THE CLOTHES WE WEAR

JOURNEY CLUB TRAVELS

CARPENTER
The Journey Club meets
PREFACE

The Clothes We Wear is one of the "Journey Club Travels," a series of industrial readers on food, clothing, and shelter, designed for the use of pupils in the lower grades of the elementary schools.

The children organize a Journey Club to take trips to various parts of the world to find out about the foods they eat, the clothes they wear, and the houses they live in. The investigations are made by the children themselves and the text is the story of their personal observations. They arrange a Museum to hold the interesting things they collect on these travels.

In The Clothes We Wear, the children take their Journey Club travels to see for themselves how their clothes are produced. Their motto is "to find out," and in the course of their journeys, they learn not only the basic facts about clothing, but also the primary features of transportation and commerce.

The book is based on the latest educational ideas of child-interest and vitalized experience. The plan is developed through a series of industrial projects in which the personal element is brought out in every conceivable way. The subjects are presented as a series of adventures and discoveries rather than as lessons. The children themselves walk through the cotton fields and talk with the planter. They follow the bolls through the gins and visit a mill where they learn every step in the process of cloth making. Trips through Belgium and Ireland show how linen is obtained, and a western boy tells them of life on a sheep ranch. They study woolen cloth through a moving picture of a woolen mill, and in Japan they see how silkworms are raised.

One of the Journey Club girls
shows how she knits sweaters and the grandmother of one of the boys tells stories of knitting machines and the things they make. The children themselves dye Easter eggs and squares of cloth for their Museum, and learn about the dyeing industry from a boy who has visited a German dye-works. They take a trip through a ready-made clothing factory in Chicago, and visit girls in Belgium and Italy to study lace making.

At the home of a shoe collector they try on shoes from all parts of the world, and follow this with excursions through a tannery and a shoe factory. They spend a day in Gloversville to learn about gloves, and have exciting adventures with an Indian in the Canadian woods. There they see the fur-bearing animals, learn how they are trapped, and later go with the raw pelts to the fur factories of New York. By radio they hear the story of the fur seal of the Pribiloff Islands. They make crude rubber in the jungles of Brazil and see rubber growing on a plantation in Malaysia, and they talk with a rubber manufacturer on the steamer coming home. They give a play for their friends which tells the stories of the precious metals and stones used for jewelry.

At the close of their travels, the Journey Club members go with a boy from the country to buy clothes in a big department store where they learn how their clothing is brought within their reach. Throughout the book, transportation and commerce are emphasized, as is also the interdependence of peoples.

Every effort is made to stimulate the imagination of the pupil. Certain of the Journey Club members are mentioned by name throughout the series, and a striking feature of the books is the fact that photographs of these same children are used in illustrating each different subject. This makes the Journey Club live for the child-reader, and carries out the illusion of real trips made by real children. The idea of the Club and the Museum should be carried out as far as possible in the school room.

Some suggestions to teachers are given on pages 195–198.
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THE CLOTHES WE WEAR

CHAPTER 1

THE JOURNEY CLUB MEETS

Hurry up! Walk faster! The Journey Club is meeting to-day and we must not be late.

Do you belong to the Journey Club? Do you remember the wonderful times we have already had, traveling over the world to "find out" about the Foods We Eat?

What journeys we took! By train and by boat! We rode on horseback over the plains and even on camels out into the desert. None of us has forgotten our flights in huge aeroplanes and our many trips through the lands on the other side of the world. Our motto is to "find out" and we have already found out about the foods we eat every day. We saw how they are put up for our use and we followed them across land and sea to our stores.

We brought home from each trip many interesting things for our Journey Club Museum, which is kept here at Jack’s home. As we look at its treasures, we talk of our journeys and wish they had not been finished so soon. Then Bob’s voice rings out:

“Let us go off again and find out about the clothes we wear. My father says they come from all parts of the world, so that will give us a chance to take many more trips. He says that our clothing is almost as important to us as our food.”

And indeed, clothes are very important. Suppose we were cast away half-naked on a desert island, like Robinson Crusoe. Like him, we should first try to find food to keep us from starving. After that we should begin to look around for something to cover our shivering bodies. We
should hunt the wild animals for their skins, and gather some of the plants for their leaves or bark.

The beasts and the birds, the fishes, and all other animals except man do not have to seek clothing. They are protected by fur, feathers, or scales against rain and snow, heat and cold. They cannot reason like man and thus cannot plan to take care of themselves. So they must rely upon Nature to do that for them.

And how well old Mother Nature performs this task! She gives all birds and beasts the things they need. When the season is hot she changes their heavy winter coats for thinner ones, just as in summer we put on our light dresses and suits.

If you take a pussy-cat on your lap in the spring, you soon find yourself covered with her long winter hairs. They are dropping out to give place to her cooler coat of the summer. Edith says this is so with the horses and cows on her farm and Mary tells us her canary sheds its feathers, too. All animals which have fur

Our clothes come from all parts of the world
get two new suits every year, one in the spring and a thicker one in the fall.

Some of the wild beasts move northward as the hot weather comes on. Nature tells them when and where to go. She warns the birds also when the season is changing. We have all watched them flying south in the fall to escape the cold northern winter. It is in such ways as these that Mother Nature takes care of our animal friends.

How Strong-as-a-Lion Kept Warm

It is different with man. Nature has not given us the power to grow fur or feathers upon our thin skins. But she has given us the power to think, and so we have learned to make clothes for ourselves. Here is a story which tells how the first clothes may have been made.

Long, long ago, when the children lived with their shaggy-haired fathers and mothers in caves in the mountains, there was a boy whose name was—well, his name was just like a grunt. You see, the words they used then were much like the animal-talk of the bears and tigers in the forests. It sounded like "Oomp-a," though of course it could not have been that. It probably meant "Strong-as-a-Lion," for those were rough days and men had to be brave and strong to keep off the wild beasts.

Strong-as-a-Lion and the rest of his family had no clothes to wear. Their hair grew long but it did not cover their bodies like the fur of the beasts or the feathers of the birds. As the days grew colder and colder, the children began to shiver. When their father saw this, he wagged his great head and wrinkled his brow.

"Mother," he snarled in his gruff, grunt-y manner, "we have
got to do something to keep these children warm. They are not even so well cared for as the little lions and bears. We must think hard."

So Mother began to think too. She soon found a way, as all mothers do when their children need something. Said she:

"Why don't you take some of those nice warm furs away from the beasts, and make clothes for Oomp-a and the rest of our little ones?"

Strong-as-a-Lion’s father did so and that was the beginning of clothes.

When the cave families moved south into warmer weather, they took off their fur suits and made others of leaves to keep off the hot rays of the sun.

Each year after that, better and better ways were thought out. Strong-as-a-Lion’s grandchildren had much nicer clothing than his first little fur skin. At last it was found that cloth could be woven from the fibers of plants, and that wool and hair could be twisted to thread and turned into cloth.

How we should laugh at the clothes they wore then! They were coarse and rough. They had no buttons nor hooks, but were tied together with strings or pinned on with long sharppointed thorns.

Patience True and Her Homespun Dress

When our own great, great grandfathers were children, they had clothes more like our own. Patience True was a little girl who lived long ago, when there were only a few small settlements of people on the shores of North America. These settlements were called “Colonies” and those times are often spoken of as “Colonial” days. Patience was of about our own age. Most of her clothes were made right in her home. She often helped her mother turn the spinning wheel
which twisted out thread from the wool, flax, or cotton grown in the neighborhood.

Patience sometimes worked at the loom, a great wooden machine that stood in front of the fireplace and almost filled the room. Here she helped weave cloth from the thread they had spun. She was fond of bright colors and always begged to have her dresses red or blue. Her mother colored them with the dyes she had taken out of the juices of plants in the gardens or forests near by.

This cloth was called homespun for it was spun and woven at home. At that time, no one had ever heard of a sewing machine. Every stitch had to be put in by hand. It took a long time to spin, weave, dye, and make a dress for a girl or a suit for a boy.

Patience loved the days when the traveling shoemaker came to stay at her house. She liked to stand beside him and watch him as he cobbled shoes for her family. She brought him skins which her father had tanned, and asked him all sorts of questions as he cut out the boots and sewed or pegged on the soles.

Our Clothing To-day

We do not make such things by hand to-day. The spinning wheel has gone. None of us but Edith, who lives in the country, has ever seen one. The hand-weaver is rarely found now, and most of our clothes are made by machines, whirring around in great mills. Thread is spun by machinery, and cloth is woven on looms moved by steam or electricity. The visiting cobbler is no more. Our shoes are from factories where many hundreds of
paids are finished each day. Our hats, gloves, and stockings are the work of other machines. Some of us wear dresses and coats which were cut and sewed in other factories. These are "ready-made" clothes.

Children who live far away from stores often wear clothes made at home. But even these are sewed on sewing machines, which do the work many times faster than our great grandmothers could do it by hand.

Most of our own clothing is made in the United States. But the materials come from all parts of the world. We shall find out just where on our Journey Club trips. We shall see how they are prepared by our friends who live in those places. We shall also learn that the children of many far-away lands do not dress as we do.

Indeed, we may visit some people who wear almost no clothes. Such people are called savages, and they live in uncivilized countries. Their homes are rude huts, and their food may be fish or wild animals, or roots and plants.

But we shall find that civilized
men all wear some kind of clothing, although it is not always the same. We remember that Ikwa and Too-Kee, our Eskimo friends of the cold lands, wear clothes made of fur. Hassan and Hada play about on the warm desert sands in gowns of light cotton, and our Indian playmates, Little Wolf and Humming Bird, keep themselves warm with jackets of deerskin trimmed with birds’ feathers.

We shall see many ornaments. Every one of us likes pretty things, and we choose our clothes not only to cover our bodies but because they look well.

Where Our Clothes Come From

If our clothes could only tell us their stories, we should see how many, many parts of the world we must visit to find out about them. Bob’s coat was once wool on the back of a sheep in far-off Australia. Jack’s linen collar came from flax plants in Belgium. Mary’s dress is of cotton from one of our own Southern States, and Helen’s hair ribbon of silk was spun by tiny silkworms away out in Japan. Dick’s shoes and Paolo’s raincoat came from South America. The shoes were once part of the skin of a steer on the plains of Argentina, and the rubber raincoat was made from the juice of a rubber tree near the Amazon River.

As the Journey Club visits these far-away lands, we shall find that many of their people wear things that have come from right here at our homes. They have sent to the United States for this clothing. In return they help prepare other material to send back to us.

No one country has all the kinds of things it needs for its people. So each sells to the others
its own special products. Thus every one is helping the others to live more comfortably, and each is doing his share in the work of the world. This buying and selling is really trading. It is called Commerce.

Here at home, too, we help one another. The work of making our clothes requires many people. Some grow the materials. Others prepare cloth, rubber, and leather. Still others are kept busy turning these things into shoes, hats, dresses, and suits for us to wear.

But we shall find out about all this as we go on with our travels, here at home and from the far-away lands from whence our clothes come. If you have not done so before, will you not join the Journey Club now and come along with us?
CHAPTER 2

IN THE LAND OF COTTON

All aboard! The train is ready to start. We scramble into our places with much talking and laughing. The Journey Club is off on its first trip to "find out" about the clothes we wear.

It has not been hard to decide what we want to see first. There
is one thing that we use more than any other. This is cotton. Some one asks what we wear made of cotton, and Bob replies quickly:

"My shirt is cotton." Mary points to her pretty blue dress, and Edith cries out:

"Some stockings and underwear are cotton, too." Tom pulls out his cotton handkerchief, and

Jack says his summer clothes are of the same material, only thicker. Then Helen breaks in:

"We use cotton for other things than our clothes. Think of the sheets and pillow cases on all our beds! — the towels for our faces and hands, and the thread we need to make our clothes and sew on the buttons!"

So we easily see that we each use cotton in some way every day.

Where to go to find out about cotton — that was a great question. We might have chosen India or Egypt, or northern Mexico and some of the countries of South America. Cotton is grown also in Asia and several other warm parts of the world. But these lands are far off, and besides, none has much more than enough to supply its own needs. Many of them buy their cotton from us. The United States is the chief cotton land of the world. Three fifths of all the cotton worn by man is grown in our South.

As we ride along in the train, Jack takes out a pocket-map and we pick out the states where the most cotton comes from. He draws a line with his pencil from one state to another. See, they form a wide strip across the southern part of our country. That is known as the Cotton Belt. It is there we are going.

Now we are far from our homes. We are speeding south over the rails, and have come into southern Virginia. Look out of the car windows! Off there at the
right is our first cotton field. We see more and more cotton as we rumble on through North and South Carolina, and into parts of Georgia, Alabama, and Mississippi. At last we come to lands where cotton is the only crop, and after several days’ travel we reach Texas where we are to stay for a time. Texas grows more cotton than any other one of the Cotton Belt States.

Cotton in the Early Days

As we fly along through the country, each of us tells something he has heard about cotton. Bob’s tale makes us laugh. He says:

“Cotton was used thousands of years ago in Asia and Africa, long before it was known well in Europe. One day, an English traveler, Sir John Mandeville, came back from the Far East with a story about a wonderful plant that grew in India. He said that this plant had a single long stalk, with a live, white, woolly lamb growing on the top. When the lamb wanted food, the stalk bent over and the lamb ate the grass on the ground. Sir John said that its wool was fine and that the people made beautiful cloth from its fleece. He called it a ‘vegetable lamb.’”

What a sight that would be! A fuzzy white lamb with a slender green stem under its stomach, on which it swayed back and forth in the air! It seems strange to us that people believed such a story.

Cotton has always been grown in America. When Columbus landed in the New World, he saw the Indians weaving it into cloth and hammocks. Later it was found that it had been used even for clothing the dead. In South America men have dug up old, old mummies wrapped in coarse cotton cloth.

The cotton of our country was
by or to New Orleans or Galveston, whence ships will carry them to New England, or Europe, or some other part of the world.

Look at those big motor trucks over there! They have just unloaded their cotton. We run to the drivers and ask for a ride back to the plantations.

We bounce merrily over the country roads, and soon reach the cotton fields. We are in a great sea of snow-balls growing on bushes. People are wading about in the white ocean. They are picking the balls and throwing them into baskets and bags. They bend over as they work. Often only their backs can be seen.

What a jolt! The truck has stopped suddenly beside a group of full baskets. We jump to the

In the Home of Cotton

But here we are at our station in Texas. As we step from the car we see many great bales of cotton. They are waiting to go by train to mills near

The cotton blossom is like the marshmallow first a wild plant. Later on our forefathers set it out in their gardens because of its pretty blossoms and fluffy white pods. It was only when its value for clothing became known that they started the plantations which form the Cotton Belt of to-day.
ground and the owner of the plantation comes up. His name is Mr. Carter. He leads us through the long rows of green bushes, loaded with white. The bushes are about as high as our shoulders. The white cotton is on the ends of their branches and twigs.

Let us stand here a while and watch the pickers. They are nearly all negroes, men, women, and children. Hark! they are singing as they work and their hands move almost in time to the music. We find ourselves humming with them, for it is "Dixie," a song we know.

"Away down south in the land of cotton, Cinnamon seed and sandy bottom.—"

They tell us that singing helps them work fast. They are paid by the amount they pick, so the quicker they work, the more money they get.

"Pick some yourselves if you like," says our planter friend. We think of our Museum, and each of us breaks off a twig with
a snowy ball on its end. These balls are called "bolls." Each is about as big as a hen's egg. The boll looks like the white cotton batting we sometimes use to stuff cushions.

What is Bob doing? He is pulling his boll to pieces to see what is inside it. Deep down in the white fluff he finds some tiny brown seeds. Each is wrapped round and round with white hairs. Mr. Carter calls these hairs "fibers." Each fiber is less than two inches long. Bob tries to pull the fibers from the seeds, but they stick tight. They are fastened on like the hairs of our heads. They must be torn off before they can be used to make thread and cloth.

Let us suppose that Mary's boll is telling us its own story. It says:

"Last spring I was a little black seed like those you see in Bob's hand. I lay in a big bag with hundreds of my brothers and sisters. It was dark and we were crowded together. We were glad when the planter came and took us out to this field. The ground had been freshly plowed. He dropped us one by one into snug nests in the soft, warm, reddish soil. We lay there in rows about four feet apart. The earth was kept soft through the summer by much plowing and hoeing. The rain and the sun made us grow fast. This part of the country with its long, warm days and plenty
inside me, and silky white hairs were wrapped around them. I kept on growing until the heat of the sun turned my pod-skin a rich brown. Inside it my silky hairs became longer and longer. I swelled and I swelled until at last my white fluff burst my skin open like popcorn over a fire. I was then ready for Mary to pick.”

As we walk through the cotton fields, Mr. Carter explains that of rain is just right for us. We cannot stand cold and Mr. Carter took care not to plant us until after the last frost of the spring.

“We soon sprouted and poked our heads through the earth. Our green stalks pushed up higher and higher. Then came out our beautiful blossoms. At first they were white and looked like wild roses. Later they turned pink, and when they dropped off, each left a wee pod.

“I was one of those pods. I grew and I grew. Seeds formed

A cotton plant ready for the picker

A cotton pod and its fluffy white boll
most of the cotton is still picked by hand. Machines have been built which can pick cotton; but the bolls ripen at different times and the work takes many weeks. Each plant must be gone over again and again during the summer, and this is best done by hand. One man can pick several hundred pounds of cotton a day.

Where Edith’s Dress Grew

Edith is holding her boll up before her. She turns it this way and that. “Just think,” says she, “my best summer dress may have been grown on this very plantation.”

“I do not believe so,” replies Mr. Carter. “Your best dress is of finer cloth than that made from our fibers. The cotton we grow is called Upland Cotton. That which made your fine dress came from some little islands off the coast of Georgia or South Carolina. It is woven of the Sea Island cotton whose fibers are finer and longer than these. They make the most beautiful cloth.”

“You see,” the planter went on, “there are almost as many kinds of cotton as there are kinds of apples. Each has its own place in the making of thread and cloth. The ones we use most are Upland, Lowland, Gulf, and Sea Island cotton. Egypt also grows fine cotton, and so does Peru. Some of the cotton of Peru is of a reddish-brown color. All cottons are the same in that they are made up of fibers fastened tight to seeds. The difference lies in the fineness and length of the fibers. In every case, the fibers must be torn from their seeds before they can be used. Come along with me and see the cotton gin where this is done.”
We Visit the Gins

Those wagons are carrying loads of cotton to the gins. Mr. Carter tells us to climb on and ride. We sink down into the soft mass. The cotton sticks to our hats and coats. It clings to our hair. When Jack holds a great bunch to his chin, he looks like Santa Claus just in from the snow.

By and by, we stop at a shed filled with machines. They are whirring around with such a noise that we cannot hear ourselves speak. These machines are the gins. They seem to be gobbling the bolls, and spitting them out again in sheets of soft fluff. The hair-covered seeds go in at one end, and the lint, or cotton, flows out at the other. As the machines tear off the fibers, electric fans blow away all dust and dirt.

Here is a gin that has stopped working. Look at all those little round saws with teeth on their edges! They lie side by side and whirl around on an axle. Their teeth chew or pull off the fibers as they go through with the
The little round saws of the cotton gin chew the fibers.
seeds, and the fibers, or lint, come out in soft heaps of foaming white cotton. It looks so much like whipped cream that we are tempted to taste it. It is known as raw cotton.

This raw cotton is now ready to be pressed into bales for the market. In another room we watch men doing this. Each bale is wrapped in coarse brown bagging and put into the presses. The presses squeeze it and squeeze it until the soft fluff becomes almost as hard as the iron bands which the men bind about it to hold it together. Mr. Carter tells us that each bale will weigh from four to five hundred pounds.

As we step out of the shed into the sunshine again, our planter friend says that in the early days all this work was done by hand. One man could take the seeds out of only one pound of cotton a day. Then came young Eli Whitney who made the first cotton gin. Dick knows his story and tells us about him.

Before we leave the plantation we are shown the room where the seeds are piled after the fibers have been torn off by the gins. Their dark brown skins shine with grease, and Mr. Carter says they contain a great deal of oil. They will be ground up and this oil will be pressed out. We eat it in salads and use it for cooking. Some is turned into soap or yellow butterine. What is left of the seeds after the oil is taken out is pressed into cakes for cattle and hogs.
We visit a cotton mill in North Carolina

The Journey Club members are writing a letter this morning to their friend, Mr. Carter, the cotton planter in Texas. It reads:

Back Home Again
Dear Mr. Carter:
We want to thank you for your kindness to us when we were in Texas. We enjoyed our visit to your plantation and we have put the cotton bolls and seeds which you gave us in our Museum.
Perhaps you will like to hear of our trip through a great mill where raw cotton like yours is made into cloth. We stopped in North Carolina on our way home. The mill was a huge red brick building with hundreds of windows. There were thousands of men, women, young and old, at work in it.
First we watched the big bales of cotton unloaded from motor trucks. We saw how the machines pull the cotton apart and blow out the sticks and the dirt. The cotton is beaten and is run between rollers which take out every speck of sand. It comes out as white as new-fallen snow.

There were several young men working in the mill, and one of them, a big boy named Joe, took us through all the rooms. He picked up a bit of cleaned cotton and showed us that the fibers were all tangled, lying this way and that. He told us they must be combed out straight before they could be spun into thread. Joe called this "carding" the cotton.

One of the carding machines was not running and we looked at its rollers. They are covered with hundreds of tiny teeth, no bigger than the point of a needle. When the cotton has been carded, the fibers lie as straight as our hair just after it has been combed.

Joe took up a handful of carded cotton and rolled it gently between his palms. The fibers clung together and he soon had twisted them into a long rope. Joe said that the spinning machines make the fine thread for sewing and weaving in much the same way.

He showed us some cotton fibers under the big microscope of the mill. As we peered through the glass we could see that each fiber is wavy and that several, twisted together, cling tight to each other because of this curl.

We next went into the spinning room. Here the noise was so great, Joe did not try to talk. He pointed to the machines where the cotton was flowing out in
thick soft ropes like the one he rolled in his hand. He then took us to see others which were twisting several of these ropes into one.

The machines make one think of greedy monsters. They eat up the ropes hungrily, rolling them about in their iron mouths so hard and so fast that when they come out they are one very fine thread. This is the spinning.

The spun thread is wound upon spools for weaving and sewing. Joe says that some factories make only the thread, but the most spun here is woven into cloth.

The weaving made us think of the mats we made in kindergarten, when we were little. We used to take straight strips of paper of two different colors. We would lay those of one color lengthwise and side by side.
THE CLOTH IS WOVEN

Then we wove the others through them, first over one strip and under the next, until we had a mat like that in this picture.

Cloth is woven like this, except that fine threads are used instead of paper strips, and machines called looms do the weaving. Joe told us that the long threads are the “warp” and the ones which go from side to side are the “woof.” He showed us the long warp threads wound on two rollers just the width the cloth is to be. The rollers are set apart from each other, and the threads run from one to the other. The little bobbin which weaves the woof over and under the warp is the shuttle. It flies back and forth through the threads so quickly one can hardly see it go. Joe says it makes 150 trips every minute.

The cloth from this mill is fine and white. Some of it is colored, too, for here they make ginghams and calicoes as well as muslins and soft cambrics. The dyeing is done either in the thread or after the cloth is woven.

The mill men told us that cloth has been woven for thou-
sands of years. It used to be made on hand looms. It then took much longer to make one yard of cloth than it does to turn out several hundred by the machine-looms of to-day. Now the most of our cotton cloth comes from the big mills in our New England and Southern states. Cottons are woven also in England, in India, in Japan, and in many other parts of the world.

We thank you again, dear Mr. Carter, for helping us find out how cotton grows, and we hope you will come to see our Museum some day.

Your sincere friends,

The Journey Club.
CHAPTER 4

THE WONDERFUL BLUE FLAX OR THE STORY OF LINEN

We tuck our steamer rugs well round our knees and lean back in our long chairs. The Journey Club is sailing across the Atlantic on a great steamship. We are sitting on deck in the crisp, cold air, making our plans for a visit to Belgium. We are going there to find out about flax. The flax plant gives us linen. Linen is used almost as much as cotton.

Mary has a fairy tale about the first flax ever seen. She tells it to us as we snuggle down under our rugs. This is the story:

Long, long ago a poor shepherd was tending his flocks on a hillside. He spied a deer in the forest near by, and ran to hunt it with his bow and arrows.

He followed its path through the trees. Suddenly he found himself in a dark tunnel. At its end shone a bright light. He went on and on, and at last came out into a cave with walls covered with diamonds, rubies, and emeralds. On a throne in the center sat a beautiful queen, with her court standing about her. Her robe was pure white, and her belt was sown with jewels. In her hand she carried a bunch of flowers as blue as the sky.

"You may choose a gift for yourself," said the Queen to the shepherd. "What shall it be? Will you take precious jewels or fine gold and silver?"
But the poor shepherd was so overcome by her beauty that he said, "I wish only the blue flowers in your hand."

The Queen was pleased. She gave them to him, saying, "You have chosen wisely. Take also some of their seeds. Plant them and care for them and you will grow rich." Then came a flash of lightning and a loud clap of thunder. And lo and behold! the Queen and cave had vanished.

When the shepherd brought the flowers home to his wife, she was angry. She would have chosen the jewels or gold. In the spring the shepherd plowed up his garden and planted the seeds. Throughout the summer he watched the slender green stalks shoot up and up. Then the blossoms opened and his fields became a sea of blue, rippling in the breeze.

