

TALKS
TO
CHILDREN



HOUGHTON MIFFLIN COMPANY
BOSTON
NEW YORK







THE DRINKING POOL



TALKS
TO
CHILDREN



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"Goodies to Eat" (from "Muvver and Me," by Robert Livingston); published by Houghton Mifflin Company.

NOTE

“The Girl Who Trod on a Loaf,” “The Flax,” and “The New Year,” by Hans Christian Andersen; published by Houghton Mifflin Company.

“The Harvest of the Fields,” “The Harvest of the Woods,” and “How Gofa Made the Pots” (from “Days Before History,” by H. R. Hall); published by Thomas Y. Crowell Company.

“We Plough the Fields” (from “Church Harmonies — New and Old”); published by Universalist Publishing House.

“Little Water-Drop’s Journey” (from “With the Little Folks”); published by Houghton Mifflin Company.

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“The Water Bloom,” and “The Waning Moon” (from “Stories and Poems for Children,” by Celia Thaxter); published by Houghton Mifflin Company.

“Star People,” by Katharine Fay Dewey; published by Houghton Mifflin Company.

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INTRODUCTION

THIS book has been prepared with the purpose of helping the busy mother to perform her part in the education of her children by encouraging them to ask questions and by answering them patiently and intelligently.

Parents need constantly to remind themselves of the value of a child's first questions and the importance of answering them in such a manner as to guide the growing mind into habits of observation, thoughtfulness and further investigation.

It must be remembered that this world is very new to the little child. It is but natural that he should wish to know all about it. How can he learn? By asking questions. What and how much he learns will depend upon the answers he receives.

The wise mother, therefore, welcomes, even anticipates these questions and sets aside, with the same regularity with which she plans the meals, some part of each day which shall truly be the children's hour, when they can go to her with their queries sure of ready response.

At bedtime, in their warm nighties, toasting their toes before the open fire, my own three boys and I, and as often their father as well, have talked since the oldest of them was first able to understand, thus storing up many precious memories.

The talks here given have grown out of my own

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experience and are amplifications of our own bedtime talks. They are not intended to be used word for word as they stand, but are offered merely as a suggestive guide which may serve, I hope, as a useful means of stimulating thought and answering innumerable questions about the common things of everyday life — where we live, what we eat, how we are clothed, how we make our way from point to point, etc., seeking always to encourage intelligent questioning, to inform the children, and to enlarge and enrich their vocabulary.

We have tried always to choose the best words, even though unfamiliar to them, being careful to explain briefly and clearly what they could not readily grasp.

Above all, these talks are intended to lead the child to a sense of the significance of the interdependence of all things, all workers, nations, races, seasons, ages; each upon each, and the dependence of all upon their Creator.

ALICE PACKARD

SHELTER

TALKS TO CHILDREN

I HOME

“Over in the meadow, in the sand, in the sun,
Lived an old mother-toad and her little toadie one.
‘Wink!’ said the mother. ‘I wink,’ said the one:
So she winked and she blinked, in the sand, in the sun.

“Over in the meadow, where the stream runs blue,
Lived an old mother-fish and her little fishes two.
‘Swim!’ said the mother. ‘We swim,’ said the two:
So they swam and they leaped, where the stream runs blue.

“Over in the meadow, in a hole in a tree,
Lived a mother-bluebird and her little birdies three.
‘Sing!’ said the mother. ‘We sing,’ said the three:
So they sang and were glad in a hole in the tree.

“Over in the meadow, in the reeds on the shore,
Lived a mother-muskrat and her little muskrats four,
‘Dive!’ said the mother. ‘We dive,’ said the four:
So they dived and they burrowed in the reeds on the shore.

“Over in the meadow, in a snug beehive,
Lived a mother-honeybee and her little honeys five.
‘Buzz!’ said the mother. ‘We buzz,’ said the five:
So they buzzed and they hummed in the snug beehive.

“Over in the meadow, in a nest built of sticks,
Lived a black mother-crow and her little crows six.
‘Caw!’ said the mother. ‘We caw,’ said the six:
So they cawed and they cawed, in their nest built of sticks.

TALKS TO CHILDREN

“Over in the meadow, where the grass is so even,
Lived a gay mother-cricket and her little crickets seven.
‘Chirp!’ said the mother. ‘We chirp,’ said the seven:
So they chirped cheery notes in the grass soft and even.

“Over in the meadow by the old mossy gate,
Lived a brown mother-lizard and her little lizards eight.
‘Bask!’ said the mother. ‘We bask,’ said the eight:
So they basked in the sun on the old mossy gate.

“Over in the meadow, where the clear pools shine,
Lived a green mother-frog and her little froggies nine.
‘Croak!’ said the mother. ‘We croak,’ said the nine:
So they croaked and they plashed, where the clear pools shine.

“Over in the meadow, in a sly little den,
Lived a gray mother-spider and her little spiders ten.
‘Spin!’ said the mother. ‘We spin,’ said the ten:
So they spun large webs in their sly little den.”

OLIVE A. WADSWORTH, “Over in the Meadow.”

IT’S time to go home.” How many people all over the world say this! Brother coming home from school, Mother coming home from the store or club, Father coming home from work. Did you ever say, “It’s time to go home”?

“And then what did you do?”

Came home to Mother and Father and Brother and Sister, did n’t you? And came right into the house and found Mother and a warm, cozy room and some play-things. By and by, when it got dark, you turned on the light, or Mother lighted a lamp, and gave you some supper and then told you a story, or looked at the pictures in a book and told you about them, and after your prayer was said, cuddled you into a springy bed,

HOME

tucked you in under warm, soft blankets and kissed you
“Good-night.”

Now suppose your house had not been here when you came home! What would you have done?

“Gone over to Dana’s?”

But suppose his house had not been here?

How did your house and Dana’s happen to be here and how long have they been here, do you think? And all the things that Mother uses to make you comfortable; to get your supper and to put you to bed and to make the home warm and bright; where did they come from?

No, they have not always been here. There was a time when all about here as far as the whole town, yes, and two towns and farther, there was nothing but woods. No, not a single house, just a great forest.

Father and Mother did n’t live here then. No, nor Grandmother, nor her mother and grandmother. In fact there were no white people here then, but — there were *homes*.

Can you think of any one who might have had a home here then? Any families that build their homes in the woods now?

“Yes, the squirrels.” High up in the tree-tops, you will see what looks like a great bunch of dry, brown leaves and sticks and this is the squirrel’s summer home. In the winter you may find a squirrel family in its house in a hollow tree and if you watch in the autumn, when the leaves are turning red and gold and flying through the air like birds, you will see them laying in their winter store of nuts and acorns.

TALKS TO CHILDREN

Yes, the birds, too, have their homes in the trees, though look sharp when you go out again and you will see that some of them build their homes right on the ground, some of them in hollow trees, and some in the bushes and vines. Although these houses, or nests, as we call the birds' homes, are made with great labor and care, they use them only one season, so if you wish to look at them closely you may bring them home in the autumn and winter. That is the time when Jack Frost is out playing in the garden and woods, and the trees are bare, remember, and do not take them at any other time or the birds may come home some night, just as you do, and not find any home.

If you do bring the nests home and look closely at them you will find that each kind of a bird builds a different kind of a house and that they do not all use the same kind of things to build with. Look long and hard enough and you will find out just what each kind of a bird does use with which to build its nest and just what sort of a place each kind chooses in which to build.

Dallas Lore Sharp, who has told a great many children what to look for in the woods and fields, says, and I want you to learn this: "Learn to look long enough and hard enough at everything to see something fresh and interesting about it. Most persons have eyes, but only a few persons can really see. And that is because they cannot fix their roving eyes on any one thing long enough to tell any two things about it. All they can tell is that it is a lion and not a dandelion."

See if you can find out what birds weave their nests, what birds plaster them like a mason, what ones ham-

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mer them out like a carpenter, what ones build in holes and hollow trees and will build in houses that you put out for them, and what ones glue their nests to chimneys and what kinds build no nests at all.

See, as well, what they use to line their nests with.

Out in the grass you will find homes, too, under logs and stones and bricks; down in the meadows you will find homes; and in the ponds and brooks; in the sea, also, and in the marsh, there are homes a-plenty; and in the sand on the shore.

When you hear the cricket chirping, that delightful little musician in his suit of black patent leather, you will likely find him sitting in the sun or feasting upon some sort of green, growing leaves, but if you follow him home you will find that he is a cave-dweller and makes his house almost anywhere near his food supply of clover or grass, under boards or loose stones or a clod of earth in some sunny nook in the fields or by the roadside.

When you are frightened away by a spider just like Little Miss Muffet, if instead of running too far you watch him for a while and then look for others as you go walking, you will find that some spiders weave a tent for their babies, some make a tube web in holes under the stones, while some carry their babies on their backs and build webs in which to sit and watch for the insects which they eat for food.

Go and watch at the ponds and brooks and meadows in the spring, and you will find homes of all sorts, built of all kinds of things which are to be found near by; homes of families that crawl, that walk, that fly, that swim,

TALKS TO CHILDREN

and some that cannot move about except when they are carried.

Late in March, you will find where the frogs live if you go down to the swamp or marsh, and perhaps you will find their eggs laid in a mass in the shallow water. Not many days later, you will see the tadpoles swimming about finding food for themselves.

In April, you may find a little nest of algæ or green scum. In this the fish's eggs are laid and here the little fishes are hatched and stay until they are big enough to take care of themselves.

Out in the tall grass or dry moss, or the thick creeping vines like the mountain cranberry, you will find zigzagging here and there, a network of tiny trails, beaten hard and smooth by tiny feet. If you take pains to follow these you may find the home of the little field mice, a cozy little nest lined with soft grasses and containing six or eight cunning babies. Sometimes, too, you will find their homes in a last year's bird's nest in a bush.

In a marsh by the edge of a lake or stream you will often see what looks like a great mound of coarse reeds and grass; this is the muskrat's home.

In the same sort of place the beaver builds his lodge. He is both a carpenter and a mason and saws down great trees with his sharp teeth. With these he dams up wide streams. He carries sticks, stones, and quantities of mud with which to build and plaster his house.

In a hollow log, or in the ground, you may find a whole colony of ant families at home, or in a hollow tree, a beehive hidden away full of honey for the winter's food.

Oh, yes, there were homes of all sorts, and here where

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our house now is, long before either you or I, or our grandmothers came here to live, there were just such animal homes and others of great savage animals, which we do not see to-day.

These animal homes you have found are not all alike; some are in the ground, some are on the ground, and some are far above the ground and they are made of different materials and in different ways.

How is it with houses that people build? Is your house just like Dana's? Yours is large and his is small? Yes, and his is made of wood and yours of brick. And Jack's of stone? I'm glad you noticed that and what is Auntie's made of? Yes, plaster.

These are not all of the things that people use. When Mrs. Grover was in Hawaii, she found the houses there were many of them made of a long, heavy grass.

In China bamboo and mud and clay are used a great deal. [Bamboo and how it grows and what it is used for will interest the children.]

We are told that way off in Central Africa where not many people have ever visited and the forests are still thick and dark that the houses are built of poles around which are woven grass and broad leaves to form a thatch.

In the Arctic regions where it is cold and the snow stays all the year round, Daddy said he found the houses built of snow.

In some places there are sod houses. Square pieces of grass sod are cut and piled up like bricks.

Then there are dugouts, that is, as its name says, houses dug out of the ground.

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Down in New Mexico, you will find adobe houses. Clay and chopped straw are mixed and pressed into molds, then left in the sun to dry, and this makes adobe bricks. The roofs of these houses are often made of brush on which mud is spread.

Houses have even been built of salt, rock salt cut into blocks. So you see, that just as animal homes differ so do those of people according to the place in which they build their houses; what they find to build with, and according to what they have learned about how to build.

Men, however, have learned to use the things about them to make tools with which to work and make more and more comfortable houses; to bring to the place in which they wish to live the things which grow far away; to make their houses cool in summer and warm in winter; to light their homes when it is dark and to shade them when the sun is too bright; while the animals, apparently, do not improve or advance in any way, and although fiercer and stronger, many of them, man has tamed them or killed them and made them almost wholly dependent upon his will.

[Be sure and bring out in this talk the idea of the universal need of shelter and that out of the house, the family with its love, each for the other, makes a home. Sing "Home, Sweet Home."]

II

THE LOG HOUSE

“Meanwhile Alden at home had built him a new habitation,
Solid, substantial, of timber rough-hewn from the firs of the forest.
Wooden-barred was the door, and the roof was covered with rushes;
Latticed the windows were, and the window panes were of paper
Oiled to admit the light, while wind and rain were excluded.
There too he dug a well, and around it planted an orchard:
Still may be seen to this day some trace of the well and the orchard.”

HENRY W. LONGFELLOW, “The Courtship of Miles Standish.”

AFTER a while men who lived in places where there were trees learned to cut them down, trim off the branches, and make log houses. This was the sort of house that the first white people who came to this country made.

After the branches were trimmed from the trunks of the trees they were cut into logs of the right length and fitted together.

If you should lay your sticks to make a square you would see how they started the house. To fit them together at the corners they cut notches in the ends of the logs and fitted them in. Then, because they had no nails as we have now, they made long pins by whittling the wood and pinned them together with these. To drive in the pins they made holes first, for you cannot drive a wooden pin into wood as you can an iron nail. To bore these holes they used augers as carpenters do to-day. They built the walls high enough by piling log upon log, just as you build with your blocks.

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This left spaces between where the cold air and rain and snow could blow in. These spaces they chinked up with mud and sods.

When the work was too hard for the family to do the neighbors came and helped them. These neighbors lived sometimes miles away and sometimes there were only a few fields between the houses.

Should we think now of sending for the neighbors to help us build our house? Who would do this work for us?

When the roof was put on the house it took a number of helpers. This was called a "raising" and was as good fun for the children as a holiday is now, for all the neighbors came and stayed to dinner.

They cut the logs into short pieces and used these for shingles. You can see how different these were from the shingles which are used to-day.

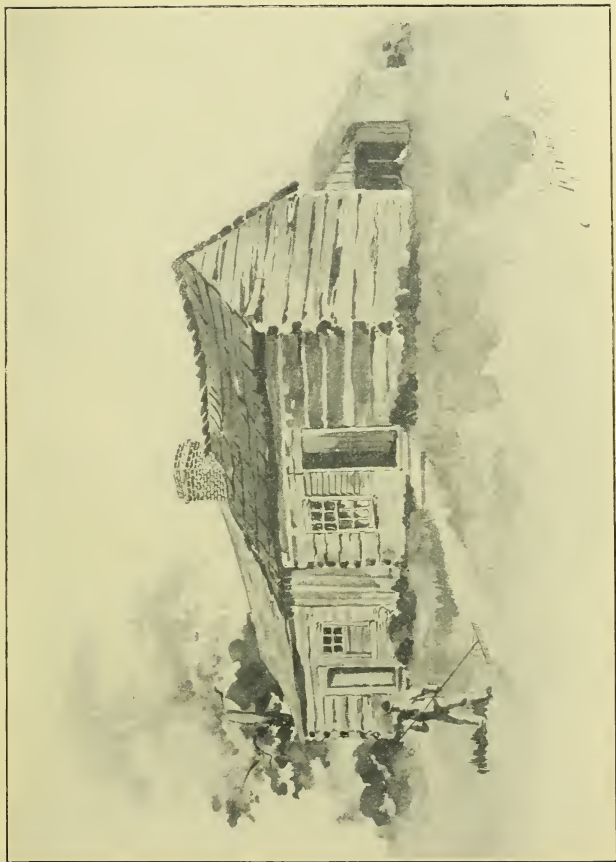
There were no furniture stores then so what did they do for beds?

They nailed boards to the sides of the walls, letting the walls form two sides of the bed. For mattresses they used dried grass, pine boughs, corn husks, or feathers.

Tables and chairs were made from logs, too, just as we made some at camp once.

In this large room, the only one they had to use for kitchen, dining-room, living-room, and sometimes to sleep in, they built a fireplace of stone with a great chimney — usually this chimney was outside of the house.

This fire was the only means of heating the house and very often its bright blaze was the only light. We read



A LOG CABIN (THE EARLY HOME OF ABRAHAM LINCOLN)

From a drawing after a photograph

THE LOG HOUSE

stories of many a boy of those days reading by the fire-light.

At the side of the fireplace was fastened a great bar of iron which could be swung from side to side. This was known as the crane. On it hung great iron hooks. On these the iron kettles and pots were hung and the crane then swung over the fire. When the kettle was to be emptied the crane was swung away from the fire and the pot would cool and be far enough from the blaze so that the person cooking could stir what was in it or dip from it.

To bake they placed a tin oven over the hot coals. Sometimes they built ovens of brick and in these built a fire. When the oven was hot enough they cleared out what was left of the coals and baked in that.

What fun they had by those open fires in those days — when the snow was deep outside or the wind was blowing hard, they were warm and cozy inside by the cheery blaze, telling stories as they roasted apples or popped corn.

There were bedrooms made up near the roof in some of these houses but there were no stairs to reach them.

So when they went to bed they had to climb a ladder which they made as Daddy made one for your tree house, by nailing sticks to the tree, by nailing strips of logs to the side of the house.

My grandmother used to tell me stories of what her grandmother told her about sleeping in one of these log houses. She could hear the wind whistling and feel the snow sifting in between the cracks and blowing on her bed.

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Sometimes as she listened to the pine trees, saying to her as they did to Hiawatha, "Minne wawa," she could hear the wolves howling far away. They were afraid of a fire, though, so she knew they would not harm her in the log house with its open fire.

The only light was from a tallow candle and this she must not burn any longer than to pop quickly into bed.

All the water they used they carried in pails from a spring a long way from the house.

But they were very happy there for the whole family was together and she had never known a better house.

III

THE INDIAN HOME

BEFORE your house was built here you told me there were homes here; homes of animals, but did you know there were homes of people here, too?

Not white people like us, but people whose skins were dark red or copper-colored.

You remember the Chinaman at the laundry has a yellow skin. And the Japanese who sold you the toys made in Japan has a yellow skin, too. All these families are called the Yellow Race and those with red skins the Red Men, or Indians.

These Red men used to live in all parts of this country. When Columbus came here he thought this country was India and he called the people whom he found here Indians and that is what the Red men have been called ever since.

In those days, you must remember, the people did not know how to make boards or bricks. They had no sawmills or brick yards. There were no carpenters for whom they could send when they wanted to build a house; there were no stores where they could buy a bed or a table or a chair or even anything to wear or to eat.

Instead of our stores, schools, and churches, there were great forests of trees bigger than any that you have seen, covering places bigger than our whole town, and here lived great, wild animals such as we seldom see to-day except in the circus or in the zoo.

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Can you name any? Yes, wolves, bears, elk, and many other animals which you will never see because they have all been killed.

In other places there were great plains covered with grass and there the buffaloes, cattle, and ponies wandered wild, feeding on the grass.

These ponies the Indians caught and tamed.

Other animals they killed for food and used their skins and furs for clothing; they also fished and ate the fishes. In this way they became great travelers, as well as hunters, because when the great herds had eaten the grass in one place, they roved about in search of new pastures, and the Indians had to follow. They could not live in one place for years as we do.

So they made their houses of the things that grew near where they happened to be, and in the easiest and quickest way. Sometimes when they moved they took their houses with them, just as people now take a tent with them when they go camping, or as the men in the army did when they were in the war.

The Indian homes were not all alike, nor made of the same kind of things any more than are all the houses of the people whom you know.

The Indians out on the plains called their houses tepees. To make these they cut straight, strong slender trees and chipped off all the branches. These made poles. These poles they tied together at the top with thongs. To make the thongs, which they used as we use rope or string, they cut the skins of animals into strips. Then spreading out the poles at the bottom, they pounded the ends into the ground, tight, and covered

THE INDIAN HOME

the whole with a buffalo skin or the skins of any animals that they happened to have killed. Sometimes they painted pictures on the skin covering; pictures of hunting or of fighting.

An opening was left at the top for a chimney, so that if it was cold, they could build a fire on the ground in the middle of the tepee and the smoke could go up through the hole.

Around the edges of the tent the father and mother and children wrapped themselves up in the skins of animals and slept. They hung a big kettle over the fire and cooked their meals and were very happy because it was their home.

Other tribes of Indians who lived in a part of the country where the grass grew tall and thick covered the poles with this instead of skins. First they wound smaller poles round the first poles, like hoops on a barrel, and then wove wisps of grass in the framework just as you weave raffia mats.

The Navajo Indians covered their framework of poles with earth, putting on first a layer of bark and weeds to keep it from falling through into the hogans, as they called their houses. For summer they made an open shelter by driving poles into the ground in four corners, then laying poles across the top and covering the top, back, and one end, with boughs and grass.

The Digger Indians, so called because they dug roots from the earth for their food, made a similar house, but covered their pole framework with rushes.

Others called their houses wigwams or lodges.

These they made of pine boughs. Probably here

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where we now live there was once a wigwam made from the boughs of some of the big trees that we talked about and probably many a night a great camp fire gleamed in what is now our front yard, or perhaps where our garden is, and the family sat around and watched the cooking of the deer, which the father had shot for their supper with the bow and arrow he had made himself.

By and by perhaps you will learn more about these Red Men and what they did before you lived here.

[The children will enjoy making an Indian head-dress and building a hogan in the woods.]

IV

THE ESKIMO HOME

A WAY up north where the Eskimos live, there are no forests because it is too cold for the trees to grow, but the snow is deep and hard so that it can be cut in great blocks. With this the people build their houses, igloos they call them. They choose a place where the snow is deep and firmly packed. With a long knife made of bone, they cut a great block from the snow. Standing in the hole where this block was, they cut out other blocks with which they make a circle. On top of these another layer is placed, carefully, as in a brick wall, so that the joints as they come together do not form a straight line. Layer after layer is placed until for the top layer just one block is needed to finish the igloo. Then snow is carefully packed in between each block just as the bricks in a wall are packed together close with mortar.

For doors, openings are cut underneath the lowest layer of blocks, and for some distance in front a tunnel is dug in the snow, through which they crawl when they wish to enter the house.

For windows, cakes of clear ice are set in the wall. To keep out the cold, skins of animals are hung about the walls or at the openings.

For a bed the snow is packed hard and on this is laid moss, grass, or twigs, if they can be found. Over these

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are laid the skins of animals, seal or walrus, and soft skins and furs are the bed clothes.

The smoke from the stove, which is a wick of moss in a hollow stone filled with whale oil (and this gives them their light, too), goes up through a hole in the roof, just as it does in the Indian homes.

Only one-room houses these, but the Indian mothers and the Eskimo mothers love their babies just as your mother loves you and tucks them away warm and comfy under furs and skins just as your mother does you under sheets and blankets.

When the snow is deep enough we will try to make a little igloo in the back yard. I remember one winter Brother made one with the room inside big enough for him to stand up in. Oh, what fun he had!

V

THE FIRST HOMES

JUST as Indian homes were built before our houses were, so other houses were built by people who lived before grandmother was a little girl, and some by people who lived so long ago that now there is nothing left of their houses to see but a stone or two or a tool or weapon which they used. And so we think back to a time when "there were no houses or farms or roads from one place to another, and there was not a single city, or a town, or even a village in the whole earth."

