Nature and Science Reader Book 3

Surprises

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Surprises

by

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A LETTER TO THE BOYS AND GIRLS

Dear Boys and Girls:

There are thirty-nine chapters in this book. Besides these chapters, there are many science games.

Sometimes people who write books for children tell them how to study the books. We think you will not need to be told. We think, when one of you reads a chapter, you will say, "Now I shall try to see for myself everything this chapter tells about." And when you have read about the science games, we think you will play as many of them as you can.

In this book we have told you as many interesting facts as there seemed to be room for in thirty-nine chapters. Every fact may surprise you when you first learn about it. You may say, "I never knew why the cotton plant needs fibers to use!" after you read the chapter that begins on page 1. Perhaps you will say, "I never guessed that spider silk could be made into cloth!" after you have read page 37.

Here is something for you to remember. All the facts and surprises in this book are outside the book, too. Of course they had to be in the world outside before they could be found and put into a book.

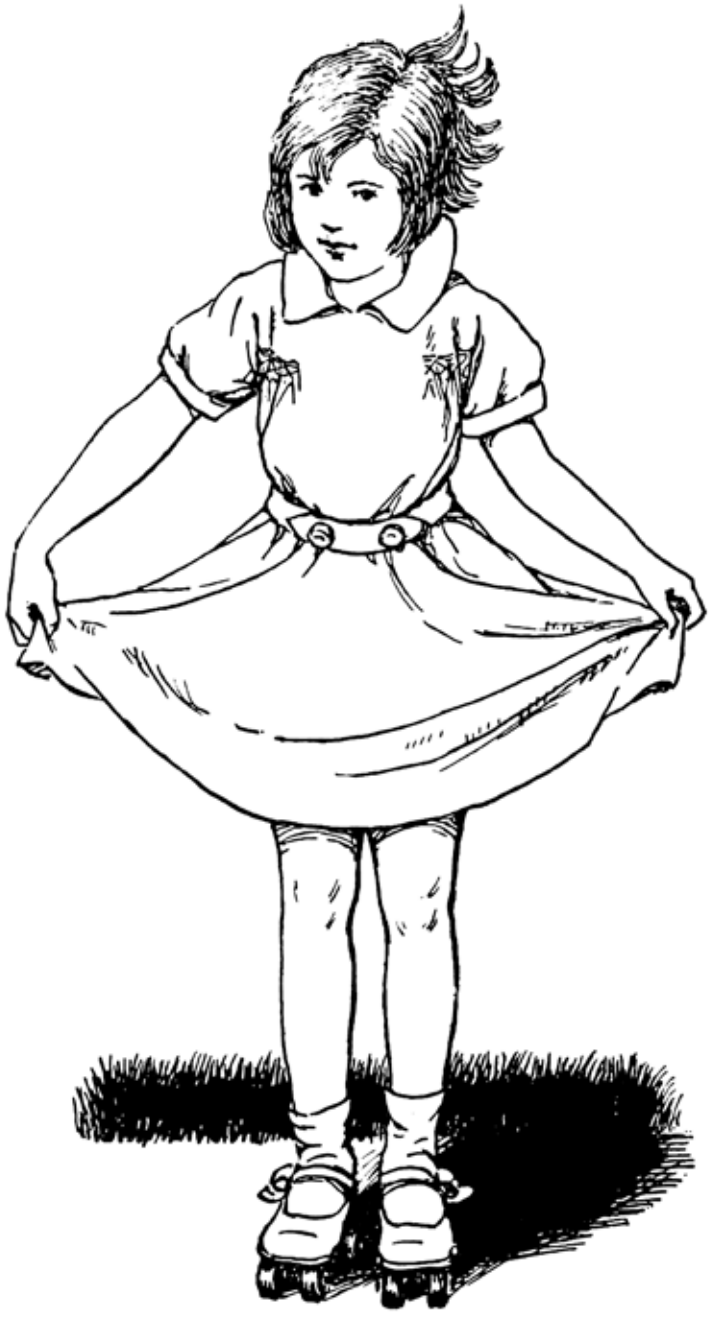
Perhaps, by the time you have read all the chapters and played all the science games, you will have a very good habit. You may have the habit of looking at things in the world outside books and trying to learn about them, too. But perhaps you have that habit already. Many boys and girls have.