One night the fairy queen came to him in a dream. She told him how to harvest his crop. She taught him to spin and weave a fine cloth from the fibers inside the stalks. This cloth was linen, for the blue flowers were flax. The neighbors paid high prices for the cloth made by the shepherd and his wife, and they soon grew rich as the fairy had promised.

No one really knows when flax was first grown. But linen has been used for thousands of years. It is even older than cotton. We read in the Bible of a certain rich man who wore "purple and fine linen." The flax harvest is spoken of in the story of Moses.

We do know that flax first came from Egypt. We know also that, in early Colonial days, our own great-great-grandmothers raised it in their gardens. They made for their children suits and dresses of linen and wool mixed together. They called such cloth linsey-woolsey.

A Day in the Flax Fields

We have chosen Belgium as a place to find out about linen because it is here that some of the finest flax grows. Before the World War we might have visited Russia, for that country then
gave to the world three fourths of all the flax used to make cloth.

Flax does not need so warm a climate as cotton. It grows better in lands which are cool and damp. It is found in Austria, Germany, France, Belgium or Holland, and in Egypt as well.

Flax is raised in our own country, but not for its fiber. Weaving linen in ancient Egypt

We plant it chiefly for the seed which we use to make oil and other things.

But here we are in Belgium. We are in the old town of Courtrai, on the banks of the River Lys. There are automobiles at the station and we ride in them over a smooth road to where the flax grows.

We jump out of our cars and run over to the fields where they are pulling the flax. Look at that man tearing the plants from the earth! He knocks the roots against his shoes to shake off the dirt. The stalks of the flax reach to our waists. We see that some of them are still green. The men tell us it is better not to wait until they are ripe, as the fibers must not get dry and stiff.

Linen fibers are not at all like those of cotton. The flax fibers are from the slender stems of the plants, and each stalk must be pulled out by its roots. To cut it down with a knife would shorten the fibers and so injure them for making fine cloth. Therefore, harvesting the stalks is best done by hand although there are machines which can do the work.

But see—Jack has pulled up a stalk! He asks Bob to help him break it. They bend it and twist it, but they cannot snap it in two. They only hurt their hands. How they have bruised the stalk! They have torn off the outside bark. One of the workmen takes it from them and shows us the long straight fibers lying inside. He pulls out some and lays them in Jack’s hand.
We can pick them apart. They are coarser than cotton fibers and many times longer. They do not curl. As the sun shines upon them they look like fine silver threads.

Flax stalks and fibers are long and straight

"Look at those men!" cries Dick. "Why are they drawing the stalks through those iron combs?"

As we come near, we find that the seed pods and seeds are dropping like rain from the combs on a sheet spread underneath.

The men call the combs "rippling." The combs will take out every seed without breaking the fibers. This is "rippling" the flax.

Not far away are the packers. They are tying the stalks in neat bundles and putting them into wooden crates lined with straw.

"Where do they go now?" Mary asks.

"Come along with us and you shall see," is the reply.

We follow the crates down to the river. Whew—what a horrid smell! We put our handkerchiefs to our noses and look about to see whence it comes. It is from those other crates which are lying in the waters of the stream. The flax in them is rotting.

The crates of flax stalks which we have brought are soon sunk beside them. Stones weigh them down on the bed of the stream. They will be taken up once or twice and the stalks dried in the sun. Then they will be put back to rot again. This is called "retting." Flax is retted to soften the hard outer bark, so that it can be taken off without breaking the fibers inside the stalk.
In some countries flax is retted by spreading it out in the sun and dew for several weeks. In other places the stalks are left lying in pools or in little canals.

Here is some flax that has been dried after its long bath. It has been stacked up in the sun until the softened bark is quite brittle. We watch the stalks pounded or broken and the hard parts taken off with dull wooden scrapers. This is "scutching." After the scutching the inner fibers are tied up in bales for the linen mill. Those bales over there are ready to ship. Each bale will weigh as much as Mary, Jack, and Bob put together.

**In the City of Linen**

We have left Belgium in an aeroplane, have flown over the English Channel to Great Britain, and have landed in Belfast, Ireland. Belfast makes so much flax into cloth that it is sometimes called "Linen-opolis," which means the City of Linen. It has many huge factories which make linen cloth.

The mill we visit has thousands of men, women, and children at work. We see them open the bales and shake out the fibers. The dirt is then blown out by strong blasts of air. They comb the fibers again and again and separate the long ones from the short ones. The broken fibers are taken out. These are called "tow" and are used to make a
coarse cloth. Some of the best fibers are as long as our arms. The mill workers tell us the longer they are, the finer will be the cloth woven from them.

Edith has picked up some of the long silvery fibers. She is trying to twist them into thread as did our friend, Joe, in the cotton mill in the South. They are easy to roll and she soon has a long "sliver," as the first soft ropes are called by the flax spinners.

The spinning machines must twist many such slivers together to make a single fine linen thread. Stay away from those spindles, or you will get wet! Flax is spun under water to keep it soft. As the machines whirl about a spray is thrown out in every direction. The spinning girls have waterproof aprons over their dresses.

What an ugly gray color the linen thread is! We think it
looks dirty. We do not wonder that it must have many boiling-hot baths before it can be woven. When clean, it is bleached white or colored with dyes. Sometimes this is done before the thread is woven into cloth.

As we go through the weaving rooms, we see that linen cloth is made in much the same way as cotton. The looms are run by electricity and the cloth is even folded by machines. The very finest of the linens are woven on hand looms.

**Some Ways We Use Linen**

The last room we visit is piled high with bolts of the linen made here. We wonder where it will go, and in what form we shall buy it. That white stack may make our dresses and waists, or it may go into collars and cuffs for our fathers' shirts. Those reds and blues look like the linen of our sailor suits, and that fine white stuff will perhaps be cut into handkerchiefs or turned into underwear.

Those bolts near the window seem coarser. They will be made into pillow cases and sheets. The man in charge of the room shows us towels and napkins and fine table cloths, woven in beautiful patterns. He calls the best of them damask.

We are especially interested in wide strips of linen for aeroplanes. When we flew here in our 'planes, we little thought that the huge wings that held us up in the air, were only light frameworks covered with cloth like that we now have before us.

"I don't see much difference between linen and cotton," says Mary. "They look so much alike."

"But they really are not," explains the linen-maker.

"Linen is far stronger than cotton. It is cooler and smoother.
and it takes up water more quickly. I will show you a good way to tell them apart.”

He asks Mary for her handkerchief. He tells her to wet her finger and touch the underside. As she does so he says, “You see the dampness does not show through. That proves it is cotton. Now do the same with this bit of linen.”

We watch closely. As soon as Mary’s wet finger-tip is put under the linen, the water is soaked up and a wet spot shows clearly.

“That is the reason,” says he, “why linen is good for towels and napkins — it takes up water so quickly.”

Linen makes many other things we use every day. It gives us our fishing lines, and canvas for tents. It forms laces and thread. Even writing paper is sometimes made of ground-up rags of old linen.

On our return voyage we look over the things we have collected for our Museum. We have bits of cloth from the mill, and some silky fibers from the flax fields. Jack has saved a handful of seeds. We are sitting on the top deck of the steamer in the shadow of the mighty smokestack. All at
once Edith claps her hand to her eye. A bit of soot has blown in. We remember that flaxseeds are often used to take cinders out of one’s eyes, and so we decide to try it with Edith.

Jack gives Mary two seeds. She drops the tiny brown things in between Edith’s lids. They make the tears come, and as these flow down, the soot comes out with them. Edith wipes the seed from the corner of her eye and says it feels better.

Flaxseed is sold in our drug stores for poultices and plasters, but the most that we raise in the United States goes into linseed oil to be mixed with paints and varnishes. Some is used for oil cloth and the linoleum covering our kitchen floors. We decide to buy some of this oil and a scrap of linoleum for our Museum.

They break the flax before scutching
CHAPTER 5

A VISITOR FROM A SHEEP RANCH

“Patsy O’Flynn had no breeches to wear
So he bought him a sheepskin and made him a pair.”

It is a cold day in midwinter. The members of the Journey Club are running up the steps of Dick’s house. We stamp the snow from our boots, and shake out our heavy wool coats before going in. Our fingers are numb. We blow hard upon them so that we can undo the buttons of our warm woolen sweaters.

There is a rush for the fireplace. We gather about it and talk of the skating we shall have when the snow stops.

We need our heaviest clothing on days like this. Linen and cotton are not warm enough. So we all wear garments of wool to shut out Jack Frost.

“Where are we going now?” Edith asks in a very small voice. “I have come in from the country and I am chilled to the bone. I don’t think I could travel far to-day.”

“We really ought to find out about our coats and caps,” says Bob who does not mind the cold. “I know they were once on the backs of woolly sheep, but I want to see how the wool is turned into our sweaters and suits, or stockings and underwear.”

As he is speaking, a strange boy enters the room. Dick pulls him into our circle before the roaring fire. Says he,

“This is my friend, George, who has come from the West to make me a visit. We shall not need to go out of doors to-day to find out about wool. George lives on a ranch in Montana. His father has thousands of sheep
Our Old Friends the Sheep

Sheep have been the friends of man for thousands of years. They gave him wool in the old Bible days. It was the shepherds watching their flocks in the fields who saw the Star of Bethlehem on that first Christmas night. Joseph’s coat of many colors was probably wool. The Twenty-Third Psalm gives us a wonderful picture of how a shepherd cares for his sheep.

Columbus set sail to discover America from the kingdom of Spain where the finest sheep of his time were raised. He is said to have brought some with him on his second journey to the New World.

Patience True, who lived in Colonial days, had her own pet lamb. She helped care for it and the rest of the flock which gave the wool her mother spun and wove into warm clothing for her.

As our people moved westward, their flocks grew in number. Now there are millions of sheep eating the grass on our

Our coats and caps were once on the backs of woolly sheep
A VISITOR FROM A SHEEP RANCH

plains and high mountain ranges. We have so many sheep that if they were divided among all the school children of America, we should each own three.

But the wool from these millions of fuzzy backs is not enough to make all the clothing we need, we use so much. We have to buy wool from our friends in Australia, New Zealand, China, and Africa, and also South America and Europe. All those countries have many sheep and raise wool to sell.

“Life on a Sheep Ranch

Here is George with his scrap book. It has pictures and other queer things pasted in it. We crowd around him as he begins to explain them.

Sheep pens on George’s ranch

“This big house is our home. All the rooms are on one floor and you can see how many wide porches we have. In summer we spend most of the time out of doors.

“Those shacks at the back are for the sheep-men. It looks like a village and really it is. Father’s
George and his pony Brownie

ranch has thousands of acres of land, and his flocks are so large that it takes many men and horses to do all the work. We have our own store and carpenter shop. That is the shed of the blacksmith who cares for the horses, and those other buildings are for housing the sheep in winter and for storing the wool."

"Oh, what a beautiful pony," cries Bob pointing to a picture on the next page. "Is it yours?"

"Yes, indeed, you can see me there kneeling beside it. That is Brownie. I ride for miles every day. I like to go with the men when they mend the wire fences. We have to take care that there are no holes where the sheep can get out or where wild beasts of prey can creep in and kill them.

Out on the ranges we live in a camp on wheels
"Sometimes I gallop on Brownie to take salt to the sheep. They like salt as much as I like candy. I sprinkle it on the ground and they lick it up quickly.

"Here is our camp on wheels," George goes on speaking. "When we take the sheep out on the ranges, we have this covered wagon to carry our beds and our cook stove and dishes. We stay several weeks at one time. We sleep in the open and get our own meals. My, but things taste good cooked like that. When the sheep have eaten all the grass near one camp, we drive them on to a new pasture.

"Last summer Father sent the flocks to the National Forest. That is a wood land that belongs to our Government. It has plenty of grass. We had to pay for every sheep which grazed there. But it was well worth it, for the grass was so long and tender that they came home fat as butter."

A Big Barber Shop

"What is this?" Mary asks, holding up a loose picture that had slipped from the book. "See those masses of sheep, huddled together. The men seem to be cutting the wool from the sheep."

"I call that our Big Barber Shop," laughed George. "They are shearing the sheep. But that is an old picture. We don't use those hand shears any more. It takes too long. You know that a sheep is covered with wool. I have pasted in my book some that came from the back of my prize lamb."

We touch the soft bunch of curly gray hairs. They are so tangled together we can hardly see the separate fibers.

"In the winter the wool grows thick and heavy to keep the sheep warm," George continues his story. "Before it falls out in the spring we clip it off and send it away to the woolen mills. The sheep are happier without their winter overcoats in the warm
summer weather. Each sheep grows about six pounds of wool. The wool clipped from one sheep at one time is called a fleece.

"Here is a picture of the new way of clipping. See, how the men have thrown those sheep down on their sides and are holding them still! Their clippers go by electricity. They always remind me of those the barber runs over the back of my neck when he cuts my hair. They have little sharp knives which hum as they go, snip, snip, through the wool. The shearers are so skillful that the fleece drops off whole. They roll up and tie the wool from every sheep by itself. One man can shear one hundred and fifty sheep in one day. Some of the ranches have their sheep clipped by traveling shearers, but we do it all with our regular men.

"I wish the Journey Club would come out to our ranch at next shearing time," says George. "We have great fun when it is over. Every one is glad, for then the hardest work of the year has been done. We have a whole day of sports and games of all kinds, and there is a feast of good things to eat."

"Look at those men!" Mary exclaims. "They are picking over
A sheep after the shearing

A Merino sheep has short wool

A visitor from a sheep ranch

A sheep after the shearing

A Merino sheep has short wool

“The fleece and putting it into bags.”

“Yes, those are the sorters,” says George. “Wool is not all the same, and the age of the sheep makes a great difference. We make three piles, the wool from the lambs, that of the one-year-olds or yearlings, and the coarser fleece of the mothers and fathers. Some ranches roll the wool all up together and let it be sorted when it gets to the mills.”

The Sheep Family

“What kind of sheep do you have on your ranch?” This is Bob’s question.

“We have more Merinos than any other kind,” replies George. “Their wool is shorter and makes better cloth than the longer haired ones.”

There are still other branches of the sheep family, which do not give such good wool. In the Rocky Mountains we might find wild sheep with long curling horns. They are hunted for their meat. There are sheep in Russia which often have four or five horns each, and China has some with fat tails, so heavy that their owners tie little sleds beneath them to help the sheep bear their weight. They are like the sheep of Bo-Peep. Each really “brings his tail behind him.”

In hot lands wool grows much thinner and seems more like hair. There are other animals who give
The Angora goat has long hair

us the hair from their coats to make into cloth. These are the Angora goat, the Llama and the Alpaca from the high Andes in South America.

"Isn't this a cunning lamb?" Mary has found a snapshot of George with a woolly wee lamb as black as coal. It is nibbling a bit of grass from his hand. There is a verse written underneath the picture. It reads:

Georgie had a little lamb,
Its fleece was black as ink,
It was so tame that from his hand,
That lamb would eat and drink.

In Egypt there are herds of black and brown sheep, but the most of our western sheep are all white, or white with brown faces. Yet in nearly every flock we should find two or three of these little black fellows who frolic as happily as though they were white like their brothers and sisters.

Paolo tells us that, when he lived in Italy, his mother used to make cheese from sheep's milk. We remember also that it is the sheep which gives us the mutton we eat.

A Four-footed Shepherd

"This is Sandy," says George, pointing to a picture of a big collie dog. "He is a beauty and he knows almost as much as a person. You should see Sandy and the other dogs help round up the sheep. I have only to raise my hand and point to a lamb and Sandy will drive it out of the flock. If it strays off he will bring it back to us safely. The
men could not care for so many sheep without the aid of these dogs.”

“A little black lamb

“But where does the wool go from your ranch?” asks Helen. She wants to find out how it gets into her snug winter coat.

“Most of the wool is shipped to the mills of New England. A little may go across the Atlantic Ocean to Europe, from where it may be brought back to us again as clothing or yarn.”

“But how is it made into cloth?” Helen persists.

“I don’t know,” answers George. “If the Journey Club takes a trip to find out, I want to go too.”

Here Dick’s mother brings in steaming cups of hot chocolate and a plate piled high with cookies. As we eat, we show her George’s pictures and tell her that we next want to see wool turned to cloth. Says she:

“I know just the thing. Tomorrow I will take you all with me to the new moving picture at the Palace Theater. It is called ‘John’s Bag of Wool,’ and it tells the whole story of the making of wool cloth.”
CHAPTER 6

JOHN'S BAG OF WOOL

Shh! Go in quietly! The picture has started and we must find our seats in the dark.

The screen shows us John, a boy our own age, standing beside a great bag of wool. It is marked with a big letter "J." Dick’s mother, who knows the story, whispers that the fleece from John’s own sheep has been put in this bag and he is to follow it until it comes out of the mills as cloth or as yarn.

Men are now pressing the wool down in other coarse sacks and tying them up. They toss them into the huge motor trucks. Now John’s bag is thrown in, and he climbs up to sit by the driver.

Chug! Chug! They are off to the railroad station. In the next scene we see the freight cars, filled with the wool bags, flying over the rails. We read the words of the titles that help tell the story. They say:

"John’s bag of wool arrives at a mill in Lawrence, Massachusetts. This city is one of the biggest weaving centers of the United States."
See! They are unloading the bags and carrying them into a long brick building on the banks of a stream. The mill was built near the river so that the power from the fall of the water might turn the great wheels that give the electricity needed to run the machines.

John easily finds his bag marked with its “J.” He watches the men tear it open and pull out his fleece. They throw it on tables covered with wire netting through which drop all the sticks and the dirt. They sort the wool again and pick out the pieces which grew on the sides and the shoulders of the sheep.

“That wool is the best,” George whispers to us.

What is John doing now? He thrusts his hand down into the wool. Next he holds it up and wipes his fingers on his clean handkerchief. What a lot of dirt comes off! All wool is dirty. The fleece is covered with an oil from the sheep’s body. This is “yolk” or wool fat. It helps
keep off the rain, and it so mats the top hair that it protects the underneath part of the fleece.

George says in some lands they wash the sheep before shearing them. They drive them to the streams and shampoo them all over. But our flocks are so large that this would take much too long.

The next part of the film shows us John in the Scrubbing Room. He is walking past great machines with rows of bubbling vats. They are the washers. Each has several tanks of hot soapsuds, and John follows his wool from one to another. As we look into one, Mary whispers to Helen:

"That is just like our washing machine. Those rakes in the middle are stirring the wool round and round in the water to get out the dirt. And there are the wringers which squeeze out the water."

Sure enough! Each vat has two rollers through which goes the fleece. The water is squeezed out each time the wool passes from one tub to another. When it comes through the last set of wringers, it is fluffy and white, and nearly dry. Sometimes the wool is sprinkled with oil to make it spin better.

In the next picture we see the wool put on a traveling belt which carries it into the Drying Room. From there we watch it blown through a pipe to the carding machines.

**Why Wool Is Warm**

John is standing beside the carders. He picks up a handful of clean woolen fibers. What
are these things we see now on the screen? They look like curly worms and each seems covered with scales. We are told that these are the hairs which make up the wool of the sheep. They are shown here many times bigger than they really are. The picture has been taken through a microscope so that we may see just what they are like.

It is because of the tiny scales on the fibers that wool threads can cling closer together than those made of linen or cotton. They catch in each other and allow no holes in the cloth to let in the air or the cold.

We watch John as he goes from machine to machine. The carding is much like the combing of cotton and flax, except that the wool comes from the carders in wide sheets which have to be split into soft strands for the spinning. These strands are wound into balls and put into great cans, from whence they are fed to the machines which spit
them out later twisted into yarn for knitting and weaving.

Worsted and Woolens

There are two kinds of thread made from John’s Bag of Wool — worsteds and woolens. Their carding is by no means the same. With worsted, the fibers must be combed and combed until they lie straight; the yarn then looks almost as smooth and even as wire. Woolen yarn is more fuzzy, and the wee hairs may be crisscross or even matted together. The cloths do not look alike, for worsted is shiny and the weaving shows out. Woolens are duller and seem much softer.

We all understand the next part of the picture. It shows how the woven goods must be shrunk. We know what that means, for we often find we cannot pull on our wool stockings after they have been washed in hot water. The heat and the dampness seem to draw up the fibers and our stockings may come out much too small for us. Great care must be taken in washing all wools.

If the goods were not shrunk or “fulled” here at the mill, the wool clothing might be ruined with its very first wetting. Once cloth is well shrunk it is not so likely to shorten again.

Those vats of steaming water and soapsuds soak the cloth John is watching. The workmen then take it and stretch it out to dry. They press it and pound it to give it a nice finish.
The Teasel and Its Scratchy Head

What is a thistle doing in a woolen mill? The title tells us. It says:

“This is the teasel plant. It gives us its head to make the cloth soft. It is prickly like a bur and when we rub it lightly over the wool it pulls up the hairs into a soft nap.”

The teasel looks like a pine cone, or the head of a thistle. A close-up view shows us that it is covered with tiny stiff hooks like those our mothers use for crocheting. John helps the workmen set many of the heads into a rack. The rack is then drawn over the cloth and the wee hooks scratch up the fibers in a soft fuzz. This fuzz is cut off smooth and even by a shearing machine. After that the goods are pressed. If the yarn has not been already dyed, the cloth may now go to the coloring vats.

Quickly the film shows the last pressing and brushing. Then comes the measuring, folding, and packing. John looks at some of the tags on the neat bolts of cloth. Some are marked “For Blankets” and other tags say

Finished cloth for broadcloth, serge, and suitings
"Broadcloth," "Serge," or the name of some other woolen dress goods. Those heavier ones are for "Suitings."

The yarn will be sent away to be knit up by hand or made by machines into stockings and underwear, gloves, sweaters, or caps. That very coarse thread is for making wool carpets.

We wish we might stay to see John visit the knitting mills and the factories where these things are made up. But it is quite dark outside and we must go home to our dinners. We decide to write to the mill we have seen in the picture and ask for some samples of the things that they make. George promises to send us bits of sheep's wool and also pictures like those in his scrap book. We shall be glad to have them for our Museum.
CHAPTER 7

A GIFT FROM A WORM OR HOW WE GET SILK

We are in Japan this morning. We have crossed the wide Pacific Ocean to the homes of our friends, Taro and Haruko-San. Taro is a boy about as old as Jack and Haruko-San and Mary are both eight years of age.

It is springtime. The air is soft and balmy. There are flowers in the gardens and the trees are putting forth their tender green leaves.

We have come here to find out about silk. Japan gives the world the greatest part of all the raw silk that is woven into fine cloth and ribbons. China stands next, and France, Italy, and other lands also raise some.

Breakfast is over. We lay down the funny little chop sticks which are the knives and forks of Taro’s people. We squat in a circle on the fine matting that covers the floor. Taro’s mother sits in the center. She is dressed in a pretty blue kimono, and her slanting black eyes shine as she tells us some stories of silk.

The Lonely Chinese Princess

“Long, long ago,” she begins, “no one knew tiny worms could spin silk. In those days there lived a little Chinese princess. Her father, the Emperor, never allowed her to go outside her walled garden, and she often grew tired of the games she played there. She could not travel about like you boys and girls.

“One afternoon she ran away from her nurse. She spied on a stubby mulberry tree some queer looking worms. They were eating the leaves and their jaws moved so fast that she stopped to watch them. After that, she
Taro's mother tells us stories of silk came every day to see what they were doing. Soon they began to spin webs round and round their small bodies, and one day they were quite hidden in the tiny nests they had spun. All she could see were some little round whitish balls clinging to the twigs of the bush.

"She was sad, for she thought her new friends were dead. She decided to play funeral and give them a burial feast. She spread a stone table with hot tea and cakes. As she picked up the balls, one dropped into a cup of boiling-hot water. She tried to get it out and a fine silvery thread stuck to her finger. It came from the ball house spun by the worm. The Princess pulled it gently and unwound a long fiber. It was so pretty that she ran to show it to her mother, the Empress.

"Her Empress-Mother, whose name was Si Ling Chi, worked with such threads, until she found out how to twist several together in one strong even strand. Thus the first silk was made. The Chinese call this Empress the Goddess of the Silkworms, and they worship her memory."
We like this story so much that Taro’s mother tells us some more. One is about another princess who took the first silkworm eggs out of China. The Chinese did not want other lands to learn the secret of silk. But this princess married an Indian king. When she left China for her new home, she stole some of the precious eggs and hid them in her hair. In her palace in India she reared worms and made silk. From there the method spread throughout India and on into Persia.

There is a third tale of two monks, who packed up some of the tiny white eggs in a long hollow cane. They gave them to the Emperor Justinian in Constantinople, who, with them, started the silk raising of Europe.

Mrs. Silkworm at Home

Taro and Haruko-San are ready to show us some of these little silk makers. There are great factories in Japan where silkworms are cared for by the hundreds of thousands. But Taro’s mother
MRS. SILKWORM'S FAMILY

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thinks we shall see them better where there are not quite so many. Says she:

"You had best visit Taro's aunt, Kito-San. She has a nursery in her own house, and she will tell you just how they are reared. Silkworms are to be found in thousands of homes all over our land. There are also factories, big and little. The making of silk is one of the most important things that we Japanese do for the world."

We follow Taro to Kito-San's home. It is a long, low, one-story building. Kito-San asks us to take off our shoes at the door and gives each of us slippers which will not harm the soft matting that covers the floor. She leads us through the living rooms to the one given over to spinning the silk.