When you get tired of playing, or cold or hungry or it begins to rain or to get dark, how nice it is to go into our house, but at that time there were no houses anywhere.

"There was just the great, round world, all fresh and new, and covered with growing things; and there were wild beasts of all kinds in the forests, and fishes of all kinds in the seas, and all sorts of birds and flying creatures in the air.

"Besides all these wonderful things in the new, new world, there was Man.

"He was quite new, too. He did n't know much of anything about the world. All that he really knew was that there was a world, and that he was in it, and that there were fierce wild animals in it, too, which would kill him and eat him if he did n't kill them first. And he knew very well that he was not as swift as the deer, or as big as the elephant, or as strong as the lion, or as fierce

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as the tiger, and it seemed to him as if he had n't much chance to stay alive at all in a world so full of terrible creatures who wanted to eat him up.

“But this Prehistoric Man was very brave, and he could do two things which none of the other creatures could do — he could laugh and he could think.

“One day, he sat down on a rock, and took his head between his hands and thought and thought, and by and by he lifted up his head and said to his wife, — for of course he had a wife, — ‘I have it, my dear. If we are not as strong as the wild beasts, we must be a great deal more clever.’

“So he got right up off the rock and set about being clever. And so did his wife. They were so clever that they hid themselves in trees and rocks where the wild beasts could not find them. And they found out the secret of fire.

“The other creatures could not find out the secret of fire to save their lives, and they were dreadfully afraid of it. Then the Man and his wife made weapons out of stones and bones, and they made dishes out of mud, and though these things were n't a bit like our weapons or our dishes, they got along very well with them for many years.

“In the earliest times of all, the Woman hunted and trapped the wild creatures, and fished, all by herself, but by and by she began to let the Man do the hunting and bring home the game, while she stayed in the cave house and kept the hearth-fire bright and took care of the children. She cooked the food that he brought home, and she made needles out of bones and sewed skins to-

THE FIRST HOMES

gether for clothes for her husband and the children and herself. After a long time she began to plant seeds of wild things that she found were good to eat, and to raise food out of the ground.

“All these things they did, and many more that had never been done before, — and because they were so much more clever than all the beasts of the forest, the Prehistoric Man and his prehistoric wife lived a long time in a little peace and more happiness than you might at first think possible.

“They taught their children all the clever things they had thought out, and these children, when they grew up, taught them to their children, and this went on for hundreds and thousands of years. Each generation learned new things and taught them to the next, until now we have houses and churches and villages and cities dotted over the whole earth, and there are roads going from everywhere to everywhere else. There are railroads and steam-cars and telegraph and telephone lines, and printing-presses, so that to-day everybody knows more about the very ends of the earth than Prehistoric Man could possibly know about what was happening fifty miles away from him.

“And all these things we have to-day because the Prehistoric Man and the Prehistoric Woman did their part bravely and well when the earth was young.”¹

¹ From *The Cave Twins*, by Lucy Fitch Perkins.

VI OUR HOUSES

THE first houses, in days before people learned to be gentle, and were rude and savage like the animals, were not comfortable and beautiful like ours. They were just shelters where people could be safe from storms and wild animals, and from each other — for they fought with each other just as wild animals do.

For their homes they used a cave in the rocks, if there happened to be one; or if they lived where there were cliffs on the mountain side they crawled into the spaces where the rocks had worn away and left niches; or they dug pits and crawled in, much as the rabbits and foxes make their burrows.

After a long time, how long no one knows, they learned to make weapons and rough tools out of stone. They had no iron and did not know how to get it as we do now, so they could make no axes and saws and planes, such as our carpenters use, but in time they managed to build rough huts with brush and mud.

It is a long story of how each father taught his little boy what he learned, and of how each mother taught her little girl what she learned, and of how each little boy and girl found more things, and how to make more and better things out of what they found, until instead of crawling into a cave for shelter we can have almost any kind of a house that we want. We do not have to build

OUR HOUSES

it all ourselves either, or use grass or logs or whatever happens to grow near by.

Let's think of some of the finest houses we know and how they were built. When we get through, see if you can count on your fingers how many kinds of workers helped to build them and from how many places the things used to make them were brought.

What must we have first?

A cellar? [Talk a bit about the need of a cellar. Warmth, storage, the heater, etc.] Then, if you look at the house outside you will see the foundation wall on which the house rests. [Talk of the need of a good firm foundation.]

Jesus spoke of this when He was teaching people how to lay the foundation of their lives. He said their lives were like a house and a good character was the foundation and then he told them how to make the foundation strong. Let us read in the Bible what He said:

“Whosoever cometh to me and heareth my sayings and doeth them, I will shew you to whom he is like:

“He is like a man who built an house, and digged deep, and laid the foundation on a rock; and when the flood arose, the stream beat vehemently on that house, and could not shake it; for it was founded upon a rock.

“But he that heareth, and doeth not, is like a man that without a foundation built an house upon the earth; against which the stream did beat vehemently, and immediately it fell; and the ruin of that house was great.”

[To make this foundation we send for the mason; count one on our chain of helpers.]

You thought the cellar came first, and true enough we

TALKS TO CHILDREN

must dig the cellar before we build the walls, but before we begin at all we must plan very carefully what kind of a house we want to build, for we are no longer contented with one room and no chimney, or stairs, or windows. What rooms shall we need?

So we send for an architect to draw a plan which will tell the workmen just how large each part shall be and where to put it. We will count one for the architect, for whom we send first, and two for the mason.

Of what shall we make our house? Wood, brick, stone, or concrete? To-day we can use any or all of these in our house.

After the mason has done his part we will send for the carpenter to put up the framework. What a hammering there will be as he nails the boards together and what a buzzing and what a whirring as he saws the boards to fit.

We will go to a carpenter's shop sometime and look at his tools, or we can go to a hardware store and see the tools that the workmen use; for to-day no workman need make his own out of a stick or a rock; there are great factories making thousands of every kind of tool that any workman may need.

The carpenter will put up the great timbers and shingle the roof, board in the walls, and nail on the laths. Then the mason will plaster the walls and the glazier will come and put glass in the windows. **THAT MAKES FOUR.**

We forgot the plumber who will come and pipe the house for water and the electrician who will wire it for light. How different from the old way of finding a

OUR HOUSES

spring if you wanted water or of having no light but the sun, stars, and moon, or a tallow candle.

Then the painter will come and stain or paint the woodwork and floors; and the paperhanger will come and paper the walls. How many does that make? Yes, **FOUR MORE**. Let us count on our fingers one-two-three-four-five-six-seven-eight.

To keep us warm we can have almost any kind of a stove that we want, an open fireplace, an iron stove, a furnace, out of the way and out of sight in the cellar, with pipes running to each room carrying hot air; or hot water, or steam to heat every room; and to cook our food, a gas stove, an oil stove, or even an electric stove. Just think of it, when you wish for Aladdin's lamp, a stove that will keep you warm or that will cook your food, and you have nothing to do but to press a button.

How different from the Eskimo's igloo with no chimney and a wee little lamp that serves both for light and for a stove; or the Indian fire, for which he must first find enough dry wood, and before men found out how to make matches they had to start the fire by rubbing two sticks or stones together until they made a spark and then with this tiny spark set fire to some dry leaves and chips.

What a lot of workers have helped to make the house and, working together, what a fine house they have made!

Can you name them again? Yes, all these and more, for we have not said a word about the miner who gets the iron out of which the tools and nails are made; and the coal by which the iron is heated so that it can be

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hammered into shape. To the miner we go also, as you will see, for the lights in our houses and for the dyes with which we color so many things.

Look around the room and find something which is colored. See how many colors you can find. Would you like to live in a room where everything was just one color or black or white?

We have not spoken of the lumberman without whom the carpenter would have no boards; the quarryman, who provides the stone; or the brickmaker to whom we must go for bricks.

Do you see now what we mean when we say that man is no longer savage but has grown civilized?

Yes, we mean that instead of fighting each other, men are working together to make things better than they find them; and that they have learned to share with each other, both the work, and the things which they make.

VII

LUMBER

WHERE do the boards and timbers come from that the carpenter uses to build our houses? If you look out of the window and listen, the trees may tell you; that is, if you have learned their language. You did n't know trees could talk? Well, when we are in the woods again we will listen. You do know that trees have names, don't you? Different trees are no more alike than different people. You know that people live in families and those in a family have the same last name but different first names. It is the same way with trees. Your last name is what? And your first name? Yes, and my last name? And Brother's? Why, the last names are all the same; but your first name is? And my first name? And Brother's? All different. You have a baby name, too, a nickname, have n't you? And so has Brother. The trees have nicknames, too; we call these their common names. They have another name which we call their scientific name.

We'll go into the woods and listen to the trees long enough to see if they ever sing or talk and if they can tell us anything about the boards and beams and shingles and floors in our houses. Perhaps we shall want to call them by name when we see them again. [Take a walk in the woods and listen under ash trees, and pines, and oaks, and especially under beech trees if you can find any. Children will like to bring you the different leaves

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and try to name them after you have told them what their names are. If there are no leaves they will enjoy finding what they can and even in winter the oaks and beeches will have some leaves dry and rustling.]

Perhaps you know the name of some of the trees already. Where do the apples come from? And the pears, etc. These are our fruit-trees. Now where do the nuts come from? Chestnuts come from chestnut-trees, walnuts from walnut-trees, pecans from pecan-trees. Who gathers the nuts besides boys?

Jack Frost, and the wind. [Talk about Jack Frost and how he opens the burrs and the shells.] Anything else in the woods that gathers the nuts? Squirrels. There are fruit-trees and nut-trees and where do the acorns grow? Yes, on oak-trees.

I walked along a street one hot day in summer. There was n't a tree on the street. How the sun beat down and scorched me. How tired and thirsty I was. By and by I turned into another street. It was so cool that I felt happy right away. I thought I could n't walk another step, but on this street I was n't tired and my head did n't ache any more and I felt like singing and skipping. Do you know why? All along this other street there were trees; maple- and elm-trees, and the birds were singing in them and building their nests. They shaded me from the hot sun and made my walk pleasant and easy. No fruit or nuts grew upon them, but they were shade trees and a shield from the hot sun in summer and the cold wind in winter. ;

Out in the deep woods there are trees with cones upon them and their leaves are shaped like needles; all the

LUMBER

year round they are covered with these green needles; do you know what the name of these trees is? "Pines." Yes, and there are others, though their needles are not just like those of the pine nor of each other; they are spruces and firs and cedars and hemlocks, and, oh, how sweet they smell! These trees that stay green all winter we call evergreen trees, and sometime I will tell you what we call the trees that lose their leaves in the cold weather. [If the child asks tell him that they are deciduous.]

For many ages trees grew in the forests. Men never touched them. Great giants these trees grew to be. Men were like tiny ants beside them. Seeds fell from them and dropped in the earth, and the sun and the rain fell upon them and more trees grew up. Grandfather trees grew old and died; the wind blew them over, and the winter storms threw them to the ground. Lovely moss and trailing vines and wonderful flowers in time carpeted these fallen trees, and a wonderful place was the old forest.

Then man learned to make fire and to use wood to keep it going. They learned, too, to cut down trees and make log houses; and then they learned to cut up trees, first with axes, then with saws, then with great saws that were pushed through the log by wheels that running water pushed around, and later with machines run by steam or electricity.

If you should saw up a log of wood in long strips, what would you have? Boards. Now don't you think the trees ought to know where the boards that the carpenter uses to build your house come from? I don't

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know all the songs of the pine-tree, or the oak, or the beech, but I have listened to some of them more than once. Suppose you slice a log to leave four flat sides, then cut it right down through the middle. Then cut each half through the middle, and what have you? Four beams, small ones, but that is the way the beams of the house are made. Boards are made by slicing the logs. Shingles are made from pieces of wood not large enough or good enough for boards and cut thinner.

There are men who buy trees, miles and miles of trees, and hire men to cut them down. These are the lumbermen, and we must thank them for the boards and all the parts of our houses which are made of wood. Perhaps you can think of a great many other things that are made of wood besides our houses. These lumbermen go into the deep woods where as far as you can see the trees stand close together, sometimes way up steep mountain sides. There they cut down the great trees with saws and with axes. Then with the logs they build houses, sometimes two or three to sleep in, and one big cook house where they cook and eat their meals. They often stay all winter.

After a tree is cut down all the branches are cut off. Then the trees are sorted according to their size and whether they are straight and smooth or not. All the masts for the great ships are made of trees like these. The finest and straightest are saved for them. Some are saved for telephone and telegraph poles. When you see these poles along the street try to think how they looked in the great forest with their shady branches covered with leaves and perhaps the squirrels and the birds nest-

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ing in them. Those that are to be used in houses are first cut up into logs.

Then they must be taken to a sawmill to be cut up into timbers and boards and shingles and laths, etc. These mills are each built beside a stream of water, do you know why?

When Winthrop was a little boy he found out why. He was walking with me in the woods in New Hampshire, and we heard a stream of water rushing over the rocks. In one place in the stream rocks and logs had been put across to hold the water back. It was allowed to run through only in one place. The water held back in this way rushed to get through, and right below this place there was a great wheel upon which the water must fall.

This wheel was hung so that the water would fall right in the middle, and Daddy told Winthrop that they hung the wheel where the water would hit it with the most force. Sometimes he said they hung the wheel so that the water would hit the top of it and sometimes the bottom, and sometimes, like this one, in the middle. As the water fell upon the wheel it turned it round and round. When the stream was very full after heavy rains the wheel went very fast as the water poured over it in a great stream.

Sometimes in a long, dry summer not so much water poured over the wheel, and it did not turn so fast. Around this wheel was a band, and this ran into the mill which was built over the water-wheel. Inside, this band ran around another wheel which was fastened to still other wheels by bands. As the water turned the outside

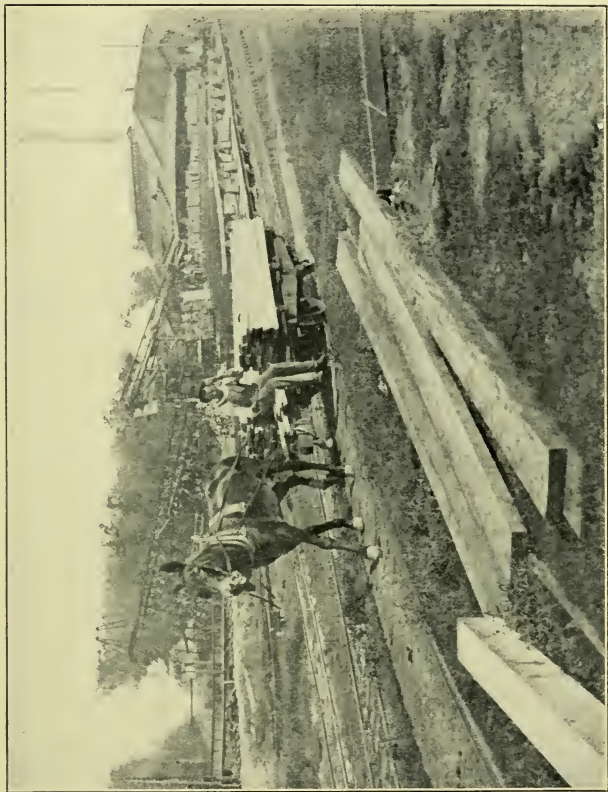
TALKS TO CHILDREN

wheel all the other wheels turned around. When the men wished to stop any of these wheels they slipped off the bands. These wheels in turn were fastened to great saws, round like a circle and so called "circular saws." When the great logs were put up against these whirling saws they cut them just as the men wished. First the outside of the log was cut off in strips. These strips were called slabs, and were put into one pile. The rest of the log was sawed into different sizes and piled to be shipped away to different places.

After the trees are cut into logs they must be taken to the mills. This is not always an easy thing to do. There are no good roads into the woods, and in places it is wet or muddy so that wagons would sink deep in, and could not be drawn with a heavy load of logs. In such places the lumbermen fell trees and make a log road. Many of the trees are cut so far from a good road that it is a day's journey to haul the logs. In such places they wait till the snow is deep enough and then load them on great sleds. These are sometimes drawn by several horses, and sometimes great oxen draw them to the bank of the nearest river.

In the spring when the ice melts these logs are rolled into the water and float away — so many that you can hardly see the water — like a great raft downstream until they are stopped by the big dam before a sawmill. A dam, you know, banks up the stream and holds the water back.

Then one by one the logs are pulled out of the water and run into the mill. The machines pick up the logs as you would a stick, and then what a buzzing and what a



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HAULING LUMBER

LUMBER

whirring as the logs are changed into smooth, clean boards.

Nowadays many lumbermen work just this way, but often they build railroads right into the forests and run electric light wires and telephones to the camps which they build for their men. They carry with them a saw-mill which works by steam or by electricity. With this they cut up the trees into lumber and send it out to the nearest good road on little cars over the tracks which they have laid. There great trucks take the lumber wherever needed.

Think of all the things that we use that are made of wood, and when you listen again to the trees I believe they will tell you a story.

Did you ever watch a little tree grow? Plant a grapefruit seed in a pot, and we will keep it in a window and water it every day and see how long it will be before we have a tree. We will plant a peach stone out of doors and watch that. I remember I did plant one once when I was a little girl, and after three years we had some of the nicest peaches on it that I ever ate. It grew right up beside my window and in the spring was covered with the prettiest pink blossoms.

Think of the years that the great forest trees have been growing, but so quickly can men cut them down that, in a few weeks, thousands of these great trees that have taken years to grow can be cut and made into lumber. So fast have men been cutting the forests that some men are now working to save what are left. They tell us that the world will dry up if we have no trees; that even the springs from which our water comes

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will not last without the trees. So they ask that when men go into the forest for lumber they cut only a part of the trees of any kind, leaving a few here and there to make and scatter their seeds that more trees shall, in time, grow up and take the places of those which are taken.

We have Arbor Day, too, a day in which we are each asked to set out a tree.

Think of our swing in the apple-tree, of how you like to climb the cherry-tree, of swinging on the birches, think how sweet the pines and firs smell, of the whirling red and gold leaves of the maple-trees and what fun it is to scuff through them in the fall, and then I know you will do what you can to take care of the trees.

VIII BRICKS

FOR our wooden houses we go to the lumberman, and we know how he makes the boards; but where do the bricks come from that are used to make our chimneys and our brick houses?

In every city there are great rows of brick houses, and think of the bricks that are used to make just one of these buildings.

Brick houses were made so many thousands of years ago that no stories have been written about the people who first made them; and yet some of the bricks are still found although the houses have fallen down. In this country, in the West, there are many houses made of the same kind of bricks.

In these places there are few trees, and those are small ones, but there is plenty of clay. You know the clay that we mould into spheres and cubes. This clay was easily moulded like that, and the people who lived so long ago learned to mould it and shape it into bricks and to dry them in the sun. Sometimes they mixed bits of straw or grass with the clay. This held it together better.

To-day most of our bricks are made by machinery. When you stop to think how many we use for stores and hotels and tenement houses and for great factories, you will see that they could not all be made by hand and dried in the sun as they were long ago. If you wished to

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make things of sand, where would you go? Yes, where there is sand. If you wished to plant a garden? Where there is a smooth place with good soil. So when men wish to make bricks they find a place where there is clay.

You know how dry and cracked the clay which you use gets. The fields of clay become just the same on top where the air and sun bake it. In the brick yards they plough it up just as the farmer ploughs his garden. This loosens the clay so that it can be taken up. Then it is carted to the mill. Here it is crushed to powder by great iron wheels. It falls from these wheels into a box on whirling iron knives. The whirling knives mix it with water which falls steadily in a thin spray into the box. In the bottom of another box is a mould which holds six bricks. You have seen Mother put flour on her hands or butter in a pan when she is cooking, so that her dough will not stick. So sand is put into these moulds to keep the clay from sticking to them, and then the clay, mixed with water, is forced by a machine into these moulds. As fast as the moulds are filled they are pushed on to a table. A man with a trowel scrapes off any clay that clings to them, and another man turns them upside down on a wooden tray and carries them to a shed to dry. These empty moulds are carried back to the box and again filled. A machine does all this. The trays with the bricks are placed on shelves in the shed and left to dry. In eight or ten days they are taken to a great oven, called a kiln, and piled in with spaces between them, as many as fifty thousand in an oven, and the heat is turned on slowly. Here they bake for as many as four days;

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then the heat is slowly turned off, and they cool in about four days. To make good bricks they must not be heated or cooled too quickly.

Some bricks are better looking and wear better than others because they are made of finer clay and are pressed harder and baked more slowly than others.

To make a house of bricks, the bricks are fastened firmly together with — nails? No, with mortar, and this is made by the mason. He has a big box or trough, and into this he puts some lime and two or three times as much water and stirs them together. Then he puts in sand that has been sifted so that there are no stones in it and stirs it all up with a hoe. You have seen the mason all spattered with white spots as he stirs the mortar. He cannot help this if he works quickly, and so he wears white overalls to keep his clothes clean.

There are the bricklayers and the helpers who carry the mortar and bricks to them. The bricklayer lays a few bricks in a thin coating of mortar, then taps them with his trowel and scrapes off the extra mortar that clings to them. As he builds up the walls he leaves spaces for the windows and doors. The mortar between the bricks is called the joints, and he places the bricks so that one joint will not come over the joint below. Look at a brick wall some time and see if you can find these joints and see how the line is broken. In England many of the gardens are fenced in with high brick walls covered with ivy and roses. Bricks are used for making sidewalks, too. Can you think of anything else for which we use them?

IX

STONE

LOOK at a picture of a great stone castle. See the great towers and the deep ditch, or moat, as it is called, all around it. See how this moat is lined with stones so that it won't cave in. Notice the bridge across the moat. This is a drawbridge, that is, a bridge which can be drawn up and lowered at will so that no one can cross it unless those in the castle are willing. This castle was built ages ago when men had to shut out people who would harm them. It has lasted all this time because it was built of stone and put together with cement. Wood and nails would have rotted and rusted away long, long ago. When you think that men once crawled into a hole in the rocks and called that cave a home, and then realize that men learned to make homes like this castle, are n't you glad that you are a man and can think?

Houses are still made of stone, some all of stone, some of brick and stone, and some of wood and stone.

Our house is made of wood, but if we look at the part outside that rests on the ground, or go down into the cellar, we shall find the cellar wall of stone, and held together with mortar, which is made of sand and lime mixed with water.

Now where did these great blocks of stone come from, and how did they get into our cellar wall? Most of the stone used for the foundation of houses, as we call the

STONE

cellar walls, is made of gray stone which is very hard and sparkles. This is called granite. If you walk about in the woods or among the hills, or even along some sea-coasts you will find great ledges of granite. Many men earn their living by getting this granite from the ledges and cutting it into great blocks to be used in building. This is used not only in houses, but in monuments, for stones for cemeteries, for walls, and for paving streets.

Getting it from the ledges is called quarrying, and the place where it is found a quarry. There is so much of this granite in New Hampshire that people often speak of it as the Granite State.

