for decomposition, and plough that acre of turnips into the land, you will have more manure in the soil than if you fed a flock of sheep upon it, without the addition of oil-cake or any other extraneous manure. Again, take other green crops, such as rape, and plough them in, and you will have a larger amount of substances calculated to bring forth the next crop than if you passed that acre of rape through the bodies of animals. You may call this theory, gentlemen; but it is absolute fact; there is no theory about it. It has been tested by practical men, and I will give you one or two instances. A gentleman heard me make this statement when I was lecturing at Maidenhead—and let me remark that the gentlemen who composed my audience on that occasion were not quite so decorous as you gentlemen have shown yourselves this evening; for I heard some of them call what I said “gammon” (laughter). Now, notwithstanding its being “gammon” a certain gentleman determined to try whether or not the