How light and airy it is! And how warm! Kito-San tells us that "Mrs. Silkworm" is a very fussy person. She must have a clean home with fresh air and warmth. She does not like noise nor any strong smell.

"These are the eggs which will soon be hatching out into the babyworms." Taro's aunt points to sheets of cardboard, covered with masses of tiny white specks. Each is no bigger than the head of a pin. It looks much like one of the seeds of a turnip.

"Some of those eggs were laid at the end of last summer," says Kito-San. "They came too late and we had to put them in a cold place to keep until this spring. You see, the silkworm can eat nothing but the tender leaves of the mulberry tree. So the eggs must not hatch until there is plenty of food for the wee baby worms. We put the mother-moths on a cardboard like this. Here she lays her eggs, often as many as four or five hundred. We can lift these cards about without harming or bruising the delicate shells.
"How would you like to hatch worms on your body?" This question makes us shiver, and our hostess goes on. "Out in the country that is sometimes done. The silk farmers tuck the eggs inside their kimonos and keep them warm there, close to their skin. But the most are hatched out in well-heated rooms or in little hot boxes called ‘incubators.’"

Taro is calling us. He is looking at hundreds of wee black worms crawling over a tray. They are the new babies. It would take eight of them to measure an inch, they are so tiny. Taro says they have each sixteen hair-like legs and a soft fuzzy covering on their bodies.

See that piece of cardboard which fits over their tray! It is full of small holes. Sprinkled on its top are fine bits of mulberry leaves. The baby worms crawl up through the holes to get to the light. It is a tight squeeze. As they push through, the worms scrape off all the bits of shell that cling to their bodies. Then they begin to suck the sap from the tender chopped leaves. The tiny silk spinners are so greedy that they must be fed from five to ten times a day.

Those boys and girls going out of the door are the leaf pickers. They have bamboo baskets in their hands. The mulberry trees of Japan are not tall like ours. They are more like a bush. The boys and girls can easily reach up and strip off their leaves.

"Do all silkworms live upon mulberry leaves?" Edith asks Kito-San.

"Yes, mulberry leaves make the best silk. There are also wild worms which eat the leaves
of the oak tree and the chestnut, but their silk is uneven and yellow in color. It makes a cloth called tussah, or a kind of pongee.”

A New Coat Once a Week

“Come over here,” calls out Bob. “Just look at those fellows. They are shedding their skins.”

“They are changing their coats,” Kito-San explains. “You can see how much larger they are than the babies. As they grew, their skin became too tight and had to be thrown away. When she is about five days old, ‘Mrs. Silkworm’ wants a new jacket. She grows restless and pale. She does not eat. She wriggles and wriggles out of her old skin and comes forth in a brand new one. She is hungry and gobbles up all the food within reach. We pile leaves on her tray and all goes well for a while.

“But in about six days more, she has outgrown her new skin. She throws it off just as before. She grows so fast that she needs a new coat every week. This shedding of skins is called molting. It happens four times, and each new coat is of a lighter color. When she has on her fourth and last coat, she is full grown and ready to spin.”

How careful the Japanese girls are who help Kito-San in moving the trays! They tell us the worms are so tender they cannot be touched even with feathers. They lie in their trays, which are fitted in racks one over the other. When the worms are changed from one tray to another, leaves are put down where they can crawl upon them. Then the leaves are lifted on to the clean trays.

Little Silk Spinners

Taro has picked up a leaf with a grown worm lying upon it. Kito-San says it is just thirty-two days old.

How much bigger it is than the
wee baby worms! And how different! It is now longer than Taro’s middle finger. Its skin is hard and of a creamy white color. There are scales on its head.

Where are its eyes and where are its ears? Taro tells us that silkworms have no ears. Its eyes are those six black holes in a row down each side of its body. See, how it moves its head from side to side. It seems to be saying:

“What is the matter? I want some more leaves to eat.”

Taro lays it down with its brothers and sisters. They are gobbling their food as fast as they can. Their jaws move from side to side. They hold the green leaves in their front legs, and bite off huge pieces.

“Oh dear,” cries Mary, “hear the rain on the roof!”

Taro bursts out laughing. He says:

“Look at the sunshine there at the window. The noise you hear is the worms chewing their leaves.”

Over here the spinners are making their cocoons, little ball houses like those found by the Chinese princess. Twigs, bits of bamboo, and arches of straw have been put within reach. The worms crawl upon them and pick out good places to start building their nests.

How deftly they throw the silk over the twigs! We look closely. The shimmering thread comes from two holes in their upper lips.

“Those tiny holes are called spinnerets,” says Kito-San. She points with a straw, as she explains. “You see, the silkworm has a sac on each side of its body. These sacs are filled with a jelly which the worm spits out in two tiny streams. These streams of jelly join together to make one fine fiber. The jelly grows hard when touched by the air. It forms the silvery thread which
the Princess took to the Empress. This thread is raw silk. It is sticky with a kind of gum and this makes it cling tight to the twigs or whatever it touches.”

Some of the cocoons are half done. In others the worm spinners are already hidden from view. As she works, Mrs. Silkworm tosses her head from one side to another. She throws out the fiber in figure-eight twists. She lays one on the other, first here and then there. She closes the web round her body, shutting herself in from the world.

Taro picks up a cocoon which seems finished. “No, she is still spinning,” he says. “Put it to your ear.” And indeed, there is a faint sound to be heard. The work is going on inside the cocoon. When it is done, all will be still. It takes three days or more to spin one of these snug little nests.

“Why does a silkworm make a cocoon?” asks Edith.

“It is time for its body to turn to a moth,” is Kito-San’s answer. “Like the caterpillar which becomes a butterfly, it changes its form. During this time it must be out of sight and in the dark. It is then called a chrysalis. So it winds itself up in these strong silken strands. After nearly three weeks it breaks open its nest and comes out a white moth with brown stripes on its wings. If it is a mother-moth, it looks about for a place to lay eggs.

“But when the moths burst their cocoons, they break the silk threads of which they are made and spoil them for spinning.” Kito-San continues her tale. “So we put the silk balls into hot ovens as soon as the worms are asleep in their chrysalis form. This kills the moth and

Thousands of silken cocoons
the silk is not hurt. We let live just enough moths to give us the eggs for the spinners we need."

"Fairy Eggs"

There are many piles of cocoons on the floor of the next room we enter. Two Japanese girls clad in gay kimonos are sorting them as to their color and fineness. Bob takes one of the cocoons up in his hands. He shakes it and we hear a rattling noise like that of a peanut. That is the chrysalis dried up by the hot oven.

The cocoon is silver white. It is oval in shape and about the size of a pigeon’s egg. We can hardly believe that a wee thing like it will give a silk thread many hundred feet long. It seems like a "fairy" egg.

Kito-San takes us to see her girl workers in the reeling rooms. They are winding the silk from the cocoons. Each sits in front of a reeling machine. Like the Chinese Princess they first drop the cocoons into hot water. Look at that pan! There are five or six of our "fairy" eggs bobbing up and down in it.

The girl who sits in front of it is stirring them about with a brush. When all the sticky gum
has melted, she catches the ends of the silk fibers up on the brush. Her fingers pick them off and give them a twist. She pokes the six tiny threads through an eye in the reeling machine. She twists them again and threads them through a second hole. These are “guide eyes,” which keep the threads straight and even. A single silk fiber would not be strong enough to be wound, so four or more must be twirled into one strand.

The reel is a wheel which the girl turns by a foot pedal. It is a framework of wood which moves slowly about, unwinding the raw silk from the bobbing cocoons. The threads are fed to it in such a way that the skein is as even as though reeled by machine.

Now the girl is slipping her skein off the reel. She twists it and lays it with four or five others. These are tied into bun-
dles, and put up in a bale with hundreds just like them. They are wrapped in oiled paper and then bound with matting for shipment abroad.

Kito-San asks us if we shall visit a silk mill in Japan. But we reply that our own country has the biggest factories of the world for weaving silk cloth. We shall see that work at home. Paolo would like to go also to Europe and find out about the silk that is made in Italy and France. Kito-San says to us as we leave:

“Good-by to you all. Ask the men in your mills if their silk does not come from Japan. You cannot raise silkworms well in your country. There is so much work that must be done entirely by hand, and your wages are too high. I pay my girls but a few cents a day, so that my worms can be tended at very low cost. We send to the United States almost all our raw silk. Three fourths of what you buy comes from us. I venture that hair ribbon of Helen’s may have been spun right here in my home.”
CHAPTER 8

THE STORY OF HELEN’S HAIR RIBBON

“Let’s Pretend” is a game we all like to play. As we sit in our deck chairs on the ship going home, we shall pretend Helen’s hair ribbon can talk, and can tell us its story. It is of pretty blue silk and it rustles when she unties it to pass it around. Hark! It is beginning.

“I came from Japan, the land you have just visited. I shall not tell how my thread was spun, for that you have seen. Let me start with my voyage across the Pacific Ocean. Then I was just a bundle of raw silk, packed tight in a bale with hundreds of others. How hot and dark it was in the hold of the steamer! Traveling about on Helen’s brown hair is very much nicer.

“We landed at San Francisco and a fast train whizzed us across the United States. The first thing we knew we were being unloaded at a mill in New Jersey. It was at Paterson where they make more silk than in any other city in the whole world. The
We were unloaded at a Paterson silk mill

Passaic River flows through it and its streams give enough electric power to run many factories. They have been weaving silk in Paterson for almost one hundred years, and thousands of its people do nothing else.

"We were glad when the men tore our bale open, and we could breathe fresh air again. But our joy was soon over. They pulled us out and tossed the raw silk this way and that. First they tried to find out just how much real silk there was in each skein. They cut off bits of our threads and weighed them on scales. They baked these in ovens to get out all the moisture. All raw silk is soaked before reeling, as you saw in Japan. It holds a great deal of water. So when the dried samples were weighed, the men could tell just how much
of our weight was silk and how much was water.

How Silk Is Treated

"I did not like the men they called 'throwsters,' they were so rough. They wound us on bobbins and threw us into vats of warm soapy water to clean us for spinning. But these baths were not so bad as the other cleanings they gave us. We were reeled on new spools, and passed between two hard metal plates set close together. It was a tight squeeze to get through and each bit of dirt or straw pulled us up with a jerk. It stopped the machine, so that the workmen could pick it out gently.

"The next thing was the doubling and twisting," the story goes on. "Our fine silken fibers were twirled over and back. Many kinds of thread were made in that mill, some for cloth, some for ribbons like me, and others for sewing, embroidering and knitting.

"Waste silk is made up of the short broken strands and the rough outer parts of the cocoon. The waste silk is used for weaving commoner cloth. It must be spun like linen or cotton.

"Raw silk such as I was, is much finer," says our Ribbon proudly. "I come from the inner walls of the silkworm’s nest and my long fibers are so straight they do not have to be spun. They need only to be doubled and twisted the right number of times to make a thread of any thickness.

"The worst of my adventures was the 'boiling off.' We were thrown into soapsuds and boiled so as to melt off the gum that still clung to us. In some factories, chemicals and metals are put in this boiling water. That makes the silk heavy, but not nearly so good.
“I was bleached white and then dyed the lovely blue color I now have. Some of the silk in that factory was dyed after weaving. It was woven, then bleached, and last of all dipped in the coloring tanks.

“Weaving silk is much like weaving cotton or wool. For the wide pieces of cloth, the long warp threads are laid across the whole roller and unwound as the flying bobbin weaves in the woof.

Kinds of Silk Cloth

“I am proud to belong to the family of Silk,” says Helen’s Hair Ribbon. “For silk is the most beautiful cloth in the world. It is costly and only well-to-do people can afford it. The United States is a very rich nation. It uses more silk than any other land.

“You should see the wonderful stuffs they made in that New Jersey mill. I lay beside satins for gowns, beautiful crêpes, and gay necktie silks. I rubbed against gorgeous silk velvets, and heavy silks for umbrellas and draperies. Some of the raw silk that came with me from Japan was made into fine thread for knitting stockings and gloves.

“The finest of all were the silken brocades and the gay printed silks. They were too proud to even whisper a ‘Hello’ as we were carried by. And indeed they were lovely! The brocades had flowers and birds done in their weaving on a wonderful French loom. The printed silks were given their figures by huge metal rollers which stamp on the colors as the cloth goes through.

“Well, to make a long story short,” concluded the
OTHER WAYS WE USE SILK

Ribbon, "when my weaving was done, and I had been finished with twisted silk to help clean his teeth, and Paolo tells how he

It takes a big fish to break a silk line

a soft silky sheen, I was rolled on a spool made of cardboard, and sent then out to the stores. There Helen's mother bought me and so here I am."

Now that Miss Hair Ribbon has told us her tale, we try to think of other things made of silk. Mary speaks of her party dress. Bob mentions his neckties, and Dick pulls open his coat and shows that it has a silk lining. Edith points to the silk trimming on the girls' hats. Jack's mother makes him use dental floss of once went fishing with a silk fishing line. It takes a big fish to break a line of that kind, silk is so strong.

What an exhibit we shall have for our Journey Club Museum! We shall ask the Agricultural Department at Washington to send us some silkworms or cocoons. We can get samples of silk from our mothers, and we shall put in some photographs of our Japanese friends. We might also write to Lyons for samples of the beautiful silks made in France.
CHAPTER 9

GRANDMOTHER’S KNITTING NEEDLES

“You must each get a cushion and sit down on the floor here near my chair.” Jack’s grandmother is speaking. She has invited the Journey Club to spend the afternoon with her and see how she knits stockings and sweaters and some of the other warm knit things we wear.

She draws her armchair up near the roaring open fire. We sit in a circle about her, and she sets down in our midst a big jar of cookies. Says she:

“I am sure you can listen better while eating. Now what shall we have first? Would you like a story or shall I show you what I can make with my knitting needles and yarns?”

Bone needles of all sizes

“Oh, please let me show them how to knit,” begs Helen. “I have just learned and I have already made a sweater for my biggest doll.”

So grandmother gets out her box of knitting needles. How many there are! There are fine
Bob and Jack fence with knitting needles
ones of steel about eight inches long, with points at both ends. There are longer ones of bone, as big as a pencil, each with a little round knob on one of their tips. Grandmother tells us this knob is to keep the stitches from slipping off the needle. She has great brown needles of wood, and some of celluloid as yellow as amber. Some are so long that Bob and Jack can use them as swords to fence with each other.

"Knitting needles are of all sizes," says his grandmother. "Those steel ones are about as thick as the lead in your pencils. They will make a fine cloth. Those giants of wood as big around as a nickel will turn out coarse heavy sweaters or even thick blankets. The kind of cloth I want to make decides which needles I use and what yarn I buy."

"Where are the eyes of the needles?" asks Mary. "Knitting needles are different from those made for sewing. They do not need eyes, for they do not pull the thread after them. Watch Helen now and you will see that they work more like hooks, drawing loops of the thread through one another."

**Helen Knits**

Grandmother hands Helen a ball of pink yarn and a pair of large needles. We gather about her and look closely as she twists the yarn in a row of even loops on one of the needles. This is called "casting on" stitches. Then Helen takes the other needle in her right hand and begins her work. Helen's fingers fly back
and forth. She knits over and back, over and back, from one end of the needle to the other. Soon she has made a strip long enough to show what knit cloth is like. We remember that in weaving two threads were used, the warp and the wool. It seems strange indeed that such a firm cloth as this can be made with one single thread.

"I take four needles to make stockings," says Jack's grandmother. "I knit just like Helen who has used only two, but I knit round and round and the stocking leg comes out like a tube. I make it wider or narrower by adding on or taking off stitches. I must change it many times to shape the heel and the toe.

"Would you like to see some of the many things I can knit with my needles and yarn?" grandmother asks. "Come, look at these Christmas presents which I have already made. Jack may see too, for his gift is not here."

Grandmother takes out of a cedar chest two beautiful sweaters, a cap, some mittens and golf stockings, and even a soft blanket for her baby granddaughter. All sorts of garments can be knitted from yarn.

The boys are interested, but Bob says that only girls knit. Edith reminds him that boys are glad to wear knit sweaters and stockings on cold snowy days, and grandmother tells us that the shepherds of Scotland need so many warm things, that they knit as they watch their flocks on the hillsides.
Now tell us a story,” begs Jack as we sit down again around the cooky jar in front of the fire. “What shall I tell you?” says grandmother thoughtfully. “Perhaps you would like to hear the adventures of some bales of yarn which went into the mill as hanks of thread and came out finished garments packed up for the stores.

“Well, every day such huge bales are brought into a knitting factory in the center of a bustling city. There are many different kinds of yarn, and the men must sort them out. The bundles of yarn first have a ride in little carts on wheels through room after room filled with machines. Whirrr, whirrr, such a noise! Everywhere the yarn goes there is a din and a clatter. It is left here and there beside workers busy at clicking machines. The machines are the knitters and the clicking is the sound of their needles working away knitting up yarn.

“Weaving is simple,” grandmother goes on. “You will remember that you easily found out how cloth is woven. But the knitting machines are so many
that I could not begin to tell you about them all. In the big factories, five or six machines may be used to make one single garment. There are more than three thousand kinds of machines for turning yarn and thread into clothing for us.

“Our yarn is a little afraid of the stocking machine. It seems to gobble up the wool and to chew it and chew it until it comes out in a round stocking leg. The machine has a ring of many steel hooks just like the ends of fine crochet needles. The yarn is twisted about these hooks in loops. There is a hook for each loop.

“When the machine starts, it goes click-click-clickety-click. The little hooks are kept busy pulling new yarn through loop after loop, and the stocking leg grows very fast. The stocking machine seems almost human. It can make the leg narrow or wide. Special machines shape the heel round and finish the toe. The stocking made from our yarn in the knitting mill looks much like these of mine knit by hand, except that the machine stitch is finer.”

“Can those machines make a sock any size?” asks Bob.
"Yes, indeed," is grandmother's reply.

"Oh, I wish I had one," cries Dick. "I would knit myself a stocking many feet long to hang up next Christmas."

We laugh at the idea, and Helen says with a shake of her head:

"You would find nothing in it. Greedy boys like you should have no presents at all." Then grandmother takes up her story again.

"Some of the yarn from the bales is dyed in bright colors. They hang in the storerooms of the factory beside hanks of bright cottons or silk, waiting their turns at the busy machines.

Knit Garments We Wear

"When the wool has all made its trip through the mill and been turned into clothing of one kind or another, it is brought down to the packers to be shipped out to the stores. What a lot of garments there are! There are piles of leggings and sweaters, and all sorts of underwear. There are caps, gloves, and mittens, as well as jackets and scarves. There are stockings and socks of every description. These garments are knit of wool, silk, and cotton.

"As these different kinds of clothing lie near each other I am sure that they talk about their adventures," says grandmother. "The jackets and sweaters tell how their sleeves are knit quite
apart and sewed on by electric sewing machines. The suits of underwear probably boast that it takes many machines to finish them up, to bind off their edges, sew on their buttons, put on their labels, and make their neat buttonholes.

"But the proudest of all the things in the packing rooms are the silk stockings. Every one likes stockings of silk. It is said that the first pair of silk hose in the world was knit for Elizabeth, the great queen of England. She thought them so nice that she vowed she would never again wear stockings of wool. It was during her rule that William Lee invented the first knitting machine. This was turned by a handle, and not until many years later, were garments knit by steam and electric machines like those of to-day."

Grandmother's story is finished. The cooky jar is empty and it is time to go home. Our hostess gives us two sets of knitting needles, a piece of plain knitting, and a half-finished sock which she has in her basket. With these, we shall start the knitting exhibit for our Museum. We shall add to them some bits of cloth knit by machine.
CHAPTER 10

A BASKET OF EASTER EGGS OR HOW WE DYE CLOTH

The Journey Club is meeting in Mary's kitchen. We are going to dye Easter eggs. If they turn out well, we shall dye also some pieces of cloth for our Museum.

"What is your favorite color?" asks Helen.

"Red," Bob calls out.

"I like blue," says Edith, "lovely sky blue."

Jack chooses green and Helen takes yellow.

We have bought our Easter egg dyes at the corner drug store. On each little package is printed the directions for use. Some of the envelopes in which the dyes come, have six or eight tiny cakes of different colored powders. They cost but five cents a packet, and one packet will dye many eggs.

Dyes have been known for thousands of years. But they were not always so easy to make nor so cheap as to-day. Only the kings and queens of the olden times could afford to wear robes of beautiful Tyrian purple. This precious dye came from a small shellfish which crawled about on the bed of the ocean. In a tiny sac behind its head was stored a drop of white liquid. When this was spread upon cloth and put out in the air, it turned first to green, then to blue, and at last to rich royal purple.

We are not sure that Patience True of Colonial times had gay
Easter eggs. But we do know that she helped her mother color the homespun cloth for her dresses and coats.

In the earliest days, when man began to make cloth, he saw the birds and the flowers in their many-hued dresses. He wanted his clothes to be as pretty as theirs. So little by little, he found out how to color his cloth with the juices of plants.

Patience True and her mother made their own dyes from trees, plants, and flowers. Indigo, which first came in sailing ships from India and Central America, gave them their blue. It is the same plant that makes some of the blueing we use in washing our clothes. Some of the reds Patience had came from roots and woods which she cut up and boiled. In her garden grew the madder plant from whose juice they took the dye Patience liked best of all. This was rich Turkey red. Patience was fond also of the deep purple which they got by mixing together the blue and the red.

When yellow was wanted, they used some quercitron, a bark of a tree that grows in our Eastern and Southern states. Juice of the pokeberry made a rose-colored stain. Still other plants and barks gave them green, brown, and orange.

Later on it was found that there were animals which could be made to give dyes. From Mexico came the cochineal, a little insect which lives on the cactus plant. It is so tiny that 70,000 weigh only one pound. The Mexicans pick these insects off the
prickly leaves and roast them to a dry powder. This makes a red dye. Another insect which gives red is a bug called the "lac."

Colors from Coal

The most of the colors we are using to-day are not made from either vegetables or animals. They come from a mineral. They are called "aniline dyes." As we watch them melt in the boiling water, and see their lovely hues, we can hardly believe they were all once hidden in a lump of black coal. But this is quite true.

If we should put a bit of soft coal in a little glass tube and heat it to melting, we should see a smoky gas coming off. A small piece of coke would form in the bottom. If we looked very close, we should find a few drops of sticky, black stuff on the glass. This is coal tar. From it come aniline dyes.

For years, the men who make coke and gas let this coal tar go to waste. Now they treat it in such ways as to give us many dyes which are of both great value and beauty.

Paolo remembers a visit he made to a dye works in Germany when he was in Europe with his uncle last year. He tells us about it.

"A boy-chemist in England was the first to find that coal tar would make dyes. The Germans used his idea, and until the World War Germany made more dyes than any other land. At the works they told my uncle that the United States used to buy the most of its coloring matter from German factories. Our country now makes many dyes of its own.

"But let me tell you about the German dye works we visited," Paolo goes on. "You should see the huge vats where the dyes are boiled out. They are filled with steaming liquids. Their odors are dreadful. These come from the chemicals which are mixed and stirred in by machinery. We saw some tanks of blue, and others of red and yellow. There were hundreds of colors and shades."
"The coloring matter settles in the bottom of the tanks. When it is filtered out, it looks like a clay. I watched men put it in barrels and take it to be fired. They shoveled it on to trays which they slid in the ovens. "I had to walk carefully to keep my shoes clean," Paolo continued, "for there was much dye spilled on the ground. The workmen look funny enough. Their clothes and their faces are like Easter eggs. They are all smeared with dyes. When the men finish their work, they hurry to the baths for they cannot go out on the streets looking like that.

"At that German dye factory there were men who did nothing but try out new colors. These are the chemists. They had little tanks and stoves in rooms called laboratories. There they mixed dyes and chemicals together to see what new hues they could make. The chemists tell the workmen just how to mix and boil up their dyes."

How We Dye

We have now washed our eggs clean, and have melted our dye cakes and powders in boiling water. We dip our eggs in the dye and then lay them gently on paper to dry. Soon we have a basket full of bright blue, green, orange, and red Easter eggs.

There are little slips of paper covered with colored pictures in our dye envelopes. We lay these on the eggs, and wrap a damp cloth around them. The dampness melts the colors and when the papers come off, the pictures are left stamped on the shells.

These picture transfers remind us of what Helen's Hair Ribbon told us of the printing of silk. For this, she said, the cloth was run between rollers marked with patterns which were covered with wet colors. The silk came forth stamped clearly with pretty designs.

Now that we have finished our eggs, we want to dye samples of cloth for our Museum.

Helen's Hair Ribbon told us that her raw silk had to be plunged into boiling-hot soapsuds to get its sticky gum off. Then it was bleached white before being colored.

Our friend Joe, in the cotton mill, showed us how cotton is boiled in hot lye and then rinsed
in water. He said it must be dipped into acid and dried before dyeing.

We also recall that wool is covered with grease which must be washed out before that cloth can be bleached. If the cloths are not so cleaned and treated, the dyes will not take. The colors will be spotty and not at all even.

Mary’s mother has given us some white scraps of silk, cotton, and wool. These cloths have all been cleaned and bleached at the factories, so they are ready for dyeing. We cut out neat squares. Helen thinks we should first try out our dyes with odd pieces.

Bob picks up three scraps, one of each stuff. He dips them into the hot red dye. As he takes them out again, Edith exclaims:

“Oh, they are not at all the same color. Isn’t that queer? See, the cotton is hardly stained at all, and the silk and the wool are of different shades.”
So they are! Cotton is a vegetable fiber, while wool and silk were once part of animals. They do not act the same when treated with chemicals. The coloring of cotton must be done with special dyes.