You will like to go to a quarry some time and see the great derricks lifting out the blocks that have been blown away by dynamite or sometimes broken away by drilling holes in the rocks where it is to be split and then driving wedges into the holes until it is forced apart.

Sometimes in the quarries saws are used to cut away the stone, not saws with teeth like wood-saws, but sand-saws, moved by steam engines and in many quarries now by electricity. In a quarry in Vermont a little boy only ten years old saw men smoothing slabs of marble by rubbing sand and water over them with flat stones. This was such slow work that he tried making a little machine which would work when he turned a crank. Did you ever see Mother chop meat with a knife? Then you know how much better and more quickly she can do it in the food chopper when she just turns a crank. Grandmother never had a chopper. She always took a wooden bowl and chopped with a knife. In the same

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way the work in the quarry was made quicker and easier by the little machine which the boy made.

Granite is not the only kind of stone used. There are many stones made of lime. Marble is one of the most beautiful of these. Our mantel is made of marble, and so is the top of the table. This comes from quarries in the fields or on the hills just as the granite does.

Some time you must see the wonderful marble stairways and halls with great pillars in the Congressional Library at Washington. Do you know what a pillar is? No, not a pillow, but a pillar? These pillars are beautifully carved, and here and there in the marble floors colored stones and metals have been set in, inlaid, to make pictures.

Perhaps we can go to Rutland, Vermont, and see one of the biggest marble quarries in the world. Once it was just a sheep pasture, hilly and dry and rocky, with a swamp behind it. The man who owned it did n't think it was worth very much away out in the woods, a long way from the village, and so dry and rocky he could n't make a garden of it.

One day a man came along who knew some of the rocks by name and what they could be used for, and he saw that some of these rocks were limestone. He knew that if he burned them he could sell the lime, so he offered the man who owned the pasture an old horse for it. The man knew nothing about rocks except that they got in the way when he ploughed his fields or mowed his grass. He saw no beauty in them, knew none of them by name, and never dreamed that they were of use or could be sold. So he thought the other man was very foolish to

STONE

give a horse for the old pasture and that he had made a very good bargain.

When the new owner began to use the limestone he found that it was a very fine marble, which is one of the best kinds of limestone, and that he had a valuable quarry. From this millions of dollars' worth of marble are sold every year, and great machines run by electricity are kept busy there cutting it out.

Many beautiful buildings are made from sandstone. This is a kind of stone made of sand and held together by different kinds of minerals. Iron is a mineral, you know; the name of another one is silica. Do you know any mineral that we burn? Yes, coal. Sandstone is wonderfully colored. I used to look at pictures of the Grand Canyon, and I did not believe that there could be stones with such bright and lovely colors as these banks of sandstone. I thought they were just painted that way in the pictures, but once I went and saw them, and the colors in the sandstone were really brighter than any pictures that I had seen.

Some of the sandstone is brown, and this has been used for the front of fine city houses. It used to be thought a very grand thing to live in a house with a brown stone front. Thomas Bailey Aldrich has written a little joking verse about such a house which sometime we will read in his poems.

There are slate quarries, too. Many roofs are made of slate instead of wooden shingles and, of course, wear much longer. When I was a little girl we used slates instead of paper to write on and had pencils made of slate. Slate is n't solid like granite, but slivers off in thin lay-

TALKS TO CHILDREN

ers. When we go to walk we will see if we can find any other kind of stone that splits off in layers.

All over the world temples, tombs, and palaces have been built of stone, some of them so many ages ago that only parts of them are left, and we have to guess what they were made for, and how such tremendous blocks could have been moved so far and have been carved so wonderfully.

We will try and find pictures of some of the most wonderful of these and plan some time to go all over the world and see them.

There is the Taj Mahal in India, the most beautiful marble building ever made, inlaid with jewels and with screens of marble lattice work in patterns as fine as lace.

There are the great Pyramids in Egypt, each one of them of more than two million great blocks of stone, piled up like steps, built for tombs for the Egyptian kings centuries ago. What is a century? When you had your first birthday candle you had lived one year; now you have four because you have lived four years, and a century is one hundred years.

There are the obelisks built in Egypt. These are great columns of stone beautifully carved and we can see one of them in Central Park in New York. How do you suppose men ever brought it across the ocean?

In Athens there is the Parthenon, one of the most beautiful of marble temples. A temple, you know, is a place where men worshiped as we do in a church to-day. There is a model of this in the Boston Art Museum.

Wonderful as these are — and I hope we shall be

STONE

fortunate enough to see them some time — we shall find that they are but the beginning of what men have made and are still making out of stone.

Perhaps if we keep our eyes open and study hard we shall begin to understand something about this world in which we live, a world so wonderful that even the stones are beautiful. As I think of the Maker of all these things a verse which my mother used to read to me comes to my mind: “In wisdom He hath made them all.”

X

CONCRETE

STONE and wood were made for man. He found them ready-made as part of the world. He learned to get the trees from the forests and stone from the quarry and use them. He cut up the trees and broke up the stone and found a way to carry them where he wanted them. Children, you know, very soon learn to take things apart. Think of your toys. Is it as easy to put them together as it is to pull them apart?

Then he learned to put things together and make for himself things with which to build. You remember he mixed clay with straw and moulded bricks.

Then he took stone, not good enough to build with as it was, small and rough pieces, and crushed it. He mixed it with sand and cement and stirred it up with water. Then he moulded it into blocks and dried it, and he had a new kind of stone, which he called concrete.

In Rome we find great walls and roads to-day which were made of concrete ages and ages ago.

Trees, you know, grow very, very slowly, and rocks were not made in a day, so it is well not to waste even the pieces. Blocks of concrete can be made from waste stone very quickly by men who have learned how, and it is being used a great deal. You have seen houses made of it; gray, red, brown, or green, and it is said that they last longer than buildings made of wood or brick.

After the concrete is mixed it is moulded into blocks.

CONCRETE

The moulds look like boxes without covers and are of different sizes and shapes so that the bricks can be large or small and not all the same shape. After being pressed hard in the moulds and smoothed off, a machine draws off the box, tips the block onto a heavy board, and the blocks are taken away to dry. They are not dried too quickly, or they would crack. In fact, for a few days they are sprinkled now and then with water to make the drying slower and more even.

Sometimes the concrete is not made into blocks but plastered over the framework of the house, or bridge, or steps, or whatever is to be made. Sometimes it is put on smooth, and sometimes it is thrown on so that it will dry rough. This is called stucco. Concrete is made with designs or figures and used for trimming brick buildings, etc. These designs are first drawn, then carved on wood. The wood is placed on the bottom of the mould and the concrete pressed down upon it and then turned out and dried as the plain blocks were.

Once Daddy wanted a bird bath in the back yard so we could watch the birds bathe and drink. The cement baths that he could buy were very beautiful, but very expensive, so he said, "Let's make one." He bought a bag of cement, and down in one corner of the garden he dug off the top soil and underneath found some sand. Then he took four strips of board and made an oblong frame. Over this he stretched wire screening. He put one end on the ground and lifted the other up in the air. Under this end he put a heavy, long stick to hold it up. Then he shoveled the sand onto the wire, and the part that went through was sifted free from stones.

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This he mixed with cement, measuring both very carefully so as to get just enough of each, and stirred it all together with water. He put boards around the outside edge of the place, where he wanted his bird bath, to make a circle just the size he wished it to be. Then he poured in the concrete he had made and shaped it up with a trowel, making it deep in the middle and shallow on the edges, and left it to dry. The next day it was hard as a rock and he took the boards away and filled it with water. As he turned to go away I called from the window, "Oh, look!" and there was a fat robin splashing in the water. Sometimes goldfinches and bluebirds splashed in it together. Would n't you like to have seen them?

XI

THE MINER

A PEEP INTO ONE OF GOD'S STOREHOUSES

By Jane Andrews

ONCE there was a father who thought he would build a beautiful home for his children, putting into it everything they could need or desire throughout their lives. So he built the beautiful house, and any one just to look at the outside of it would exclaim, "How lovely!" For its roof was a wide, blue dome like the sky, and the lofty rooms had arched ceilings covered with tracery of leaves and waving boughs. The floor was carpeted with velvet, and the whole was lighted with the lamps that shone like stars from above. The sweetest perfumes floated through the air, while thousands of birds answered the music of fountains with their songs. And yet, when you have seen all this, you have not seen the best part of it. The house has been so wonderfully contrived that it is full of mysterious closets, storehouses, and secret drawers, all locked by magic keys, or fastened by concealed springs; and each one is filled with something precious or useful or beautiful to look at — piles and piles and heaps upon heaps of wonderful stores. Everything that the children could want or dream of wanting is laid up here; but yet they are not to be told anything about it. They are to be put into this delightful home, and left to find out for themselves.

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At first you know they will only play. They will roll on the soft carpets, and listen to the fountain and the birds, and wander from room to room to see new beauties everywhere. But some day a boy, full of curiosity, prying here and there into nooks and corners, will touch one of the hidden springs; a door will fly open, and one storehouse of treasures will be revealed. How he will shout and call upon his brothers and sisters to admire with him! How they will pull out the treasures, and try to learn how to use the new and strange materials! What did my father mean this for? Why did he give that so odd a shape, or so strange a covering? And so through many questions and many experiments, they learn at last how to use the contents of this one storehouse. But do you imagine that sensible children, after one such discovery, would rest satisfied? Of course they would explore and explore; try every panel, and press every spring, until one by one all the closets should be opened, and all the treasures brought out. And then how could they show their gratitude to the dear father who had taken such pains to prepare this wonderful house for them? The least they could do would be to try to use everything for the purposes intended, and not to destroy or injure any of the precious gifts so lovingly prepared for their use.

Now God, our loving Father, has made for us, for you and for me, and for little Madge and Jenny, and for all the grown people and children too, just such a house. It is this earth on which we live. You can see the blue roof, and the arched ceilings of the rooms, with their canopy of leaves and drooping boughs, and the velvet-covered

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floors, and the lights and the birds and the fountains; but do you know any of the secret closets? Have you found the key or spring of a single one, or been called by your mother or father or brother or sister to take a peep into one of them?

If you have not, perhaps you would like to go with me to examine one that was opened a good many years ago, but contains such valuable things that the uses of all of them have not yet been found out, and their beauty is just beginning to be known.

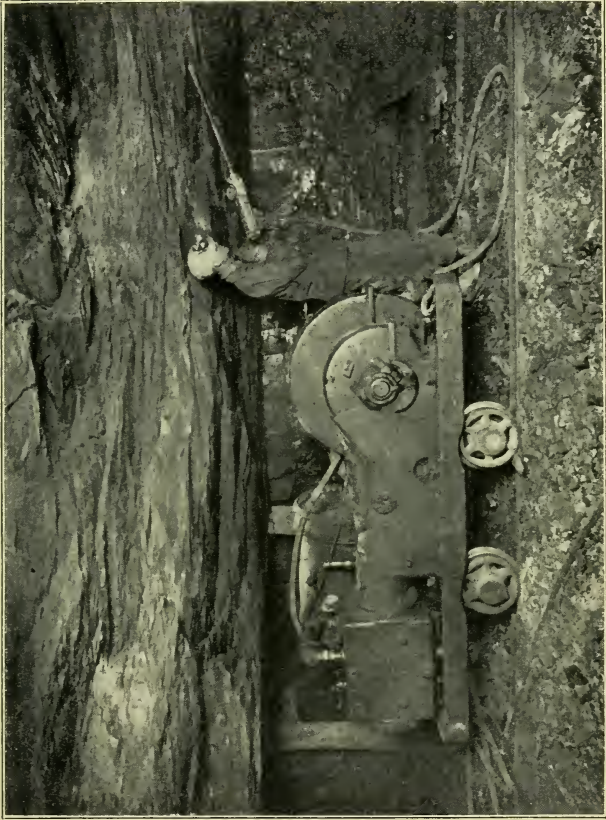
The doorway of this storehouse lies in the side of a hill. It is twice as wide as the great barn-door where the hay-carts are driven in, and two railroad-tracks run out, side by side, with a little foot-path between them. The entrance is light, because it opens so wide, but we can see that the floor slopes downward, and the way looks dark and narrow before us. We shall need a guide; and here he comes — a rough-looking man, with smutty clothes, and an odd little lamp covered with wire gauze, fastened to the front of his cap. He is one of the workmen employed to bring the treasures out of this dark storehouse, and he will show us, by the light of his lamp, some of the wonders of the place. Walk down the sloping foot-path now, and be careful to keep out of the way of the little cars that are coming and going on each side of you, loaded on one side and empty on the other, and seeming to run up and down by themselves. You will find that they are really pulled and pushed by an engine that stands outside the doorway and reaches them by long chains. At last we reach the foot of the slope, and, as our eyes become accustomed to the faint light, we can

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see passages leading to the right and left, and square chambers cut out in the solid hill. So this great green hill, upon which you might run or play, is inside like what I think some of those large ant-hills must be — traversed by galleries and full of rooms and long passages. All about we see men like our guide, working by the light of their little lamps. We hear the echoing sound of their tools, and we see great blocks and heaps that they have broken away and loaded into little cars that stand ready, here and there, to be drawn by mules to the foot of the slope.

Now, are you curious to know what this treasure is? Have you seen already that it is only coal, and do you wonder that I think it is so precious? Look a little closer, while our guide lets the light of his lamp fall upon the black wall at your side. Do you see the delicate tracery of ferns, more beautiful than the fairest drawing? See, beneath your feet is the marking of great tree-trunks lying aslant across the floor, and the forms of gigantic palm-leaves strewed among them. Here is something different, rounded like a nut-shell; you can split off one side, and behold! there is the nut lying snugly as does any chestnut in its burr.

Did you notice the great pillars of coal that are left to uphold the roof? Let us look at them; for perhaps we can examine them more closely than we can the roof and the sides of these halls. Here are mosses and little leaves, and sometimes an odd-looking little body that is not unlike some of the sea-creatures we found at the beach last summer; and everything is made of coal — nothing but coal. How did it happen and what does it



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COAL MINING

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mean? Ferns and palms, mosses and trees and animals, all perfect, all beautiful, and yet all hidden away under this hill and turned into shining black coal.

Now, I can very well remember when I first saw a coal fire, and how odd it looked to see what seemed to be burning stones. For when I was a little girl, we always had logs of wood blazing in an open fireplace, and so did many other people, and coal was just coming into use for fuel. What should we have done if every one had kept on burning wood to this day? There would have been scarcely a tree left standing; for think of all the locomotives and engines in factories, besides all the fires in houses and churches and schoolhouses. But God knew that we should have need of other fuel beside wood, so he made great forests to grow on the earth before he had made any men to live upon it. These forests were of trees, different in some ways from those we have now, great ferns as tall as this house, and mosses as high as little trees, and palm-leaves of enormous size. And when they were all prepared, he planned how they should best be stored up for the use of his children, who would not be here to use them for many thousand years to come. So he let them grow and ripen and fall to the ground, and then the great rocks were piled above them to crowd them compactly together; and they were heated and heavily pressed, until, as the ages went by, they changed slowly into these hard, black, shining stones, and became better fuel than any wood, because the substance of wood was concentrated in them. Then the hills were piled up on top of it all; but here and there some edge of a coal-bed was tilted up and appeared

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above the ground. This served as a hint to curious men, to make them ask, "What is this?" and "What is it good for?" and so at last, following their questions, to find their way to the secret stores, and make an open doorway and let the world in.

So much for the fuel: but God meant something else besides fuel when he packed this closet for his children. At first they only understood this simplest and plainest value of the coal. But there were some things that troubled the miners very much. One was gas, that would take fire from their lamps and burn, making it dangerous for men to go into the passages where they were likely to meet it. But by and by the wise men thought about it, and said to themselves, "We must find out what useful purpose God made the gas for; we know that he does not make anything for harm only." The thought came to them that it might be prepared from coal, and conducted through pipes to our houses to take the place of lamps or candles, which until that time had been the only light. After making the gas, there was a thick, pitchy substance left from the coal, called coal-tar. It was only a trouble to the gas-makers, who had no use for it, and even threw it away, until some one more thoughtful than the others found out that water would not pass through it. And so it began to be used to cover roofs of buildings, and, mixed with some other substances, make a pavement for streets; and being spread over iron-work it protected it from rust. Don't you see how many uses we have found for this refuse, coal-tar? And the finest of all is yet to come, for the chemists got hold of it, and distilled and refined

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it until they prepared from the dark, dirty pitch, lovely emerald-colored crystals which had the property of dyeing silk and cotton and wool in beautiful colors — violet, magenta, purple, or green. What do you think of that from coal-tar? When you have a new ribbon for your hat, or a pretty red dress, or your grandmamma buys a new violet ribbon for her cap, just ask if they were dyed with aniline colors; and if the answer is “Yes,” you may know they came from the coal-tar. Besides the dyes, we shall also have left naphtha, useful in making varnish, and various oils that are used in more ways than I can tell you, or you would care now to hear. If your Cousin Anne has a jet belt-clasp or a bracelet, and if you find in Aunt Edith’s box of old treasures an odd-shaped brooch of jet, you may remember the coal again; for jet is only one kind of lignite, which is a name for a certain preparation of coal.

But here is another surprise of a different kind. You have seen boxes of hard, smooth, white candles with the name “paraffine” marked on the cover. Should you think the black coal could ever undergo such a change as to come out in the form of these white candles? Go to the factory where they are made, and you can see the whole process; and then you will understand one more of God’s meanings for coal.

And all this time I have not said a word about how, while the great forests lay under pressure for millions of years, the oils that were in the growing plants (just as oils are in many growing plants now) were pressed out and flowed into underground reservoirs, lying hidden there until one day, not many years ago, a man acci-

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dentially bored into one. Up came the oil, spouting and running over, gushing out and streaming down to a river that ran near by. As it floated on the surface of the water (for oil and water will not mix, you know), the boys, for mischief, set fire to it, and a stream of fire rolled along down the river, proving to everybody who saw it that a new light, as good as gas, had come from the coal. Now those of us who have kerosene lamps may thank the oil-wells that were prepared for us so many years ago.

When your hands and lips are cracked and rough from the cold, does your mother ever put on glycerine to heal them? If she does, you are indebted again to the coal oil, for of that the glycerine is partly made.

And now let me tell you that almost all the uses for coal have been found out since I was a child, and, by the time you are men and women, you may be sure that as many more will be discovered; if not from that storehouse, certainly from some of the many others that our good Father has prepared for us, and hidden among the mountains or in the deserts, or perhaps under your very feet to-day. For thousands of people walked over these hills of coal before one saw the treasures that lay hidden there. I have only told you enough to teach you how to look for yourselves; a peep, you know, is all that I promised you. Sometime we may open another door together.

XII

NAILS

COAL, and all the comforts with which it has supplied us, is not the only thing for which we must thank the miner.

The lumberman provided the beams, boards, shingles, and laths for the carpenter, but who supplies the nails with which he hammers them together?

The storekeeper? Yes, for now we can go to the hardware store, and for a few cents get a lot of nails. But it was not always so. You remember we talked about how men used grass or strips of animal skin to tie their houses together. There was a time, when there were no sawmills to make boards, when the houses were made from the logs and fastened together with long wooden pins, and even after men had learned to make boards, they used nails made of oak, which is a very hard wood.

After a time, just as they found coal and a way to mine it, men found many metals that we use. Can you name any? Brass, copper, tin, gold, silver, iron, etc.

We will take a piece of iron and hammer it to a powder. Be careful not to let any of it fly into your eyes. Then we will take the horseshoe magnet which Father brought you and see what happens. The little black particles which the magnet draws up are iron, and the sand particles are left behind.

In the mines the iron is mixed with sand and other things, and with great effort and study men have learned

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to make heavy rollers to crush the masses of rock blasted or picked out of the ditches or mountain sides, and giant magnets to attract the iron. Machines work these, and send the iron into one place and the waste material into another.

They learned how to melt the iron in great furnaces, how to work it into bars, and even into fine wire, and how to make steel of it. Then they learned to make nails of it, first hammering them out by hand, and then, in great factories, by machinery. Think of some of the nails that you have used or seen and what we need nails for. There are machines now that can make from a hundred to a thousand nails in a minute, and we can buy about three hundred kinds, from the smallest brads and tacks to the heaviest rivets and bolts. Not all are hammered out by machinery. Some are made by running melted metal into sand moulds.

So if we tried to write down all the things for which we depend upon the miner, we should have a long list. Let's do this, and as we go about see if we can find any new ones to add to it from day to day. Then we will find pictures of these and make a scrapbook.

XIII

WINDOWS

“A man who looks at glass
On it may stay his eye
Or through it let his vision pass
And all the heavens espy.”

H. D. THOREAU

COME into the closet and shut the door. Now let us open the door just a crack, and what comes in? Yes, the light, and how good it is! After the darkness of the closet how fine it isto have just a little ray of light. Let's open the door slowly and finally go out into the room full of light and sunshine. Why, it seems almost as bright as it is out of doors! We can see each other and to walk about, to read and write, to play and work. What makes the room so much lighter than the closet? Oh, yes, you have found out. It is the windows. And of what are they made? Man did not always have windows and even to-day not everywhere are the windows made of glass.

When men lived in caves the only opening through which they could see or through which the light could enter their home was the opening through which they crawled in, and even in front of that they often had to roll a great stone for protection.

In the cold countries where the Eskimos build their houses of blocks of snow, they sometimes have windows of ice. In some places shells are used, and in Japan,

TALKS TO CHILDREN

paper. None of them are as transparent as the glass which we use, you see. Do you know what transparent means? Yes, something you can see through.

If we want windows in our homes, or if we break a pane of glass, we send for the glazier; he will come and measure the window frame, and with little tacks and putty fasten in a pane of almost any size or shape which we need, and so clear is the glass that not only does the sunshine and light come in and brighten our rooms, but we can look out upon all the beauties of the garden or field or wood. The bright sunshine can stream in and waken us in the morning, or we can gaze out at the moon or stars at night. We can watch the rain or the snow, enjoying its wildness or its beauty and know that it cannot get through our windows to harm us or our pretty things inside.

But before we could have this clear, transparent glass for our windows many people had to think and to work.

You can go to great factories, if you will, and see glass made and shaped into dishes or ornaments or windows. First, fine white sand — not all kinds of sand will do — is mixed in a great trough with potash and other things and melted in a furnace. Then it is cooled until it is like paste. Then men dip blow-pipes into this and blow what they take up on the ends of these into different shapes; then they roll it upon marble until it is partly cool, and then blow it again. This is done over and over until the right-sized cylinder is made. Then with cold iron the cylinder is broken open and cut from the blow-pipe and placed in ovens where the heat softens and flattens it. Other tools, some of them made

WINDOWS

from wood, are used to make them perfectly flat, and for curved panes of glass, blocks of iron especially shaped are used. Then the glass is cut into the desired shapes and sizes with diamonds.