So, instead of telling you how to study these chapters, we shall just wish you many good science hunts, both inside this book and outside it. We hope, too, you may have many pleasant surprises.

Your friends,

EDITH M. PATCH

HARRISON E. HOWE



A SUMMER DRESS

1. COTTON FIBERS

Before Ruth could have her everyday dress to wear, it had to be cut from cloth and sewed.

Before the cloth could be cut and sewed, it had to be woven from threads.

Before the threads could be woven into cloth, they had to be spun from fibers.

And before the fibers could be spun into threads, they had to grow on cotton plants.

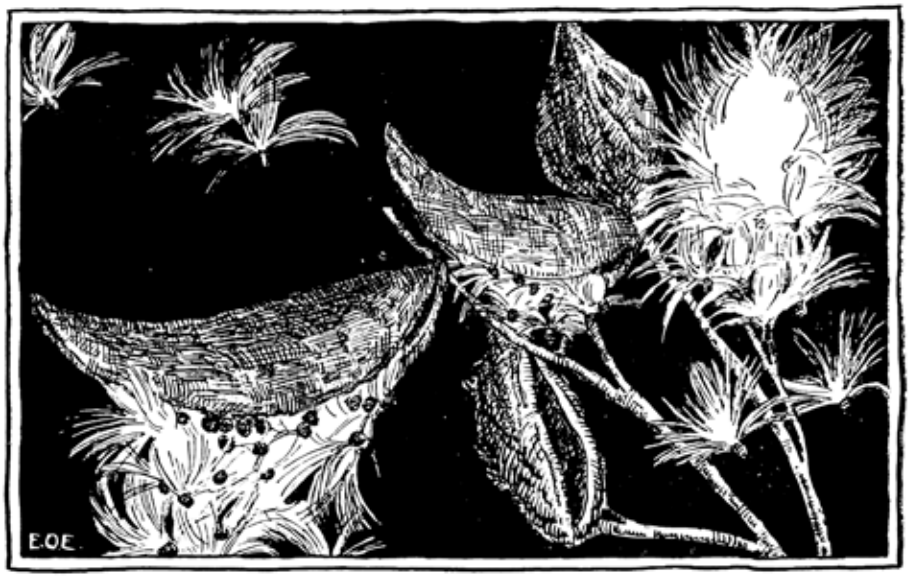
So Ruth liked to say, “Once upon a time this cotton dress was growing on some plants.”

The cotton plants, of course, had no need of dresses. They had other uses for their fibers.

Dandelion Seeds with Fibers

Did you ever see a dandelion plant after the yellow blossom head had grown into a white seed head? Did you blow some of the seeds with your breath and watch them move away in the air?

Did you ever find a milkweed plant when the seed pods were ripe and open? Did you notice how the seeds came out of