"Do you remember that in the weaving factories, we were told that much dyeing is done in the thread or the yarn?" This question of Jack's brings to our minds the dye rooms we have all seen. Almost every cloth-making mill has now its own dyeing works.

The dyeing rooms are filled with vats of boiling dye. Men walk about in thick heavy shoes. They stir the yarn and the cloth with long poles. The yarn is washed in machines which swirl it around in the hot water. It is squeezed dry through wringers before it is dyed.

The coloring of yarn is best done by hand. With cloth, machine stirrers are more often used. But the color must be even and great care must be taken with every tankful of goods.

We each dye one square of cloth. Bob's is a bit of silk, colored red. Edith's is blue worsted, and Jack's is green woolen. Helen has dipped some yarn in the yellow and Mary has given her cotton a faint purple tint.
Sh! Sh! Do not speak! Do not even whisper!

We are going to listen to a radio talk. It is wonderful indeed to hear songs and stories right out of the air as we can nowadays. But the radio we are to hear is even more wonderful than the real one, for it will bring to our ears the voices of Things. Our machine is a game called "Let's Pretend." We shall suppose that we have a radio by which we can hear what the Things in Helen's Sewing Basket say to each other when there is no human around.

"I tell you I am the most important," says a tiny shrill voice. "I sew up the seams and put Helen's dresses together."

Of all you Things in her Basket, she needs Needles the most."

"No, no, Mr. Needle," another voice cries. "We Pins come before you. We pin up the cloth just as it should be."

"But how about the Thimble? I am very useful."

"And Thread?" breaks in a low drawling voice.

"And we Hooks and Eyes."

"And all of us Snappers."

"Don't forget me, the Scissors!"

All the Things in the Basket are talking at once. Finally a calm voice is heard.

"Hush! Hush! you children. It is I, the old Darning Egg, speaking. I have lived in a Sewing
Basket a very long time. I have seen pins and needles, hooks and eyes by the dozens. I know more than you all. There is only one way to decide this question. You must each tell your story and show why you are useful. Then this Blue Dress of Helen's shall say which did the most to make her ready for wearing. Now, Needle, begin!"

The Sewing Things seem to like this idea. The noise dies away and the shrill sharp voice of the Needle comes to our ears.

The Tale of the Needle

"We needles have not always been known to man. In the old Roman days people wore togas. These were loose pieces of cloth draped over their bodies. They were not sewed. They were often held on with belts.

"Then some one thought of punching holes in the cloth and of lacing it together with bits of string or of leather.

"The first real needle was carved out of bone. Its eye was a rough hole. The Eskimo friends of the Journey Club use such needles to-day. Too-Kee, the girl of the Northlands, has a sewing set made of walrus tusk. It has a rude bone needle and an open-end thimble.

"Even in Colonial days the needles were not finely made as we are to-day. But I must say that people then knew how much we were worth. Sometimes there was only one of us needles in a whole village. It was passed carefully around from one house to another. What a whipping was given the boy or the girl who lost the precious Town Needle!

"I believe that steel needles were first found in China. Then England and Germany learned how to make better ones. These countries turn out the most of the Needle Family to-day.

"It takes a long time and many workmen to produce a needle
like me," this proud voice goes on.  
"Even with all the machines used in our needle factories, seventy pairs of hands worked on me to fit me for sewing. And they only began after my iron had been mined from the earth, and been melted to steel and stretched out into a coil of thin wire.

"They unwound this wire which was just as thick as I am. Whirring machines cut it in bits, each as long as two needles. I was half of one of these needle-twins. They put us up in bundles bound with iron rings. They then heated us all in the furnace. They rolled us over and over against one another until we were even and straight.

"How dizzy we got when they threw us on that wheel covered with rubber. It whirled us about like a Merry-Go-Round, but many times faster. As we spun round and round our ends were rubbed on a grindstone, and soon each twin-needle had two sharp little points.

"It took several machines to put in our eyes. One flattened our heads in the middle of our bit of wire and made two slight dents. Then two holes were punched through, and with a sharp blow I was cut apart from my twin. Thus two needles were made of each bit of wire.

"Great care was taken to leave me strong and stiff, so that I should not break," continues the needle. "I was strung by my eye on a fine wire, with hundreds of my brothers and sisters. Then we were baked in a furnace and given a cool bath of oil. We were washed and dried and heated again. The men called this 'tempering.' My beautiful shine came from the polish we got by rolling about in bags filled with soap, oil, sand, and emery powder. At last I came out as you see me now.

"There are many kinds and sizes of needles. My cousin for the sewing machine has his eye in his point. My brother who sews up cuts for the doctor is curved like a bow. Then I have some rough coarse relatives who can poke holes in canvas or sew the heaviest carpet.

"Just look at me! Think how long it took to make me! How many hands worked upon me! See how my head and eye are polished smooth so as not to cut
the thread! All my family are just as carefully made. We are sorted to size and put up in our neat packets of paper. For such really fine Things, we can be bought for a very low price.

"Come, Blue Dress of Helen's," says the needle in closing, "you must admit that you could not hold yourself together if I had not pulled the thread through you in such fine even stitches. I feel sure you will decide that the Needle is King of all Sewing Things."

A Spool of Thread

Now the voices change and the words come much slower. The Spool of Thread speaks.

"Yes, you went first, Needle, but you must pull Thread after you wherever you go. You are really my servant. I am sure that the Thread that sews up the cloth is the most needed of all.

"Helen knows how much trouble it took to spin me from raw cotton. She has even seen the loose ropes of soft fibers twirled into thread. The men in the cotton mill doubled and twisted me again and again. You can see written on my back that I am made of 'six cords.'

"Helen will remember how I was bleached. Some of my family are colored with dye. We come in all shades and we can match almost any cloth.

"I was wound on this wooden spool by a machine. Although there are hundreds of yards of me, I am put on as even and smooth as can be. That hole in my spool is for my use on the sewing machine.

"Beside cotton thread such as I, there is my strong cousin Linen Thread. We have spools of silk and balls of wool right here in our Basket. No Needle would be of any use at all, if it were not for the Threads it draws along after it. We are their tails and we follow them wherever they go, as in the old rime:

"'Old Mother Twitchett had but one eye,
And a long tail which she let fly,
And every time she went through a gap,
A bit of her tail she left in the trap.'"

With this, the Spool of Cotton ends her story and we next hear the loud tinny voice of the Pin.
The Useful Pin

"People may say we are not important. I must admit you do hear the words, 'It is not worth a pin.' But they would find out if they had to do without us. They needed us so much that men worked and worked to get machines which would grind us out by the millions. Do you know, you Sewing Things, that enough pins are made each year to give every person in the United States more than one hundred. We may not need as many workmen to make us as that stuck-up steel Needle, but we are used every day by everybody.

"And it was not always so easy to get us, I can tell you," the Pin boasts. "In the long, long ago, clothes were held together by thorns and sharpened bones. Later soft metal was beaten into sharp pointed pegs. In Colonial time here in America, they even had pins of iron.

"It would open your eyes to see how rapidly we pins can be run out of the machine like a river."

Courtesy of Oakville-American Pin Division, Scoville Mfg. Co., Waterbury, Conn.
The pins run out of the machine like a river
turned out to-day.” The little fellow’s head seems to swell as he talks. “We go into a machine as wire. We come out as pins. Our metal is brass. The wire runs through steel rollers to be straightened and smoothed. The machine eats it up and bites off pieces, each as long as one pin. Little steel fingers hold these bits in a vise. Then a blow of a hammer flattens one of their ends into wee heads.

“Hurry! Scurry! We pins rush down into a slit. We drop through and hang there in a row, caught by our heads. Then our other ends are filed to points by a grinding machine. As each lot is finished, it is pushed on to make a place for some others. We pins run out of that machine just like a river.

“We are yellow and dull when first made. These white shining coats of ours come from a bath. We are boiled clean of dirt. Then we are dipped in a tub of acid and tin which makes us shine like silver or, as often is said, as ‘bright as a new pin.’

“After that comes the fun of getting into our paper sheets for the stores. We are laid side by side in a machine. Then, pop! we hop into our places in neat even rows. Girls cut the sheets of paper just the right length and fold them up ready for sale.

“We hop into our paper sheets

“It is not strange we are cheap when we are so easily made, and in such great numbers. If there were only a few pins to be had, people would pay almost any price for us. Did you ever hear this rime?

“‘See a Pin and pick it up,
All that day you’ll have good luck.
See a Pin and let it lie,
You’ll need that Pin before you die.’”

“No, sir-ee! You cannot do without Pins. My cousin the Safety Pin is splendid for children. He does not prick, for his point is well hidden. He is made much like us straight ones. He is bent into shape and a small metal plate is fastened on for his clasp.
"Don’t you remember, Blue Dress, that when Helen’s mother made you, she laid in your hem and made you to fit, all with Pins? Think of that when you judge!"

**Most Important of All**

"I am the Scissors and I cut straight," says the next speaker. "I tell you all plainly that this is a foolish game you are playing. I could describe how I was pressed out of finest steel. I could give you the story of how I was treated and filed and made into two keen knives, working together. I cut out the cloth before either pin or needle or thread is put in it. If it were not for me, clothing would have no shape at all and would hang like a bag. But I have enough real work to do without tiring myself with such silly chit-chat."

Now several voices are shouting at once.

"But, we are important, we Hooks and Eyes. We hold dresses together. If it were not for us and the Buttons in the Red Button Box, Helen’s dress would fall open and she would take cold."

"We Snappers are much newer than you old Hooks and Eyes. Our two little pieces of tin fit so well in each other and hold on so tight that many prefer us to all other fastenings."

The chatter grows shriller, and it does not calm down until a stern voice comes out of the din:

"Here, here, Sewing Things. I, Helen’s Blue Dress, want to be heard. I have listened to you. Now you listen to me! Scissors is right. You are silly, silly Things. None is most important. I could not have been made without any one of you. I had to have Needle. I had to have Thread, and Pins, Hooks, and Snappers, and Scissors as well—all have their places in making a dress. We, like human beings, depend each on the other. It takes every one of you to make cloth into clothing. Thus, the most important thing of all is to Help One Another."
CHAPTER 12

OUR BUTTON EXHIBIT

"Button! Button! Who's got the Button?"

Each of us has. At our meeting to-day we shall make up a button exhibit for our Museum. Every Journey Club member has sewed a different button on a square bit of cardboard. He has written neatly below of what the button is made and where it came from.

We gather around a table in Bob's dining room. We lay our buttons upon it. How many there are and how different they look! They are of all shapes and sizes and of varied colors and kinds.

"Let us each tell the story of the button he has brought," cries Mary. "I have found out about mine. But that one of Jack's is so queer, I cannot think what it can be."

"That's a splendid idea," says Dick. "Bob shall begin because we are meeting at his house. Bob, what is your button?"

A Very Old Fellow

"This is an old, old button," says Bob, as he holds up his card. "It was once on a suit of my great-great-great-grandfather. It was carved out of wood in 1780 in Philadelphia by one of our first button makers. In ancient times there were no buttons. Don't you remember the story of the Needle? It told us that the old Romans wore togas held together with belts.

"Buttons began to be made only about 500 years ago," Bob goes on. "And even then, they were used chiefly for trimming. The dandies of Queen Elizabeth's
court covered their satin vests and coats with shiny gilt buttons. We ourselves wear some buttons which we could very well do without. They are put on our clothes because they look well. My father says that our American factories make hundreds of millions of buttons each year. Besides these, we buy almost as many from the button makers of Europe."

Bob lays his wooden button in the center of the table. Edith next holds up the one she has brought to the meeting. It is a pearly white disk the size of a penny. It is sewed to the pasteboard through holes in its center.

A Button of Pearl

"My button is one of a kind we all use," says she. "We use it so much that we seldom think of its travels and of the long way it has come. It is called a pearl button, but it is really mother-of-pearl. It was once a part of an oyster shell. It is made of the same material as the real pearls that are sometimes found inside the oyster.

"Once upon a time this button of mine lay on the bed of the ocean in the Persian Gulf in far off south Asia. If Bob has a map, he can show us just where that is. The oyster from whose shell my little button was made snuggled down in the sand. Fish swam back and forth over it, and seaweed floated above.

"One day a brown-skinned pearl diver dropped down through the water. He dug up the oyster still in its great shell, and put it
Edith's button was once part of an oyster shell.

with many others into a basket. Then a rope pulled him back again to his boat on the surface."

"If I were a diver," says Dick, breaking in, "I should look for real pearls."

"But real pearls are rare," says Edith, "and the oyster shells bring in more money. They are shipped off by the ton to the button factories. There the shells are soaked in water for days until they become softer and easy to cut. Round disks are sawed out of them by whirling steel tubes with fine teeth filed on their edges. These tube saws are about as long as my finger. They are of all sizes, each just as big as the button it will saw out. The saws are whirled around by machine and they cut from the oyster shell the coarse disks which are called 'blanks.'

"The rough blank for my button was ground smooth on an emery wheel, and then another machine drilled in the holes through which the thread goes. You see, this button has four of those holes in its center, but many pearl and bone buttons, like these on my cuff, often have only two.

"See, how bright the button is," says Edith as she holds it up in the light. "That came from the rubbing and polishing, which has made it shine like a pearl. When it was finished it was sewed on a card with others of the same size and kind, and then packed in
the pasteboard box for the store where my mother bought it.”

A War Relic

“Oh, look at this button! Isn’t it pretty?” cries Helen as she takes up Dick’s card and passes it round. He has brought a shining brass button which glistens like gold. It is one of a kind worn by the officers of our army and navy.

“My Uncle Frank is a captain in the navy,” Dick begins proudly. “This button came from one of his old uniforms. It has traveled with him all over the world. It has sailed into the ports of China and Japan, and of Europe as well. It fastened his coat during the World War. Don’t you think we should give it a place of honor in our Museum?”

“It looks like the button on my reefer coat,” says Tom, “but mine may be smaller. Brass buttons are worn also by policemen and street-car conductors, and by bell boys in hotels.”

“Uncle Frank told me that brass is made of copper and zinc,” Dick goes on with his story. “A round piece is cut out of a sheet of metal. Then the design is stamped on by a machine. The flat metal disk is then pressed into its button shape, and the little ring for the thread is clamped on its back. It is now gilded and polished and ready for use.

“You can see that my button is different from Edith’s,” says Dick as he turns his button around.
"It has no holes in its center. It is sewed on by the ring on its back. The ring is a small bit of wire fastened on tight. It is called a 'shank.' When the thread passes through the shank, Mr. Button is caught fast to the cloth."

The Ivory Sisters

Helen’s card has two buttons. One is creamy white and the other bright red.

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Ivory Sisters. They are far better than bone. This white one is animal ivory. It came from the tusk of an elephant. Men chased the great beast through the jungle and finally killed him. They took out his tusks and sold them for ivory. But such tusks are so rare and so hard to get that ivory buttons cost a great deal. They are so high priced that but few can be used.

"This little red sister is ivory too," Helen continues. "But she is much cheaper. She belongs to the vegetable kingdom. South America was her home. There in the forests she grew on a tree in a bur somewhat like that of a chestnut. That bur was as big as your head, and inside it were twelve or more hard, shiny nuts. Each nut was half the size of my fist. The burs were picked by natives and the nuts taken out and shipped to the button factories.

"There the shells were ripped off. The hard white kernels inside were split into halves. Machines shaped these halves to buttons. Vegetable ivory is easy to dye, and such buttons can be had in many bright colors. They are
dipped in dye tanks and dried on wire racks. After they are polished, they are sold for use on our suits, coats, and dresses."

**A Button from a Hoof**

"You have all seen the place where my button was started." Jack is speaking. He holds up a dark-colored square button. "Don’t you remember how, in our travels to the homes of the Foods We Eat, we went to Chicago to find out about meat? Well, this square fellow came from that place. He was once the hoof of a steer, running over the plains of the west. When the animal was killed for beef in the busy stockyards, the meat packer sold his hoofs to the button factory.

"There the hoofs were boiled soft and cut into strips. This Mr. Button was chopped off with a knife. He was shaped and dyed and his shank fastened on. He was then smoked and polished. He is often called a horn button. Some buttons are made from horns but the most so-called horn buttons really come from the hoof and not from the horn of the animal."

**Other Queer Buttons**

Mary has brought a button covered with cloth. She says: "I don’t know exactly how this button is made. The inside is a mold of pasteboard or wood. The cloth is stretched smooth over this and held tight by that metal disk clamped on the back. My button is sewed on in a different way from those with holes or shanks. See that small tuft of cloth sticking out through that hole in its metal back! That takes the place of a shank. The thread is drawn through it again and again, and so the button is
The buttons are ground smooth kept firm for its work of fastening our clothes.

"Such buttons are often covered with silk, or linen, or wool. We can finish our dresses with buttons made of the very same cloth."

Other members of the Journey Club have brought buttons of leather and bone, of tin and of gum, and even of paper. Paolo has one of glass. Many buttons are made of porcelain, china, and rubber. Strange to say some are squeezed out of seaweed, blood, and skimmed milk. Who would believe that a button can be made of an Irish potato? But we find out that when treated with acid, the potato grows as hard as a brick and can be used in this way.
CHAPTER 13

EDITH’S NEW GINGHAM DRESS

Mrs. Gray, Edith’s mother, has invited the Journey Club to spend the day on the farm. We have already taken many trips to find out about cloth, and now want to see how it is turned into clothing. So we are going to watch Mrs. Gray as she makes a spring dress for Edith.

The air is soft and warm. There are green leaves on the trees and the songs of the birds are heard through the open window. We stand about the sewing machine where Mrs. Gray sits at work. A table near by is covered with pieces of gay-colored stuffs, and the scissors and sewing box are laid close at hand.

“You boys do not wear many clothes made at home,” says Mrs. Gray. “Nine tenths of your suits are bought in the stores. I suppose that some of the girls also get dresses there. But much sewing is still done by your mothers and by dressmakers who come in to sew by the day.”

“I like the clothes my Mother makes better than any I can buy ready-made,” says Mary. “She lets me choose the colors I want, and I often go with her to pick out the cloth. Dresses like mine would cost much more to buy, for mother puts so much hand work upon them.”

“But our suits and coats are best bought ready-made,” says Helen. “Don’t you think so, Mrs. Gray?”

“Perhaps,” is the answer. “The factories can do such work better, and the cost is often the same.”

Making a Dress

“Well, now we shall see how clothes are made right at home.
We watch Mrs. Gray make Edith a dress
We must first choose the cloth and decide on a pattern.”

Mrs. Gray turns to the table, and Edith picks up a yellow envelope. She pulls out of it many oddly shaped pieces of thin tissue paper. She tells us that a pattern like this has all the parts needed to make up a dress. Patterns come in different sizes. Edith must have one just right for an eight-year-old girl.

We read the printed directions that come with the pattern. They tell just where to cut and how the goods should be sewed.

Mrs. Gray lets us choose which cloth to make first. We pick out a pretty rose-colored gingham. She spreads the stuff smooth on the table, saying:

“There is just enough here to make Edith’s dress. The pattern told me the amount I should need, so that I knew just how much to buy.”

She next lays the pieces of the pattern carefully on the cloth. She then fits them together so that they cover almost every bit of the gingham.

“That’s like a picture puzzle,” says Jack. “Why do you put them so close together?”

“So that no cloth shall be wasted,” is the answer. “I pin them on tight so they shall not slip, and the dress be cut wrong.”

Snip, snip, go the scissors. When all the pieces are cut, the tissue paper is unpinned. Then Mrs. Gray threads her needle and puts on her thimble. She begins sewing the edges of the cloth pieces together with long even stitches. She calls this “basting the seams.” It holds the cloth in place as it slips along under the needle of the sewing machine.

“I will baste only a few seams,” says Mrs. Gray. “Then I will show you how I run my machine.
I can work many times faster than my great-grandmother could. She had to put each stitch in by hand, and it took a long time."

**A Helpful Friend**

"This is one of the best friends I have," says Edith's Mother, laying her hand on the wheel of her sewing machine. "Wouldn't you like to hear a little about it?" Of course we say "Yes" and so she goes on:

"It was less than one hundred years ago that a man named Elias Howe invented the first machine that would sew. He had almost no money, and it was only after much trouble that he succeeded in putting his machine on the market. Even then people laughed at the idea that iron and steel could take the place of fingers and thimble.

"But by and by, however, they learned that the sewing machine could do the work well and that with it much time could be saved. Other men made improvements. Allen B. Wilson and Isaac M. Singer each added to it some new ideas and it grew better and better. So to-day we have these wonderful modern machines which do all the kinds of sewing that can be done with our fingers. Some can embroider, take fine fancy stitches and even make buttonholes.

"The first Howe machine was turned by a handle. My last one was run by a treadle and my foot aches even now when I remember how tired it used to get! The machine I have here is a late electric model. I screw the metal piece on the end of this wire into the electric-light socket, just as you put in a light bulb. I then turn on the current. To start the machine running, I put my toe on this small bit of iron which lies on the floor. It is much like driving an automobile. As long as I press my foot on the lever, the machine sews away. When
I lift my foot off, it stops at once. I can make it go as fast or as slow as I wish.”

The Sewing Machine at Work

We watch Mrs. Gray as she starts the machine. Round and round flies the wheel! Up and down hops the needle! What a small thing this is to do so much work! It rests on a table of just the right height. It is so light that Mrs. Gray can carry it about from one room to another.

There is a spool of white cotton stuck on a metal pin in the top. We follow the thread from it as it goes to the eye in the point of the needle. Small metal guides hold it straight in its course and allow it to pass through just quickly enough to make the right stitch.

What is Edith doing? She pulls out a shiny plate in the bottom and shows us the bobbin. This has a second thread wound on a reel and placed snugly inside it. The bobbin flies around under the cloth in such a way that its thread catches in that which is brought through by the needle. So each stitch is held tight. Edith’s mother explains that this is a “lock-stitch” machine. She tells us of another, which has only one thread and which makes a “chain stitch.”

“The chain stitch is somewhat like crocheting,” says she. “Many women think that the ‘lock stitch’ is better and that its sewing lasts longer. It will not unravel like the ‘chain stitch.’”

How fast the cloth moves along under the needle! It is pulled through by the machine as it is sewed. Edith tells us proudly that her mother can make her whole dress in one day.

“Yes, I think I can,” says Mrs. Gray thoughtfully. “But not one with hand work upon it. That takes much longer. To finish this dress, I must sew up the seams, and put in the sleeves. I must try it on Edith two or three times to be sure it will fit. Last of all come the collar and cuffs, and the trimmings and buttons. Then I shall press it out with my electric iron, and it will be ready to wear.”
Mary asks if the clothes bought in the stores are not made much like the dress we are watching to-day.

“Yes, more or less,” is Mrs. Gray’s answer. “Handmade dresses are sewed by women in factories or dressmaking shops. Those made by machine are almost the same, but they are turned out by the hundreds or thousands. They are shipped to the stores all over the country.

“I think that the Journey Club should visit a clothing factory and find out how they sew there. You will not be able to see how all kinds of dresses are made, there are too many. Did you ever read the verses about Miss Flora McFlimsy who complained that she had ‘nothing to wear’ although she had

“Dresses for breakfasts and dinners and balls;
Dresses to sit in and stand in and walk in;
Dresses to dance in and flirt in and talk in,
Dresses in which to do nothing at all;
Dresses for winter, spring, summer and fall.
All of them different in color and pattern,
Silk, muslin and lace, crêpe, velvet and satin,
Brocade and broadcloth and other material
Quite as expensive and much more ethereal.’

“Now I think the Journey Club has found out enough for one day. Go downstairs with Edith and make some lemonade. There are doughnuts and chocolate cake in the pantry.”

With many thanks to Mrs. Gray, we run down the steps and soon are having a feast in the big airy kitchen.
CHAPTER 14

BOB'S OVERCOAT

"There he goes! There he goes!
All dressed up in his new spring clothes!"

Jack sings this as Bob comes into our meeting to-day. Bob has on a new overcoat of brown woolen cloth. He walks proudly for he knows it is nice. He tells us it is of the latest style they had in the store where he bought it.

"This coat came from one of the biggest clothing firms in America," says Bob. "See, the silk label sewed on the lining shows that it was made in Chicago."

As we look at the square of silk with the name of the makers and their address woven in it, Dick makes a suggestion.

"Why don't we go there to find out about our ready-made things?" But Mary has another idea. Says she:

"My father told me last night that New York has the most of such factories. Seven out of every ten ready-made dresses for women and girls are sewed in that city, and nearly two fifths of all the men's and boys' clothes come from there too. I really think we should go to New York."

"That may be true," Dick replies, "but the home of Bob's coat is one of the greatest clothing works in the world, and I know he would like to see where it was made."

So we decide on Chicago. When our train arrives, we go out to the taxicab stand. We jump into several bright-colored cars and ride to the factory.
We take taxicabs to the clothing factory
A Huge Clothing Factory

What a big building it is! We almost break our necks as we look up toward the sky to count its twelve stories. Inside at the desk, we talk with the man who gives information. He phones our message to the factory manager.

As we wait, we look about us. We are in a big office. Fifty or sixty women and men are at work at their desks. There are adding machines and clicking typewriters.

"Those people are clerks who take care of the bills and write business letters," says the information man. "We have fifteen hundred men and girls who do nothing else. They send orders for supplies from the cloth mills, and arrange for the shipments of our suits and overcoats to the stores all over the country."