All this work must be done with great care, for badly prepared glass will lose its transparency on being exposed to the air. Everything that goes into it, therefore, must be thoroughly tested. If the glass is not heated just hot enough and kept at just the right heat, or if it is not cooled slowly enough, it will break easily. You know how good molasses candy is when it has been made just right, but what a sticky or black, hard mess it becomes if it is boiled too long or gets too cold before you pull it. It is just the same in making glass.

After it is made many hands must help to cut it, pack it and ship it to the store where the glazier must buy it before he can bring it to make your home bright.

FOOD

XIV

KINDS OF FOOD

“What can be more delicious
Than a breakfast steaming hot
Of oatmeal, cream and sugar,
With sweet cocoa in a pot,
And scrambled eggs and corn bread
With marmalade or jam
And fruit when it’s in season?
I like breakfast quite a lot.

“When home we come from lessons,
My! how good our dinners taste!
Hot soup and meat, potatoes,
Beans, we eat with childish haste.
We scrape our plates quite shiny
And wait for our dessert
Of pudding, jelly, pie or cake,
There’s not a speck we waste.

“By half-past five we’re tired,
So we hurry home for tea,
To find our muvver waiting
For small sister and for me.
Our bread and milk and porridge,
Prunes and cookies disappear,
And though perhaps we’re greedy
Eating’s fun, you’ll all agree.”

ROBERT LIVINGSTON, “Goodies to Eat.”

WHEN you went to the city with Mother, what did you see the fireman on the train shoveling into the engine? Yes, coal. He said he was feeding his

TALKS TO CHILDREN

engine, and when the coal was all burned up the train would have to stop unless he fed the engine again.

Now to keep your little body running Mother has to see that you are fed, but what does she give you instead of coal?

Bread, butter, milk, cereal, fruit, vegetables, meat and fish, oh, yes, and pudding, cake, candy, nuts, and — how did we forget it? — *ice cream!*

Now where does mother get all these things to feed you with? We know where the fireman got his coal to feed his engine with, don't we? Do you remember the story of how the miner found it and how many men worked to get it to the places where people need to use it?

It's just the same with everything we have, a long chain of workers, each one doing a little and then the work all together making you and me happy and able to live. Let's take some little strips of paper and make a long chain by pasting the ends of the first piece together, slipping the end of the next piece through the loop thus made, pasting those ends together, and so on. We'll make a loop for each helper for our bowl of milk — oh, the middle loop broke, and the chain is all in a heap on the floor and no good! Let's see if it's that way with our chain of helpers.

Let us think of all who have helped before the Baby can have his bowl of milk for supper:

The sunshine, rain, and dew have helped the grass to grow;

The farmer has mowed the grass, and made it into hay, then stored it in his barn and fed it to the cow;

KINDS OF FOOD

The cow has given the milk;

The milkmaid has filled the pail, and brought the milk to Mother, who puts it into a pretty bowl for Baby's supper.

But suppose any one of these things were not done, what then?

Suppose no sun shone, or rain fell, the farmer did not mow, or forgot to feed or milk the cows. Then would Baby have any milk in his pretty bowl?

XV

USE OF FOOD

ALMOST the first words you said when you were very tiny and could n't yet talk plainly were: "All gone!" You said, "Aw don! Aw don!"

Mother did n't know what you meant until you kept saying it and pointing to your empty bowl.

Now where did baby's bowl of milk and cereal go? [Draw out the story of the need of food to make and keep a strong body.]

It goes into the little mouth and down a long tube to the stomach, where it is changed; digested, we say, and part of it made into blood which goes by other tubes to the heart. Part of the food does not make blood and this is no longer of any use to the body, so it is carried away through other tubes out of the body. When we go to the bathroom this is what we get rid of. After the part of the food which is made into blood is taken from what we eat the rest must not stay in the body or it will poison it and we will be sick. So we must take care to go to the bathroom every day. Every child must do this. Now the world has been most wonderfully planned so that the food that is waste for men and animals serves for food for plants. What you leave in the bathroom — and it must be taken care of in some way to keep the world sweet — the farmer buries in his garden, and when he has mixed it with the soil and planted his

USE OF FOOD

seeds, the little plants feed upon it, and it is turned again into food for men and animals.

The part of the food which has been changed into blood goes through other little tubes to the heart. Have you ever seen a pump? [Talk of pumps and how they work. If the water which you drink comes through a faucet it would be well to take the child to see the reservoir and the pumping station.]

Then the heart acts just like a pump and pumps the blood all over your body, giving life and food to all the parts. [Name parts and tell how many eyes, ears, etc. Children like, "Knock at the door, peek in, lift up the latch and walk in," and such rhymes calling attention to the parts of the body.] The body needs much water for food, too. Be sure and drink enough each day.

Now when the blood has been all over the body, making strong bones and muscles, etc., it also cleanses the body and becomes impure itself, so a way to make it sweet and clean again was planned. It goes to the lungs; and from your throat, right beside the tube which takes the food to your stomach, runs another tube which takes the air which you breathe in through your nose and mouth down into your lungs. This air, if it is good and fresh, makes the blood sweet and pure again and ready to go all over the body once more to keep it rosy and healthy.

Some kinds of food feed the body better than others. Some kinds do not feed it at all, but keep the heart and stomach working so hard that you become sick. That is why Mother wants you to eat the right kind of food and

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to eat regularly, so as to keep your heart pumping all the time, and your body strong and healthy.

When Baby says, "Aw don!" how nice it is if the right kind of food has gone to make his body strong. If he has played with it or thrown it around, Mother is sorry when he says, "Aw don!" just as he was when he let go of his balloon string and his little toy was "Aw don!" or he forgot to feed or water his pet, or left the door open, and that was "Aw don!" I know a little boy who lost his rabbit this way. [Talk about waste and neglect, being careful not to preach or bore. Read Andersen's story of "The Girl who Trod on a Loaf."]

THE GIRL WHO TROD ON A LOAF

By Hans Christian Andersen (Adapted)

OF course you have heard of the girl who trod on a loaf, so as not to spoil her pretty shoes; and you know all the punishment this brought upon her.

She was a poor child, but very vain and proud. She had a bad disposition, people said. As she grew older she became worse instead of better. But she was very beautiful, and that was her misfortune.

"You will bring evil on your own head," said her mother, "and when you grow up you will break my heart!"

And she did, sure enough.

At length she went into the country to be the servant of some very rich people. They were as kind to her as if she had been one of their own family. And she was so well dressed and so pretty that she became more vain than ever.

USE OF FOOD

When she had been there a year, her master and mistress said to her, "You should go and visit your relations, little Inger."

So she went in all her finest clothes. But when she reached the village, and saw her old mother sitting on a stone, and resting her head against a bundle of firewood that she had picked up in the forest, Inger turned back. She felt ashamed that she, who was dressed so well, should have a mother who was a ragged creature and picked up sticks for her fire.

A half year more had passed by.

"You must go home and see your old parents, little Inger," said her mistress. "Here is a large loaf of white bread — you can carry them this. They will be rejoiced to see you."

And Inger put on her best clothes and nice new shoes. She lifted her dress high, and walked carefully so that she might not soil her garments or her feet.

By and by she came to where the path went over a marsh. There was water and mud in the way. She threw the loaf of bread into the mud, so that she could step on it, and go over with dry shoes.

But just as she placed one foot on the bread, and lifted the other up, the loaf sank into the marsh, deeper and deeper, until she went entirely down, and nothing was to be seen but a black bubbling pool.

And what became of Inger?

She went down to the Moor-Woman, who brews below. The Moor-Woman is the aunt of the Fairies. But no one knows anything more about the Moor-Woman, except that when the meadows and marshes begin to

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reek in Summer, it is because the old woman is brewing.

Into her brewery it was that Inger sank. The kettles were filled with horrible smells, and Snakes and Toads were crawling around. Into this place little Inger sank; the bread stuck fast to her feet, and drew her down. She shivered in every limb.

“This comes from wishing to have clean shoes,” thought Inger.

She stood there like a statue, fastened to the ground by the bread. Around her were many strange beings. How they stared at her, with wicked eyes!

“It must be a pleasure to them to see me,” thought little Inger; “I have such a pretty face, and am so well dressed.”

And she dried her tears. She had not lost her conceit. But the worst of all was the dreadful hunger she felt. Could she not stoop down and break off a piece of the bread on which she was standing?

No! Her back was stiffened; her hands and her arms were stiffened; her whole body was like a statue of stone. She could move only her eyes. The gnawing hunger was terrible to bear.

“If this goes on I cannot hold out much longer,” she said.

But she had to hold out, though her sufferings became greater.

Then a warm tear fell upon her head; it trickled over her face and neck all the way down to the bread. Another tear followed, and still another, and then many more. Who was weeping for little Inger? Had she not a mother up yonder on the earth?

USE OF FOOD

And Inger could hear all that was being said about her above in the world, and it was nothing but blame and evil. Though her mother wept, and was very sorrowful, yet she said:

“Pride goes before a fall! That was your great fault, little Inger! Oh! How miserable you have made your mother!”

But Inger’s heart became still harder than the Stone into which she was turned. She felt hatred for all mankind. She listened and heard people above telling her story as a warning to children. And the little ones called her “ungodly Inger.” “She was so naughty,” they said, “so very wicked, that she deserved to suffer.” The children always spoke harshly of her.

But one day when hunger and suffering were gnawing her dreadfully, she heard her name mentioned, and her story told to a child — a little girl. The child burst into tears.

“When will she come up again?” she asked.

The answer was, “She will never come up again.”

“But if she will beg pardon, and promise never to be naughty again?” asked the child.

“But she will not beg pardon,” they said.

“Oh! I wish she would!” sobbed the child. “I will give my doll and my doll’s house, if she may come up! Poor little Inger!”

These words touched Inger’s heart; she wished to cry, but she could not.

Years and years went by on earth above, and Inger’s mother died. The child who had wept for her grew to be old — oh, very old indeed, and the Lord was about to

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call her to Himself. And as her gentle spirit was passing she remembered Inger, and wept once more for the fate of the unhappy one.

And her tears sounded like an echo in the abyss where Inger was. One of God's spirits was weeping for her! And remorse and grief filled Inger's soul, such as she had never felt before.

She thought that for her the gates of Mercy would never open. And, as in deep shame and humility she thought thus, a ray of brightness penetrated into that dismal abyss, a ray more vivid and glorious than the Sunbeams that melt the Snow-Figures children make in their gardens.

And this ray, more quickly than the Snowflake that falls on a child's warm mouth can melt, caused Inger's stony figure to dissolve, and a little gray bird arose, following the zigzag course of the ray to the earth above.

But the bird was afraid and shy of everything around it. It felt ashamed, and hid in a dark hole in a wall. There it sat, and it crept into the farthest corner, trembling all over.

For a long time it sat thus, before it ventured to look out at all the beauty around it. The air was so fresh, so soft. The Moon shone so clearly. The trees and the flowers gave out sweet odors. How all Creation told of love and glory! The little bird would willingly have poured forth its joy in song, but the power was denied it.

Then it flew out of the hole, and longed more than ever to sing in gratitude. Perhaps some day it might find a voice, if it could perform some deed of thankfulness! Might not this happen?

USE OF FOOD

The Winter was a hard one. The waters were frozen thickly over. The birds and wild animals in the wood could scarcely get food. The little bird flew about the country roads, and, when it found a few grains of corn dropped in the ruts, it would eat only a single grain, while it called to all the starving Sparrows to come and enjoy the rest.

It would also fly from village to village and look about. And where kind hands had strewed crumbs outside the windows for birds, it would eat only one crumb, and give all the rest to the Sparrows.

At the end of the Winter the little bird had found and given away so many crumbs of bread that they equaled in weight the loaf upon which little Inger had trod in order to save her fine shoes from being soiled.

And when it had given away the very last crumb, the gray wings of the bird became white, and expanded wonderfully.

“It is flying over the sea!” exclaimed the children who saw the white bird.

Now it seemed to dip into the ocean, and now it rose into the clear sunshine. It glittered in the air. It disappeared high, high above. And the children said that it had flown up to the Sun.

XVI

SPIFF'S SUPPER

COME, Spiffie," called Mother, "it's time for supper and off to bed." And she came in with a tray on which were bread and butter, sauce, and a big glass of sweet, rich milk, and set it on a little table in the nursery.

"If I'll eat quickly will you tell me the story about Little Alice and when she first saw a cow, and all the things the cow gives us?" said Spiff, as he came to the little table and began to drink his milk.

"Yes," said Mother. "I'm glad you like to hear about the cow, for she is one of the animals that it would be hard for us to get along without. We will go and see one some day soon and we will see how much we can find out about her.

"Do you know how many legs she has and what we call her foot? Do you know what she has on her head and how she chews her food?" [Speak of her cud and her second stomach.]

"What do we call the father cow?" [Bull.] "And the baby?" [Calf.]

"Now you have finished your supper and I'll read you some stories about what the cow gives us; there are too many for one night, but we will start on them now."

XVII

THE COW

By Caro A. Dugan

I. MILK, BUTTER, AND CHEESE

LITTLE ALICE was five years old, and had lived all her life in a city. She knew nothing of woods, and brooks, and fields full of clover and daisies, of bees, and butterflies, and birds, except through stories. Alice liked to hear these stories, and when she was snugly tucked in her little white bed, she would say, "Now, Mamma, please tell how the cows showed you the way home that time you were lost," or, "Tell how you played with the little brook in the woods."

Alice's father and mother loved their little girl very dearly, and when they found that she was growing pale and quiet, instead of being rosy and active as a healthy child ought to be, they began to think what would be the best thing to do for her. "She is drooping just as a flower would, if shut off from the warm sunshine and pure air, in a narrow street," said the mother.

"Then we must take our little flower to the country, where air and sunshine are plentiful," said the father, "and give it a chance to grow." Mr. Boyd was a busy man, and he had not left his work for a day since his little Alice was born; but he was a wise and careful father, and he did not wait long after deciding what was the right thing to do.

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In less than a week Alice, with her father and mother, was speeding out of the city, on their way to a real country farm. As the piles of brick buildings were left behind, and the sky widened and lifted to the great boundless arch of blue, Alice raised her wondering eyes to her mother; but when they neared field and woodland, and she saw leaves glistening and dancing in the sunlight, water rippling over pebbly bottoms, white daisies nodding to each other by the roadside, her cheeks flushed with excitement, and she danced first on one little foot, then on the other, for very joy. You happy country children, to whom all these things are sweet and natural as the air you breathe, can you think what it was to a city child to see them all for the very first time? It was a long ride, and Alice grew tired. It was dark, and the stars were out when they left the train, and Alice was fast asleep in her father's arms. When she opened her sleepy eyes, she found herself in a long, low room, where a table was set for supper, with the whitest of tablecloths and shining ware. Everything was cheery, and bright, and clean, and the room was sweet with the fragrance of red roses that filled a great jar in the open fireplace, and even climbed up outside and peeped in at the open window, as if they, too, wished to see and welcome the little visitor. Alice lifted her eyes in astonishment, and saw a kind, motherly face smiling down at her. She could n't help smiling back — everybody always smiled back at Aunt Lizzie — and the two were friends at once.

Oh, how good that supper tasted to little Alice! Never had she eaten such yellow butter, such bread,

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such strawberries, red and large and juicy; and as for the thick, golden cream that Aunt Lizzie poured over her berries, our Alice had never seen anything like it in all her life. She whispered, "Mamma, do we eat custard on our berries?"

"Bless the dear child!" said Aunt Lizzie, "has she never seen cream before? Do you know what a cow is, little one?"

"I saw some in a picture once, and Mamma told me about them. They give milk."

"The cow gives you a great many things besides milk, little daughter," said her father.

"How many?" she eagerly asked.

"Let me see your two hands," said Mr. Boyd.

Alice held them up. "Now spread out all your fingers and thumbs. There! I think you will find that the good cow gives you something for each little finger and thumb."

"Truly, Papa? Will you tell me all about them?"

"You must try to find them out for yourself; but Mamma, Aunt Lizzie and I will help you. You can ask us all the questions you wish."

"You shall see the cow to-morrow morning," said Aunt Lizzie, "and learn where the milk comes from that you will drink for your breakfast."

Alice's first thought next morning, when the early golden sunbeams touched her eyes and opened them wide, was of Aunt Lizzie's promise. She was quickly dressed, and ran downstairs and out into the yard. Oh, how lovely and fresh was the morning!

Alice sat down on a long wooden bench that stood by

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a fence, separating the yard from a great field full of dewy grass. She peeped through the bars and wondered what made the grass so wet, and then she turned to look at Aunt Lizzie standing in the doorway under the climbing roses. Something very warm and sweet was breathed against her cheek from behind, and she gave a jump and looked around.

“It is one of the cows, our good Lightfoot,” said Aunt Lizzie; “she is bidding you good-morning.”

Alice looked rather timidly at the great creature with shining red sides and big, crumpled horns; but Lightfoot’s eyes were so large, and soft, and gentle, and she stood so quietly looking over the bars, that Alice soon put up her hand to pat her, and again she felt the cow’s warm breath, sweet as the clover she had been eating.

“Here comes Luke to milk her,” said Aunt Lizzie.

Luke had a bright tin pail in one hand, and a queer little wooden stool in the other. He swung himself over the fence, put the stool on the grass beside Lightfoot, and seating himself, put his pail under the cow. Alice looked wonderingly at the great, soft udder, as Luke took hold of the cow’s teats, and then clapped her hands with delight when the white, foaming milk came streaming into the pail.

“Oh, Aunt Lizzie, I’ve seen the real milk coming!” shouted Alice.

“You can count one on your little thumb now; one good thing we can thank the cow for giving us,” said her father, coming out to enjoy his little girl’s pleasure.

Aunt Lizzie brought a pretty china cup; Luke filled it

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with the warm, new milk for Alice to drink, and she said, "Thank you, dear Lightfoot."

When the pail was nearly full, and Luke was walking off with it, Aunt Lizzie said, "Come, little Alice, and see what becomes of the milk." Round the house they went to a low stone building. Entering, Alice found herself in a cool, airy room, where a little spring of water bubbled up right in the middle of the stone floor. The walls were lined with pans full of milk, and platters holding rolls of yellow butter.

There was something else, white and round, that looked very nice, Alice thought, but she did not know its name. She saw Luke pour the new milk into shining pans and set it away. There were two women here at work. One had a shell in her hand, and with it was taking something from the top of the milk. "Why, it is the cream!" said little Alice; "but why does she put it in this high tin roller?"

"That is a churn," said Aunt Lizzie, "and if you watch Molly, you will see what can be made out of milk."

Alice stayed and talked with Molly, even helping send the dasher up and down with her own hands, and was delighted to see the cream grow thicker and thicker, till the yellow butter began to appear. She held up her forefinger then, and said: "That counts one for the butter, does n't it, Aunt Lizzie? I can hold up two fingers now."

"Come back to the house, and I will show you something for the tall middle finger," said Aunt Lizzie.

Alice tripped along the path, Molly and Aunt Lizzie

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following with two great pails of milk. These were emptied into a tin boiler that stood over the kitchen fire. More milk was brought, and after it was heated, Aunt Lizzie put in a curious, brownish substance which she told Alice was rennet, and came from the stomach of the calf.

Alice was greatly interested when after this the milk began to grow thick and form curds. She watched Aunt Lizzie chop the curds and press them till all the thin liquid whey was squeezed out of them, and they were salted and pressed in a round, solid form like those in the dairy, each cheese being put into a large hoop of wood, until it became of the right shape.

“See! this is a cheese, Alice.” And then kind Aunt Lizzie let Alice press and salt a tiny cheese with her own hands. How pleased and proud was the little girl when it was placed on the supper table, and Mamma, Papa, and even Aunt Lizzie each ate a small piece of Alice’s own cheese.

“Does the cow give us anything else to eat?” she asked.

“All in good time, little daughter,” said her papa. “You have learned quite enough for one day. Another time ring finger shall have a chance to stand up with the others.”

II. LEATHER

WHEN Alice was getting ready for bed one night she asked her father to tell her a story, and as she drank her cup of milk she thought of the good cow, and said, “Oh, Papa! tell a story for my third finger; here is milk for my

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thumb, butter for my first finger, and cheese for my middle finger; my third finger wants something; I am sure the cow can give me something to count on this little finger!"

"Yes, Alice, I remember a story I read once," said her papa, "and I will tell it; but you must keep your mind busy with what I say; for I think I will make you guess a riddle this time. Take off your boots and put them on this cricket; get your slippers and sit here on my knee."

Alice hurried to do as her papa had bidden, and was soon sitting on his knee, earnestly listening to this old and oft-repeated story:

"There was once a king who had not learned how to do many things; his people knew as little as he did about making houses, dishes, or clothes for themselves; they lived in tents and wore coarse clothes, not yet having learned to weave fine cloth. I think they made some garments from the bark of trees; they went with bare heads and bare feet all of the time.

"One day the king's horse fell dead under him, and there were no servants with him who were strong enough to carry him; so he was obliged to walk a long distance. The sharp stones cut his feet, and the briars pricked and tore them, until the king was in a great rage and said he would never again leave his tent until the earth should be carpeted for his feet.

"Then all his people began making coarse carpets, and at the end of a year they asked him to walk out and try the new carpet. He went out, and was greatly pleased; for the earth was so covered with the people's

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carpets that no sticks or stones could touch his feet; but when night came, he refused to go back to his tent, but bade them make a tent where they were, so he could pursue his journey next day. The people were greatly frightened, knowing he would soon come to the end of the carpet if he journeyed in this fashion. One of the servants went away by himself and spent the night in work; some of them went about crying and wringing their hands; while others made a few yards more of the carpet for the earth and hastened to spread it at the end of that already finished. Next day when the king came to the end of the carpet he was very angry and was going to have all the servants beaten, when the one who had worked all night came forward, and kneeling before the king, said, 'Sire, I have a carpet for the whole earth, though none but the king may walk upon it.' The king asked if it were like the paltry one whose limit he had reached in two days, and the servant replied, 'Nay, gracious king; thou canst wander in valleys, and thy feet never be torn by brambles; thou canst tread the burning desert, and thy feet remain unscorched.' 'Ah!' cried the king, 'bring me that priceless carpet, and half my kingdom shall be thine.'

"Oh, Papa!" said Alice, "did he really have a carpet like that?"

"There's my riddle, little girl; can you guess how he carried such a carpet as that in a sack?"

Alice answered, "I must think hard," and closing her eyes with her hands, she said in a disappointed tone, "He must have been a magician"; but her papa told her he was no magician: then she thought again, but could

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not guess, and, opening her eyes, they fell upon her little boots on the cricket, and she clapped her hands, and shouted, "I know! I know! the servant had made the king some shoes."

"You guessed rightly, my child, and now for your third finger; why shall we thank the cow for shoes?" Alice took the tiny boot in her hand while her father told her that the skin of the cow is used for soles and heels of even cloth boots, and some coarse, heavy boots are made entirely of cow-hide. So Alice thanked the cow for milk — there's one for her thumb; for butter — there's two for her first finger; for cheese — three for her middle finger; and for leather — which makes four, for the ring finger.

Thank you, thank you, thank you, thank you, good cow! I hope everybody will treat you kindly.