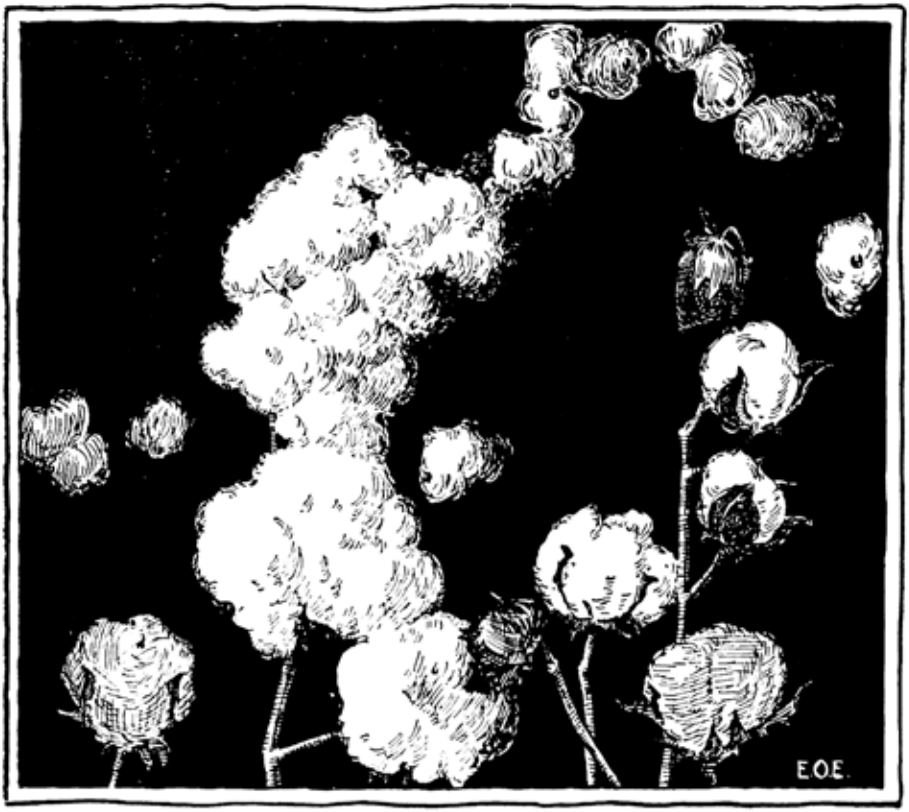


Milkweed Seeds with Fibers

the pods and sailed far out of sight with the wind?

Dandelions and milkweeds and many other plants have seeds with little fine fibers on them. The fibers act like tiny

sails. With the help of these sails, the seeds travel in the air for a while. In that way they go to new places before they settle down and start to grow.



Cotton Seeds with Fibers

Can you think, now, what use a cotton plant may have for its fine white fibers?

If you guess that the fibers are sails for their seeds, you will be right.

Cotton seeds grow in pods. There are many seeds in one pod. The pods open when the seeds are ripe. Then the fluffy fibers are taken into the air by the wind and go off with the seeds that are hitched to them.

There was a time when people did not know how to make cloth with cotton fibers. In those days all the cotton plants grew in hot countries.

In such places cotton plants live from year to year. Some kinds grow to be trees or large shrubs. There is no cold weather to kill them.

But long ago people learned how to use cotton fibers. Then men living in cooler countries obtained seeds and grew these useful plants.

In cooler places, however, cotton cannot live in winter. So the seeds must be planted each year.

There are many places in the southern part of the United States where cotton can grow in summer. The summer is so long that the plants can grow and blossom and have ripe seeds each year.

But in the North the summers are too short for the seeds of these plants to ripen.

Ruth said, "If I lived in the South, perhaps I could see just how the cotton looks before it is spun into threads and made into cloth."

Courtesy U. S. Dept. of Agriculture

Cotton Plant

2. BLUE DYE

Cotton fibers are white and Ruth's cotton dress was blue. So Ruth knew that the cloth had been dyed. But she did not know where the dye came from. Do you?

The name of the blue dye is indigo. There are different kinds of plants from which this blue color can be taken. They grow in many countries.

But the indigo plants from which most blue dye has been made grow in India. There was a time when indigo plants grew on more than a million acres of land in India.