Now word has come that the manager will see us upstairs in his office. We step from the elevator and walk past room after room where we catch glimpses of men bending over their desks. The manager greets us and shakes hands all round.

"So the Journey Club wants to watch a coat made from beginning to end?" says he. "Well, we shall be glad to have you go through our workshops. There you will find thousands of coats on their way from bolts of cloth to the backs of such boys as you. We are like Aladdin of the Wonderful Lamp. We rub our lamp, and start our factories running.
and out of our mill come 45,000 overcoats and suits every week. Think of that! We make more than seven thousand for each working day.

"I fear it would take you too long to see all our shops. We have eight different buildings. In them are eleven thousand men and women doing one thing or other to give you your clothes. You had best go through one workshop where you can follow an overcoat like Bob’s in its cutting and stitching and other adventures."

"Do you make girls’ dresses too?" Helen asks.

"No, we do not," is the reply. "We have a few coats for women, but the most of our garments are for your fathers and brothers. You see, men wear clothes more or less of one style. They are simpler than dresses and so are easier to make in great numbers. Dresses are usually turned out in the smaller factories or in dress-making shops."

**What the Sewing Machine Did**

"Less than one hundred years ago," says the Factory Manager, "men’s clothes were made almost entirely by tailors sitting cross-legged on benches in their own little workshops. There are many of these even to-day. They cut, sew, and fit each suit to the buyer. Often they have but two or three helpers. They turn out one suit at a time, and the cost is much greater than that of the ready-made ones which flow out of our factory in streams of hundreds and thousands."

"Did they have sewing machines in the first little tailor shops?" asks Edith.

"No, indeed," is the answer. "It was the wonderful new machine sewer of 1850 which helped the tailors to make clothing quickly. Then came the idea that much more time might be saved if many garments were cut at once and sewed one right after the other. The tailors soon learned that all men and boys are built the same way, and that if they could cut out certain sizes, they could fit almost any one.

"Now I am going to ask Mr. Brown to take you through one of the shops. He will lead you along the very path taken by Bob’s coat."
From Cloth to Coat

We start on the top floor of the factory. We watch the men open the huge bolts of cloth as they come in from the weaving mills. Some of the stuffs were woven in America, and others have traveled across the Atlantic from England and Scotland. They are first measured by men at long tables.

Those men near the windows are inspecting the goods. See, how they throw each piece up over those tall wooden frames. They are chalking the rough places and spots. With needles and thread they are putting little white stitches in the edges of the cloth. These catch the eye of the cutter, who looks out for the bad spots, to be sure that none shall go into the garments.

We stand a while by the shrinkers as they run the new cloth over wide metal rollers. These have holes in their sides which let out clouds of white steam. Near by we can hear the swish of more cloth as it goes through its baths in tanks of hot water. The cloth is being shrunk. The workmen tell us it was shrunk or “fulled” at the weaving mills. But they shrink it all again here so that they may be sure the cloth will not lose its shape.

How Bob’s Overcoat Was Cut Out

We next go into the cutting rooms. The first things we see are thousands of pieces of brick-
colored cardboard, hanging on hooks.

"Those are the patterns," explains Mr. Brown. "Each card is marked with a number which tells for what part of the coat it is meant. Bob's overcoat here

She points out the cutters at work at their long tables. We walk over to watch them. They are spreading out the cloth and piling it up, layer on layer. Here is one man who has at least twelve thicknesses before him. He picks

has in it about thirty pieces of cloth and we used thirty patterns to cut it. Those men at the other end of the room are making the patterns. They follow drawings made by our designers. The designers are men who think up the styles, and decide what kind of clothes will please people best."

"Look over there!" cries Mary.

up from the table some of the cardboard patterns and lays them upon his pile of cloth. He fits them in this way and that, and marks on the cloth round the edges with a bit of white chalk.

As we look Helen asks:

"How can you cut so much at one time? That pile of cloth must be at least four inches high. I
am sure no scissors can chop their way through it.”

“I do not use scissors,” the cutter replies. “I have an electric machine which does all the cutting. I cannot talk as I work for my hand might slip. But you shall see for yourself that my cutting machine will slide through all this cloth as a sharp knife goes through layer cake.”

He shows us his machine. It is so small that he holds it in one hand. He places it against the cloth. Buz-z-z-z! The electricity has started the machine. With the other hand he turns the cloth this way and that. There is a little round disk of steel with an edge sharp as a razor, which whirrs its way through the cloth quickly and evenly. The machine cuts the corners square and makes smooth rounding curves. When we remember that each suit of clothes contains fifty or more pieces of cloth, we can easily see how much time is saved by this little machine which cuts out twelve suits or overcoats at one time.

Each bunch of pieces is now wrapped with paper and marked with a number that tells what part they are for and the kind of garment to which they belong.
We gaze open-eyed at a machine which knots a string round them, and cuts off its ends, all in a second.

**A Motor Truck Ride**

We go along with these bundles of pieces to the shops where they are sewed. We stop on our way in the assembling room. Here the pieces of cloth meet their friends, the lining and buttons, bindings and thread. All such things are called "findings." They are bundled up with the cut cloth and piled on motor trucks.

Mr. Brown tells us to climb aboard too. We jolt over the cobble-stoned streets. The main building of this factory is right in the heart of the "Loop," as the busiest part of Chicago is named. The other workshops are found several miles further west.

The bundles on our truck are for making coats. Those cut for the vests go to the vest-making building, and those for the trousers to the shops where they sew trousers only. A great clothing factory is really a number of small workshops, in each of which cloth is turned into finished garments.

**Where Bob’s Overcoat Was Sewed**

Here we are at the Coat Factory. We jump down and go with Mr. Brown up three flights of stairs. We open a door and find ourselves in a vast room which hums like a beehive.

The shop manager says Bob’s overcoat came from this very room, some four months ago.

"Oh, dear," cries Bob. "They told me in the store it was one of the newest they had."

"They told the truth," says the manager. "You see, we must make our clothes months ahead,
so as to get them out to the stores at just the right season. Although it is now spring, the suits and coats you see here will not be sold before fall.”

What a din! The sewing machines are running like mad. All are electric, and are guided by foot levers. Some get their thread from spools of cotton six inches high, or from large reels of silk. These are hung just above the machines. A small spool of thread like those used by Mrs. Gray would be sewed up here in a very few minutes.

“There are one hundred and twenty-five different things to be done to a coat,” says the head of this shop. “Forty or fifty persons work on every one. Each worker does one special thing. Those girls sew seams all day. These put in the sleeves. That man is fixing the large side pockets, and his neighbor is working on the smaller ones. Others do basting and padding and pressing. Those girls by the window are sewing with needle and thread. They put in the linings and finish the coats.

“Some of the buttonholes are made by machines,” says Mr. Brown, “but on the fine clothes, girls make them by hand.”

“There are the pressers,” says the manager. “Come, let’s have a look at them. The irons they are using are really gas stoves. Each has a hot flame burning inside it. It is too heavy to lift, so that iron arms hold it in place, and the presser just guides it over the cloth. Over there are the machine pressers which will steam and press a coat smooth in less than a minute.”

The End of Our Trip

It takes about six days to make a coat here in this shop. The work is well done and the workers are careful. If each stitch is not perfect, the coat is sent back to be fixed.

The finished coat is taken to the main building in the Loop.

“But where are the trousers for the suits you make here?” Dick asks our guide.

“They and the vests are made just like these coats,” is his reply. “They have their own patterns and are sewed in special shops. Each will be put with its coat before the suits are packed up for shipment.”
CHAPTER 15

TWO GIRLS WHO MAKE LACE

To-day we start out on a journey to Europe. An express train takes us swiftly to the great city of New York where our steamer awaits us. We are making this trip to find out about lace.

We do not use lace to keep out the cold. In the midst of the winter a coat made of lace would be chilly indeed. But our clothes all need some kind of trimming. For the suits of the boys there are buttons and braid, and the dresses for girls may have edgings of lace or designs of embroidery to make them look pretty. Lace is the very finest of trimming. Our travels in Europe will show us from where it comes and how it is made.

At the Lace Counter

On our way to the boat, we visit one of New York’s big department stores. We go to the lace counter and talk to the sales girl about our trip. She is interested and she takes down many rolls of lace from her shelves and spreads them before us. She also shows us huge books filled with samples of lace. As she tells what they are, Helen says: “I can never remember all those names.” The other Journey Club members feel the same as Helen. This store has laces of every kind and description. There is fine lace and coarse lace, wide lace and narrow. Some have big patterns of flowers and
birds. Other are daintier, and the thread is much finer.

The sales girl tells us that laces come from different parts of the world—from Belgium, France, Spain, Italy, Germany, Norway and Sweden, and other lands. Each country makes many kinds.

"Lace is really all made out of thread," says the sales girl as she runs her hand under a strip. "The thread may be cotton, or linen, or even silk. Each kind of lace is a net with patterns worked in it, and the most of it is made in one of three ways.

"This 'needle point' lace is worked with a needle, and in this piece of 'pillow lace' the thread is woven with bobbins. The lace we call 'imitation' is done by machine. There are also some laces which are crocheted. This beautiful filet lace is net darned here and there, just like a stocking, and the darning stands out, making the pattern."

Our deck games make the time fly on the steamer
With Louise of Belgium

It is now eight days later. We have had glorious weather upon the Atlantic, and with our games on the deck of the big ocean liner, the time has flown by. We land at Antwerp and go straight to Brussels, the capital of Belgium.

Brussels is famous for the beautiful lace, made by the deft fingers of its women and girls. When we arrive the weather is warm and we find many lace makers at work out of doors.

As we stroll through the streets, we see a girl our own age sitting on the doorstep of her home. She has a cushion upon her knees. On it is some lace over which her fingers are moving this way and that. We stop and Jack introduces the Journey Club. He tells her we have come all the way from America to find out how lace is made.

She is delighted. She says her name is Louise and she calls to her mother and her two older sisters. They bring out the lace work they are doing and all are eager to show their beautiful pieces.

“I began to make lace when I was just six,” says Louise, “and I can now do it quite well. If you will sit down, I will show you how it is made.”

We take our places on a wooden bench and on the steps of the house. Louise puts her chair in the center so that we can all see. She rips from her cushion the piece of lace she has been making.

“The lace that I make is called ‘pillow lace,’ because it is made on a pillow,” she explains, holding up the small cushion resting
on her knees. She picks up a piece of thick creamy paper with a pattern drawn on it. This paper is parchment. It is made of sheepskin and is very strong.

In a Belgian lace shop

"I must follow the lines of this pattern in making my lace," says Louise. "See, I fasten the parchment tight to my cushion. Then I put in all these pins. I leave them sticking up in the air, for they help guide my threads."

Louise shows us next a number of tiny wood spools with linen thread wound upon them. These are her bobbins and they carry the threads as she moves them about. She fastens the end of each to a pin at the beginning of the pattern. She lets the bobbins hang down over the edge of the cushion. Now she is ready to work.

She picks up first one spool, then another, and her fingers fly fast as she twists them this way and that. Over and under go the threads, amid the forest of pins. Now a twist, now a twirl, and as if by magic the lace grows before our very eyes. As one part is finished, Louise takes out
the pins and pulls her lace along the pattern. She begins again where she has left off, putting in her pins and winding her threads deftly about them.

Pillow lace is fine and of great beauty. It takes a long time to make. Louise brings out some large pieces of lace which are the work of her mother. How lovely they are! There are birds, beasts, and flowers in some of the patterns.

A Day in Venice

We cross from Belgium to France and go under the Alps through a tunnel to sunny Italy, Paolo’s own native land. He wants us to go to Venice where live his Aunt Desdemona and her daughter, his Cousin Maria. He pronounces her name Ma-re-a and says it is the Italian for Mary.

Now we have reached the railway station in Venice. As we come out of the door, Bob starts to run down the steps. But Paolo calls out:

“Be careful there, Bob!”

We are surprised to see that we are right on the water, and instead of the taxicabs we ride in at home there are odd-looking boats bobbing up and down at the foot of the steps. These boats are gondolas. On the back end of each stands a gondolier, a man with a cap on his head and a sash round his waist. He pushes his boat about with an oar. The gondoliers call to us as we come down to the water. They motion us to get in and sit down in the little houses in the center of their boats. A gondola holds only two or three persons. So it takes a good many to carry all the members of the Journey Club.

We make quite a procession as we glide into the stream.

As we look about us we see smaller streams going out to the right and the left, and find that we are not on a river as we thought at first. We are gliding along on the Grand Canal, the main highway of Venice. It is one of the many water-streets of this strange city.
IN THE CITY OF CANALS

Venice is built on the sea. As we ride on, we wonder that the houses do not get wet inside. They seem to be resting right on the water.

Maria jumps up and down with joy to see Paolo. His Aunt Desdemona welcomes our Club and insists that we all come into her house and have luncheon. Our plates are heaped high with delicious spaghetti. Paolo says that we have come to Venice to see how they make lace in Italy.

"I am afraid that I cannot do it well enough yet to show you," says Maria. "I am just learning. But mother is one of the best lace workers in Venice. She will tell you all that you want to find out."

The lace Paolo’s aunt makes is worked with a needle and thread. It is called "needle-point." How different it is from the pillow lace we have just seen in Belgium! We see that her design is also marked out on parchment. But she has sewed a piece of fine linen beneath it. She shows us how she lays her first threads loosely along the lines of the pattern. She catches them lightly with needle and thread to
A baby's lace dress made in the Philippines

hold them in place. Then she begins to embroider over these threads. She talks as she works. "The design must all be embroidered on the linen. In the part I have finished I have put thousands of stitches. When it is all done, I shall cut away the bits of cloth which are not in the pattern. That will make hundreds of wee holes and will give a lacey effect."

We enjoy our stay with Paolo's relatives. His aunt shows us some fine lace one hundred years old. She tells us that lace was made as far back as the days of Christopher Columbus.

No one knows just when lace was invented. It has always been prized as a trimming for gowns. In Spain a woman often wears a lace scarf or shawl on her head instead of a hat. Spanish lace head-scarfs are called "mantillas."

We use lace for many things other than trimmings. It makes window curtains and covers for beds. Our mothers delight in lunch cloths and doilies trimmed with it, but the most that we buy is put on our clothing.

Handmade laces like these we

A lace handkerchief from South America
have seen take long and tedious work, so they cost a great deal. For this reason men have invented machines to turn out lace cheaply, but the handmade lace is by far the more beautiful. grind out many miles of lace every day. The one we go through has room after room filled with noisy machines. Some of the lace machines are so heavy that a big motor car could not pull them along. It is hard to understand how such delicate laces can be made by such clumsy masses of iron and steel.

But the finished strips are beautiful. The work is done quickly and the cost is so little that almost any of us can afford to have some. It looks to us much like the "real" or hand-

Lace Made by Machine

We decide to stop off on our way home at Calais in France to see how they make lace with machines. France has thousands of hand workers like Louise and Aunt Desdemona, but it also makes much lace in factories. In Calais alone there are more than four hundred mills which

How lace is made in the Philippines
Mary has lace collar and cuffs on her best party dress made lace, but our mothers could tell which is which at a glance.

Embroidery and Trimmings

As we journey back home, we talk of the trimmings we have on our clothes. Mary has lace collar and cuffs on her best party dress. Edith’s blouse is embroidered with a pretty design which her mother made entirely by hand. Helen’s handkerchief has a flower on one of the corners but this, she thinks, was the work of an embroidery machine.

The boys have some trimming on their suits, although they are plainer. Jack’s sailor blouse has braid round the collar. This is a straight band woven of cotton which is sewed on flat near the edge. There is also an anchor embroidered on one of his sleeves.

Braids and edgings come in all colors. They are usually made of cotton or silk. Many of us use them on our wash dresses and suits. Edith remembers that her aunt has a dress with a border of beads, in a beautiful pattern. They were sewed on by machine.

Indeed, the trimmings we wear are of many kinds, but we all agree that lace is the finest and the one we like best.
CHAPTER 16

OUR CARPET OF LEATHER

Jack has a riddle for the Journey Club.

“What kind of carpet is it that each of us walks on every day wherever he goes?”

We are silent, thinking as hard as we can. Then Mary speaks:

“We do not always have a carpet. We often walk on the floor or the sidewalk or on the rough ground.”

“Yes, but even then we are on this carpet,” says Jack. “Do you all give it up?”

What can it be? No one can guess, and Jack finally tells us.

“The carpet is of leather. Each of us carries his around with him. With every step, we tread on the leather soles of our shoes. That leather protects our feet like a carpet from the hard floor or the ground.”

We have to admit Jack is right. We had not thought of our shoes in that way. But except in the summer, when we sometimes go barefoot, we do walk upon leather all the year round.

No one knows just when the first shoe was made. It was probably long ago, in the days when the cave children ran about in their coverings of skins. The stones were so sharp that their fathers bound up their feet with strips of the skins of wild animals. Later pieces of such skins were cut out to serve as soles, and tied on the bottom of their feet with skin straps wound about the ankles. Shoes like those are called...
sandals. How rough and crude they must have been! It seems strange that they are the forefathers of the finely made footgear we are wearing to-day.

We Visit a Shoe Collector

As we plan our trips through the world of leather, Bob makes a suggestion:

"Mother's friend, Mrs. Thomas, has a collection of shoes from all parts of the globe. She travels a great deal and wherever she goes, she buys the shoes of that country. She must have a hundred or more pairs, and I know she will be glad to show them to us. Let us telephone her, and ask if we may not stop there on our way to the train."

Bob comes back from the phone with a smile on his face.

"It is all right," he cries. "We can go along now."

Soon we are shaking hands with Mrs. Thomas at the door of her home. She leads us into a big room where are several glass cases. Inside them on the shelves are rows of strange boots, shoes, and slippers.

We sit in a circle, and listen as she talks of shoes from far-away lands. She takes out two sandals, one made of leather and the other of straw.

"Sandals were the first shoes of all," Mrs. Thomas begins. "The cave men cut them from prehistoric sandal

A prehistoric sandal

skins, and the early Egyptians wove them from grass. Such shoes are still worn in Asia and Africa. That straw sandal Mary

A straw sandal from Japan

is holding came from Japan. You have all seen children wearing straw shoes in your Journey Club trips through China and India."

Edith's sandal

"I wear sandals like this in summer," says Edith, taking up a sole of tough leather with long ankle strings, "but mine fasten on with buckles and straps."
"The Romans wore sandals too," Mrs. Thomas goes on, "and so did the people of old Bible days. But they soon found it was not enough to protect only the sole and then they began to make bags of leather which covered the whole foot. As time went on, shoes grew better and better, until, when America was discovered, men had boots and shoes of fine leather of gay colors and fancy designs."

Mrs. Thomas brings out a book filled with drawings of the footwear of those times. It shows oddly shaped boots with wide floppy tops, low shoes with pointed toes curled up at the ends, and slippers and high boots embroidered and studded with jewels. It is said that Sir Walter Raleigh had thousands of dollars' worth of gems set in his boots. As we turn over the pages our hostess asks:

"How would you like a shoe with a toe so long that its tip must be pinned to your garter below your knee to allow you to walk? Such shoes were worn by the dandies of the old English courts."

"Is that a wooden shoe?" asks Helen, pointing to a rough object carved from a block of wood.

"Yes, that is a sabot," Mrs. Thomas explains. "You can see many such wooden shoes in Holland and Belgium, and also in the country towns of France and Germany. They are good for wet weather, for the water cannot soak through. They look heavy but they really are light, and the children can run in them as fast as you can in your shoes of
Dutch children wear wooden shoes

leather. Besides, they are cheap, and will last a long time.

“The Japanese also have wooden shoes, but they are more like thick sandals. They are held on by the toes, which are slipped under strips of cord or leather, fastened across the end of the sandal. The Japanese have rainy-day shoes of wood with two props about four inches high, set in the soles. They look like low stilts.”

How interesting all these shoes are! And how different from ours! Mrs. Thomas allows us each to try on a pair. Edith chooses blue silk slippers embroidered with silver, once worn by a Chinese woman with bound
feet. They are so small Edith can get in only her toes. Mrs. Thomas tells us that the toes of the poor woman who wore them were so bent under the sole of her foot, that she walked almost entirely on her great toe.

An Indian moccasin

Jack tucks his feet into soft Indian moccasins, and Bob draws on over his shoes some Alaskan fur boots. Dick shuffles around in wood sabots, and Mary dances about in Turkish slippers of red leather, embroidered in gold. The shoes Helen picks out are queerest of all. They are from Manchuria. They look like the silk slippers of the rich Chinese men. But each has a high square wooden heel in the center of its padded sole and the one who wears it must walk on this heel. Helen cannot keep her balance.

We wonder how the Manchurian children can play in such shoes.

As we look over the collection, we feel that we should rather go barefoot all the year round as do some of our friends in the hot lands, than to use the foot gear of these far-away countries. We decide that the best of all shoes are the leather ones we have on our own feet.

How We Get Leather

What a procession we should see if all of the animals whose skins are made into leather should walk through our streets! It would be much like a circus parade. First would come the goats, cattle, and sheep whose hides are used for all kinds of footgear. Then would follow the kids, chamois, and deer, and the antelopes, horses, and dogs whose skins make our gloves. The pigs would be there, for we take their hides for saddles and handbags, and with them perhaps the great hippopotamuses whose thick skins make strong belting to run heavy machines. At the end of the procession, slowly crawling along, would be snakes and alligators,
and quaint furry seals wobbling this way and that on their clumsy flippers.

Of all of these animals, the most important are the sheep, goats, and cattle. Three fourths of the leather we use goes into our shoes, and the most of this comes from them. We need so much that our own farms cannot give us enough and so we must buy hides from our friends who raise these animals in other parts of the world. The hides come in on ships from Asia, South America, Africa, and even Australia, and go through our tanneries where they are turned into leather. It is to a tannery that we go after leaving Mrs. Thomas.

Automobiles bring us from the train to the tannery we are to see. What a horrid smell fills the air! It comes from those hides piled high on the trucks in front of the door, and also from the work going on in the building. We whisper to each other that we do not want to stay any longer than we actually must in order to find out what we want to know.

The tanner chats with us as we go about with him. He tells us that the hides on the trucks are from the stockyards of Chicago and other cities of our middle west, and that all the skins of the animals killed for meat are saved to make leather.

He takes up a hide and shows us that it is formed of two different layers. There is one on the outside which has a coating of hair. This is hard and tough, but under it is another which is softer and finer. The outer layer must be taken away. The inner layer, or "true skin," is then cleaned and softened and tanned into leather. It is from this inner layer only that leather is made.

Making Leather

We watch the hides on their way through the tannery. We
Automobiles bring us from the train to the tannery

step carefully, for everywhere there are great vats filled with bad-smelling liquids and we do not want to fall into them. The hides are first examined, then weighed, and then thrown from one bath into another.

The first bath is of pure water. This soaks out the dirt and softens the skin. Then the hides are put into a liquor which contains lime. The lime loosens the hair. The hair and the outer layer of skin are next scraped off by men with long knives, who cut away also any bits of flesh that may have stuck to the hide. An acid bath washes out all the lime, and a last fresh-water soak cleanses the skin. After this the skins are dried and then they are ready for tanning.

"Why must skins be tanned?" asks Dick.

"Because they would rot if left as they come from the animal's back," is the reply of the tanner. "Shoes made of untanned leather will soon fall to pieces. Tanning makes the hides soft and helps them to stand wear."
The hides are washed in lime vats to loosen the hair
The hair and outer layer of skin are scraped off

“Some years ago we used to cure leather almost entirely with the acid taken from “tan” (the bark of hemlocks and oaks and other trees) and from the leaves of the sumach plant. From tan we get the word tannin. We then put the hides between layers of tanbark and turned water in upon them. The water soaked the tannin out of the bark and the mixture went into the hides, thus curing them. They would lie in their tannin baths for weeks and months. Tanning that way took a long time.

“Now we have chemicals which do the same work in a very few days, and which make about as good leather,” the tanner goes on. “Sometimes we even use both methods, leaving the hides a short time in the tannin baths, and aiding the tanning with soakings of chemicals.”

At one place in the tannery
they are fishing the tanned hides out of the vats. Men are stretching them on racks, giving them coats of oil and hanging them up to dry. After this comes the greasing, and then if the leather is dyed, the color is spread on each skin with a brush. The last thing to be done is to run the cured skins between heavy rollers of metal. This evens and polishes them, and they come out finished leather ready to be made into shoes, boots, and slippers.

Our friend, the tanner, shows us many different kinds of leather and gives us a small sample of each for our Museum. He tells us the Morocco leather comes from goatskins, and that Russia leather is treated with birch bark. Patent leather, he says, has coat after coat of enamel or varnish and the color is baked into it.
CHAPTER 17

THE STORY OF SHOES

"Wear other clothing if you choose,
That scarce will hang together,
But your good health depends on shoes,
Made of the strongest leather."

We have chosen a great shoe factory in Massachusetts as the next stop in our journey. It stands on the spot where Thomas Beard, the first American cobbler, set up his little shoe-shop, after landing from the Mayflower on its third trip in 1629.

Thomas Beard made his shoes entirely by hand. He probably left his shop now and then to go from house to house and stay in each home until he had sewed and pegged the shoes for every member of the family.

Such traveling cobblers were common in Colonial days. Patience True, of whom we have already heard, had her shoes made that way. She liked to see the cobbler at work and to watch him as he put on his leather apron, got out his tools, and then cut the shoes from the leather her father had tanned. He used thick cowhide for the soles and heels, and soft calfskin for the uppers.