III. HAIR AND BONES

It was sunset, and Alice sat in the doorway under the roses, watching for Luke, who had gone to the pasture after Lightfoot and the other cows. Aunt Lizzie had a good many cows — Old Brindle and Pet and Jessie and White Lily and Brown Bess and Short-horns and Bell — but Alice liked Lightfoot best of all, and every night watched for her coming, and stood by Luke's milking-stool with her little cup to get a drink of new milk. This night Alice watched and waited in vain, for Luke did not come. The rosy sunset glow faded out of the sky; it grew darker, and here and there a star peeped out, but still Luke did not come.

"Alice, it is bedtime now," called her mother, and

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with a sigh of disappointment the little girl climbed the stairs to her room, and began to prepare for bed.

While her mother was brushing out her long, soft hair, Alice heard a familiar voice, and flew to the window. There stood Luke, telling Aunt Lizzie that the bars of the great pasture were down, and the cows all gone. He had had a long tramp, but could not find them.

“I will mount Tita at sunrise to-morrow and have another hunt,” said Luke.

“Oh, may I go with you?” cried Alice; “can’t two ride on Tita?”

Luke looked up, smiling to see the little white figure at the window, its bright hair blowing in the night breeze, and answered, “Oh, yes, Tita would n’t mind carrying us both on her strong back; I’ll take you if your mother is willing.”

“Would n’t she be a trouble to you?” asked Mrs. Boyd.

“Oh, no!” said Luke, smiling again. He and Alice were great friends.

“Oh, my dear Lightfoot!” said the child, as she nestled down in her little bed. “Mamma, do you think Lightfoot is lonesome way off there in the dark?”

“No, little daughter; you forget that Brindle and Jessie and Short-horns and the others are all with her, and I don’t think she minds the darkness, while she has plenty of soft grass to lie upon. Only think how pleased she will be to see her little mistress coming for her in the morning.”

So Alice went to sleep with happy thoughts, after all.

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Very early next morning she rode out of the yard, seated before Luke on Tita's broad back. At first, when the horse's great shoulders began to move under her, Alice was a little afraid, and clung fast to Luke, feeling almost as if she were on a moving mountain; but she soon became used to the motion and felt safe and happy.

The eastern sky was full of golden light that grew and deepened until the great sun came in sight, and then how the dewy fields glistened and shone! Alice laughed with delight when she saw the silvery spider webs shining like little fairy tents in the wet grass — "Sign of a fine day," Luke told her — and the dear white daisies nodding good-morning to the sun, and when they rode through the woods where low-hanging branches sent showers of bright drops in their faces.

On they went through woodland and along the river, and at last, far off across the river meadows, they heard the faint tinkle of a bell.

"That is old Brindle's bell!" said Luke.

Tita pricked up her ears and trotted merrily on, and in a few moments they saw the horns of old Lightfoot herself. How glad Alice felt then; she could hardly wait to be lifted down from Tita. She threw her arms about Lightfoot's neck and hugged and kissed her for joy. What do you suppose Luke did? He took a tin cup from his pocket, saying, "You must be hungry, little Alice, after such a long ride," and in a moment he had it filled with Lightfoot's fresh milk. It tasted good to Alice, I assure you. She began saying, "Thank you, Lightfoot, for milk, thank you for butter, thank you

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for cheese, thank you for leather, thank you again for milk."

"We are near the Grays' new house," said Luke, looking off through the trees; "come with me, and we will find how the cow helps us make houses."

"Does she really?" said Alice; "how can she?"

"Ah, that I will let you find out for yourself."

A few steps brought them to the new house. Several men were at work on the house.

"What are they doing?" said Alice; "that man is all sprinkled with white — is he painting?"

"Not painting, but plastering," said Luke, "making the walls warm and tight with plaster, so no cold air can creep in next winter to chill the people who will live here."

Alice watched the spreading on of the wet plaster with great interest.

"Now see if you can find out how the cow helps make that plaster," said Luke.

Alice looked at it, and said doubtfully, "It is white like milk, but I should n't think milk would make good plaster."

"It is the lime that is white," said Luke; "step nearer and look very carefully."

"Why, it is full of funny little hairs, like cow's hairs," said Alice. "Oh, I know now; the good cow gives her hair to help make plaster." And up went one of her hands, with all the little fingers outspread, while she said, "Now, little baby finger, you may stand up with the rest, and thank the cow for hair to make plaster. Why do they put it in the plaster, Luke?"

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“It holds it together better, and so makes a closer, warmer covering for the walls. Now if you come into the garden, perhaps we will find something that will make Mr. Thumbkin on the other hand stand up.”

“Does the cow help make gardens as well as houses? What a good cow!” said Alice.

They found the gardener busy sprinkling the earth about young plants and vegetables with a kind of white powder.

“Did that come from the cow? What is it?” asked Alice.

“That is pretty hard for you to guess,” said Luke.

“It does n’t look like this,” taking a piece of solid white bone from his pocket; “but it really is made of the bones of the cow, burned and crushed to powder. It makes the earth rich, and so helps the plants to grow.”

“Oh, my dear Lightfoot!” said Alice, when at last, mounting Tita, they began to drive the cows homeward, “how many things you are good for!”

When they rode into Aunt Lizzie’s yard, Alice held up two thumbs and four little fingers, calling out, “Oh, Mamma, Papa, Aunt Lizzie, — Luke has found me two new things that the cow gives us!” And as Luke lifted her off Tita’s back, and she ran toward the house, so eager for breakfast, she looked back with a bright, friendly smile to say, “Thank you, Luke.”

IV. HORN

ONE day Alice came into the house bringing a bit of broken comb to her mother and asked how it happened to be such a light color, while her comb was black. Her

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mother asked her if she did not think it might be an old black comb faded; but Alice felt sure it could not be, for she had seen old black combs that were not faded, though they had lain for weeks in the sun and rain. Then her mother laughed, and said, "You have found something now for the pointing finger of your left hand; and if you can name the six things for which you have learned to thank the cow, we will go out to the pasture to see if you can find what the cow gives us that can be used in making combs."

Alice held up her thumb and fingers and counted very rapidly:

"Mother Thumb, thank the cow for milk; that is one.

"Father Pointing Finger, thank the cow for butter; that is two.

"Brother Middle Finger, thank the cow for cheese; that is three.

"Sister Ring Finger, thank the cow for leather; that is four.

"Little Baby Finger, thank the cow for hair for plaster; that is five.

"Mrs. Thumbkin, thank the cow for bones to make the plants grow; that is six."

"You remember well, Alice; come now with me and learn what part of the cow is made into combs."

Alice tied on her sun hat, and putting her hand in that of her mother she went out to the field of clover, where Lightfoot was standing under a tree, chewing her cud. Alice had never noticed Lightfoot's chewing before, except when she was nibbling the clover, and she went close to her head, and said, "Oh, Lightfoot!

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Mamma says chewing gum is not a nice habit!" I do not think Lightfoot minded Alice's reproof, but she swallowed what she was chewing and began to smell at Alice's pocket, which pleased Alice greatly, for she had something in that pocket for the cow, but she had not expected the cow to find it so soon.

"What do you think Alice took to the cow in her pocket?"

"Clover?"

"No; there was all the clover in the pasture that the cow needed."

"Sugar?"

"No; the cow did not care for sugar, but it was something white and fine like sugar."

"Salt?"

"Yes; it was salt." Alice had learned that cows are very fond of salt; and when she took a handful from her pocket she laughed to feel the cow's rough tongue as she licked the salt from her hand.

Lightfoot was a gentle cow, and Alice thought her big brown eyes were very beautiful. When the salt was all gone, and Lightfoot gave a last kiss to the little hand, Alice threw her arms about the good cow, and said, "You dear old bossy cow, where do you keep combs? I'd like to learn. I've seen you comb your own glossy hair with your tongue, but your tongue does not look like this comb," and she took the bit of comb from her pocket and held it up before the cow, who did not act as if she had ever before seen a comb, or cared whether she should ever see another; in fact, she gave an odd little sound in her throat as if she were going to

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say something about the salt, and up popped her cud, which she began chewing again as if Alice had never rebuked her about it.

This surprised Alice very much, and she asked her mother where Lightfoot kept her food. Mrs. Boyd then told her that cows and some other animals chewed their food several times before it was taken deep into their stomachs; that they swallowed it into a place called the first stomach, where they let it lie until they wanted it, when it could be raised for another chewing.

“That would be a nice arrangement for little girls who like strawberries and ice-cream so much,” said Alice; but her mother reminded her that she must find that part of the cow which looked most like the comb about which they had come to learn.

“I see! I know!” said Alice; “her horns look almost like this comb!”

“Yes,” said her mother; “when the life goes out of the cow’s body, her horns are sent to a place where they are made into combs; so you see the cow serves us as long as she lives, and then she leaves us her body to use. I think some lazy people would be put to shame if they honestly compared themselves with Lightfoot. I hope my little girl will never become one of those women who serve no purpose in life.”

Alice could now count seven fingers, and she pointed the seventh at the cow and shook it playfully, saying, “Thank you, cow, for horn for combs.”

THE COW

V. GLUE

ALICE had a doll that she thought was the best and dearest doll in the world. Her mother gave it to her when she was quite a little girl, and she had always taken as good care of it as if it were a real, live baby. The doll had a china head, its hair was yellow, its eyes brown, and its cheeks very pink. It had two white dresses and a great many sashes, made out of bits of ribbon given to Alice from time to time.

It had a tiny straw hat trimmed with brown ribbon and a bit of brown feather, to wear when it went out to walk, and a pretty white nightdress to put on at night. The good Luke had made a dainty little bedstead for Alice, and Aunt Lizzie had given her a mattress, and sheets, and pillows, and a blanket and quilt; so every night when Alice went to bed, the dolly went, too, and slept in its own wee bed beside its little mother.

One morning, after breakfast, Alice said, "Now, Gretchen" — that was the doll's name — "we have a great deal to do this morning. We must help Aunt Lizzie make butter, and we must help Luke pick the strawberries for dinner. Only you must n't eat many, Gretchen, while you are picking — only two, three, five you may eat."

Gretchen looked very smiling, as if it mattered little how few strawberries she had as long as she was with Alice. Round the house they went, following the little footpath to the dairy, where it was so cool and pleasant. Alice liked to go there often to see the sweet, yellow butter made from Lightfoot's milk. I think it helped

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Aunt Lizzie more to see her happy little face, and hear her talk to Gretchen, than even when Alice's little hands took hold of the churn-dasher and made it go up and down, to "rest" Aunt Lizzie. After the butter came, and Molly was busy working and salting it, Alice and Gretchen went to the garden and helped Luke hunt for strawberries under the green leaves. Alice worked very busily, and I don't believe she ate more than the two, three, five berries she had promised Gretchen, she was so eager to fill her tin pail.

How glad she felt when it was heaped to the brim with rich, red berries, and she could take it to the house to show Mother and Aunt Lizzie! She walked up to the door, carrying the pail carefully in one hand, and holding Gretchen with the other. Her mother came to meet her, asking, "Did my little girl pick all those strawberries herself?" Before Alice could answer, she hit her foot against the great, flat door-stone, and over she went, the strawberries rolling in every direction in the grass, and, what was far worse, Gretchen falling on the big stone with such force that the pretty china head was knocked completely off her body.

Alice cried when she picked herself up and saw poor little headless Gretchen.

"Never mind, dear; we will ask the good cow to help us, and we shall have Gretchen all right again before long."

Alice was so astonished that she stopped crying, to ask, "Why, Mamma, do you mean that the cow can really put my Gretchen's head on again?"

"Yes, Alice; I think Gretchen's fall will give your

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tall middle finger a chance to stand up with the others."

With her mother's help Alice picked up the scattered berries, none the worse for their roll on the soft grass, and then the two went into the house, and Mrs. Boyd asked Aunt Lizzie where she kept her glue.

"Glue, Mamma?" said Alice; "that is what Papa used to mend chairs with; does the cow give us that?"

"Yes," said her mother; "it is made from the cow's hoofs. After the cow dies, her hoofs are washed and cleansed and made into this brown sticky glue."

While she was talking, Alice's mother was spreading the glue with a brush on the rough edges of poor Gretchen's neck. Then she took the head and pressed it carefully and firmly down into place again.

Alice danced about, exclaiming, "My dear Gretchen! May I have her now, Mamma?"

"No, dear; we must put her away till to-morrow, when the glue will be dry and hard. Now let me see how many fingers you can hold up."

Up went one little hand, and Alice said, "Thumbkin, thank the cow for milk; Pointer, for butter; Middle Man, for cheese; Ring Man, for leather; Little Man, for hair. Now the other hand. Thumbkin, thank the cow for bones; Pointer, for horn; and Middle Man, for glue. Only two fingers! I wonder what they will tell me! Oh, Mamma! I love Lightfoot better and better every day. I will make something for her now while I am waiting for Gretchen."

What do you think it was? It was made of white daisies, and was something Lightfoot could wear. Yes,

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it was a chain for her neck — a long, beautiful, daisy chain.

Alice worked hard, and had it all ready when Lightfoot came to be milked; and as Luke lifted her up so she could throw the chain over the cow's horns, she said, as fast as her little tongue could say it, "Thank you, thank you, thank you, thank you, thank you, thank you, thank you, dear good Lightfoot!"

Can you tell me why she thanked the good cow eight times?

VI. STEAK AND TALLOW

ALICE had been promised a real picnic in the woods, and the day after her doll was so beautifully mended with the glue, the family began making ready for the "woods party," as Alice chose to call it.

You may be sure Lightfoot gave her share for the dinner: her milk helped to make the buns; her butter helped to make the cake; her cheese was packed beside the doughnuts which Aunt Lizzie made; and in the morning when the family rockaway was driven to the door, Alice was so happy that she could hardly wait for the others to get their places. She took the little seat which seemed made for her and shouted to her papa to be sure to get the jug of cream; to her mamma, not to forget the milk; to the pony, not to overturn the rockaway while she ran back to the house to get her doll, who would cry her blue eyes blind if she were left at home; then she ran up and down stairs, to the cellar and garret, just because she was too happy to stand or sit still while the grown folks were packing

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the luncheon. Finally they were quite ready to start, and the pony trotted briskly off, not seeming to mind Alice's "whoas" or "go alongs" any more than he did the doll's hold of the end of the reins.

Alice looked surprised when her father stopped at a meat market in the little village and took her in while he bought a few pounds of tender steak; but he said, "That's for your lesson out in the woods to-day." Alice was glad to have the promise of a lesson from her father, for his lessons were always easy to learn, she thought.

They drove over a straight road that made Alice think of a wide sash ribbon, it looked so smooth and long; then they turned into a shaded road that wound along the bank of a pretty little river, and Alice got out of the rockaway a dozen times to pick a handful of flowers. There were wild purple asters, bright golden-rod, and brilliant red flowers upon slender stems that Alice had never seen before: her father told her it was cardinal flower, and he was much pleased that she remembered the name.

When they left the river bank, they climbed a rocky hill, where the pony was taken from the harness and given some oats, which they had not forgotten to bring; for Alice's father was kind to horses as well as to children.

They found a bright little spring of clear, cold water bubbling up between two great rocks; they found a flat rock which served for a table; and while Mrs. Boyd and Aunt Lizzie were setting the table, Mr. Boyd gathered some pine needles and dry branches, with which he kindled a fire beside a great rock; he then cut

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a slender green bush, and trimming off its leaves, made one end of it quite sharp, upon which he held the meat in the fire. Alice grew hungry as she smelled the sweet odor of the roasting meat, and asked her papa to hurry a little with the lesson, or she should get too hungry to listen. Mr. Boyd cut off a bit of the meat and gave it to her, saying perhaps she would remember without much talking that she was to thank the cow for the steak, as it was part of a cow, her life having gone out and left her flesh for our use.

Alice counted her fingers again: "Thank you, cow, for milk, butter, cheese, leather, hair, bones, horn, glue, and steak."

When the meat was all roasted, they took it to the table, and agreed that such roast beef as that made the picnic dinner the best they ever ate. Alice made them laugh by saying it was the best picnic feast she ever saw. She had never been to a picnic before, and she could not see why she should not call it the best.

When they started home, Mr. Boyd said, "Let's drive around the other way home, so we may see new sights." And Alice was very happy to go a new way; but after they had driven several hours, and things looked newer and stranger, Aunt Lizzie said they would do better to find the home road, she thought, and Mr. Boyd said, "Just what I've been trying to do more than an hour!"

And they all confessed that they knew nothing about the road they ought to take to get home.

Alice woke her doll to ask if she knew the way home; but she did not know, and having been asleep, had a

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good excuse for being lost. She asked the pony if he knew the way home, and he neighed as if he wished he were there, but could not tell them where to go. It grew late, and Mr. Boyd said they would stop at the next farmhouse and stay all night if it were too far for them to drive home.

Alice was pleased with the prospect of spending the night in a new place, and hoped there would be a little girl who had a doll in the next farmhouse.

The next house was rather small, but there was a little girl and a doll, and a bed to spare for the strangers.

Alice thought it great fun for her papa to sleep on a sofa in the sitting-room; for there was no bed for him. The little girl who lived in the farmhouse was named Ruth, and she offered her crib to Alice and her doll.

When it grew dark, Alice was very much surprised to find that there was neither gas nor lamps in the house; but she was too polite to ask questions about it. Ruth's mamma, however, lighted several candles, so that the room was very pleasant, and after she had lighted Ruth's white-haired grandmother to her room and kissed her good-night, she came back to say that Grandma was so much afraid of lamp explosions that they had never used one, though the candles gave rather a dim light. Alice's mamma said a house with love in it like that could never be dimly lighted.

Alice thought she might ask Ruth how candles were made, and Ruth was very happy to tell her how they used the fatty part of cow's flesh.

Alice forgot where she was and jumped up, clapping her hands and shouting, "That's ten! That's ten!"

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“Ten what?” said Ruth.

“Why, ten things for which to thank the cow,” answered Alice; “but please go on and tell me all about it.”

Ruth brought in some tin candle-moulds and a ball of cotton called “wicking,” and showed Alice how the wicking should be threaded into the moulds, and the melted beef’s tallow or fat poured in and then cooled, after which the candles could be drawn out of the long tin horns, as Alice called them.

Alice then told Ruth about the ten things the cow gives us — milk, butter, cheese, leather, hair, bones, horn, glue, steak, and tallow.

The girls then played a game called “Blow out the candle.” Ruth shut her eyes and walked three steps backward from the candle, turned around three times and took three steps forward, and then tried three times to blow the candle out; but when she opened her eyes, she found she had been blowing at the door-knob. Alice tried it, and found she had walked toward her mother, and had been puffing at her back hair instead of at the candle, as she supposed.

The girls amused themselves in this way until bedtime; and the next morning when Alice started for home — in the right road this time — Ruth’s mamma promised them that Ruth should come to make Alice and Lightfoot a visit before many weeks.

XVIII

THE REINDEER

THERE is an animal that has been and is to-day just as good a friend to people who live in very cold countries, where grass cannot grow well, as the cow is to us.

How is the cow a good friend to us?

I am glad you know that she gives us so many things. Milk, butter, cheese, roast beef, tallow for our candles, glue to make boxes and books and furniture and toys, leather for our shoes and gloves, etc., hair for the mortar with which we build so many things beside the foundation of our houses.

What a good friend the cow is! I wish you would some time think what other animals we have that are giving us things all the time that we could not do without, and then I wish you would think whether we ought to treat the animals well. Should we wait until they ask us before we see that they have plenty of water to drink or enough to eat, or have a good, comfortable place to rest?

They can't ask us, you say, and I am glad you know that. I hope that if ever you have the care of any of these friends of ours, or a chance to see that they are cared for, you will remember how much we owe them.

But I am thinking of an animal that gives the people in the cold countries all these things that the cow gives us and even more. It can live on the moss that grows

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there. What does the cow have to eat? [Hay.] But grass cannot grow where it is too cold, and so the cow cannot live in the Northland to give all these things to the people there. You can't guess what it is that I am thinking of that does live there? Let me tell you something else:

“More rapid than eagles his coursers they came,
And he whistled and shouted and called them by name:
On, Dasher, on, Prancer, on, Dancer and Vixen,
On, Comet, on, Cupid, on, Dunder and Blitzen;
To the top of the porch, to the top of the wall,
Now, dash away, dash away, dash away all!
As dry leaves that before the wild hurricane fly,
When they meet with an obstacle mount to the sky;
So up to the housetops his coursers they flew,
With a sleigh full of toys and Saint Nicholas, too.”

Now, what do I mean? Yes, the reindeer. Santa Claus is so fond of his reindeer that he has named them. Let us see if we can say their names.

The people of the Northland are fond of them, too, for they give to the people there all the things that the cow gives us. Yes and more; for you know, from the story of Santa Claus, that they do the work of horses as well. Besides all this the reindeer-skins are used to make tents, robes to keep the people warm when they go riding, blankets, curtains which serve as doors, coats, hoods, leggings, boots, and suits of clothes.

I have seen very beautiful cloaks, which the people of the land where the reindeer lives made of reindeer-skin. Some of these were trimmed with sealskin and embroidered with beads.

So when you think of Santa Claus and his sleigh full



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REINDEER

THE REINDEER

of toys, or think you hear his sleigh-bells tinkling far off over the housetops, as he hurries away home in the dim light of Christmas morning, don't forget the good old reindeer and how much they are giving to the people who live in the Northland.

XIX

PRIMITIVE MAN'S FOOD

BEFORE you are out of bed in the morning the milkman leaves the milk for your breakfast. The storeman brings oranges, eggs, butter, and all the other things which you need for breakfast, dinner, or supper. The marketman brings all the meat you need, and the fishman sends fish. We do not even go to the store to get it, but just sit down to the telephone and order whatever we want. Suppose the milkman should n't come, and the marketman could send no meat, eggs, or butter, and the storeman should have nothing for us some day, what should we do? I have been reading a book which tells what people ate ages and ages ago. It tells of times when there were no stores of any kind.

You remember the stories of the cow which I read to you and of all the things which Alice saw on the farm in the country. This book tells of a time when there were no farms.

I wonder if you could think back to a time when men could n't build houses to live in, for they had no saw or axe to make boards with. No one, not even one man, had ever seen such a thing, or heard of such a thing, or thought of such a thing. If it rained, or was cold, or they were afraid anything would hurt them, these people just looked around and found a cave in the rocks and crawled in.

When they were hungry, they looked about and

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found something to eat. There were plenty of things to be found, too.

We will go down in the woods, near the spring, where no house has ever been built, and try to think of the world as it was before any one had ever cut a tree or built a house. Is there anything down there in the woods now that grows wild that we can eat? There is watercress in the spring. One day Brother and I went down there for some to feed to his rabbits and to make a salad for supper. The snow was deep and the pond was covered with ice, but the water bubbled up through the clean, white sand in the spring, and the watercress was growing fresh and green. As we drew near, something scampered away and we found a rabbit's tracks close to the water where he had been drinking from the spring. While we were gathering the cress we heard a rustle in the bushes and then a whirr-rr and saw a streak of brown flash out of sight. It was a partridge. As we walked on we came to an old hollow tree, partly tumbled down. The tree was dead. Brother ran and climbed on it and said, "Oh, see the kindling-wood tree!" It did look more like kindling-wood than a tree, but it really was an old, wild-apple-tree. In days before I was a little girl it had borne apples. After we had played about the old apple-tree for a while I said, "We must start along now, but watch for some other trees which might give us things to eat."

