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IMAGINATION OVER KNOWLEDGE

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Leaf Green And Sunbeam

But the earth broth which the roots supply is not the only article of importance in the plant's bill of fare. The air about us holds one thing that every plant needs as food.

This air is a mixture of several things. Just as the tea we drink is a mixture of tea and water, and milk and sugar, so the air is a mixture of oxygen and nitrogen, and water and carbonic-acid gas.

Oxygen, nitrogen, and carbonic-acid gas,—each one of these three things that help to make the air is what we call a gas, and one of these gases is made of two things. Carbonic-acid gas is made of oxygen and carbon. Now, carbon is the food which is needed by every plant. But the carbon in the air is held tightly in the grasp of the oxygen, with which it makes the gas called carbonic-acid gas.

To get possession of this carbon, the plant must contrive to break up the gas, and then to seize and keep by force the carbon.

This seems like a rather difficult performance, does it not? For when a gas is made of two different things, you can be pretty sure that these keep a firm hold on each other, and that it is not altogether easy to tear them apart.

Now, how does the plant meet this difficulty?

You cannot guess by yourselves how this is done, so I must tell you the whole story.

Certain cells in the plant are trained from birth for this special work,—the work of getting possession of the carbon needed for plant food.

These little cells take in the carbonic-acid gas from the air; then they break it up,

tearing the carbon from the close embrace of the oxygen, pushing the oxygen back into the air it came from, and turning the carbon over to the plant to be stored away till needed as food.

Only certain cells can do this special piece of work.

Only the cells which hold the green substance that colors the leaf can tear apart carbonic-acid gas. Every little cell which holds a bit of this leaf green devotes itself to separating the carbon from the oxygen.

Why this special power lies in a tiny speck of leaf green we do not know. We only know that a cell without such an occupant is quite unable to break up carbonic-acid gas.

But even the bit of leaf green in a tiny cell needs some help in its task. What aid does it call in, do you suppose, when it works to wrench apart the gas?

In this work the partner of the bit of leaf green is nothing more or less than a sunbeam. Without the aid



of a sunbeam, the imprisoned leaf green is as helpless to steal the carbon as you or I would be.

It sounds a good deal like a fairy story, does it not,—this story of Leaf Green and Sunbeam?

Charcoal is made of carbon. About one half of every plant is carbon.

The coal we burn in our fireplaces is the carbon left upon the earth by plants that lived and died thousands of years ago. It is the carbon that Leaf Green and Sunbeam together stole from the air, and turned over into the plant.

If one looks at a piece of coal with the eyes which one keeps for the little picture gallery all children carry in their heads, one sees more than just a shining, black lump. One sees a plant that grew upon the earth thousands of years ago, with its bright green leaves dancing in the sunlight; for without those green leaves and that sunlight, there could be no coal for burning to-day. And when we light our coal fire, what we really do is to set free the sunbeams that worked their way so long ago into the plant cells.

It is more like a fairy story than ever. Sunbeam is the noble knight who fought his way into the cell where Leaf Green lay imprisoned, doomed to perform a task which was beyond her power. But with the aid of the noble Sunbeam, she did this piece of work, and then both fell asleep, and slept for a thousand years.

Awakening at last, together they made their joyful escape in the flame that leaps from out the black coal.

In truth, a sunbeam and a flame are not so unlike as to make this story as improbable as many others that we read.

And because I have told it to you in the shape of a fairy story, you must not think it is not true. It is indeed true. Everywhere in the sunshiny woods and fields of summer, the story of Leaf Green and Sunbeam is being lived. But when the day is cloudy or the sun sets, then there is no Sunbeam to help the Princess, and then no carbon is stolen from the air.