The old-fashioned cobbler pounded his leather even and smooth on a flat stone which he held on his lap. He used a pointed tool called an awl to make holes in the skins. Through these went the thread to hold the pieces together. His wooden pegs, which fastened the soles to the uppers were driven in by a hammer, and the low heels were tacked on with nails put
in one by one. The filing, scraping, and polishing were all done by the shoemaker, and in fact, with his crude tools, he made the whole shoe himself from beginning to end.

This was slow work, but in 1811 came a change. A man invented a pegging machine which fastened the uppers to the soles in a jiffy. Soon sewing machines were made to sew the uppers together. More and more shoemaking machines were invented, until to-day there are more than one hundred to do the work of the slow-moving fingers of Patience True’s cobbler.

In a Modern Shoe Factory

What would Thomas Beard think if he could go through this great factory with the Journey Club, seeing the thousands of workers and the steady stream of shoes pouring out from the many machines. He would learn that the factory can make a better shoe in five minutes than he could cobble out in two or three days, working steadily and carefully.

We talk with the manager, asking permission to go through the workshops. Says he:

“You have chosen the right place to find about shoes. Our state of Massachusetts is the center of shoemaking and nearly half of all the shoes in the United States come from its factories. Our two cities of Brockton and Lynn make more shoes than any other two towns in the world. In Philadelphia and in some cities of the Central States there are also many shoes made.

“In all big shoe factories like this one, every bit of the work is done by machine. Each worker has one special job which he does over and over all day long. He has only to guide the leather in the way it should go through his
machine and the finished shoe finally comes out cut, sewed, and polished and ready to wear."

The manager tells us it takes fifty-eight different machines to make any shoe, and the fancy boots and slippers may go through twice that number before they are done. He is proud of the fact that all these wonderful machines have been invented by Americans.

As we stroll into the factory, Jack sniffs and declares he can smell newly tanned leather. This comes from the soft skins for the uppers and the thicker sole-leathers which are being unpacked from their boxes and bales. They have come here direct from the tanneries. In the unpacking rooms we find also pegs, buttons, laces, and linings, all sorted and put up in bundles to be sent to other parts of the factory.

We first watch the “skiving” machine. This pares the leather to an even thickness, making it ready for the rollers which take the place of the pounding on Thomas Beard’s lapstone.

We stop a while in the cutting rooms where the different parts of the shoe— the uppers, soles,
heels, linings, and insoles — are all cut by machine. Each piece is shaped by a sharp steel die which is dropped by machinery on the leather, cutting it as neatly as our mothers cut cookies.

When all the parts of the shoe have been cut to their patterns, the pieces are sorted and tied up in packets, each of which carries a ticket of careful directions.

The shoemakers tell us that every shoe contains 26 pieces of leather and over one hundred other things such as cloth, buttons, and bindings. All must be put together in just the right way.

Making a Shoe

Our eyes pop with wonder as we watch a shoe made. Here the machines are stitching the uppers together, putting in linings, making buttonholes, and clamping in eyelets. The stitching is done in the wink of an eye and we follow the finished upper to the bottoming room, where the soles are fastened on by other machines. Still others tack on the heels and even sew on the buttons.

Mary calls to the others as she sees a girl worker throw a handful of buttons into the top of a machine and run the shoe
The finished shoe looks just like those in the stores

On our way back home we stop at a shoe store and look at the boots and shoes of all kinds there offered for sale. They were made like those we have seen.

The storekeeper gives the Journey Club advice as to what kind of shoes to wear. He says we must not buy shoes which are too small, or they will make sores.

The Journey Club could not travel far on lame feet!

Edith reminds us what fun it is to go barefoot, when the weather is warm and the grass is soft and green. But we agree that most of the time we should be thankful for our "carpets of leather," which protect our feet against the cold of winter, and keep them safe from harm.
A FEW days ago this letter came to the Journey Club. It is from Mary, who is away on a visit to her uncle and aunt. It reads as follows:

Gloversville, N. Y.
Dear Journey Club Members:

Can't you make a trip here to Gloversville to find out about gloves? This region makes more than half of all the gloves of the United States. Uncle Ned works in a glove factory and Aunt Bess makes gloves at home. They both want you to come.

Last night Uncle Ned told me a lot about gloves. He says they were worn by the Greeks and the Romans, and that the knights and ladies of the old courts of Europe had gloves with lace frills and jewels set in their backs. They embroidered them with flowers and birds, and the women often wore their rings outside their gloves.

The Limerick gloves made in Ireland were of leather so fine that a pair could be squeezed into a walnut shell.

This town of Gloversville was founded by a company of glove-makers who came here from Scotland before our Revolutionary War. They brought with them skins and the proper needles and thread, and when their homes were set up, began making gloves again, as they had back in Scotland. Gloves were then used most of all by the farmers and woodchoppers, to save their hands in
their rough work. At first the glovers supplied only the people in their neighborhood. But one day a storekeeper, about to set forth on horseback to buy his supplies at the nearest big city, threw a bag full of gloves over his saddle and took them along. He found he was able to sell them for a good price. Then a wagonload was sent to Boston for sale, and Gloversville thus began the making and selling of gloves in large quantities. It sells more than any other city to-day.

Now do come right away! Just send me a telegram, giving the time of your train and we will meet you at the station.

Hoping to see you soon, I am Your Journey Club friend, Mary.

A Day in Gloversville

We decide to follow Mary’s suggestion, and go to the famous glove town. As we climb down the steps of the Pullman car, Mary runs up to greet us. She introduces us to a tall man beside her whom she calls Uncle Ned. He has brought with him a motor truck big enough to carry all the Journey Club on a sightseeing tour.

As we ride about the city in our truck, he points out the glove factories. How many there are! He says there are more than two hundred, and that thousands of people are at work at glove-making. Gloves are made in other parts of our country as well, but New York state makes by far the most. Wisconsin, Illinois, and California also give us a good many gloves.

Here in Gloversville some factories make the gloves from start to finish, but in others the gloves are cut out and then put up in bundles which are given to women to sew in their homes.

“Where do all the kids come from for so many kid gloves?” Bob asks Uncle Ned.

“Kid gloves are seldom made from real kidskin,” is the reply. “That name is given to any soft thin glove, and the most of our kid gloves come from the skins of sheep, calves, and goats. Our chamois gloves are really of sheepskin treated with oil, and the ones we call doeskin, buckskin, and dogskin were once on the backs of sheep, deer, calves,
We go sightseeing in a motor truck
or dogs. Of course there may be some gloves made of real kid, but their number is small. Other animals whose skins cover our hands are the antelope, the chamois, and the long-legged kangaroo.

"The first gloves in America," Uncle Ned explains, "were made of the skins of the deer which roamed through the forests. As these became scarce, sheepskins were tried. They made beautiful gloves, and have been used ever since."

"Do the skins come from the Stockyards in Chicago, like the leather for shoes?" asks Helen.

"Some of them do," is Uncle Ned’s answer, "but we buy the finest and best from Europe, Mexico, and Central and South America."

*How Glove Leather Is Cured*

Our truck takes us to the big factory where Mary’s Uncle Ned works. He parks it at one side of the road, and goes with us to the office of Mr. Winton, the manager, who grows interested as we tell him of our Journey Club Travels. Says he:

"You have chosen a good factory to visit, for we make all our gloves right here in this building. You can see in our work-shops the skins of the animals cut, sewed, and finished and packed up for shipment."

We walk through room after room filled with busy workers.

Kid gloves are sometimes made of calfskin

We ask one of the men who is unpacking the skins whether they are tanned here. He says that the leather is bought from the tanneries where it has been cured, or "tawed," softened and stretched, and dyed the many colors that are wanted for gloves. He tells us how different this curing is from the tanning of shoe leather.

"Each glove skin," says he, "must have a soak in ‘salt pickle.’ It must be washed clean and left in an alum bath for twelve hours."
It must be pulled and ironed smooth with a big round-faced iron. Then it must be stretched tight over a framework to dry, in the hot sun or in steam.

The skins are shaved with sharp knives

Its egg bath which comes next makes it soft and pure white. When the skin is dyed, it is laid on a metal table and colored with brushes. After this comes another brushing with alum, a drying and dampening. At the last, the skin is rolled up and, with its brothers and sisters, it is packed in a barrel to season. When the skins come out, they are all shaved with sharp knives and polished with pads of flannel. They are then ready for us.”

Turning Skins into Gloves

What a lot of skins there are here! There are white skins and black skins, yellow and brown ones. There are all shades of gray and even some of gay colors for fancier gloves.

Jack picks out one fine brown skin like the gloves we wear most. Says he:

“Let us follow this one piece of leather on its travels through the factory and see what happens to it before it comes out as gloves.”

We like the idea, and with Uncle Ned, we hurry along after the high pile of skins on their way to the cutting rooms.

“These are the cutters,” explains Uncle Ned. “See, Jack, there goes your brown skin. It is being cut into square and oblong pieces, each the size of a glove. Sometimes this is done with machines which cut several
skins at one time, but the fine ones are shaped by hand with sharp knives.”

We enjoy watching the next cutting. The squares of brown leather neatly on this and fits on a cover so that they cannot budge. He then starts the machine. The leather squares are pressed down on the sharp die, and lo! they come out, six nicely cut hands.

“But where are the thumbs?” asks Helen.

“They are cut separately by other machines,” answers the cutter. “So are the ‘gussets,’ those little side strips which fit in between the fingers.”
It is hard to hear ourselves speak in the stitching rooms, there are so many sewing machines all going at once. They are turned by electricity and steam, and they whirr away all day long as the procession of gloves marches under their needles.

We find it hard to keep up with our brown gloves, as they are taken this way and that through the sewing rooms. Each worker is doing one thing over and over, and takes only a few minutes on each pair of gloves. We stand by the “silkers” who put in the fine stitching that runs down the backs. Then we hurry with Mr. Glove as he goes to the machines which sew up his seams and put in his thumb.

It is all done so quickly that it seems a very short while until we have seen the hem stitched round the wrist, the buttonholes made and the buttons sewed tightly on. Some of the gloves have small metal fasteners which are clamped on to the leather in just a few seconds.

“What are these queer-looking things?” Bob cries as we spy some hands made of metal.

“Those are the stretchers,” replies Uncle Ned. “Your finished gloves are pulled over them and they are treated with steam to shape them and smooth them ready for packing.”

We stop in at his office to say “Good-by” to Mr. Winton. He tells us that more gloves are made nowadays for work than for dress. Our out-of-doors sports have lessened our interest in dress-up affairs, and even our fine ladies do not wear so many long fancy gloves as they did years ago.

“Do all our gloves come from our own factories?” Jack asks Mr. Winton.

“No, indeed,” is his reply. “We buy more than seven million dollars’ worth from England and France and other lands. But as those we make ourselves are worth nearly fifty millions of dollars, you can see that our own gloves are the most important of all. France is noted for its
fine ladies’ gloves, and its city of Grenoble is the largest glove center in the whole world.”

A Chat with Aunt Bess

From the factory we ride to Uncle Ned’s home, where Mary’s Aunt Bess has lunch ready for us. How our tongues fly as we sit around her big table! She is eager to hear all the things we have seen.

“I make gloves too,” says Aunt Bess, “but for another kind of factory. They cut out the gloves and put in the back stitching. Then they bundle them up with the thread and the buttons and bring them to me to sew up and finish.

“There are hundreds of women here in Fulton County doing such work in their spare time. We are like the farm girls in the early days who did all the glove sewing right in their homes. They used to put their finished gloves between pasteboards and sit down upon them while sewing the next. This pressed them smooth and flat.”

We are delighted when Mary’s Aunt Bess gives us a pair of gloves for our Museum. One is neatly sewed, and the other still in pieces to show just how gloves are cut.

Helen suggests that we try to get other kinds of gloves to add to this exhibit. She says she will bring some woolen mittens which were knit by machine. Jack promises a pair made by hand by his grandmother. Dick will ask his mother for a glove of knit silk, and Edith is sure she can find a pair made of cotton. There are also gloves of soft fur which we wear in the coldest weather, and Mary says that her great grandmother wore lacey “mitts” of silk thread. They had no ends in the fingers.
CHAPTER 19

FURS FROM THE NORTHLANDS

“Away, away to the Northlands,
Where the sunny hours are few,
And the nights so long in winter
That we cannot sleep them through,

Where they drive the flying reindeer
In sledges when it snows,
And the children look like bear’s cubs
In their funny furry clothes.”

Whew! How cold it is in the Far North!

We shiver and pull our coat collars higher about our ears to shut out the wind. Jack Frost is abroad and always on the lookout for a bit of bare skin to nip. So we have put on our heaviest clothing while traveling here in the far north of Canada.

The Journey Club is making a trip to find out about furs. Old Mother Nature takes good care of her children. She gives the four-footed ones of this region the thickest of coats for this cold weather. The icier the climate, the finer is the fur.

The people here wear furs throughout the winter. Like our Eskimo friends, Ikwa and Too-Kee, they often dress in fur overcoats and fur trousers, fur boots, and fur hoods.

In our own country where the winters are not quite so cold, many furs are worn too. We sometimes see them when the weather is mild, and even in summer. Furs look so rich that women and girls like them for their beauty as well as for their warmth.
Until the discovery of America, the most of the furs came from the cold parts of Europe and Asia. But it soon became known that there were many fine fur animals in the New World and a great business sprang up in the fur trade with the Indians. Some Englishmen founded the Hudson Bay Company for this very purpose, and from then until now, that company has given the world much of its fur. It has divided northern Canada into small hunting sections and its traders may be found everywhere. As we sail up the rivers, we see here and there the little stores which they run for their trading with the Indian trappers.

Many of our best furs come from Canada, although the United States also has a large part of the world’s supply. Alaska has forests filled with fur-bearing creatures, and we have even started farms to raise foxes and mink for their skins.

At a Trading Post

Our first stop to-day is at a small trading station. We tramp through the snow to the door of a little log house. This is the home of a trader and also his store where the trappers come to sell their furs and buy goods.

The trader is surprised to see so many American children out here in the wilds in the heart of mid-winter. He says we have
come too soon for the real spring trading when all of the trappers bring in the furs they have trapped through the winter. October and May are the best trading months.

We tell him we have come now because we want first to see how the Indians catch the animals whose skins make our furs. And we know that in winter the trapping is best and the fur grows the thickest.

"I warn you the trip will be hard," says the trader. "You will have to tramp through the woods and you may freeze your noses. But Indian Joe has just come into the post. I might ask him to guide you. His traps are not so far away as some of the others."

Just here the door opens and in steps a man clad in fur cap and coat. He has the long dark face of an Indian and his black eyes twinkle when he hears what we want. There is an Indian boy with him who smiles at us shyly. It is Indian Joe and his son, whose name is Bald Eagle.

"Boys and girls want to see traps?" says he in reply to the trader’s request that he take us with him back to the woods.

"Me afraid woods too lonely, weather too cold, traps too far. Can boys and girls use snowshoes?"

"We’ll promise not to complain," cries Bob. "We can all walk on snowshoes. We have come this long way just to look at your traps and find out about furs."

Bald Eagle urges his father and after some talk, Indian Joe agrees to take us along with him. It has been some time since we have used snowshoes. We all stumble at first and Mary even falls down on her nose in a snow-drift. But we soon get the knack and trudge happily off after our Indian friends to a camp near at hand. Here we hire dog teams to carry us into the heart of the forest.
What fun it is to skim over the snow on the low wooden sleds, each drawn by six or eight dogs! Indian Joe and Bald Eagle run by our sides and call out to the leading dogs of each team, telling them which way to go. We fly on and on through the trees. We do not pass a single house, and meet no other travelers on the whole trip, these woods are so lonely.

A Day with Indian Joe and Bald Eagle

We stop with a jerk at the log cabin home of Bald Eagle. His mother stands in the door. She is an Indian squaw with a little papoose tied on her back. The baby’s black eyes peep out at us from the fur bag in which he is snuggled. He seems warm and cozy, bobbing up and down as his mother moves about and makes us welcome. He reminds us of Baby Bunting whose father got “the rabbit skin to wrap the Baby Bunting in.”

Now we are off for the traps. We shuffle along on our snowshoes and thread our way behind our guides through the snow-covered pines. Here is the first trap. Indian Joe says he has other kinds of steel traps and also some made of wood. In the jaws of this trap is a tanned lynx which looks like a great cat. The fur is long and soft, but Indian Joe says lynx will not bring a high price.
Indian Joe places his traps near the homes of the animals, finding out where these are from their tracks in the snow. He covers the traps with leaves or small branches so that the keen little eyes may not spy them.

In the second trap we find a small brown creature which Bald Eagle says is a marten. This gives one of the most costly of furs. It is much the same as a sable.

Indian Joe is delighted when he sees a black fox in a trap farther on. He tells us the skin will bring hundreds of dollars. With its brother, the silver-tipped fox, the black fox is the finest fur that he gets. We are surprised to see how many of the traps are full. The Indians have been hunting these animals for hundreds of years, and they know their habits and ways.

The air is cold to-day, the little brooks are covered with ice and all the animals in the traps are dead, and frozen. We help our new friends to carry them into their log-cabin home. Here Bob asks Indian Joe how he gets the skins off.

"You watch, me show," is the reply as he picks up the frozen lynx and places it close to the
fire. The warmth thaws the stiff carcass. He then takes out his sharp hunting knife and skillfully makes a slit up one hind leg, across the body under the tail, and down the other leg. With a quick turn of the wrist, he pulls the skin from the body, just as we would take off a glove. He holds it up for us to see. Raw skins like this are called “pelts.”

**Furry Friends of the Northlands**

We are tired when night comes and are glad to sit quietly about the fire and listen to the stories of the hunting of our furry four-footed friends.

Our Indian host tells us tales of black foxes whose skins have sold for thousands of dollars, and of their commoner brothers with red, white, and gray coats. Fox fur is long but it does not wear well.

We run our fingers through the soft hair of the marten, or sable. This animal has fur of a dusky brown hue and the darker it is, the higher the price it will bring. The best sables come from Russia. It is said that a long coat of such skins may cost a small fortune.

Those brown pelts Mary is holding were worn by mink. The mink is somewhat like the sable but its color is lighter and its hair is much shorter and not nearly so fine. Still, it is much liked and gives us rich-looking furs.

As we stood with Bald Eagle this afternoon on the bank of a stream, we looked at a dam which the beavers had built. These animals, we learn from our Indian friends, live in little groups or towns, in the banks of the streams. They dig out holes for their houses or “lodges,” as they are called. They gnaw the walls smooth and firm. The doors are under the water, and Mr. Beaver has no way to get in and out of his home except by diving and swimming.

He is always afraid that the water may fall and the winter
ice may freeze up his front door.
So he dams up the stream just below his home by building a strong wall of logs, bark, stones, and mud. This keeps back the water, making it so deep that the ice cannot reach as low as the door of his home. He can go out and come in through the water by way of holes in the ice all winter long.

Bald Eagle showed us a tree that had been felled by the beavers. It looked as if it had been chopped with an ax and we could see the marks of their strong teeth where they had gnawed through the wood. He told us how the beavers sometimes drag whole trees across the stream.

They lay them in place and chink them together with mud and stones until they form a wall so strong and so tight that it will dam back the rushing waters.

Indian Joe brings out a beaver skin. It has long coarse top hairs which will be pulled out, leaving fine brown under-fur. This is made up into caps and collars or sewed with other like skins into beautiful coats.

Our trapper friend tells us how he catches the beavers in winter. After the ice comes, they spend the most of the time under the water and in their snug homes. Indian Joe says he first runs a long stick down through the ground right into a lodge. When Mr. Beaver comes home, he tugs at the stick to get it out of his way. So when the top of the stick moves, Indian Joe knows just where the animal is, and he drives his hunting spear sharply down through the earth. He thus kills the beaver.
The beaver has a furry neighbor who is almost as busy as he. This is the muskrat who makes a snug winter home out of reeds from the stream banks. He chops the reeds down with his teeth. He lays them up in the shape of a mound, weaving them together so that when the snow lays its white blanket upon them, his family is as warm as that of Mr. Beaver in his hole in the mud bank. The door of the muskrat’s house is also under the water.

The muskrat lives on the stream bank

As we lay these skins down, Indian Joe shows us others of many different kinds. There are gray squirrel pelts, skins of rabbits and hares, and of lynx and raccoons.

Jack pinches his nose with his fingers as Bald Eagle holds up the skin of a skunk. We laugh for we know that the bad-smelling spray which the skunk can throw out does not cling to his fur. He uses that only for defense when in danger. The skunk skin is of a glossy dark color, with two pure white stripes running straight down the back. It is made chiefly into coat collars and scarfs.

Among the other furs which Bald Eagle shows us are a dozen or more ermine, snow white with only a black tip on the very end of the tail. They were taken in winter when this tiny weasel has its whitest coat. The skins trapped in summer are cream yellow. Ermine used to be worn only by kings, but to-day it is liked chiefly by ladies for dress-up occasions. It makes lovely trimmings as well as elegant cloaks.

The cabin is bare and when the stories are told, we wonder
how we are to sleep. The only beds are two hard wooden bunks built against the log wall. Then we remember that we have our sleeping bags lined with fur. We crawl in feet first and pull the openings tight round our necks. We lie about on the floor as near the fire as we can. Soon we are asleep watching all kinds of furry animals crossing our paths in the land of dreams.

Trading Furs

We wake early and soon after breakfast are again skimming over the snow on our dog sleds. Indian Joe has piled a load of his pelts on one of the sleds. He needs supplies and he says he will trade these furs for them at the store.

We all like to trade. Bob and Dick trade their marbles and Mary and Helen often exchange one paper doll for another. In the early days skins were traded for beads, tobacco, or guns. The Indian trapper has no use for money here in the wilds. But he does want goods to take back to his cabin. So he trades his furs for them. The trader gives him for his furs, wooden checks which he can use in the store to buy such food, traps, guns, or clothing as he may desire.

Our southward-bound steamer carries many bundles and bales of furs which are being sent to the big cities of our land and to other countries as well. London has always been the greatest fur market, but since the World War, New York and St. Louis have become quite as important. St. Paul, Minnesota, is another fur city.

In a New York Fur Factory

We have now left our steamer and come by train to the city of New York. We want to find
out just how the stiff pelts are cured and turned into the soft fur caps, coats, and gloves which we can buy in the stores.

In a trip through a fur factory we see that the skins are first wet and scraped clean. They are then soaked overnight, and given a shampoo with warm soapy water. If there are long hairs like those of the beaver, they are gently pulled out.

Next comes the greasing and kneading to make the skins soft. Grease is smeared over the pelts, and men with bare feet tramp the skins up and down until the grease has soaked in. In some factories this work is done by machines.

After this the grease is rubbed off with sawdust, and then the skins come out soft and clean. We watch combs of steel take the snarls out of the fur, leaving the soft hair lying as smooth as ours is when we start out for school in the morning. The skins are then dyed, or they may be left in their natural color.

We find that the making of skins into garments is a business all by itself. The furs often are cut into strips or small pieces
which are so matched with hundreds of others that all are of just the same shade. They are then sewed so neatly together that a long coat looks like one skin. The head and tails are often used as trimming. In neckpieces of fox, the pelt is left whole. A false nose and mouth are fastened in place, and little glass eyes twinkle out through the soft fur as if to say "See what a fine fox I am!"

At a fur store on Fifth Avenue in New York, we find all sorts of furs. The Persian lamb with its tight curling black hairs comes from Persia and the high mountains of Tibet and Mongolia. The blue-gray chinchilla with its soft downy fur is from a rat which lives high up in the Andes of South America. It looks like a tiny rabbit and its big black eyes peep out over a mustache nearly twice as long as its head. Chinchilla fur is fine and soft and always brings a high price.

We find also the same kinds of skins that Indian Joe traps here turned into rich coats lined with satin and silk. There are caps and capes, and many neck pieces ready for the lucky persons who can afford them.

The chinchilla looks like a tiny rabbit
CHAPTER 20

FLIPPY-FLOP, THE FUR SEAL

A RADIO STORY ABOUT THE PRIBILOFF ISLANDS

The Journey Club is meeting at Helen's house. Her father has a radio outfit and we are gathered about it. The things we are to find out to-day will come to us through the air many miles. We have read in the newspapers that this afternoon a seal hunter just returned from the far-away Pribiloff Islands will broadcast a story about the fur seal. We have tuned in and shall be able to hear it through the loud speaker.

Jack looks up the Pribiloff Islands on a map of America. There they are to the north, sticking up in the waters of Bering Sea, to the west of Alaska. Helen's father tells us that they are the summer home of most of the seals of the world, and that the greater part of our sealskins comes from their rocky shores.

It is time for the talk to begin. Buz-z-z-z-z- Buz-z-z-z-z- Now comes the voice. We can hear it quite plainly in spite of the fact it has traveled so far. Listen to what it says!

Ladies and Gentlemen:

I am going to tell you of the adventures of Flippy-Flop, the fur seal. He was born on the rocky shore of one of the foggy Pribiloff Islands away off in the cold Bering Sea. It was summer when he first opened his eyes, but there was no bright sun to greet him. A thick mist covers the sky most of the time, and it rains a great deal.

Flippy-Flop's parents do not live there in winter, there is too
much snow and ice. But every summer, they come with thousands of their brothers and sisters and cousins and friends. They lie out on the black rocks and sleep on the sand. They fish and play in the cold waves of the sea. The snow and ice have all gone when they appear, and there are even wild flowers and tall grass in the fields well back from the shore.