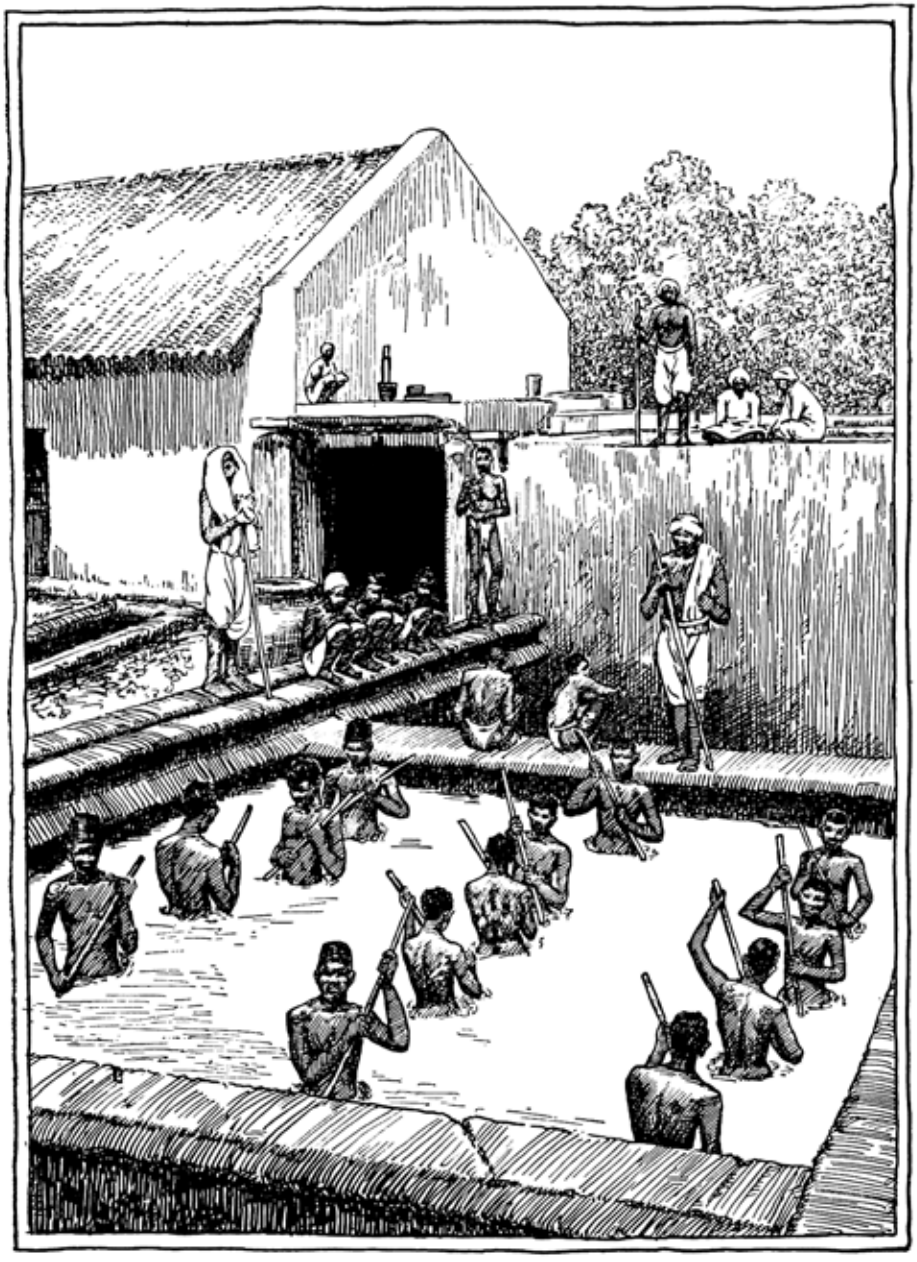
Do you know how a pea plant looks? Have you seen what sort of leaves and flowers and seed pods it has?

Did you ever see sweet peas growing? Did you notice the leaves and the pods that held the little pea-like seeds?

Indigo plants have leaves shaped somewhat like those of sweet pea plants. Their seeds grow in much the same sort of pods. Their blossoms, though much smaller, have somewhat the same shape.

There is a good reason why peas and sweet peas and indigo plants should have leaves and flowers and seed pods that are somewhat alike. They all belong to the same family of plants.

At first the people of India had no machinery to help them make indigo



A BEATING VAT

dye. They cut the plants by hand with knives. Then they put them into great vats. There the plants were covered with water.

Later the men let the water and plant juice run into lower vats, called beating vats. The men stood in the vats and beat the liquid with paddles. This was the way they mixed air with the liquid.

There was more blue color in the liquid after it was beaten and mixed with air. It colored the legs of the men who were working in the vats.

After a while the indigo coloring stuff sank to the bottom of the vats. Then it was taken and dried and made into little cakes of dye.

Ruth's grandmother and her grandmother's mother had had blue cotton dresses. These dresses were dyed with indigo that came from indigo plants. In those days that was the best kind of blue dye.

But now people can get dye in a different way. They have learned how to make indigo in factories. When they do this, they start with coal tar.

Coal tar is black. It is thicker and stickier than molasses. It has a very bad smell. It is a poison.

Many useful things are made from this ugly, black, sticky poison.

Men boil the coal tar and change it in

different ways. And after a while it is not coal tar any more. It has been changed so that it is something else.

Fragrant perfumes and certain good-tasting harmless flavors are made from coal tar. Beautiful dyes are made from it, too. And some of these dyes are blue indigo.

The indigo from coal tar that was used to dye Ruth's dress gave it a lovely color. It was, indeed, lovelier than the indigo blue in her grandmother's dress.

For men can make more shades of blue now than they could a long time ago. So Ruth could choose the dark shade or the light shade that she liked best of all.