Now let me tell you some of the things which we found growing wild in the woods which men without gardens or farms might have had to eat. We did not find them all the day that we went for the watercress,

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for at that time the snow covered most things deep. We took many a pleasant walk and each time found something different. All the walks Brother liked, but none so well as the one to the spring and "the kindling-wood tree," where he learned for the first time that the spring bubbles up out of the ground, clear and fresh, when everything about is frozen and covered deep with snow, and that there the little woodland people go and drink and find fresh, green watercress to eat. If we had been very hungry we might have killed the rabbit or the partridge for meat for our dinner and with the watercress for greens and the clear spring water we should have had a very good meal. That is what men had to do in those days of which I read and which we are trying to think back to.

One day we followed the little stream of water that ran from the spring. It kept getting deeper and wider until we could not jump across it any more. This was one warm day in the spring-time. We were looking into the water, wondering how we were to get across the stream. I told Brother the stream was so wide that we called it a brook now. Something splashed in the water, and there we saw a speckled trout. "Oh!" he said, "if I only had my fish-line now!"

"There is one thing more that the men who lived before there were stores could get to eat," I told him, and then we talked of all the different kinds of fish that had always been in the brooks, ponds, rivers, and ocean for people to eat if they could catch them. But in those days they knew nothing about fish-lines. One day when we were down on Cape Cod, wading around on the sand

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flats, we heard a queer slapping sound in the water. We waded closer and Brother saw some scallops, the first ones he had ever seen. You know what scallop shells look like, for you have some to play with in your sand box. In the water we saw shells like those snapping together and then flying open. Brother picked one up and then dropped it with a howl, for it had pinched his finger as it closed its shell. I picked one up, taking hold of it by the back part where the shells were hinged together, and showed him the part inside the shell which people eat. How do you suppose the first person ever dared to eat one? Do you suppose the scallop nipped his finger or his bare toe? We found oysters and clams in the water near the scallops. There never has been a time in the world when people could not have fish to eat if they lived near the water.

When we went walking in the fields in the summertime we found wild strawberries, blackberries, and raspberries. Brother declared these were the best things he ever tasted. That was before we found the blueberries, though.

One jolly picnic we had when the leaves were whirling through the air like the madcap brownies which they looked to be and there was a tingle of frost in the air, We took some bags with us, for Jack Frost had been out the night before, and the wind was blowing hard. That meant that the nuts were ripe, the shells would be open, and they would be blown from the trees so that if we hunted we could find them on the ground.

Sure enough, there were plenty of nuts, for we heard Brother's shout, "Come on down here; here's a bully

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chestnut-tree loaded." We found him throwing great sticks at the tree and saw the nuts falling all around.

The first burrs he picked up pricked his fingers, but he soon learned to handle them so that he could get the brown nuts from their silky little beds inside the burrs, without a scratch. I told him the Mother Tree had made that kind of a covering for the baby chestnuts to keep them safe until it was time for them to come out.

When we had picked up enough chestnuts, we went on to the hickory-trees which grew in the same woods not far away. The ground under these trees was covered with nuts, too, hickory-nuts, and the squirrels were scampering away with their cheeks full. We saw a squirrel dig a hole and hide ever so many nuts in it to save for the winter-time when there would be no nuts left under the trees.

On the way home we found some of the biggest trees that we had ever seen. Under these trees the ground was covered with acorns. They looked so much like cups and saucers that Brother took some home to play house with, with Janet. Daddy told him to taste one of them, for acorns were one of the things first used for food. Even in the earliest times people gathered acorns, fried them, and ate them. In time they learned to roast them, and to pound them with stones, into meal. That is what they used for flour. We puckered up our faces because they seemed so bitter, but Daddy said they made good, wholesome food, and that in some countries even to-day the people eat them. We tossed a few in to the pig as we went by his pen. There was no question about his liking them.

PRIMITIVE MAN'S FOOD

In the winter we went to Florida. It was cold at home and the nuts were all gone or covered with snow and the trees bare, but there, wandering around under the trees, were pigs eating acorns. Do you know what kind of trees acorns grow on?

We found some more kinds of fruit-trees growing wild there, too. One kind was orange-trees. The oranges on these wild trees were not sweet like those which we buy now, but were very bitter.

One day, way out in the woods, Daddy saw deer and wild turkeys, and flocks of quail. Can you think of anything better to eat than roast turkey or venison or quail? But Daddy would not have killed one of these wild things for anything. At home he knew there was plenty to eat and he did not need them to keep him from being hungry. They were so beautiful, wild and happy there in the open air and sunshine! He hid and watched them. I hope some time you may watch a wild turkey with the sun shining on its feathers. You will never see more wonderful shades of gold, I know. I hope you will see him puff all up and let out his breath with a loud noise that sounds like "Bung!"

And a wild deer! You will never see anything more lovely than one of these graceful creatures with his head held high and his eyes shining.

If a flock of quail hears you coming first, you will see nothing but perhaps the mother standing still and making a little noise to call the babies. All about will be what look like brown leaves. These will be the baby quails, and the mother will make a funny noise to make you look at her and forget the babies.

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In the early days the woods were full of animals and birds. They were the only meat that men had and so they killed them and ate them.

To-day men have built cities and cut off the woods and killed animals until there are almost no dangerous animals left, and we have to go far into the woods or plains to find these beautiful creatures which used to be so common. Some men shoot these for fun now. Often the mother is shot or hurt and the babies are left to starve. Do you think this is right? Once Theodore Roosevelt went into a strange, wild country where not many white men had ever been. He went to bring back animals from there to put in our museums so that people here could know what sort of wild things lived in that country. As his party sailed down a river, flocks of wonderful birds flew in front of the boat. The men who were with him began to shoot the birds as fast as they could and left them lying on the water. When Mr. Roosevelt saw what they were doing, he said: "Gentlemen, this is not a slaughter-house. We will kill on this trip only what we need for food or specimens." By specimens he meant one of each kind of wild-bird or squirrel. There are specimens of birds and rocks and plants in museums. By "slaughter-house" he meant a place where things are killed. Mr. Akeley told me that story, and he heard Mr. Roosevelt say it.

In the early days where do you suppose people got milk? Yes, from cows, as we do. There were wild cows in some parts of the world. In other places there were goats and in some places reindeer, and these gave milk just as cows do for us.

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They did n't have hens in yards, but there were prairie chickens in some places and there were birds' eggs. We think it mean to steal birds' eggs now, for we do not need them for food and we love to have the birds about us.

Wheat and barley grew wild in places and these were dried and kept to grind into flour. Of this they made porridge and flat cakes.

For dishes they learned to use the things which they found about them. It is not a bad plan for us to go into the woods sometimes and learn to get along with what we find there. We can make a very good fork with a sharp stick. We had a pigskin once and Brother blew it up for a football. People used to kill wild pigs to eat and use their skins to carry water in before they learned to make jugs and pails and bottles. Gourds grew wild, too, and made very good dippers and bowls. Auntie made a very good dish for our berries once by pinning grape-leaves together with the stems.

Men, even in the very beginning, never were contented long with things just as they found them. They always kept trying new ways and hunting for easier ways to get what they wanted, and looking for better things. Instead of caves they learned to make huts for their homes, and instead of chasing an animal each time they wanted milk or meat they learned to catch them, a number at a time, when they found them, and build a wall around their hut to keep them in and to keep out whatever would steal or harm them. In this way animals have become tame as our cows, sheep, and horses are now.

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Then they learned to gather the seeds of plants, from which they got food, and to plant them. In the autumn they harvested the grain and picked and dried fruit and berries to eat in the long winter-time when nothing would grow for them. When they began to keep animals they learned to save food. Some of the grain each year they saved to plant the next spring, and so they had more and more.

I will read two stories of the harvesting which these people did in the fields and in the woods, from the book which I said I had been reading. Some time I will read the whole book to you, for it tells how people learned to take care of themselves when wild animals lived all about them. It tells how they learned to make bows and arrows and stone arrow-heads, stone axes and spears, and how a little boy named Tig and his father Garff went hunting. In those days, when the food was nearly, or all, gone, it was a big event when the men came home from hunting and brought a bison with them. All the village got together and had a big feast and the dogs had their share, too.

I. THE HARVEST OF THE FIELDS

ALTHOUGH the people had learned how to grow barley and wheat, they could not raise large crops. They tilled the ground only in patches, and they had no ploughs or harrows.

Most of the work was done by the women, although sometimes the old men and boys helped. They cleared the ground beyond the edge of the forest, and they turned up the soil with rude hoes, and in the spring



THE HARVEST OF THE FIELDS

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they sowed their seeds. They worked in parties, and as they moved across the field, hoeing, they used to sing songs to keep in time with one another, one singing the verse and the rest all joining in the chorus.

They were fond of singing whether they were at work or at play; they had songs and choruses for the different occupations, marching songs and harvest songs and songs about hunting the deer, and at the feast times they sang these songs and the choruses over again. When the time came to gather in the corn, the people often found their crops very short, for pigeons and rooks and other birds came and ate the grain, and the wild deer sometimes broke through the fences and trampled down even more than they ate.

But for all that, the harvest was always a busy time. The women cut the corn with their flint knives and carried it home in baskets. They stored it up in the storehouses in the winter village, and when the last of the crops had been gathered in the people went back to the village for the winter. Then for many days they kept the feast of the harvest. There was plenty to eat and drink; and they sang and danced and offered sacrifices, and gave thanks to the gods for the crops that they had gathered in.

[What holiday do we have when we give thanks for our harvest? Talk a bit about our first Thanksgiving. The old Greeks had a story about the seed-time and harvest. Read from Nathaniel Hawthorne's "Tanglewood Tales."]

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II. THE HARVEST OF THE WOODS

TIG used to enjoy more than anything else the days when they gathered the acorns. The women used to go in large parties, with some of the children and some of the young men, all singing and shouting. Then if a savage old wild boar was routing about among the fern, and munching the fallen acorns, he would listen to the noise of the party coming up, and grunt angrily at being disturbed, and move away into the deep forest; for he feared men, and never attacked them unless they chased him and brought him to bay.

It was splendid for Tig and the other boys — climbing into the oak-trees, and getting as far out as they could on the branches to shake down the ripe acorns. Sometimes they gathered a handful of fine ones and threw them at one another, or pelted the women who were gathering underneath; and then Gofa or some one else's mother would look up and say, "Have done now, little badlings! or surely we will leave thee in the forest here to-night, and Arthas the She-bear will catch thee and carry thee to her den to make a supper morsel for her little ones!"

And they gathered blackberries and nuts and wild strawberries, and sat down all together to eat the fruit with the bread that they had brought, and those that had not had enough to eat nibbled at the acorns. But nobody ate many of these, because they were meant to be carried home for storing, and not to be eaten raw at any time, but roasted beside the fire. And then about sunset the people all joined into a company again to go

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home. Every one had a load. There were big baskets that took two to carry, and smaller baskets for one, and little baskets for children: and some of the lads and women had wallets made of deer-hide slung over their shoulders.

And so they carried home the harvest of the woods, day by day, till all the trees were bare — and you may be sure that the squirrels had to be astir very early in the morning to get a share of acorns and nuts for their own winter stores.

III. HOW GOFA MADE THE POTS

Gofa did all the work of her own household, not only cooking the food, but also making the clothes, and preparing the skins out of which the clothes were made. Also she made the baskets for storing and carrying the food in; and the pottery too; and when her stock of household pots had become low, she used to set to work to make a fresh lot. And this was how she did it.

She went down into the valley to a place by the river where there was good clay. She took with her a large basket and a rough-and-ready trowel made out of the shoulder-blade of a deer. She dug out the clay, enough to fill the basket, and carried it home on her shoulder.

When Gofa was ready to make pottery, she first prepared the clay by mixing it with coarse sand, which she had also brought from the riverside. She moistened the clay with water when she added the sand, and kneaded it thoroughly with her hands, just as if she were making dough. She was always careful to mix the sand and the clay in the right proportions; for clay without sand or

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with too little, was apt to crack when it came to be baked, and with too much it was not stiff enough to mould well into shape. By long practice, Gofa knew just how to prepare the clay for use.

Having got the clay ready, Gofa took a lump of it in her hands and laid it on a stone slab which served her as a working bench. Then with her fingers and a smooth stone and a stick shaped into a kind of blade she worked up the clay into a little bowl, building up the sides against this stick, and smoothing the inside with her pebble. But for the larger jars and the pipkins she had another way. She took a round basket shaped like a basin and set it before her. Then she took a piece of clay and rolled it with the flat of her hand on the bench until she had made it like a long clay sausage. Then she picked this up and began to coil it around from the bottom of the basket inside, pinching and pressing it with her fingers and the pebble, until it was flat and smooth. Then she rolled out another piece and coiled this round as before, gradually building up the sides of the pot and pinching the coils together as she went on. At length by adding coil to coil, she raised the sides and neck of the pipkin, which she then smoothed and finished off outside with the wooden tool.

All the pots alike before they were baked had to be decorated. This Gofa did with a bone awl, engraving a pattern of lines and cross lines and dots upon the soft clay. She had also a little stamp of bone with which the dots could be put on in threes.

When Gofa had finished a batch of pots, she carried them into the hut to dry, and generally on the next day

PRIMITIVE MAN'S FOOD

she found that even the larger ones had dried enough in the air to enable her to take them out of their basket foundations. Then she took each one in turn and scraped and rubbed it outside with the wooden tool very carefully and lightly.

After this, she took them to where she had a fire burning out of doors upon the ground. She raked away the fire to one side, and set the pots where the fire had been, standing them all upside down, and ranging them together in as small a space as possible. Then she piled sticks and charred wood about the pots and laid little fagots all around and raked up the hot ashes and set fire to the pile. And she and Tig carried fresh fuel as the fire burned, and kept it going until they could see the pots all red hot. And then they let it sink gradually and die down of itself, and there were the pots baked hard and sound, and fit to use, as soon as they were cold.

When Gofa or any of the other women wanted to make a large pannikin for holding water or milk or meal, she used to make a tall basket, like a bucket, of osiers and reeds, and daub it inside with clay. The clay was laid on thickly and then smoothed and trimmed with the stone and the wooden blade; and the wide neck and the rim were moulded by hand. She did not attempt to lift the pannikin out of the basket mould, but set the whole thing in the fire as it was and the fire burned off the basket work and left the marks of the reeds showing all round on the outside like a pattern. And very likely it was the look of this pattern on the pottery which first gave the women the notion of engraving a design upon the smaller vessels which they

TALKS TO CHILDREN

made entirely by hand. The women generally took pains to make neat patterns, by using different simple tools of wood and bone; and sometimes they tied a piece of twisted cord round a vessel, and impressed its mark upon the clay.

XX

THE FARMER

“ We plough the fields and scatter
The good seed on the land;
But it is fed and watered
By God’s Almighty hand;
He sends the snow in winter,
The warmth to swell our grain,
The breezes and the sunshine,
And soft, refreshing rain.

“ He only is the maker,
Of all things near and far;
He paints the wayside flower,
He lights the evening star.
The winds and waves obey Him,
By Him the birds are fed,
Much more, to us, His children,
He gives our daily bread.

“ We thank Thee, then, O Father,
For all things bright and good;
The seed-time and the harvest,
Our life, our health, our food.
Accept the gifts we offer,
For all thy love imparts,
And, what thou most desirest,
Our humble, thankful hearts.

“ All good gifts around us
Are sent from heaven above.
Then thank the Lord, O, thank the Lord
For all his love.”

Church Harmonies — New and Old.

TALKS TO CHILDREN

FIRST TALK

THE cow gave us milk and butter, cream, cheese, and steak, as you have seen, but who takes care of the cow? The farmer.

Sometimes there are farms where nothing but cows are kept, and the milk is shipped in great cans to the city, whole car loads every day. Here also butter and cheese are made and sent in large quantities to people who have their houses so close together that there is no room to have cows. This sort of a farm we call a dairy.

Now what does the cow eat, for we said that all men and animals had to eat to live? [Grass and grain.] So the farmer has to sow the seed and cut the grass and harvest the grain. What does the cow eat in winter when the fields are no longer covered with green grass? [Tell how the hay is made. Among the Perry pictures for a cent each you will find classic pictures with which every child should be familiar, illustrating all these workers of whom we talk. It will pay any mother to go to school and kindergarten supply stores and church publishing houses in any of our cities for stories and pictures for children on any subject which the child brings up or about which you wish to talk to him. Museums, too, if visited to see pictures, sculpture, or industrial exhibits, about which you have talked with the child, and in search of more knowledge about the particular thing in which you have interested him, will no longer be dull, useless places to him, but a vital factor in his cultural development. But don't drag him about from one unrelated object to another.]

THE FARMER

The farmer sows seed that the cows may have grass and grain for food. Can you tell me any other animals the farmer keeps who eat grain? [Show pictures of the farm animals. It is a good way to teach their names — horse, colt, mare; sheep, lamb, ram; hen, chicken, rooster, etc.] Let's see how many pictures we can find of the animals that live on the farm. Perhaps we can make a Barnyard Scrap Book of them some day.

Without the farmer, you see, to keep the cows and raise their food, there would be no bowl of milk for you or any one. Now let us see what else the farmer does.

SECOND TALK

[TALK of the spring work of the farmer. Ploughing, harrowing, planting; of the care through the summer, and the weeding; of the need of sunshine and rain; and of the harvesting.

Talk also of the returning birds, and of how they worry and how they help the farmer. Tell how the farmer scares the birds away and why.] When there were more birds than there are now the farmer had to shoot them or they would have eaten all his crops but there are so many people now and so few birds that unless we are very careful there will not be enough birds to keep our gardens and trees from being eaten up by insects. Watch the birds and you will see them the year round running all over the trees picking, picking, picking — at what? Yes, bugs and the eggs of bugs; and we are told by men who have studied long and hard about these things that if the birds should stop doing

TALKS TO CHILDREN

this that there would not, in a few years, be a living green leaf left. Then what should we eat?

Milk? Think back, what must we have to keep our cow alive? Grass. The grass is a live green thing which we could not have unless the birds ate enough insects to keep them from eating it.

Bread and butter? Think back again to where the bread comes from, etc.

And so the farmer has learned to scare away the birds when his plants first peep through the ground and during the harvesting of his fruit and grain and let them stay in the garden the rest of the time helping him. In fact, there are men who raise cranberries who put up birdhouses all over the bog where they grow so that the birds will come there to nest and bring up their babies; and they say that the birds pay many times over for the berries that they eat by cleaning the plants of the insects which do great damage.

[At the room of the Massachusetts Audubon Society, 66 Newbury Street., Boston, Massachusetts, or the National Association of Audubon Societies in New York City, leaflets of nearly all of our native birds can be bought for a few cents each, each leaflet giving a colored picture and one in outline to be colored, and a description of the bird and its habits. The children will enjoy these. There are also charts of the summer, spring, and winter birds which I have found helpful.]

Cut open some fruit. [The children will enjoy seeing how many halves, quarters, even eighths and sixteenths there are and count and put together and see how many quarters make a half, etc. Then hunt for hidden treas-

THE FARMER

ure — the seeds. These are the babies of that particular kind of plant or tree. Cut open the seeds and see how the kernel is protected.] If we should plant this little seed what would happen?

It would grow soft and split open and out of it would come a little plant. Down would go its tiny root and up through the earth would come its little stalk and grow taller and send forth tiny green leaves until some day, if it had sun enough and water enough and room enough, it would become a great tree. Then some day on the branches would appear tiny little hard bunches. In time these would swell and unfold and the tree would be beautiful and sweet with blossoms. Did you ever see any tree covered with blossoms? [Talk about these.] In two weeks, or sometimes less, these beautiful blossoms would all drop off, but if you should look sharp where they had been you would see what pushed them off; and if you watched these things that had done this in time you would see tiny green fruit which would grow larger day by day and then begin to change color until it looked like this one that we have just cut open; and inside would be more seed babies. What a miracle is this story of our tiny seed! In faith we hide it in the ground, and in due time it comes forth a mighty tree, which in turn bears more fruit, beautiful to behold, and delicious to eat, with seeds in which are hidden other trees, each bearing fruit according to its kind. From what tree do we get the apple? the pear, the peach, the orange, the banana?

[Talk of the nuts in the same way.] Can you gather apples from oaks or oranges from grapevines? That is

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what was meant in the Bible by this verse which you often hear: "For every tree is known by his own fruit: for of thorns men do not gather figs, nor of a bramble bush gather they grapes."

[As the child sorts the seeds, lead him to see the beauty and infinite variety of color and form. Let him try to make as many kinds of boxes as he can devise and see how far above any efforts of his are Mother Nature's little boxes in which she has stored her plants.] The fruit and the vegetables and the nuts are just little boxes in which to store the seeds which are planned to become more plants and trees. [Talk of the colors of the fruits and vegetables. Talk of the shapes and compare with cube, sphere, and cylinder. Play a guessing game like this: "I am thinking of a fruit that is shaped like a sphere." "Is it an orange, an apple, etc.?" until the right one is guessed. Then the guesser: "I am thinking of a vegetable that is shaped like a cylinder," etc.]

How beautiful in form and color and variety this world is, even the things which we eat. [Talk of how the vegetables grow; on vines, bushes, trees, or under the ground, and of the parts which we eat.

Potatoes, the root; spinach and lettuce, the leaves; celery, the stem; beans, peas, grain, the seeds, etc.

Talk of the use of the roots and the leaves, etc.]

Do the farmers gather more vegetables than they can use? What do they do with them? How do they send them to market?

What vegetables are made into oatmeal, flour, hominy, corn meal, starch, sugar?

Does the city child need the farmer and his work?

THE FARMER

[As you tell of the farmer's work or tools or churning or bread-making make motions with the fingers which the child can imitate. This will present the idea more vividly to his mind. Simple rhymes have been written with suggested motions, but if you can make your own the child will like them even better.

Do not underestimate the value of the motions of the fingers. Better be making imitations of garden beds and fences, etc. than using the fingers in a less desirable way, and a good way to avoid wrong activity is to suggest wholesome activity.]

XXI

THE BAKER

“Pat-a-cake, pat-a-cake, baker’s man,
Make us a cake as fast as you can;
Roll it and roll it, pat it and pat it,
Pick it and pick it, mark it with B,
And toss it in the oven for Baby and me.”

THE farmer fed the cow, and the cow gave us milk, the dairy man churned the milk and made the butter; now where shall we go for the bread for Alice’s supper?

No, Mother will not make it this time, but she will tell you how she saw the baker make it, and some time we will go and see how it is made there, for in many places people depend wholly upon the baker, not only for their bread but for all their cake and pastry.

Some day I will let you make some bread and bake it yourself in the kitchen.

The front room of the baker’s shop had counters as in any store, with cases for the pies and cakes and rolls and loaves of bread, and paper and string with which to tie up the good things when they were sold.

