remain days, weeks, months, or years. The manuscripts of Herculaneum were written with carbonaceous ink, and there they have been for 1800 years or more, not having been at all changed by the atmosphere, though coming under various circumstances in contact with it. Now, what is is the circumstance which makes the lead and carbon differ in this respect? It is a striking thing to see that the matter which is appointed to serve the purpose of fuel *waits* in its action; it does not start off burning, like the lead and many other things that I could show you, but which I have not encumbered the table with; but it waits for action. This waiting is a curious and wonderful thing. Candles—those Japanese candles, for instance—do not start into action at once like the lead or iron (for iron finely divided does the same thing as lead), but there they wait for years, perhaps for ages, without undergoing any alteration. I have here a supply of coal-gas. The jet is giving forth the gas, but you see it does not take fire—it comes out into the air, but it waits till it is hot enough before it burns. If I make it hot enough it takes fire. If I blow it out the gas that is issuing forth waits till the light is applied to it again. It is curious to see how different substances wait—how some will wait till the temperature is raised a little, and others till it is raised a good deal. I have here a little gunpowder and some gun-cotton; even these differ in the conditions under whcih they will burn. The gunpowder is composed of carbon and other substances, making it highly combustible; and the gun-cotton is another combustible preparation. They are both waiting, but they will start into activity at different degrees of heat, or under different conditions. By applying a heated wire to them we shall see which will start first [touching the gun-cotton with the hot iron]. You see the gun cotton has gone off, but not even the hottest part of the wire is now hot enough to fire the gunpowder. How beautifully that shows you the difference in the degree in which bodies act in this way. In the one case the substance will wait any time until the associated bodies are made active by heat; but, in the other, as in the process of respiration, it waits no time. In the lungs, as soon as the air enters, it unites with the carbon, even in the lowest temperature which the body can bear short of being frozen, the action begins at once, producing the carbonic acid of respiration; and so all things go on fitly and properly. Thus you see the analogy between respiration and combustion is rendered still more beautiful and striking. Indeed, all I can say to you at the end of these Lectures (for we must come to an end at one time or other) is to express a wish that you may, in your generation, be fit to compare to a candle; that you may, like it, shine as lights to those about you; that, in all your actions, you may justify the beauty of the taper by making your deeds honourable and effectual in the discharge of your duty to your fellow-men.

NITROGENOUS, NUTRITIOUS, OR FLESH-FORMING SUBSTANCES USED AS FOOD.

In the tissues of all plants a substance is found which was known to chemists under the names of gluten, legumin, diastase, zymome, &c. These substances were found by Mulder to yield, by the action of potash and acetic acid, a precipitate, which he called protein, and which he also obtained from the animal substances knows as albumen, fibrine, caseine, &c. By this discovery it was demonstrated that the source of the substances forming the flesh of animals is the protein of plants. Whether it occurs in animals or plants, it may be divided for practical purposes into three forms—albumen, fibrine, and caseine.

Albumen is found in plants, in the juice of cabbages, asparagus, chesnuts, wheat, rye, &c.; in animals, in the blood, nerves, and the white of eggs.

Fibrine is found in plants, in wheat, barley, oats, rye, &c.; in animals, in their muscular tissue or flesh.

Caseine is found in plants, in peas, beans, lentils, and the seeds of all *Leguminosæ*; in animals, almost exclusively in the milk of the mammalia.

Flesh-formers in Food.

All the organs of the body contain the four elements, *Carbon*, *Hydrogen*, *Nitrogen*, and *Oxygen*: and no ingredients of food can be of use in building up the wasted parts of the body unless these four elements are present. The nutritive or flesh-forming parts of food are Fibrin, Albumen, and Casein: they contain the four elements in exactly the same proportions, and are found both in vegetable and in animal food. Fibrin may be got either by stirring fresh-drawn blood, or from the juice of a cauliflower; Albumen or white of egg from eggs, from cabbage juice, or from flour. Casein or Cheese exists more abundantly in peas and beans than it does in milk itself. Fibrin, Albumen, and Casein, whether they are got from vegetable or animal bodies, have the same composition as dried flesh and blood. The growth and support of an animal is now easily explained: when a flesh-eater, like the tiger, lives on the flesh of another animal, it eats, in a chemical point of view, the substance of its own body, and requires only to give it a new place and form. When a child receives its mother's milk, it does the same thing, eating in fact its mother, and giving her flesh a new place and form in its own body. The nutrition of vegetable feeders is precisely the same: they find in Vegetable Fibrin, Albumen, and Casein the substance of their flesh and blood actually formed, and have only to give it a place and position within their bodies. Vegetables are the true makers of flesh: animals only arrange the flesh which they find ready formed in vegetables. The *nutritive* value of food depends upon its richness in flesh-forming matter. An adult man, in vigor, wastes five ounces of dry flesh daily, and requires the same amount of flesh formers in his food.

The bodies which form the basis of flesh, or any other organized part, are included under the popular name of "Flesh-formers;" although in reality, besides these, water, fat, and mineral matter are found in flesh, and are, in one sense, necessary to its formation. A piece of clean muscular fibre, or dry blood, free from water, fat, and mineral matter, has the same composition as either Albumen, Fibrin, or Casein, whether they are obtained from substances of Vegetable or Animal origin. 100 parts contain:—

Carbon	54.0
Hydrogen	7.0
Nitrogen	15.5
Oxygen	23.5

1. Albumen, made from eggs and from blood. It forms about 7 parts in 100 of blood, and is always