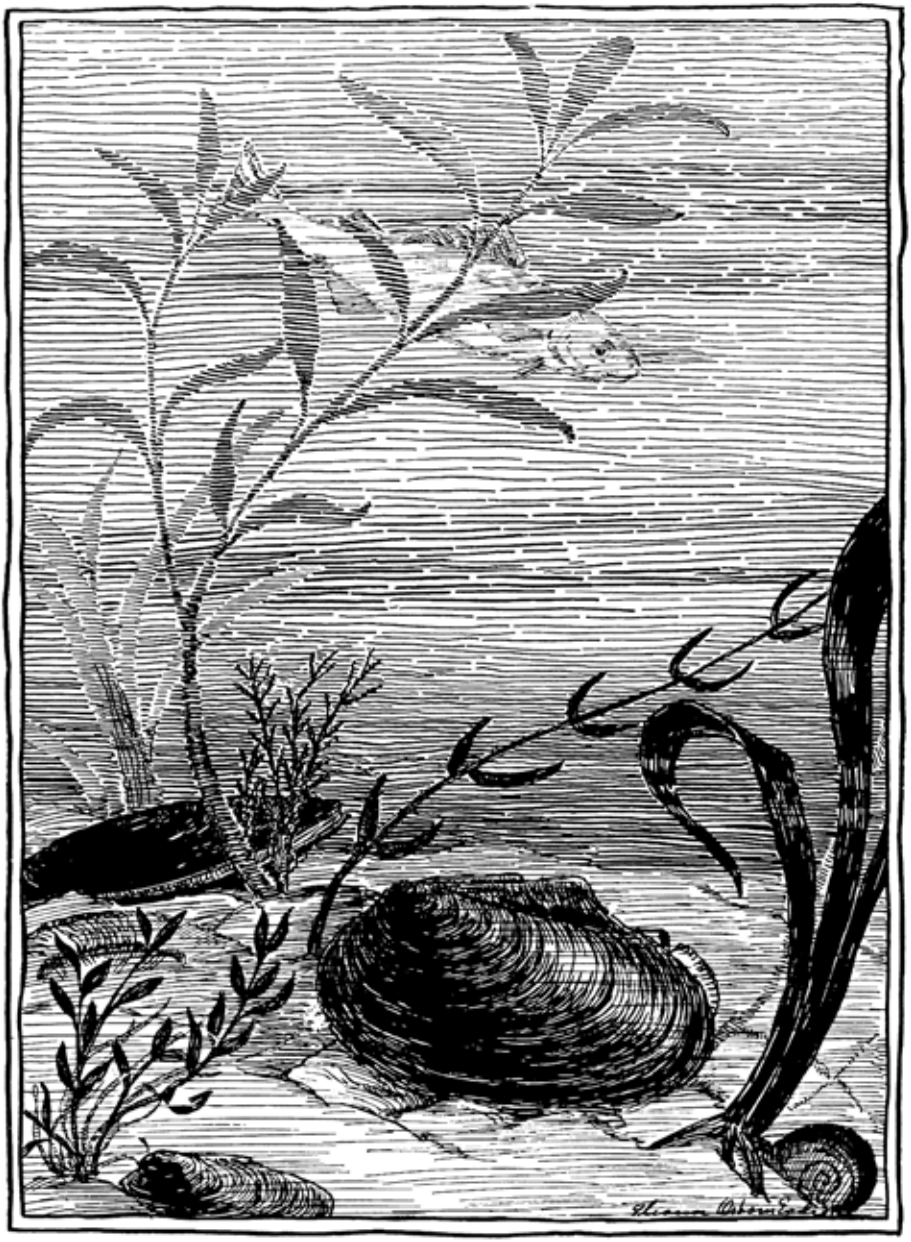
3. BUTTON, BUTTON

Who has the button? Well, Ruth has it now. It is the large, pretty, white one on the belt of her blue dress.

Once, however, it belonged to a little animal that lived in the muddy bed of a big river. Of course, it was not a button then. It was a part of the animal's shell. This animal that lived in the river mud was a mussel.

Mussels are related to oysters and clams. The bodies of these animals are nearly alike.

Each of these animals has a shell in two halves. There is a hinge at one edge of the halves. So the shell can open and shut.



Fresh-water mussels