example of the former class take a buttercup. It may be separated into parts: the roots, the stem, the leaves, the flower, even the parts of the flower; but it takes them all combined to make a perfect specimen. It has organs, each with a peculiar form and separate function, and it must have or have had life. This is what is meant by organic. When compared with an inorganic substance, how great the difference? Take a piece of limestone. It may be broken into many pieces. Examine each with care. Each is as perfect a specimen as the original piece.

Organic matter occurs as animal and vegetable. They have life, or have had at some time in their existence. Plants and animals seem so unlike that it may be profitable to examine their points in common. They have life—they have a birth or origin from a parent similar to the individual—they have the power to produce like offspring—and they die. These changes are peculiar to all organic things—and the consideration of how they occur is the field of Physiology.

Plants occupy an intermediate place in the economy of Nature between the mineral and the animal kingdoms. They build up the food of animals from mineral sources. The greater part, if not all, of the animal creation would die of starvation if there were no vegetation for them to feed on either directly or indirectly.

The food of man, the highest animal, is almost all either of vegetable origin or the flesh of plant-eating animals. The mineral substances used directly as food are few and, with two exceptions, they are used in minute quantities. The exceptions are water and oxygen.

Some chemistry must be brought in here, for every plant is a chemist, and every leaf a laboratory in which combinations are made that man finds it only possible to imitate in a very poor fashion, and then only with the aid of such powerful agents as electricity.

The following is a short scheme of the cycle of food production for animals and plants. (I am indebted to Prof. C. F. Chandler, of Columbia College, for this outline.):

Plants produce and animals consume	*Animals produce and plants consume*
O	$C O_2$
Vegetable Principals:	$H_2 O$
Starches.	$H N_3$
Sugars.	Salts.
Vegetable Fats.	
" Albumins	

When the chemical formulæ of these products of plant life are examined it becomes plain that the plants are the builders. They unite simple groups of atoms into more compound molecules. This is shown in the formation of starch, the simplest of the above vegetable principals. It is made by the union by the plant of water and carbonic acid gas. This equation will show about what is done:

$$6\,C O_2 + 5\,H_2 O = C_6 H_{10} O_5 + O_{12}$$

or, in plain English six molecules of carbonic acid gas ($C O_2$) plus five molecules of water ($H_2 O$) equals one molecule of starch ($C_6 H_{10} O_5$) plus twelve atoms of oxygen (O_{12}). This is a chemical equation, and like algebraic equations, the two sides must balance for it to be true.

Examination of the equation shows the transfer of the O_2 from the $C O_2$, and that its place is taken by $H_2 O$; but to make the combining proportion requires six of the $C O_2$ and five of the water. The right side of the equation gives the result of the chemical action that has taken place. In the present case our little chemist has made starch and oxygen, two excellent foods for man: the latter an absolute necessity. A noted chemist has estimated that more than all the present volume of oxygen in our atmosphere has been consumed by the animal life known to have been on the earth in historic time. The plants must have been the agents to replace this enormous amount. It is well to remember that *consumed* does not mean *destroyed*. It is only lost as oxygen for the time, because it is in