In the next room we found the baker at work. He had a great trough in which to mix the bread, and into this he sifted the flour which he scooped from a barrel. Then he put in salt and yeast and sugar and lard and water and mixed it all together. This he covered and left. Then he went to another trough in which the dough had risen so that it was almost running out of the trough and seemed all alive. Over this he sifted more flour. Then he



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BAKING BREAD

THE BAKER

took it out on a great table, cut off pieces, rolled and kneaded and shaped them, some into loaves, and some into rolls, put them into pans, covered and set them away in a warm place. Then he looked at his oven which was very, very large, eight or ten feet each way. With a great long-handled shovel he took out several pans of bread which he said had been made just as those which I saw had been, and after the loaves had risen to fill the pans they had been put into the hot oven to bake.

My, how good they smelled, these brown loaves, when they came from the oven and were laid on a long table to cool! Later they were wrapped in oiled paper and carried into the front room to be sold.

Barrels and barrels of flour stood along the wall, and these, he said, the miller had sent to him on a great truck.

In fact, while I was there, a man brought in some barrels, and while he was unloading them and talking to the baker, suddenly the baker ran to his oven, and as he opened the door we smelled — not the sweet odors of the other loaves, but that of burning, and there were the next loaves all black as a cinder.

How sad the baker felt, all that bread wasted! “Once,” he said, “my oven was not hot enough when my bread was ready and it ran out all over the oven and soured.”

Just on time! This is the rule for every one. The oven must be ready just on time; the bread must go in just on time; the loaves must come out just on time!

Do you remember any story about a girl who had to leave a party when she heard the clock strike? [Tell the story of Cinderella.]

XXII

THE MILLER

WE went to the baker's for bread, but to whom do we go for the barrels and barrels of flour that we saw him use?

Yes, back to the farmer for some of that grain with which he feeds his cow, pigs, and hens, etc., and for which they pay him with milk, butter, and eggs.

The animals like the whole kernels of grain, raw, but we want it cooked or ground into flour or meal and made into bread before we eat it. The man who grinds the grain is called the miller, and to him the baker must go for his flour.

There are several kinds of flour and the bread made from these does not all taste alike. [Do you know any kinds of bread? White bread, rye, oatmeal, corn, etc.] Each of these is named for the particular kind of flour from which it is made and each kind of flour is named for the particular kind of grain which has been ground to make it.

First, let us see how the white flour is made. [Show a wheat stalk or some whole grains of wheat or a picture of a wheat field. Sing the old-fashioned game, "Shall we show you how the farmer, shall we show you how the farmer, shall we show you how the farmer, sows his barley and wheat? Look 't is thus the busy farmer," etc. Talk of the planting time, and as you talk of the plough,

THE MILLER

harrow, etc., speak of his dependence upon the miner for these tools.

Speak of the unfolding and growing of each little plant, wheat from wheat, corn from corn, barley from barley. Tell the Parable of the Sower in the Bible, also the story of Ruth. Sort seeds of different kinds. Show Millet's picture of "The Sower," also "The Gleaners."

Notice the little husk in which each kernel of wheat is wrapped and show how the kernel is separated from the chaff. Talk of threshing grain and go on with the play, "Shall we show you how the farmer mows and then threshes his wheat, and finally sifts it."

Make a hand flail and thresh some grain. This will make clear the Bible reference to the threshing floor and separating the wheat from the chaff. [Although the hand flail is still sometimes used, most threshing is now done by machinery.]

In country places one man will own a threshing machine and take it around from one farm to another in the fall when the grain is ready and a number of men will work together and thresh all the grain in a day or two. They sweep the barn floor and thresh it there. Then it is shoveled into bags and carried to the miller to be ground.

The threshers then hitch their horses to the threshing machine or start the motor and go on to the next farm and thresh the grain that that farmer has raised. The motor is fast replacing horses on farms just as oxen, so common once, are so seldom used now, that you have never seen one except in pictures. When I was a little girl father used oxen to draw the hay cart.

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Often the neighbors get together, going from one farm to the other in the neighborhood, and the women see who can make the best pies and cakes and doughnuts, etc., for their dinners, and the threshing time, in spite of a great deal of hard work, is one of the jolliest times of the year.

The kernels, threshed from the stalk and sifted, are now ready to be ground into flour or meal.

The first time any one ever did this — and there are places where it is done the same way to-day — men, or more likely women, put the kernels on one stone and rubbed or pounded them with another. The stone on which they were placed was called the mortar and the stone with which they were pounded was called the pestle.

In many places there are found to-day great rocks with deep hollows worn in them where whole families of Indians ground their grain in this way.

The people learned to let wind turn wheels and push the stones around to grind their grains, and then, better still — for the wind does not always blow hard enough to turn the wheels — they made water wheels. The mills where the grain is ground are called grist mills, and you will find them beside running water. Outside the mills the water dashes merrily along until it comes to the mill dam, which holds it back, except when a little gate is raised to let it rush out and fall upon a great wheel.

As the water flows over it, around goes the wheel with a great leather band around it which runs inside the mill around another wheel. This wheel is fastened to two

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great flat stones which, as the wheels turn, go flying around, crushing whatever is between them.

Above them is a hopper, into which the grain is shoveled and through this it falls between the two stones, which, whirling around, grind the grain. We will look for pictures of grist mills and of wind mills, which work much the same way, only the wind mills have a great wheel high up in the air where it will catch every breeze that blows. You have seen these wheels with great arms like fans.

After being ground the flour is sifted through a cloth to make fine white flour, and after being put into barrels is ready for the baker.

The entire wheat flour is not sifted through cloth. The husks, or what is taken out by sifting, are left in, and it is a darker color than the white flour.

To make meal the grains are not crushed so fine as to make flour. The meal and flour all come from the grain, but they are ground and sifted differently.

[To give a very definite idea of the process of bread and butter making and to lead up to a real spirit of Thanksgiving it is a good plan to plant some grain, wheat preferably, and harvest, thresh, and grind it. This can be done even in a city back yard, in the ground, or in a window box.

For grinding, a small coffee mill will do very well. For threshing a hand flail can be made of birch switches tied together, and the piazza will serve for a threshing floor.

Then sift the flour and mix and bake bread.

As you mix the bread note the things used other than flour, and talk later about each of these.

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As you use the yeast the child can be given an idea of germs, helpful and harmful, and the rapidity with which they multiply; the need of cleanliness and of keeping food covered and cool to keep free from harmful germs. Notice that the yeast germs must be kept neither too hot nor too cold if they are to multiply and raise the bread.

Get some milk and set it and skim it.

If you have no churn use a glass cream whipper or a bowl and an egg beater. Wash and salt the butter. Then make some little butter balls. Show pictures of churns. This was the old-fashioned way of making butter, and each family raised its own cow and churned its own butter. Churns run by electricity are used now, and in many city stores you can see the butter churned in them and pressed and salted and wrapped in paper, all in a few minutes. The old way took hours, and some one had to keep the dasher going up and down all the time. When the butter took a specially long time to come they used to think some bad person had bewitched it. Many queer stories are told of the old-fashioned churning.

Serve for supper the child's own bread and butter and let him tell as much as he can of the story from the grain to the loaf, and give thanks to the Giver of every good and perfect gift.

A lot of work? Yes, but invite the neighbors' children and make it a party, and there will be nothing you do which will be more worth while.]

XXIII

WATER

UNLESS the farmer sows his seed, the miller cannot grind the grain, the baker bake the bread, nor Baby have his supper. But suppose we plant some seed and put it away and do not water it? Will the plant grow and give us grain? No, it will wither away and die. And suppose the farmer plants his seed, ever so carefully, and no rain falls upon it at any time? No, he will have no grain for the miller. And suppose the farmer does everything he knows how to do to make it rain, can he do so? He can dig ditches, as some men have done, and keep his plants moist through long dry spells, but he cannot make it rain, and without this in time his plants will die, in spite of all that he can do. And so every year when the grains and fruits and vegetables are gathered in we have Thanksgiving Day, a day to thank the One who alone can send the sunshine and the rain and who does send them to even the tiniest little seed, "under the leaves and the ice and the snow, waiting to grow."

God not only sends the rain to water the plants, but in the summer when it is hot, every evening he sends the dew. The dew is water-drops just as the rain is.

The Ancients used to tell a story about the dew. It was this:

Every morning a wonderful goddess drove two horses across the sky to tell the people that the day was dawning. She had a son, Memnon, who was a great king, and

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in the Trojan War he fought bravely to help Troy and was killed by Achilles, a great soldier, who fought for the Greeks who were trying to take Troy. Ever since, the goddess, Eos, has wept for her darling boy and her tears fall to the earth as dew, so that each morning in the warm weather when the grass was sparkling with dew-drops they said, "Eos has been weeping for Memnon."

There is water all about us — springs and ponds and brooks and rivers, waterfalls, and the ocean; and the air all about us is full of little particles of water so tiny that we cannot see them until they become warmer or cooler than the air and then they change into forms so different that it is hard to believe that they were once drops of water.

One morning, after the summer had passed and Daddy had said the boat had better be put away for the winter, Spiffie woke and found beautiful pictures on his window. He began to sing:

"Oh, Jack Frost is a merry little elf,
And a merry little elf is he;
He calls for his pipe and he calls for his brush,
And he calls for his paint-pots one, two, three,
And he calls for his paint-pots three."

He rushed downstairs, and hardly stopping to say "Good-morning," he was off to the pond. No use for the boat now, in which he had played on the pond all summer. He threw a stone in just as he did in the warm weather, but there was no splash — instead away went the stone sliding across the pond as if it were a smooth floor, and then Spiffie stepped on the pond and slid along

WATER

over the shining surface just as the stone had done. Then he ran home, calling to the other boys, "Get your skates, the pond will bear." Sure enough, the pond was frozen and Jack Frost had turned the water into ice, just as he had turned the little bits of water in the air in Spiffie's room into ice on the window pane. The next morning when Spiffie awoke the trees were all white. In the night the North Wind had blown against the clouds — which are water-drops, you know, up in the sky — and before the water-drops could tumble out, as they do when the cold wind blows on them in a cloud, Jack Frost froze them into tiny white stars, each with six points, and they fell very gently, making everything pure and white; but while he was watching, it grew warmer and the snowflakes turned to raindrops and then, as the wind changed again, the raindrops froze as they fell, and mother came in and said, "Why, it's hailing."

The storm did n't last much longer, and after breakfast the sun shone out warm and bright, so that Spiffie took his sled and went coasting and built snow forts and had a snowball fight with the other boys.

Jack Frost had done all that he could. He can make snow and ice and frost pictures and icicles, but he cannot change them back into water that you can pour from one dish into another, as you can do with water when we say that it is a liquid. Something else can do that.

"Simple Simon had a snowball,
And brought it in to roast;
He put it by the kitchen fire
And soon the ball was lost."

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Yes, heat can change it back, and melt the ice and snow. There are no stoves out in the woods and fields and on the ponds, so why don't the ice and snow have to stay all the time? Because the sun is hot and melts them; yes.

When water is heated it changes to vapor or steam. So tiny are the little particles of water forming the steam that you cannot see them until they float out into the air. Then, as they become a bit cooler, they run together and are large enough so that we can see the steam floating off in thin, little clouds. As the water-drops are heated they need more room, just as heat makes everything expand or grow larger, and as the particles push against each other they push also whatever else is against them. Watch the teakettle lid, and if the water is boiling hard you will see it go up and down. One man noticed this long, long ago and he said, "If I shut up some steam tight I believe I can make it do some work"; so he shut it up tight in a boiler and made it turn the wheels of a heavy engine around. Since then it has been used to turn the wheels of machines which make almost every kind of thing we need, and to carry long trains of freight cars loaded with things from one part of the country to another; also to push boats which take people and goods from one country to another. Of what benefit is this to you and me?

Out of doors the heat from the sun is all the time changing water-drops into vapor, and these are floating together and forming clouds. The cold winds blow on these and change them back into raindrops, and these fall to the earth again to be drunk up by the thirsty little

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plants or run into the springs to bubble out again for you and me to use and so keep clean and well. Think of some of the things for which we use water. Can we live without it?

[For a talk on forms of water, nothing could be better than the story of "Little Water-Drop's Journey," by Isa L. Wright.]

LITTLE WATER-DROP'S JOURNEY

By Isa L. Wright

ONE golden morning in summer, a little drop of water out in the ocean climbed up on top of a foamy wave and began to cry.

"Well, well, well!" said the big Sun. "What can a little drop of water be crying about?"

"Lots of things," said the little drop. "I'm tired of splashing about. I want to have some fun."

"Is n't it fun scattering shells all over the beach, and playing with the little children and tickling their toes?"

"That's just it," sighed the little drop of water. "That is just what I like to do, but a big wave always comes and takes me away, and then the tide will not let me go back for a whole day." And the little drop of water began to cry again.

"I see! I see!" smiled the big Sun; then he slipped behind a little cloud to think. When he came out again, his smile was very warm.

"How would you like to go for a ride with your old Grandfather Sun?" he asked.

"And see the world?" asked the little drop.

"And see the world," he assented. "But you must be

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very good and do as you are told, for that is the only way a raindrop can see the world."

"I'll do it!" she promised.

"All right." Grandfather Sun smiled warmer and warmer. "Now keep very still for a moment. I shall have to change you into a vapor fairy and put wings on you."

Hardly were the words out of his mouth than the little drop felt herself growing lighter. She seemed to spread out and a strange feeling stole over her.

"Where am I?" she cried. "I can't see myself!"

"Of course not," smiled Grandfather Sun. "Nobody can see a vapor fairy. Spread your wings now and fly up on a sunbeam and come along!"

And that was the way Little Water-Drop started out to see the world.

"I hope I shall see little children," she said, after they had sailed a long way up in the sky. "I like to play with little children."

"You will have lots of happy times with lots of little children in lots of different places before you get home again," said Grandfather Sun. "For seeing the world is a long journey. And now good-bye! Uncle West Wind is going to take you to a party with a lot of other vapor fairies."

"A party!" Water-Drop clapped her hands. But before she had time to say any more, up came Uncle West Wind.

"Well, well, well!" he said, as he blew a little kiss to her. "Another little drop of water going out to see the world! My party is growing very big."

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"Where is the party?" Water-Drop asked.

Uncle West Wind took hold of her hand. "It is up in that silver cloud that looks very close to the moon, but is n't," he laughed, as he whisked her away.

"What do we do at a cloud party?" asked the little drop.

"Oh, you dance and sing and fly around and guess guesses and wish wishes until the big surprise comes."

"Oh!" said Little Water-Drop, "I love big surprises!"

"So do the other vapor fairies," returned her uncle. "That is why they guess guesses about it."

"What is the big surprise?" Water-Drop asked before she thought. Then she clapped her hand over her mouth. "Don't tell me!" she cried.

How Uncle West Wind did laugh. "How can I tell you when I do not know myself?" he said. "Your four uncles, North Wind and South Wind and East Wind and myself, decide the matter in council. Then one of us goes to the party and tells the big surprise. But, of course, you may guess guesses and wish wishes about it."

And just that minute he lifted Water-Drop right up on the edge of the silver cloud. Hundreds of little vapor fairies came flying out to meet her. You can imagine how happy she was and what a merry time she had. They danced dances she had never heard of before and played games that only vapor fairies could think of. And they spoke often in whispers of the big surprise. "What can it be? What can it be?" they asked over and over. By and by, it grew colder and they danced closer together.

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"I'm shivering," said Little Water-Drop. "Let's sit down and guess guesses and wish wishes."

And that was just what everybody wanted to do. And when all the many little vapor fairies had guessed and wished to their little hearts' content, Water-Drop said: "Is n't it lovely to see the world! I wish I might fly over to that purple mountain-top and play with the little children!"

Then they all laughed. "Why, there are no little children on that high mountain," they told her.

"Then I should run down the side till I found them," she announced.

"Yoo-oo-oo-oo!" Everybody stopped to listen. They had all heard that sound before. "Why, it must be Uncle North Wind!" they all cried.

"Yoo-oo-oo!" And there he was. And every little vapor fairy felt as though she were shrinking. "Yoo-oo-oo!" he whispered once more.

"Did you bring the big surprise?" they all cried, as they shivered again.

"Whee-ee-ee!" hummed Uncle North Wind, puffing hard. "Of course I brought the big surprise. You are all going to visit the purple mountain."

"Oh! Oh! Oh!" said Water-Drop. "My wish is coming true."

"Yoo-oo-oo!" whistled Uncle North Wind. "Hurry up! Cuddle up close! It will be a cold ride, but you will soon be there." And with a bluster and a puff and a whistle and a roar, he carried the whole cloud of fairies away.

The purple mountain with her face covered with haze

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saw them coming. She was so happy that she grew more purple still and seemed mistier than ever. "I have waited a long time for you, little vapor fairies," she called. "Your little nightie-caps were ready for you weeks ago. Six points I have embroidered on every one, and no two caps alike. Here it is November and not a single one of you asleep yet."

"Do we have to go to sleep?" asked Little Water-Drop.

"Why, of course." Purple mountain was shaking out hundreds of little white nightie-gowns. "No one travels all the time. First a little journey and then a little rest, and then a little journey. That is the way to see the world."

"Of course," laughed all the little vapor fairies. And Water-Drop knew right down in her little water-drop heart that she was as sleepy as she could be. It was all she could do to count the six points on the nightie-caps the purple mountain was handing out to them. Oh, they were such cute little caps! Ever so much prettier than the ones the waves wore. And when Water-Drop put hers on she was so surprised.

"Why, I can see myself again!" she cried; "I am all white now."

So were all the other vapor fairies. And when they all lay cuddled down against the purple mountain, they looked like a fairy garden of stars.

Water-Drop was so fast asleep that she did not even hear the little children talking down in the valley below.

They were looking up at the flower garden of stars.

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“Oh, see the purple mountain!” they shouted. “It is all covered with snow!”

She was so fast asleep that she did not even feel Jack Frost pinching her cheeks and tickling her toes and nipping her nose. She did not even know that King Winter was ruling the land. She was still fast asleep when Spring came and chased King Winter away. But all of a sudden, one merry morning, she opened her eyes. And who do you suppose it was that wakened her? Why, Grandfather Sun, of course. “Well, well, well!” he was saying. “Here we are again. And how do you like the world, now that you have seen something of it?”

Water-Drop sat up in bed. “I think it is a wonderful place,” she said. She was growing warmer and warmer — so warm that she loosened her nightie-cap and pushed it back a little way. Then she laughed.

“I know what you are going to do, Grandfather Sun,” she began, shaking her finger at him. “You are going to change me into a vapor fairy again.”

“You have guessed wrong,” Grandfather Sun laughed. “I can do other things besides turning water-drops into vapor fairies. Keep very still for a minute, now, and see what happens.”

Water-Drop almost held her breath. She felt as warm as little children do when they say they are nearly melting, and then, all of a sudden, her little cap and nightie were gone, and there she was, her own old self — a water-drop again.

“Nobody wears a nightie-gown and a nightie-cap when he travels around to see the world,” laughed the old Sun.

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"I look just the same as I used to," Water-Drop told him, "but I feel different. I seem to be lighter than I was when I splashed on top of the waves."

"Ah, yes." The old Sun was nodding his head. "That is because you are not carrying the little bag of salt you played with in the ocean. You dropped it when you changed into a vapor fairy, but you will find it again. And now I suppose you will want to start on your journey, child, so good-bye! I just stopped a minute to wake you all up and say, 'Happy voyage!'"

When Water-Drop looked around, sure enough, all the nightie-gowns and caps were gone, and there were lots of little water-drops like herself scampering about. "Come on! Come on!" they all cried, and they joined hands and ran down the mountain-side. "Good-bye!" they called, "and thank you for a happy visit, Purple Mountain!"

They had a merry race and the first thing Water-Drop knew, so many others had joined them that they made a tiny little stream of water curving its way over the pebbles and dirt. "See how big we are growing!" they all cried, as other little streams hurried from different directions to catch up with them. "Let's all go on together and see the world!" They called out their invitation to all the water-drops they could see. And every little drop that could possibly run there joined in with the merry little party going on to see the world. And the next thing Water-Drop knew they had splashed right into a big brook.

"Glad to see you!" he said, welcoming them with a gurgle. "Come right on with me! I'll show you lots of

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interesting things." And he did, too. I can't begin to tell you how many — trees and bushes and big rocks and flowers and water-cresses and nesting birds and meadows, and children — oh, so many children! They found them in the woods, they met them in the meadow, and they played with them down in the cowslip pasture. There were brown-eyed children and blue-eyed children, children with yellow curls and brown ones. "I did not know there were so many children in the world!" said Water-Drop as she danced on and on.

Sometimes she splashed up on the back of a green bull-frog and looked up at the trees and the birds. Sometimes she rested in the little pools and talked to the fishes. Sometimes she went to sleep on a water-cress leaf. But always the brook was in a hurry. "Come on!" he kept calling. "If you want to see the world, come on!"

"Good-bye, lovely things!" called Water-Drop, and she said it over and over all day long. "Good-bye, little children!"

"There is a river farther down," said the brook. "You will like the river. It is so big and splashing and it has ripples all over it. When the steamers go by, the ripples are big and white almost like the waves of the ocean."

"Oh!" said Little Water-Drop, and she wished right that minute that she could see a little white ocean-wave, but then she remembered that there were more lovely things to see in the world, so she danced on.

And when at last they came to the big river, both she and the brook were so happy that they splashed right

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in. "Glad to see you! Glad to see you!" boomed the big river, and then he splashed all over a little boat that was filled with children.

"My! How happy the river must be!" laughed all the little folks. "He has splashed all over us." And they shook all the little water-drops off of their dresses and laughed some more.

"Wait till you get down to the mill," said the man who was rowing the boat. "Then you will see some big splashing."

"I shall just go down to the mill with them," Little Water-Drop decided. And down she went. And what do you suppose she did when she got there? "Br-rr-rr-splash!" said the big mill-wheel. And Little Water-Drop jumped right on and had a ride. She whirled round and round and round. "There, now!" she said, when at last she jumped off, "I have helped to grind a little bit of flour anyway."

"Indeed you have, and I am much obliged to you," said the rumbly voice of the old mill.

"Come on! Come on!" called the river.

He was in as big a hurry as the brook. "Come on, and see the world! Or maybe you had rather stay here."

"Oh, no!" said Water-Drop. "I could n't stay here. I am only seeing the world and I must get home sometime." It was the first time that Water-Drop had said a word about home.

"Getting homesick?" asked the river. "I am beginning to feel that way myself."

"Where is your home?" asked Water-Drop.

"In the ocean."

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"Is n't that nice!" Water-Drop danced faster. "We'll just go right on home together," she said with a happy laugh.

"Too-toot-toot! Good-afternoon!" whistled a big river steamboat. "If you like riding on wheels, Little Water-Drop, why not come and have a spin around on one of mine?"

"Whir-rr-rr," said the nearest wheel, "jump on!"

Little Water-Drop ran as fast as she could, gave a big jump, and there she was, spinning round and round and round. And I can assure you it was as much fun for her as spinning a top is for boys. She rode almost to the mouth of the river before she jumped off.