These chilly islands are far from any other land. There are but few people living upon them so the seals feel quite safe and almost as if the shores belonged just to them.

Soon Flippy-Flop began to crawl about among the rest of his tribe. He learned to obey the roar of the huge father seal who ruled his home. The seals live in families, and each group has its special place on the rocks. We call these homes “rookeries.”

It is interesting to see the father seals when they first come in the spring. They arrive before the rest of their tribe and they fight with each other for the best spots on the shore. The air is then filled with their roaring. They stand up on their hind flippers and throw each other about on the sharp rocks. It is always the strongest which win the best rookeries down near the water.

A month later the tribes of younger seals swim in from the ocean. This causes more fights, for sometimes two of the stronger want to rule the same tribe. There will often be as many as thirty seals in one tribe or family, besides the children, and the father soon lets them all know that he is their master.

How he roars at any seal which tries to go off for a swim by itself! Sometimes he even throws a disobedient seal down on the rocks, and it soon learns to stay very near home. The younger seals must obey the older and stronger ones, and meekly accept the worst places of all, at the back of the rookeries.

Flippy-Flop was a roly-poly little fellow with a glossy black coat. His eyes were blue-gray and his mustache drooped down on each side of his huge mouth. The head, neck, and shoulders of the seal are the biggest part of his body, and four broad flippers take the place of hands and feet. The front flippers look
somewhat like hands, but they are smothered in thick skin. This helps them in swimming. The hind flippers are so strong that a seal can gallop with great speed over the sand and the rocks.

Flippy-Flop's older brothers, the bachelors, were more brown in color, and the coats of the full-grown seals looked like pepper and salt all mixed together. Underneath this dark outer hair is soft downy fur.

What fun Flippy-Flop had playing with the other seal puppies! They rolled around over the rocks and when they were two or three weeks old, they all flippety-flopped down to the water to learn how to swim. Their big brothers came out to play with them and to teach them all sorts of tricks. Through the long days the puppies swam races, dived in and out and turned somersaults in the water. They caught fish for food. They grew big and strong.

When he was tired, Flippy-Flop snuggled up close to his mother as she slept on the shore, or he fell fast asleep in the midst of a bunch of six or eight other puppies. If you could have walked through the rookeries early that summer, you might have stroked Flippy-Flop's fur without waking him up. We seal hunters often go among the seals at this time, for then even the great father and mother seals are gentle.

After a while there came a sad day for Flippy-Flop and his family. Little by little the thousands of seals were made to march from the rocks inland. They were driven slowly on by the seal hunters. They were allowed to rest now and then and we tried not to frighten them too much.

Flippy-Flop and the other puppies were taken aside and set free with their mothers to go back to the rookeries. His big
brothers, the bachelors, were driven on to the "killing grounds," an open space near one of the villages.

Our government does not permit us to kill the seal mothers and children. If it did, we should soon kill them all and there would be no seals left to give us their fine fur. So the law allows the

There were many men and boys at work at the killing. Most of them were Aleuts, the natives of the islands who live by fishing and hunting. They look somewhat like Eskimos.

After taking off the seal skins we covered them with salt and later packed them in bales. We then loaded the bales on steamers which carried our seal skins to the fur markets. Here they were sold to the furriers, who dress them and dye them and make them into beautiful coats, collars, and scarfs.

Seal furs are so valuable that the plucking out of the long outer hairs is done with great care. This is so as not to harm the soft fine fur underneath. The

They started on their long swim

seal hunters to take only the young males three or four years of age. These give the finest fur.

Flippy-Flop did not know why his bachelor playmates never came back. He did not see the seal hunters kill and skin them. We did it so quickly that it was all over almost before Flippy-Flop had sunk down panting on the rocks after his long march.
workman pulls out one hair at a time with a dull knife and his thumb. In dyeing the furs the color is put on with a brush, coat after coat. At the end they come out a rich dark brown hue.

But let us return to our baby seal, Flippy-Flop. He and his friends stayed with their parents there on the rocks until Jack Frost told them that winter was near. Then with a roaring of the fathers and the mothers calling their young, they all dived off into the water and started out on their long swim to warmer southern seas. Within a few days not a seal was left on the Pribiloff Islands, and we knew that the rookeries would be empty until the fathers should come back early next spring.

When we think of Flippy-Flop and the fur that he gives us, we must always remember how few seals there are, and how few the law allows us to kill. We must think of the care needed to dress and dye the skins, and of the great beauty of the soft finished furs. Then we can understand why sealskin is so costly.

Well, Flippy-Flop's adventures are over for this year, and so my talk must come to an end. I will finish by quoting a verse written about seals by Oliver Herford.

"See, Children, the Fur-bearing Seal; Observe his mis-directed zeal, He dines with most abstemious care
On Fish, Ice Water and Fresh Air
Avoiding condiments or spice,
For fear his fur should not be nice
And fine and soft and smooth and meet,
For Broadway or for Regent Street."

Good afternoon! Buz-z-z-z-z-Buz-z-z-z-z.
CHAPTER 21

A TREE THAT WEEPS RUBBER TEARS

Long, long ago a prisoner was dragged before a great king.

“This is the man,” said the soldiers who held him captive between them.

“What are these lies you have been telling of yourself and your magic?” demanded the king in a terrible voice.

“Nay, Wisest and All-Powerful,” answered the prisoner. “They are no lies. I speak but the truth. I know of a tree that weeps tears of milk. These tears I catch in my cups, and from them I make great balls which bound as the lambs jump about in the meadows. I make a string from this milk which will stretch many times its own length and fly back again as before. From these tears I make also shoes for my children, and spread on my cloak, they keep me dry from the rain.”

“Enough,” cried the king. “Such things cannot be. Even I, the All-Wise, have not powers like these. He is a liar. Off with his head!”

If that king should come to our land to-day, he would have to admit that his captive spoke truly. At almost every turn he would be using something made from the tears of the tall rubber tree.

A Marvelous Tree

Suppose we were to hang on this wonderful tree each of the many things we get from it. Its branches would bend down under the load and we should have to make huge piles on the ground round its trunk. It would be more valuable than the finest Christmas tree we have ever seen.
There would be rubber toys on the low branches for the babies and above them balls and gay-colored balloons for the older children. There would be footballs and baseballs for the boys and rubber dolls and elastic hatbands for the girls. Rubber bands and pencils with erasers on their tips would be tied to some of the twigs. Golf balls and tennis balls would show out like fruit through the green leaves. On the very tiptop we should see a pair of glistening rubber overshoes, and a bit lower down rubber boots and raincoats.

Among other articles would be some of hard rubber — combs, buttons and inkwells, penholders and knife handles, sickroom supplies and rubber things for doctors and dentists—all these would cover a good many branches.

In piles on the ground would lie tires for automobiles, bicycles, and carriages, and many parts of machines made out of rubber. The telegraph and the telephone would each have its place, as would all kinds of hose for watering our lawns and putting out fires. All the dangerous live wires for our electric lights and electrical machines must be wound tightly in rubber, and our electrical workmen often wear rubber gloves. There would be thousands of other small things which we each use every day of our lives. It is said that one American factory makes thirty thousand different products from rubber.

We hardly believe it can be true that the milky juice of a bark gives them to us.

So we are going to see for ourselves. The rubber tree is called the “hevea.” We shall find it growing in several parts of the world. Its real home is in the jungles of South America.
long ago all the rubber of the world came from the forests of the Amazon Valley. But in 1876 an Englishman, named Wickham, secretly took out some hevea seeds, with which he started the first rubber plantation in southeastern Asia. To-day such plantations there and in many other parts of the world give us nine times as much rubber as do the wild trees of the jungles.

Where the Rubber Tree Grows

Get out your rubbers and raincoats! We shall certainly need them for it rains a great deal in the warm rubber lands where we are going. For half of the year, from December to May, it pours every day and the forests are flooded. We are glad it is in the dry season that the rubber gathering is done.

Our steamer, in which we set sail from New York, brings us south to the mouth of the Amazon. We land at Para in Brazil. This is the biggest rubber port of South America. We see great cargoes of rubber pouring into the holds of the ships at the docks. This rubber has all come down from the forests to which we are bound. It will go out from here to every part of the world.

We leave our big ocean liner and take a river steamer up the mighty Amazon River. Often we cannot see the opposite bank, the stream is so wide. At other times we are close enough to the shore to catch glimpses of green and red parrots and little brown monkeys in the trees on the bank.

Far up the Amazon we come to Manáos, another big rubber center. Here we change our river steamer for boats which take us up one of the smaller streams into the very heart of the forest.

As we stop at the landing of a rubber camp, two Brazilian boys come down to help us climb up on to the wooden dock. They tell us their names. They are José (ho-say) and Pedro. The boys are of about our own age. We are glad when they say they will go along with us to see rubber made.

Here we are in the heart of the jungle! Birds hop about in the trees and the bushes, and monkeys are chattering as they swing themselves from one limb to the other. Now and then they throw
We reach the heart of the rubber jungle

a nut down at our heads. We look about fearfully, for we do not know when we might stumble upon the lair of a wild beast. Pedro says it is safe enough in the daytime, but that even he would not care to walk here alone in the darkness.

We thread our way through the jungle. It is a tangle of great trees, bushes, and vines. We step with great care lest we tread on a snake. José points out a rubber tree. Its top is sixty feet from the ground. Jack puts his arms around its trunk. They will not meet, it is so thick. Pedro says that the blossoms are pale green and that the fruit has several dark-colored seeds which burst out of their shell with a noise like a gunshot.
A man is at work at one of the rubber trees. He is cutting the bark with slanting blows of his sharp little hatchet. From these gashes we see drops of white liquid oozing out of the wood. They trickle slowly down the trunk and drop into a cup which the man has fastened tight to the tree.

"Those are tears of rubber," says Pedro. "It is that milky stuff which gives you the rubbers and raincoats you are wearing. We call it 'Cahuchu' or 'weeping wood.'"

Dick dips his fingers into the milky sap. It is sticky and looks much like the juice of our milkweed. The rubber milk is called "latex." It is not a sap like that of the maple tree which gives us our sirup. It is a juice which is found in the bark. The latex protects the bark of the hevea from a beetle which eats grooves in the wood. The fluid is poison to the insect and when the bark is filled with it, the bug does not come.

We tramp through the forests with the rubber gatherer. The trees are scattered and a path has been cut from one to another. Each man has about 150 trees on his "path." He goes over his route early each morning to cut new gashes in the bark. The trees weep only a few hours, and the milk can then be poured from the cups into his bucket which is made out of a gourd.

Now to-day's gathering is done. We help carry the pails into the camp. They look like buckets of
milk from Edith's farm. Pedro tells us that the rubber is floating about in the fluid in fine little balls, just as cream floats about in a pan of cow's milk. If left for a time, the rubber would also rise to the surface.

**We Make Rubber**

While at the rubber camp we make some rubber ourselves. We stand around a fire of oily palm nuts. What a lot of smoke there is! Pedro places over the blaze a clay chimney shaped like a bottle with the bottom knocked out. A cloud of black smoke then pours through its mouth.

Low bowls filled with rubber milk are set close to the fire. Then Pedro's father gives us a long stick with a flat paddle in its middle. He rests one end of the stick on a heavy forked club driven down in the ground on the other side of the fire. He tells Jack to twist the other end so that the paddle turns just over the smoke. Now Dick takes a cup of rubber milk and pours it slowly on the paddle, while Jack turns the stick round and round.

The heat and the smoke soon bake the milk into a hard yellow coating. Dick pours on more and more milk and Jack keeps the stick turning. At last they have a round ball of rubber as big as a ham, made up of layers just like an onion. Pedro cuts one side open and the stick is pulled out. As the ball falls to the ground, it bounces high in the air. José calls this a "biscuit" or "ham," and indeed it is somewhat the shape of both. It is now ready to go with hundreds of its brothers and sisters to the factories of our own and other lands.

It was with small balls like these biscuits that the South American Indians were playing when the first white man came. Early travelers spoke of finding the natives playing with balls which they bounced with their heads.
The finished rubber hams are a dirty yellow-brown color, and each weighs five or six pounds. We try to play ball with them. We find them too heavy, and and others of the East Indies give us most of the rubber grown in this way. There are plantations in India, Ceylon, Mexico, and the Kongo Valley, and some have been started in Brazil as well. England controls four fifths of all the rubber plantations, so she can decide how much rubber each country may buy.

We have a new kind of rubber plantation in our own land. There is a short shrub that grows in Mexico and Arizona whose sap makes good rubber. It is called the "Guayule" and plantations to grow it are now doing well.

The rubber hams are shipped to the coast

Pedro and José bring out some smaller balls which they have made for themselves.

On a Rubber Plantation

The next step in our journey is a long one. We go half way round the world to Malaysia where we visit a rubber plantation and see how "weeping wood" grows when planted by hand. Sumatra, Java, the Malay States,
The home of the rubber planter we visit in Malaysia is a long, low, white house. His gardens are full of flowers, and, as we walk through the clean even rows of rubber trees, we can understand well why growing rubber this way is preferred to the unhealthy "paths" of the jungle.

Here a man can tap twice as many trees in one day, for they are not so far apart nor so hard to reach. The trees are more evenly cut and their bark is in better condition.

The rubber is taken from the latex in a far quicker way. Acid or lime juice is used to separate the rubber cream from the water. It gives a spongy mass which is kneaded and washed by machines in a little factory right on the plantation. We watch the rubber sponge dried and cut into pieces, and see it go through its last cleansing in a machine with grooved rollers. The rubber comes out in long cream-colored strips, which look just like crêpe. This is crêpe rubber. In this form it goes by ship and train to our factories.

Rubber gatherers fording a stream in Fiji
CHAPTER 22

THE TWIN RUBBERS AND MISS RAINCOAT

Standing by the rail, we watch our steamer glide out of the harbor of Singapore, on its way from Malaysia back to America. When the last white house and tall waving palm have faded from view, we take to our steamer chairs to talk over our adventures. Next to Bob sits a rubber manufacturer from Akron, Ohio. He is interested in what we are saying and asks us about the things we have seen.

The factory about which we are told
He talks about his factory and we beg him to tell us how the raw rubber is fitted for use. He replies:

"I can do that best by taking one thing and showing how it is made. Suppose I pretend that I am a pair of shiny new rubbers. I will tell you their story as if they were speaking themselves."

What the Overshoes Told

"We are twin rubbers," the story begins, "and from the day when we oozed out of the bark on that rubber plantation, we have been close together. We arrived in America after a long tiresome journey on steamers and trains. At last we were dumped into the warehouse of a great rubber factory. We were put with the other piles of crêpe rubber, just next to some biscuits which had come from the jungle.

"Our first adventure was a hot bath that softened us up and then came a trip through the washers. These had horrid steel rollers set close together. We were mashed and ground fine as we passed between them. Water played on the rollers, and when we came out, we had been so tightly pressed that we were in long flat sheets as thin as cardboard. We next enjoyed a rest in the drying room where every bit of dampness was baked slowly out of us.

"To make us strong enough to wear well, our rubber was mixed with sulphur and spread upon cloth. The rubber-coated cloth was rolled and rolled again and again until at last it was ready for marking and cutting. It was then stamped with the outlines of the many different pieces needed to make each rubber shoe. These pieces were cut out by hand. Then our cloth linings
were fitted in, and we were put together on lasts just like leather shoes. But we were not sewed. A kind of cement stuck our parts neatly together, and a coat of varnish was given us to make us look shiny.

"It was a long while before people knew how to treat rubber. The man who discovered it was Charles Goodyear, who was at one time so poor that he was put into prison because he could not pay his debts. One day Charles Goodyear spilled some softened rubber on the top of a red-hot stove. To his surprise the rub-

"Our first forefathers were shoes of pure rubber," the story goes on. "A pair was brought from Brazil to America in 1828. These were once dropped down too near a stove. When taken up, the rubber was sticky and smelly and it could be stretched to more than twice its real size. It was clear that shoes of this kind would not do for practical wear.
ber did not melt, but became very hard. He made many more tests and at last he found out that great heat makes rubber strong enough to withstand all kinds of weather. This heating is called 'vulcanizing,' from Vulcan, the old Roman God of Fire.

"Our vulcanizing was done in a steam oven," the story teller continues. "We were put in with many other pairs of boots and shoes and the heat was turned on. It was terribly hot and we had to roast there for about half an hour. But when the doors were opened, how proud we were of ourselves! Our parts were welded into one piece and we were far stronger than when we went in. We were shiny and black and ready for wear."

As the manufacturer ends his story of the twin rubbers, Helen asks him to make her rubber coat speak. The man laughs and begins.

The Tale of Miss Raincoat

"I am Miss Mackintosh. Some people call me a raincoat. I keep off the wet and when you wear me, you can go out in the storm and be dry as a bone.

"Like the twin overshoes, I come from rubber, but my rubber and sulphur mixture is laid between two fine pieces of cloth, just like a sandwich. The sandwich is baked until the rubber melts and goes into the cloth, covering each thread of the warp and the woof, and making the whole proof against dampness and rain. Such cloth is rightly called, 'waterproof.' It was a Scotchman named Mackintosh who learned how to make such cloth and from him comes my name."
Our new friend tells us that many of the rubber things from his factory are sent back to José and Pedro and even to the boys and girls of Malaysia. Here we see again how we all need each other. The rubber gatherers are working for us, and we, when we make the crude rubber fit to wear, are working for them.
CHAPTER 23

A HAT SHOW

"Where did you get that hat?"

Bob sings this as Helen comes to the Journey Club meeting with a new straw hat trimmed with bright-colored flowers. We laugh and Jack says, "That is what we all want to know. Where and how we get our hats is what we are going to find out to-day."

We lay our own hats on the table before us so that we can look at them better. First comes Helen's pretty straw hat and beside it we put the cloth caps of the boys. Some of the girls are still wearing their winter hats of felt and cloth, and Edith has a tam-o-shanter knit of soft blue woolen yarn. Mary's hat is of velvet. The hats of the girls are trimmed with all sorts of ribbons and feathers. It looks as though we were having a hat show, there are so many different kinds.

Strong-as-a-Lion, the savage boy of whom we have talked in other club meetings, did not wear any covering at all on his head. His hair grew very thick so as to protect his scalp from the sun and the cold. It was not until thousands of years after he shook his long hair in the wind that hats came into fashion. The first hats were far different from ours,
and as we talk about them, Mary reminds us that the children we have seen in foreign countries also have many strange head coverings.

"How many kinds of hats have we?" asks Dick.

"There's felt," says Jack.

"And straw," cries Helen.

"And all kinds of cloth," adds Bob.

"That is all," Mary says "except those high silk hats which gentlemen wear at weddings and funerals."

We know how the different cloths are made, but felt is strange to us all. We look at these hats, and we can see that felt is neither woven nor knit. Jack says it is made of fur but we cannot understand how fur can be turned into such a smooth firm material.

So we decide to visit a factory where felt is made. We choose one in Pennsylvania. That state leads in our hat-making industry. New Jersey, New York, and Connecticut come next.

In a Hat Factory

Our train draws into the big station in Philadelphia. We take taxicabs to the door of the hat factory, and soon are on our way through it.

The hat maker tells us many interesting things. We find that our felt is made from the fur of rabbits, hares, muskrats, and beavers. As we walk through the warehouse, our guide says:

"In the days when felt hats were first made, we used only beaver fur. Now that is too scarce and too dear. The skins you see here piled up to the ceiling are chiefly rabbit or coney, nutria, and some beaver. The nutria fur comes from a little South American animal called the 'coypu.' It is much like the beaver."
A fur warehouse contains many skins

“Do those skins come from Canada too?” asks Helen, remembering our days in the Northlands.

“Yes, some of them do,” is the answer. “But many are sent to us from other parts of the world. England, Scotland, Australia, Argentina, and France, all sell us fur to be made into felt. A German invented felt in 1510. He found that some kinds of fur were made up of wee hairs which would mat easily together. The fur fibers are not smooth and slippery, as we should think. Each one is covered with tiny hooks like the scales of a fish, or like the nails on our fingers. These interlock, and when they are steamed and pressed, they

Felt is made from the coypu’s fur
A HAT SHOW

cling tight to each other. That is just what felt is — millions of wee hairs matted together.”

Our guide picks up a skin and pulls out a handful of fur. He places it in Dick’s hand. He wets it with a few drops of water and tells Dick to rub it between his two palms. We soon see that the fur has become a thick mat. The hairs cling so tight Dick cannot pull them apart.

Razor-sharp knives cut the fur neatly from the skin

It cleanses the fur and makes it easier to felt.

We now stand by the machines which pull out the long coarse overhairs of the skins. Other machines brush the fur clean and take out the dust. The shearing of the skins seems wonderful to us. They pass through machines which, in the wink of an eye, run razor-sharp knives between the fur and the hide. This is done so neatly that the fur is not even mussed. It comes out on the other side of the cutter in just the same shape and form as when, held tight by the hide, it went in the machine. The pieces of shorn hide are made into glue.

A wide moving belt carries the fur to the sorters. They tell us that the quality of the fur differs with the part of the body from which it comes. Women grade it and sort it and put it up in packets for use later on. The fur is so light that it takes only a few ounces to make a hat for a grown man.

Other machines mix the fur and pick it to pieces. The “pick-
"Felt hats in the making"

"See those sieves!" Mary cries as we enter the felting room. She points to some copper cones pierced with hundreds of holes.

"Those are the felting machines," says our guide. We look at one closely. It is about three feet high, and almost as wide. He tells us that there is a fan which blows the air through these holes. He shows us how the soft downy fur fibers are thrown on the cone and held there tight by the sucking of the air through holes. We see that the cone is kept wet. In just a few minutes it is evenly covered with a mass of fur fibers.

The workman we are watching now takes up the cone and dips it in water. He pulls off its coating and hands it to us. It is a huge bag of wet felt. Bob thinks it looks like a big dunce’s cap.
We follow this cap on its way through the shops. We see it shrink to half its first size, as it is dipped again and again into steaming, hot baths. In the molding room our dunce cap is put over a form. It is ironed and molded into its final shape, and a coat of varnish or shellac makes it just stiff enough to keep the form well.

At one place the workmen are finishing stiff derbies. For these, the molded hats are given more coats of shellac. They are rubbed with emery paper and polished and pressed until they are smooth and have a soft sheen.

Then comes the trimming. The band of silk ribbon is put round the crown, and the silk braid and the sweatband of leather are sewed in their places. These trimmings are put on by hundreds of girls sewing away, and a stream of finished hats flows from their hands into the boxes in which they are shipped.

**Straw Hats for Summer**

As we journey back to our homes, Paolo tells us how braid for straw hats is made in Italy. Our cool light summer hats are chiefly of straw, or the splints of a palm-leaf. Paolo says that some of the best of our braids come from his native country. The town of Leghorn in Italy is specially famous for its straw hats. Other lands which send us straw are China, Japan, and some parts of Europe. Says Paolo:

“My cousins and aunts in Italy have always braided straw. They cut
down the wheat and dry it and bleach it. Sometimes they burn sulphur around it, so that the fumes may make the straw white and clean. Often the wheat stalks are split in two, although much is used whole. My aunts soften their dry straw in water so that it will not break. They plait it with their fingers into beautiful braids. They work so fast and so easily that the straw fairly flies through their hands. When it comes out it looks just like the straw braid of Helen’s new hat."

This braid is sewed together in our own factories. We should find that it is dampened and softened again before being sewed. A few stitches are put in by hand to start the braid in the center of the crown. It is then sewed round and round by hat-making machines. These turn it out in many sizes and shapes.

Paolo says that Helen’s hat was made just like this. He shows us that her straw is stiffened with a coating of glue. This is called “sizing.” It helps the straw hold its shape. A hard rain will melt the sizing and that is why a wetting may spoil a straw hat.

Bob’s father has just bought a Panama hat. It is of the finest of straw. It came from Ecuador, in South America. The Panama hat gets its name from the Isthmus of Panama through which it comes to us. The natives who
Flowers, Feathers, and Ribbons

The girls are interested in more elegant hats than the ones we have seen. They like best those of silk, ribbon, and velvet. These are usually made by the deft fingers of milliners working in factories or in their own little shops.

We each try to think of some kind of trimming we have seen on women’s hats. Mary and Helen tell of the ostrich, which gives us the long feathers from its wings and tail. There are great farms in Africa where these huge birds are raised just for their plumes.

Edith speaks of the many-colored feathers of the pheasant, of the costly egret, of the heron and other birds which help adorn our mothers’ hats. Here in our
country there are lovers of birds who have formed a band called the Audubon Society. They are trying to stop the use of feathers such feathers to be sold or brought here in ships from other lands.

Bob thinks flowers are prettier trimming than feathers. In any department store we can see them of all hues and kinds. Silks, velvets, and cottons are made into flowers which look almost real. Those on Helen’s hat are as pretty as though fresh-picked from a garden.

Ribbons and buckles and fancy pins are also used by milliners to trim our hats. There are so many kinds that it would take the Journey Club many years to find out about them all.
Edith, Helen, and Mary like to wear jewelry.
CHAPTER 24

THE PRINCE AND THE CROWN

This afternoon the Journey Club is giving a play. We have set our stage at the end of Mary’s big living room and our friends are all coming to see it. The play is called, “The Prince and the Crown.” It tells about the precious metals and stones from which we make jewelry.

The rich men and women of Bible times had many jewels. The early Egyptians wore rings, chains, and pins of pure gold and silver. Even to-day, when ancient cities of Egypt are dug out of the sands, necklaces and bracelets are often found still hanging upon the skinny throats and arms of the mummies.

In our Journey Club travels we have seen all sorts of jewelry. Bald Eagle and Humming Bird, our Indian friends, have strings of bright beads. Hada, the girl of the desert, wears wire necklaces and bracelets and perhaps earrings and nose-rings. In some parts of Africa, the natives even steal the telegraph wires to make into jewelry, and in others, the
boys and girls have great holes pierced through their ears in which they wear wooden plugs as big as our wrists.

Egyptian bead sellers

Ah Chee’s people in China love jewelry. Their favorite stone is jade, and they sometimes make dainty pins and buttons of tiny blue feathers mounted on metal. Some of the Chinese wear shields of carved silver fitted over their long finger nails to keep them from breaking. The East India peoples have emeralds, pearls, rubies, and diamonds, and Paolo says that some of the most valuable jewelry of the world today is in Europe. Many wonderful gems have belonged to the kings and the queens and the royal treasure chests have always been filled with a wealth of gold, silver, and precious stones.

We do not need to go to Europe to find beautiful jewels. In our own big stores, we can see diamonds, rubies, and emeralds, sapphires and pearls, and many less precious stones. They are handsomely set in rings, pins, necklaces, and ear-rings, and the Journey Club girls all hope to buy some when they grow bigger. Edith, Helen, and Mary like to dress up in the jewelry of their mothers.

But here come our guests. We must take our places behind the scenes. It is nearly time for the play to begin. The curtain is rising! — Here is the play, just as we gave it.
The Prince and the Crown

A PLAY IN ONE ACT, PRESENTED BY
MEMBERS OF THE JOURNEY CLUB

CAST

The Prince ............... Jack
The Diamond Spirit ........ Bob
The Emerald Spirit ........ Mary
The Ruby Spirit ........... Dick
The Pearl Spirit ........... Helen
The Sapphire Spirit ....... Edith
Gold ....................... Paolo
Silver ...................... Harry
Platinum ................... Nan

Spirits of the Less Precious Stones
Jade, Garnet, Opal, Moonstone,
Turquoise, Tourmaline, Onyx,
etc.  .  Other Journey Club Boys

Bead Dancers
Coral, Ivory, Amber, Glass, Wood,
Metals  .  Other Journey Club Girls

Scene. — The King’s Treasure House

(A corner of the living room with most of the furniture cleared out. Right, bags labelled “Gold” and “Silver.” Left, several boxes and chests. Cushions are scattered about on the floor.)

Enter the Prince.

Prince: How tired I am! Nothing to do in all this great palace. When it rains a prince gets as wet as a beggar, and in such a downpour as this, a fellow can’t play outdoors. I am tired of all my games. I wish I could find something new. (He goes to a chest and peeps in.)

What a lot of jewels! (He opens a bag and a stream of gold pieces falls to the floor.) Whew-w-w! I could buy lots of things with all that money. (He looks into the biggest chest and picks up a handful of jewelry. Then he gives a long whistle. He lifts out a gold crown set with many jewels. He drops down on a
This is Father's best crown. I haven't seen it for ages. I had forgotten how many stones there were in it. My, but I wish these jewels could talk and tell me their adventures. That would beat any story book in the whole Royal Library, and it would keep me awake.

(He takes out his handkerchief and rubs the crown jewels to make them shine brighter. He turns the crown slowly around, looking at first one side, then another. Now and then he nods his head as though he were going to sleep. Then enter the Spirits of the Precious Metals and Stones. Each Journey Club member is dressed in the color of the thing he represents. They range themselves at one side of the stage.)

All the Jewel Spirits: Hail, Hail, oh Prince! We are here at your call.

Prince (starting up and staring at the Spirits): Who are you? Where did you come from?

Diamond Spirit: We are the Spirits of the Jewels and Metals which make up that Crown. You rubbed your handkerchief upon us, just like Aladdin with his Wonderful Lamp, and you said you wanted us to tell you our stories. So we are here to obey.

Prince (rubbing his eyes): I knew the ancients thought that certain jewels had spirits, but I did not believe it. You can be sure I want to hear from each one of you. (The Prince sits up and listens with the greatest of interest. The Diamond Spirit steps forth and bows low.)

Diamond Spirit: I am the Diamond. I shall speak first for I am the King of Gemland. I am the clearest and brightest and the most prized. You would not think, to look at me sparkling there in the center of your father's Crown, that I am a cousin of the black coal used in a furnace, and a brother of the lead in the pencil with which you write. We all belong to the same Carbon Family.

I am hard, hard, hard! I am used to cut gems and glass and to drill all sorts of metals.

Prince: Where is your home, oh Diamond Spirit?

Diamond Spirit: Thousands of miles from here, my Prince. I came from South Africa. The first stones of my kind were found in the rivers of India, Borneo, and Brazil. But one day an English traveler bought a handful of pretty white pebbles from some children. He paid only a few pennies for them, but he sold them to a jeweler for many hundreds of dollars. You see, those pebbles were diamonds, and from that day to this, most of the fine diamonds have come from the mines of South Africa.

Prince: How do men find you?

Diamond Spirit: We diamonds lie scattered through a hard blue clay or rock. This blue clay runs far down into the earth like a pipe driven through the
other rock and soil. For this reason our diamond mines are called “pipes.” The pipes are large and deep and one of the greatest is a half mile across.

Thousands of negroes and white men work day and night in the mines. They blast down the blue rock and crush it with care. After that they wash out the precious white stones. The miners are watched all the time to see that no diamonds are stolen, and they live like prisoners inside the mine grounds. When they leave the mines they are searched from their toes to their heads. Even their mouths and hair are examined to be sure that they do not make off with the stones.

Prince: Did you shine so brightly when you came out of the clay?

Diamond Spirit: No, indeed, I was more like a clear bit of glass. But I traveled across the ocean to Holland where experts cut me and polished me. Diamonds are also cut in New York and Paris. The cutters first fix us tight in cement on the ends of small tools, and grind us so that each stone has many faces or facets. This is not done with a grindstone. Nothing but a diamond can cut or grind a diamond. So we are touched lightly to whirling disks covered with oil and diamond dust. Now one side is ground flat, and now another, until we have the many facets which help us to throw out light and to sparkle.

Prince: I should like to see that.

Diamond Spirit: You should see my famous brothers and sisters. The great Cullinan diamond, the largest of us all, was, before cutting, as big as your fist. There are many other huge diamonds with wonderful stories. But the most of us are quite small. Those cut for rings are seldom as big as the nail of your first finger, and some are as wee as the head of a pin.

Just look at my color! I am as clear
as spring water. Some of my family are yellow, some are rose pink, and others are blue. (The Diamond Spirit bows and walks to the back of the stage, seating himself on a cushion. The Ruby steps forth.)

Ruby Spirit: I, O Prince, am the rich red Ruby. Of all precious stones I am the rarest. I am even more costly than the diamond. My color is rose or red, and the finest of my family have a hue like that of the blood of a pigeon. I am a cousin of the yellow topaz and of the blue sapphire, and though we do not like to admit it, the common aluminum in pots and pans is one of our relatives. We all belong to the same mineral family. Its name is Corundum.

The best rubies are found in the stream-beds of Burma. We are washed out of the gravel and cut and polished just like a diamond. (The Ruby Spirit bows again and takes his seat next the Diamond. The Sapphire rises and advances.)

Prince: Pray, what are you?

Sapphire Spirit: Listen, oh Prince, to the tale of the Sapphire. I may not be so rare as my rich cousin, the Ruby, but see my gorgeous blue color. I am found in many lands, in Burma, Siam, Ceylon and Australia, and even in the United States. I am mined in rocky ledges in North Carolina, and one of the richest sapphire mines of the world is near Great Falls, Montana. (The Sapphire Spirit curtsies to the Prince and gives place to the Emerald Spirit.)

Emerald Spirit: I am the green Emerald. It is really not fitting that the Sapphire should have spoken before me. I am far rarer and of far greater value.
The most and finest of us emeralds are from Colombia, although we are also mined in Austria, Russia, China, and the dry Desert of Sahara; and now and then we are found in the United States. Our bright green shines out in veins in sandstone or slate rock. We are cut down with picks and the rock is crushed gently to get us out whole.

The most famous emerald is said to have been found in Peru. According to the tales of the Indians, it was as big as the head of a baby and they worshiped it as the "Mother of All Emeralds." (As the Emerald Spirit now moves back to a cushion, the Pearl Spirit comes forth.)

Pearl Spirit: I am the Pearl. I am one of the loveliest of jewels. My home is in the pearl-oyster on the bed of the ocean. Some say we pearls are the tears of angels which, dropping from Heaven, are caught in the open mouths of the oysters. Others think we are dewdrops changed by magic to pearls.

But, in fact, we are neither. We are made in this way. A tiny worm or a wee bit of sand gets into the oyster shell. This hurts Mr. Oyster. He is scratched every time it touches his soft, tender body. So he covers the worm or the little sand grain with a fine smooth scale, just like the inside lining of his comfortable shell. Coat after coat, he wraps round the tiny rough grain, and so turns it into a glistening silver-white pearl. Once in a great while the color may be pink, yellow, or purple, gray, brown, or black.

Prince: But how do you get out of the shell of the oyster? And who takes you off the bed of the ocean?

Pearl Spirit: The pearl divers drop down through the water to the bottom of the sea in those places where the pearl oysters lie. They have stones tied to their feet to make them sink quickly. They wear almost no clothes, and they have a clasp on their noses to shut out the water. Sometimes they have diving suits with water-tight helmets and great boots soled with lead.

The divers can stay under only a minute or two at a time, so they must hurry to dig up the oyster shells and put them in their baskets. They are then pulled up by a rope again to their boats. There the oysters are opened and searched for their pearls. It is often several days before any are found, for pearls do not grow in every oyster. The oyster shells are saved to be made into buttons and knife handles and other useful things.

Prince: I do not think I should like to work on the bottom of the sea with slimy fish and sharp-clawed crabs swimming about me.

Pearl Spirit: But they are not the worst. Think of the sharks and the devilfish and all the sharp rocks. Even the men who wear diving suits are not always safe. Their head pieces of metal shut out the water, but through
the little glass window in the front of their metal hoods, they often see the nose of a shark. They must then pull the rope hard as a signal to be drawn up, or they might be attacked.

The finest of us pearls come from the Indian Ocean and the Southern Pacific, but we have also fresh-water relatives who thrive inland in rivers. They are pretty, but their coating is rough, and their cost is not nearly so great. The Japanese have learned to help oysters make pearls, but these are never perfect.

I also wish to warn you that a great many imitation pearls are worn nowadays. They may look much like us, but they are only glass beads, coated inside with a powder of fish scales. Please do not take them for real pearls. (The Pearl Spirit curtsies and sits down with the other Spirits who have spoken.)

A moment of Silence. The Prince points to the group of Semi-Precious Stones.

Prince: Who are you who hang back there in that corner? Step forth and tell me your stories. (A crowd of spirits advances, led by the Opal Spirit. They bow.)

Opal Spirit: We are the semi-precious stones. We know we are not rare like these others, but we at least want to tell you our names. I am the Opal, and I can throw out all sorts of colors from my milky white surface. My family comes from Mexico, Honduras, and South America, and also from Australia and Europe. Some people say we are unlucky stones, but others think we carry good fortune wherever we go, and especially to persons born in October. There is a verse which says:

October's child is born for woe,
All life's troubles she must know.
But lay an Opal on her breast,
Fate shall lull her cares to rest.

(The Opal steps back and the Garnet comes forward.)

Garnet Spirit: I am the Red Garnet. I am really quite pretty, although not rare nor costly. With my purple brother, the Amethyst, I am found in far countries and in the United States also.

(The Apple-green Jade, the Blue Turquoise, the Yellow Topaz, the Black Onyx,
the Pink Tourmaline, the white Moon-
stone, and the other semi-precious stones,
each bow and state their names and colors.
Then follows "The Dance of the Beads"
in which the Beads march down the stage,
bow low to the Prince and dance in
a circle before him, chanting.)

We are the Beads
That are threaded on strings
For the necks of the daughters
Of poor men and kings.

(They dance back to their corner.
Gold advances and salutes.)

Gold: What would become of all
the gems, Great Prince, if it were
not for the metals? I am Gold, the
King of them all. For years I
have been used to make settings
for the finest of stones. My yel-
low color is the richest on earth,
and I give money its value all
over the world. "Worth its weight
in gold" is the finest thing one can be.
Indeed I am too fine. Pure
gold is so soft that a little copper
or silver must be added to it to make
it wear better.

From the beds of the rivers and from
deep in the earth I am dug by toiling
men. They seek me in every land. I
was first found in the streams which had
carried me with their sands down from
my hiding place in the rocks of the
mountains. In those days I was washed
out of the gravel in common iron pans.
The water carried off the light dirt, and
the heavier gold was left in the bottom
in fine yellow grains or in glistening
lumps which the miners call "nuggets."

This is placer mining. With the ma-
chinery and dredges of to-day, placer
mining can be done much more quickly.

Gold lies also in mines deep under the
earth from which it must be dug like any
other metal. It is found in many parts
of the United States, in California,
Colorado, Nevada, and Alaska, and also
in Canada, Africa, and Australasia.

Prince: That’s a splendid story.
(Silver comes forward and speaks.)

Silver: Please do not forget Silver,
dear Prince. My shining white metal
has been made into jewelry for thou-
sands of years. I am not so costly as
gold, but I take a beautiful polish and
shine so that you can see your face in
my clearness. I come out of the earth,
but so mixed with other metals, that

A gold mine in the Philippines
they must be taken away before I am free. (Silver is followed closely by Platinum.)

Platinum: I am Platinum. I speak last, for I am modest as you can see by my looks. Still I am thought to be the very best setting for gems. I am so rare that a ring made from me will cost much more than one of pure gold. My name comes from the Spanish word, “platina,” which means “little silver.” My color is much the same as silver, but I do not shine. When I was first found in the streams of Peru, some of the miners thought me white gold. Most of the platinum comes from the Ural mountains, in Russia, but some is also to be found in Colombia, Canada, Oregon, and Nevada. (As the Platinum Spirit bows, Gold speaks again.)

Gold: Come, Brother Metals, and you too, Precious Stones. Our stories are told. It is time to depart. Good-by to you, Prince! (Gold leads the way and they all dance off the stage waving their hands. The Prince’s head drops slowly on his chest. He sleeps. Then he wakes with a start, looks about him, and jumps to his feet.)

Prince: Where are the Spirits of all of the Jewels, and Gold, and Silver, and Platinum? Why, it was just a dream. I must have fallen asleep. There is the crown. I think more of it than I ever did before, now that I have found out—even though it was a dream—from how many countries its jewels have come. (He looks towards the window and sees the sunlight.) Whee-e-e, there’s the sun! (He puts the crown back in the chest and shuts the lid down.) Good-by, Crown, Good-by, Jewels, I’m going outdoors to play.

CURTAIN
CHAPTER 25

WE GO SHOPPING

"Shopping alone and shopping together,
At all hours of the day, and in all sorts of weather,
For all manner of things that a person can put
On the crown of his head or the sole of his foot,
Or wrap round his shoulders, or fit round his waist,
Or that can be sewed on or pinned on or laced —"

In our trips over the world to find out about clothes, we have visited the homes of our dresses and suits, our hats, gloves, and shoes, and other things we all wear. We have seen how steamships and trains help bring them to us. We have watched their boxes and bales unloaded from freight cars at our home station and we have stood beside the motor trucks and wagons that carry them to our stores.

Today Dick's Cousin Frank has come to make him a visit. Frank lives in the country many miles from a city. There is no big store near his home, so while he is here he wants to buy new clothes for school. We tell him we will take him through some of our stores. While he is shopping we can see once again just how we buy the clothes we wear.

"Where do you want to go first, Frank?" asks Dick. "To a hat store, or a shoe store, or a place to buy suits? We have all kinds of stores here in our city."

"Why don't you try a big department store?" says Bob. "You can find everything you want there, and that will save so much time."

Frank likes Bob's idea, and we are soon on our way to our biggest department store. It is in the busiest part of our business section. The streets are thronged with automobiles and trucks.
Street cars rumble past us, and the sidewalks are full of hurrying people. The store is a huge building of stone. It is many stories high, and it has so many departments that we must keep close together lest we lose one another. Start in. Frank wants a complete outfit, and we follow him from counter to counter as he buys. He finds just the warm knit underwear and stockings he needs for the cold winter in the country. The shirts he picks out are of wool grown in the west, and of cotton which may have come from Mr. Carter’s Texas plantation. The linen collars he buys next may be made of Belgian flax, and who knows but that these neckties were woven from Kito-San’s silk.

The boys’ suits are on another floor. As we walk through aisle after aisle, past cases filled with...
goods, we see that almost all the trips made by our clothes end right in this store. There are rubbers, and raincoats, thread, buttons, and scissors, and needles, and pins. There are furs from the Northlands, and bolts of cloth of all kinds from the weaving mills of our own and other lands.

Choosing a suit takes some time, there are so many colors and styles. At last Frank decides on a Norfolk suit of brown worsted, and as he tries it on, Bob sees by its label that it came from the factory we went through in Chicago. In the hat department Frank finds a brown cap to match his suit, and he ends his buying with a pair of brown shoes.

As we stroll slowly through the store, a man dressed neatly in black, bids us good day and asks what he can do for us. He is one of the floorwalkers whose duty it is to help shoppers in any way that they can. We tell him we have found out where the most of the goods come from, and we ask him how his store can get them from such distant parts of the world. He replies:

"We know that you boys and girls, your fathers and mothers, and your brothers and sisters must have clothes to wear. And we know that you will buy them if we bring them to you. We try to find the things you would like and order them from the people who make them. Steamships and trains carry them over sea and land to us. We spread our wares out on these shelves and in these glass cases so that you may see them when you come to buy.

"After all, it is you who really bring these things here. When Frank bought his suit, he paid us enough money to give some to the men who raised the sheep and clipped off the wool, some to the spinners and weavers who turned the wool into cloth, and some more to the tailors who made it into his suit. A part of Frank's money must go to the railroads which carry first the wool, then the cloth, and lastly the suit from one place to another. Then comes our share. This store which handles the suit and sells it to Frank must be paid for its work. All this comes out of those dollars which Frank gave to the clerk in the suit department upstairs."
SUGGESTIONS TO TEACHERS

The following suggestions to teachers are divided for convenience into two groups: first the general suggestions applicable to all parts of the book, and second, the special suggestions which apply to particular chapters.

GENERAL SUGGESTIONS

The Journey Club. — It is urged that a real club be formed, with a president and secretary elected by the children. The officers may be changed every two or three chapters. Records should be kept of the journeys taken and the places visited. Projects relating to subjects other than industrial science may be introduced by the teacher, such as reading, composition, nature study, etc.

The Journey Club Museum. — The value of the Museum cannot be overestimated. A set of simple shelves provides the place for the exhibits. The articles may be the everyday things which each pupil can obtain at home. The actual work of making up the exhibits should be done by the children. Suggestions as to articles for this purpose will be found in both the text and in the special suggestions.

Maps and Pictures. — There should be a special map of the world on which to trace the routes taken by the Journey Club. Small colored pins or flags will add to clarity in locating the stops and marking the parts of the world from which a certain product comes. Photographs should be obtained whenever possible. The children should draw pictures of the articles studied.

Blackboard, Clay, and Sand Table. — The blackboard may be used by the teacher for simple drawings. Clay will be found useful for modeling the animals and plants which give us our clothes. The sand table should reproduce whole scenes.

Excursions. — Wherever possible, the children should take trips to the country about to study raw materials and through neighborhood factories. The various clothing stores and department stores should be visited.

SPECIAL SUGGESTIONS FOR PROJECT PROBLEMS

Chapter 1. — The Club should be organized and officers elected. Shelves should be provided for the Clothing exhibits of the Museum.

Chapter 2. — The children should each make a cotton bale with a bit of raw cotton, a scrap of burlap, and bands of black paper. For the Museum: A
cotton boll, some cotton fibers pasted to a piece of black cardboard, a few cotton seeds, a bunch of raw cotton.

**Chapter 3.** — A trip should be made to the nearest department or dry goods store to see all kinds of cotton cloth. For the Museum: Samples of cotton cloth, a spool of thread, a mat woven of two different kinds of paper, a bit of coarsely woven cloth with several threads pulled out to show the warp.

**Chapter 4.** — The children should enact the experiment made by Mary to see the difference between cotton and linen. For the Museum: Scraps of linen, canvas, lace, linen writing paper, flaxseeds, linoleum, a small bottle of linseed oil.

**Chapters 5-6.** — The following experiment will illustrate the principle of shrinkage. Draw on the blackboard an outline around a good-sized scrap of wool cloth. Place the cloth in a small bowl of boiling water and leave for a few minutes. Now lay the cloth over the outline on the blackboard. The cloth will have shrunk and a second outline may now be drawn around it to show just the amount of the shrinkage. For the Museum: A picture of sheep and lambs, a bit of wool batt, yarn, carpet thread, samples of worsteds, and woolens.

**Chapters 7-8.** — The silkworms and the cocoons should be modeled in clay. For the Museum: A cocoon, a skein of raw silk, a spool of silk, samples of silks, satins, velvets, ribbons, etc. A bunch of silk samples from a wholesale silk house would make an ideal exhibit. There are some silk factories which will send schools an exhibit showing all stages of the making of silk.

**Chapter 9.** — An exhibition of knitting should be given in the classroom. If neither the teacher nor the pupils know how to knit, an effort should be made to invite in some one who does. A demonstration of two needle knitting and four needle knitting should be made. Knitting is a difficult process to explain and practical demonstration will aid materially. For the Museum: Knitting needles, a piece of hand knitting, a knit stocking, a knit glove, and pieces of machine knit cloth.

**Chapter 10.** — The children should actually dye scraps of cloth in the schoolroom. Small bits of white wool, silk, and cotton and a packet of dyes are the only properties needed. For the Museum: A card of all the different colors and shades may perhaps be obtained from a dyeing establishment, or one can be made with water colors. In addition, a bit of coal to show the origin of aniline dyes, scraps of colored cloths.

**Chapter 11.** — This chapter may be used as a play. For the Museum: A miniature work-basket can be fitted out at little expense. A needle, spool of thread, a few pins, hooks, eyes, and snappers, a wooden darning egg, a cheap thimble, a small pair of scissors.

**Chapter 12.** — The children should each bring a different button to class, as suggested in the text. This will form the exhibit for the Museum.

**Chapters 13-14.** — If possible the local agent for the sewing machine should be
induced to give a demonstration of the sewing machine in the schoolroom. A doll’s dress might be made from a pattern which may be had from any pattern company. The cloth should be cut and the seams basted before the sewing machine comes. For the Museum: A paper pattern, a picture of a sewing machine, pictures of children’s styles cut from a fashion paper, a pictorial booklet of one of the ready-made clothing houses showing boys’ overcoats and suits.

Chapter 15. — For the Museum: Bits of lace, embroidery, and trimmings, which the children may bring from home. A picture of a gondola and a Venetian street scene would add color and interest.

Chapters 16–17. — Visits to a shoe store and a shoe repair shop will be found useful. For the Museum: Picture of shoes from other lands. Scraps of sole leather and calfskin, obtained from the shoe repair shop, and also an insole. Clay models of the various animals from which leather comes.

Chapter 18. — For the Museum: Clay models of the animals whose skins are made into gloves. A pair of old leather gloves, one ripped apart into its several pieces. Other gloves such as mittens, knit gloves, etc.

Chapter 19. — The children should model a dog sled in clay. Also an Indian trapper dressed in bits of fur. In the sand table they should make a model of the beaver and its dam and the home of the muskrat. For the Museum: These clay models, pictures of snow-shoeing and of the fur-bearing animals, scraps of fur.


Chapters 21–22. — A trip should be made to the drugstore where many things made of rubber may be seen. The scene at the rubber camp should be reproduced on the sand table and with clay. For the Museum: A bit of crude rubber, a piece of crêpe rubber, which might be obtained by writing to a rubber factory, also rubber bands, erasers, balls, etc., a rubber overshoe, and a piece of waterproof cloth.

Chapter 23. — The children’s hats should be brought in from the cloak room and laid on the desks, in imitation of the hat show described in the text. There should be in addition a man’s soft felt hat, a derby, a straw hat, and if possible a Panama hat. For the Museum: Scraps of beaver and rabbit fur, felt, a card to which are sewed bits of all the cloths used to make hats, a strip of straw braid, a few artificial flowers and feathers. Pictures of the ostrich and other birds whose feathers we use.

Chapter 24. — The children should act the play as written. The costumes may be loose robes of colored cheesecloth, and the crown may be made of gilt paper with the stones represented by bits of shiny colored paper pasted on it. For the Museum: A card on which the various jewels are painted with water colors. Bits of gold and silver paper to represent the metals.

Chapter 25. — After a visit to a dry goods store the Journey Club should
play store in the classroom, which should be divided into different departments. One child should act as floor-walker, others as clerks, and the rest as shoppers. Frank buys his suit in the first aisle, his cap over near the window, and his other things in other sections. Arithmetic projects may be introduced in this connection.

**Review.** — An exposition may be held along the lines of a World’s Fair. Each child may take one article and prepare an exhibit and a little talk in the form of a story. He may dress in costume appropriate to some phase of the subject and add special illustrative objects to the permanent exhibit of the Museum.
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