"I hear it!" she said, in a very joyful voice.

"What?" asked the river, who was busy splashing.

"The boom and the roar and the pounding of the ocean."

"Of course." And the river splashed higher. "We are almost home."

"Well, well, well!" said a familiar voice. "So here we are again. And how is the world, Little Water-Drop?"

Little Water-Drop looked right up into the old Sun's face. "I think it is a lovely place, Grandfather," she smiled, "but still —" And then she began to laugh.

"I see! I see!" The old Sun began to smile. "You are just like all the people in the world. There is n't any place you love so much as home. Am I right?"

"Indeed you are, Grandfather Sun," said Water-Drop. "I can hardly wait to see the big whales spout water, and the porpoises jump up in the air. I want to watch the sea-gulls darting about and the little fishes wiggling

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their tails. And I want to jump up on a little white wave and splash around."

"Just where I found you," Grandfather Sun added.

"Yes, but you will never find me crying again," Little Water-Drop told him. "This time, when I get home —"

"You are home already!" shouted the Sun. "Can't you see that white wave coming out to meet you?"

But before he could say another word, what do you think? Water-Drop had splashed right up onto that white, foamy wave, and was sailing away. "I'm so happy!" the old Sun heard her say. And I am very sure she has been happy ever since. And there is another thing I am very sure of — she found her little bag of salt.

TO WHOM SHALL WE GIVE THANKS?

Anonymous

A little boy had sought the pump
From whence the sparkling water burst,
And drank with eager joy the draught
That kindly quenched his raging thirst.
Then gracefully he touched his cap,
"I thank you, Mr. Pump," he said,
"For this nice drink you've given me."
(This little boy had been well-bred.)

Then said the pump, "My little man,
You're welcome to what I have done.
But I am not the one to thank,
I only help the water run."
"Oh, then," the little fellow said
(Polite he always meant to be),
"Cold water, please accept my thanks,
You have been very kind to me."

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"Ah," said cold water, "don't thank me!
For up the hillside lives a spring
That sends me forth with generous hand
To gladden every living thing."
"I'll thank the spring, then," said the boy,
And gracefully he bowed his head.
"Oh, don't thank me, my little man,"
The spring with silvery accents said.

"Oh, don't thank me, for what am I
Without the dews and summer rain?
Without their aid I ne'er could quench
Your thirst, my little boy, again."
"Oh, well, then," said the little boy,
"I'll gladly thank the rain and dew."
"Pray, don't thank us. Without the sun
We could not fill one cup for you."

"Then, Mr. Sun, ten thousand thanks
For all that you have done for me."
"Stop," said the Sun, with blushing face,
"My little fellow, don't thank me.
'T was from the ocean's mighty stores
I drew the draught I gave to thee."
"O Ocean, thanks," then said the boy.
It echoed back: "No thanks to me!"

"Not unto me, but unto Him
Who formed the depths in which I lie,
Go give thy thanks, my little boy,
To Him who will thy wants supply."
The boy took off his cap and said
In tones so gentle and subdued,
"O God, I thank Thee for Thy gift.
Thou art the Giver of all good."

XXIV

SALT

SUGAR and salt we must have as well as flour. Where does the salt come from?

When you went swimming in the ocean did you get some of the water in your mouth? Then you know that the sea is salt. Men evaporated the sea water and the salt was left behind.

What do we mean by evaporated?

When we hang our wet clothes upon the line, the air and the wind dry them, we say. That is what we mean by evaporating the water. There is so little salt in the water and it takes so long to evaporate by standing in the sun that sometimes men boiled the water in shallow pans, and the moisture went off in steam, just as you have seen the steam come out of the spout of the tea-kettle.

There are salt springs in parts of the world and some of our salt comes from these. A spring is a place where the water bubbles out of the ground. Some springs have fresh water, but the water in other springs is full of salt.

Then there are salt mines. Deep down in the ground in these mines there are regular cities made of salt out of which thousands of tons of salt are taken every year. Over these mines, once flowed the ocean, ages and ages ago, but now it is dry land, just as the coal mines are, with great white underground tunnels and rooms.

The salt comes in coarse and fine crystals, and in

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powder as well, so that we have the different kinds of salt; rock salt for freezing ice-cream, and packing fish and meat, fine salt for table use, coarse salt, and salt for dairy use. Do you know what a crystal is?

Animals love salt as well as people, and the farmer often calls his sheep or cows or horse with a lump of it.

WHY THE SEA IS SALT

Norwegian Folk-Tale (adapted)

ONCE upon a time, long, long ago, there were two brothers. One was very rich, but so selfish that he wanted to keep for himself everything that he had. The other was very, very poor, but was willing to share even his last crust with any one in need.

The night before Christmas there was nothing left in his house to eat. This was not the first time that his family had been hungry, but he could not seem to keep enough ahead. So in despair he went to his rich brother once more, for he had often had to call upon him for help, and begged for something with which to keep Christmas with his family.

The rich brother was vexed indeed, for Christmas found him just as stingy as any other time, and at first he refused. Then he said, "I'll give you some bread, some candles, and some bacon if you will promise never to step foot in my house again. Let this be the last of you."

The poor brother took the loaves, candles, and bacon and thanked his brother for his great kindness. He promised never to bother him again and started for home, thinking how happy his family would be with what his brother had given him.

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On the road he met a poor old man so worn and hungry that in pity he handed the old man a loaf and a candle and was cutting off a bit of bacon for him when the old man stopped him.

“I have more than enough for the little that you have. Save your bacon; and because you have been so kind to me in my want I’ll tell you a secret that will make you rich the rest of your days.

“Go on your way and when you come to the two oak trees you will find a cave in the bank. Follow in and you will come to the home of the underground folks. They have everything there which they wish but bacon, and for that they will give you anything which you want. Now mind what I say and take nothing for the bacon but a little mill which stands behind the door. If you do just what I say you will not be sorry that you shared your things with me.”

The poor brother went on until he came to the two oaks, and there in the bank was the cave as the stranger had said. He followed in and the hill folk, great and small, swarmed around him, each offering something more than the last, for the bacon. He was sorely tempted to take some of the fine offers which they made, but instead clung tight to his bacon until he saw the little old mill behind the door. Then he said, “Well, I ought to take this bacon home for our Christmas dinner, but since you want it so much I’ll not be selfish on Christmas Eve, and if you’ll just let me have the little old mill behind the door, I’ll give you the bacon, and a good bargain you are getting, to be sure.”

At first they would not hear of such a thing as giving

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away the mill. So the poor brother started away with his bacon still under his arm. As he neared the door they called, "Here is the mill, take it. It is yours if you will but let us have the bacon."

When he left the cave with the little old mill under his arm he walked on a bit sadly, for, thought he, "I had two loaves and some bacon for our Christmas at home, and now, alas, what have I but one loaf and some candles and a useless old mill. I cannot even go to my brother for more, for I have given him my word that I'll not step foot in his house again."

Then in the woods he met the man who had told him about the mill. The man rushed up eagerly and grabbed the mill. He turned the handle and said, "Grind, my mill, grind loaves of bread," and out from the mill came loaf after loaf of fresh white bread, to the utter astonishment of the poor brother. Then the stranger said, "And now I'll whisper to you the words which must be said to stop the mill, or else it will go on grinding forever, once it has been started. Do not forget what I tell you are the words to stop your mill."

The poor brother thanked the stranger and left with him a good Christmas dinner. Then he hurried home as fast as his tired legs would go. It was long past midnight when he got there. His wife sat worrying when he got home and said, "Wherever in the world have you been so long? Here it is past midnight on Christmas Eve and I have never a thing in the house to give the bairns to eat."

"See what I have brought you," said the poor brother, and he set the mill upon the table. He bade it

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grind candles, then a clean, white cloth, and then a whole Christmas feast. He had only to speak the word and it ground out anything that was wanted. The old woman first blessed her stars and then begged him to tell her where he got the mill, but the poor brother just kept right on grinding out good things enough to last through the holidays. Coax as she would, he would not tell her where he got the mill.

The third day he made a great feast and invited all the neighbors and his rich brother.

When the rich brother saw all the things which his poor brother now had, he was not pleased, as you might suppose. He was very angry. "Why, it was only Christmas Eve he came begging for a bite to eat, and what has he now?"

He turned to his brother quite fiercely and said, "But where did you get all these things?"

The poor brother did not care to tell too much about the mill, so he said, "Oh, it all came from behind the door."

All went well until late in the evening. He had bade the mill grind out ale, and he became quite merry as he drank too much of it. Then he brought the mill and showed them what it would do for him.

The rich brother immediately wanted the mill and was determined that it must be his. So he bargained and bargained until they finally agreed that for three hundred dollars it should be his at the next harvest time.

All the rest of the winter and all summer long that mill was kept busy grinding out things for the poor brother and his family.

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Before any one else was out of bed on the first day of the harvest time the rich brother was pounding on the door. He had come for the mill. He paid the three hundred dollars, and away he went with the mill before the poor brother had time to tell him how to stop the mill from grinding once it had been started. Once he reached home, he told his wife to go out into the field and help the harvesters and he would stay at home and get the dinner ready. After she had gone he put the mill upon the table and said, "Grind, my mill, grind broth and herrings."

Out from the mill flowed broth and herrings. Soon there were enough, and the rich brother tried to stop the mill. But in spite of all he could do on flowed the broth and herrings till everything in the house and the house itself were filled to overflowing.

For fear he would be drowned in the broth and herrings, he ran from the house with the mill in his hands, but so fast did the little mill grind that they came roaring like a great river behind him as he ran. Now his wife, working in the field, grew hungry and thought perhaps he would be glad of her help in getting the dinner. So she told the men to go with her to the house for dinner.

Just as they had started up the hill what should they meet but the herrings and broth pouring down to meet them. Away ran the rich brother, shouting, "Eat, drink, but look out you are not drowned."

Straight for his poor brother's house he ran and begged him to take back the mill at once lest the whole town be drowned in herrings and broth.

So the poor brother took back the mill, and as soon as

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the rich brother was out of hearing it stopped grinding herrings and broth.

Richer and richer grew the poor brother, finer and finer grew his house on the hill near the seashore.

Gold and more gold the mill ground for him until, because he knew of nothing finer, he covered his house with plates of gold.

How it gleamed and glistened! Far away to sea, sailors steered their ships by it and hardly one went by without going ashore to see the rich man who lived in a house covered with gold which he ground out of a wonderful mill. There was hardly a soul who had not heard of this mill.

One day a skipper who came to see the mill asked if it would grind salt.

“Grind salt?” answered the poor brother; “it can grind anything.”

Now, you must know that this skipper took long voyages on the stormy seas to get a lading of salt. Salt, people must have, and it must be carried across the seas. If only he had a mill that would grind out salt he could sit at home with his pipe and risk his life no more in wind and wave.

He bargained until the poor brother agreed that the mill should be his. Then, for fear he would change his mind, so glad was the skipper to get the mill, that he took it under his arm and sailed away and never waited long enough to be told how to stop it, once it began to grind. The poor brother shouted in vain, but away sailed the skipper, thinking he wished to take back this wonderful mill.

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When he had sailed out of sight of land he took the mill and said, "Grind, my mill, grind salt."

The mill began to grind salt and kept on grinding salt. Out it poured until the cabin was full. It poured on until the ship was full.

Twist and turn, command and plead as the skipper would, that little mill kept right on grinding salt.

Higher and higher grew the pile of salt, down sank the ship as the weight was too much for it, but still the little mill kept on grinding salt.

There lies the mill on the bottom of the sea, grinding out salt to this very day; and that is the reason that the sea is salt. Anyway that is the story that my mother told to me and that is the story a great many very good mothers tell to their children, just as I am telling it to you. I do know that a great many sailors cross the sea to this day for a lading of salt, just as did the skipper who is said to have run away with the poor brother's mill.

XXV

CANE SUGAR

ONE winter Winthrop was in the South and went to ride one day with Mother and Daddy. Oh, how sweet the pitch pines smelled as they jogged lazily along listening to the musical melody floating to them through the woods where some negroes were cutting the pines, and enjoying the bright flash of the redbird as he flitted among the branches. Presently they heard, "Whoa, gee up, whoa," and by the side of the road saw a group of men, and a horse going round and round. He was pulling a wooden bar around which was fastened to what looked like a cider press, and juice was running in a stream from this press. Not far away was a fire with a great kettle in which syrup was boiling.

Daddy stopped the horse and spoke pleasantly, and after a few remarks about the weather and where we came from, one of the men said, "Have a drink?" He gave us each a cupful of the juice which was dripping from the press. It was sweet and rather pleasant to taste. Then he gave Winthrop what looked like a little joint of a cornstalk and said, "All the little honeys like to chew the sugar-cane," and we saw that the press was filled with just such pieces of stalk. Just then a man drove out of a field near by with a whole wagonload of sugar-cane stalks and the rest of the field in which he had cut these stalks looked very much like a cornfield only the stalks were slenderer.

TALKS TO CHILDREN

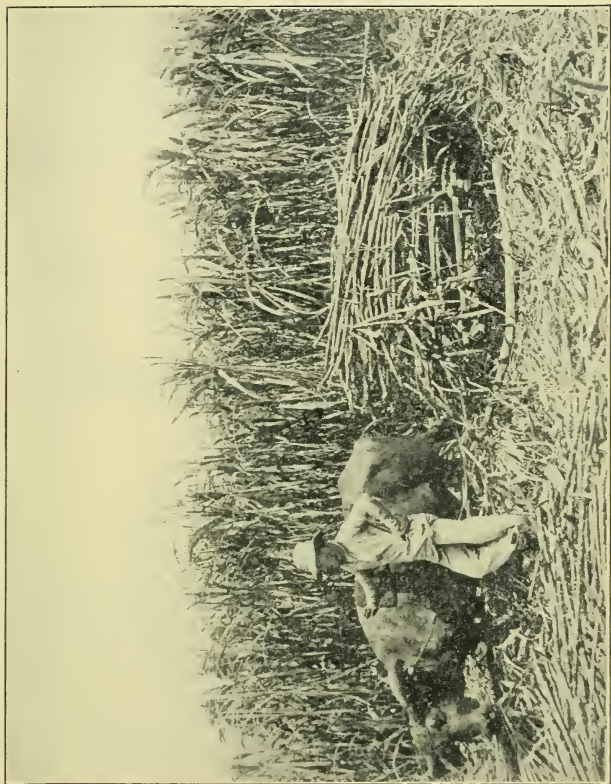
When the barrel into which the juice was dripping was nearly filled the men poured it into another kettle and set it over the fire. That which was boiling had become thick like syrup, and we watched it for a few minutes longer.

Little crystals like flakes of snow or ice formed around the edges as the syrup boiled away. This was the sugar. At the bottom of the kettle some syrup was left, and after the sugar was taken off this syrup was poured into barrels or jugs and called molasses. In the stores we had bought cane-syrup, sugar, and molasses. Now we knew that they all came from the sugar-cane which grows in the fields in warm countries. The juice is pressed out and boiled until it is thick. This makes syrup; boiled longer, it makes sugar, and what is left in the kettle after the sugar is taken out, is molasses.

The sugar was not white and dry like the sugar that we see upon the table, but we did n't see them do the things to make it so.

To make enough sugar for all the people to use and for the candy and pastry shops, it takes great factories in which machines press out the juice, and other great factories, called refineries, where the sugar is freed from dirt and made fine and white. Sometimes it is powdered and sometimes pressed into cubes. Most of our sugar comes from Cuba.

Sugar is also made from beets. There is a kind of beet which contains a great deal of sugar. These are called sugar-beets, and are much larger than the ordinary beet. From the juice of the large white roots of these beets a great deal of sugar is made, but the



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GATHERING SUGAR CANE

CANE SUGAR

greater part of the sugar we use comes from the sugar-cane. Once we planted some sugar-beet seeds, pulled the beets in the fall, and crushed out the juice in the cider press. This we boiled and made sugar, but it was dark colored and looked dirty. It was very sweet, though.

XXVI

MAPLE SUGAR

ONCE we had no sugar. Almost the whole world was at war; and cars and boats, that had carried sugar from the warm countries where the sugar-cane grows to the cold countries where it does n't, were busy carrying men and guns to the war, so that people had to get along without what they formerly brought.

It was in the early spring, in March, and the sun was getting warm and the snow was most gone. One day Winthrop was out playing and wishing he could have some cake, such as his mother used to make when there was plenty of sugar, but trying not to wish very hard because he knew that every one was giving up, cheerfully, things they wanted in order to help win the war, when he saw something which thrilled him through and through and heard something which made his heart dance with joy. It was a flash of the brightest blue he had ever seen and a trilling song that just melted into the blue of the sky till he did n't know whether he had seen them both or just felt something wonderful inside of himself, for it disappeared as quickly as it came, and look as he would, all he could see was something dripping from an old maple-tree near by.

He thought it was the snow running down, and still dreaming of the lovely thing that had stirred him so, he lazily rubbed the dripping trunk with his finger and put it in his mouth. To his surprise it tasted a bit sweet and

MAPLE SUGAR

he tried it again. Then he called his mother and she said, "Would you like to catch some of the water in a pail and then boil it until the water is boiled away and see what we have left? You know the sugar that we use is the juice of the sugar-cane boiled down and if the juice or sap of the maple-tree is sweet we may be able to boil the water away and have sugar left."

"Let's try it," said Winthrop. So he got a pail. But it was hard work to catch the sap for it ran slowly. Mother told him that it would not hurt the tree to bore a hole in the trunk and drive a spout in on which he could hang his pail and leave it overnight. So he did this. He took his little auger and bored a hole and then hammered in a wooden handle, such as are used to carry bundles and out of which he had taken the wire. On this spout he hung a preserve jar.

He was out bright and early the next morning, but there was not much sap in the jar. After breakfast the sun came out warm and bright. The next time he looked at his jar it was overflowing with the sweet water. This he took to Mother, who put it in a pan on the stove, and left it to boil while he went to hang his jar again upon the tree. Time after time he ran in to see if there was any sugar yet, but finally, when it seemed as if he just could n't wait any longer, Mother called him to come and taste. There in the dish was some clear, amber-colored syrup, only a spoonful left of the great panful of sweetened water, but a spoonful of what seemed to him the nicest syrup he had ever tasted. Mother said there was not enough to boil any more, but that if there were more she could boil it a little longer and pour it into

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pans and when it was cool there would be a cake of maple sugar.

So then Winthrop got all the boys in the neighborhood together and said, "Let's do something to save sugar and have sugar at the same time. Something showed me the way yesterday and I don't know whether I dreamed it or whether it was a fairy. Oo-oo! there it is now," and glorious on the top of the maple-tree was the flash of blue and the trilling song, and the boys shouted with one accord, "The first bluebird, hurrah!"

Then they all got pails and spouts, hunted up other maple-trees, and went to work with a will till they had collected so many boilerfuls of sap that no one in the neighborhood had room on their stoves for anything else, and the maids threatened to leave because there was no chance for a wash day.

"Making sugar has soured the whole neighborhood," said Winthrop; "but here's Daddy. He always knows what to do." And sure enough Daddy saved the day. He showed them how to make a tripod and hang a great kettle over a hot fire which they made in the woods. There they boiled down the syrup and had a jolly time sugaring off, too.

Daddy promised Winthrop that some day he would take him to a real sugar grove in New Hampshire or Vermont where they have camps built on purpose for the men to live in while they are making the maple sugar. There they carry the sap on great horse sleds and have immense shallow pans to boil the sap down in. This is where the quantities of maple sugar and syrup come from which are sold in the cities.

XXVII

HONEY

PEOPLE have not always known how to make sugar. My grandmother can still remember when white sugar cost so much that it was used only for a great treat. But long before sugar was made, perhaps before there were any little boys and girls to eat it, there was something sweet and some people even now think it more wholesome than sugar. Perhaps you can guess what, if I tell you — “The queen was in the parlor eating bread and — ” Yes, honey.

Tiny little insects made it and hid it in hollow trees. Did you ever see an insect? A fly? Yes, and mosquitoes and — but this is one that stings only if you bother or hurt it. No, not a hornet or a wasp, but a bee. There are many kinds of bees, but this is the honey-bee.

Nowadays in many back yards you will see rows of bee-hives, for people learned long ago to catch the wild bees and make houses — hives, they call the homes of bees — and so have honey without hunting the woods over for it.

If you watch the flowers closely next summer it won't be long before you will see some bees. If you sit quietly you will hear, “Buzz-zz-zz.” They fly from flower to flower, sticking their long tongue — proboscis, men who study the bees call it — down into the bright-colored tubes of the flowers. Then you will see them fly in a perfectly straight line and very fast away out of sight.

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If you should follow them you would find that they do not stop until they reach their home — the bee-hive. Perhaps the hive is miles away from the flowers on which you found them, often it is, but so straight do they always fly to their hive that people often say, “He made a bee-line for a place,” when they wish to say that some one went the straightest and quickest way.

One day late in the summer when I was in the woods in Maine, I saw some men cutting into a hollow tree which had been dead several years. I watched them awhile and saw them take out pounds and pounds of honey in the comb, just like the honey in the comb that you have seen and eaten. Then I heard one of the men say, “I should think there was nearly two hundred pounds in there, but I guess we’d better leave the rest for the bees so they won’t starve next winter.” I asked them to let me look at the honey, and the comb looked just as the combs I have seen, with tiny cells on each side full of honey. When you have some honey again I wish you would look at these little cells: every cell shaped just alike, six-sided; “hexagonal,” we call them because hexagon is the name of figures which have six sides; every one exactly the same size and every cell fitted to the next one so that not an inch of space is wasted. The honey which you buy you will find is fastened to square wooden frames, but this honeycomb which the wild bees had made was fastened to the inside of the tree and could not be taken out whole in squares as it can from the hives which men have made and fitted with these wooden frames for the bees to fasten the combs to.

HONEY

I will give you some toothpicks and you may try to make some little cells and fit them together like those in the honeycomb.

When you eat honey you will find the comb made of something which you can chew as you do gum. This is the wax of which the cells are all made, and the bees have to gather from the flowers the material of which they make each tiny cell and each drop of honey which fills them. People used to think that they took the wax all made from the plants and the honey from the little nectar sacs of the flowers.

If you bite the little end of the tube of a honeysuckle or a lilac blossom and suck it you will see what I mean by nectar sac, for at the end of the bright-colored tube is a little sac filled with a drop of sweet liquid. Did you ever do this? This is the nectar which the bees gather from the flowers. Some have more than others, but a bee has to visit over a hundred flowers to get only a third of a good-sized drop of this nectar. So when you think that in one hive is made as much as two hundred pounds of honey in a season, you will see why they are called "busy bees." It was found, too, that when bees were fed on sugar and water that they built the little wax cells just the same and filled them with honey.

But one bee does n't do all the work in a hive. It is like a great city. In each hive there are often as many as fifty or sixty thousand workers. There is one bee who is larger and finer than the others and she is the Queen. She is mother of all the rest and never leaves the home. She is carefully guarded and cleaned and cared for and waited upon by some who are specially chosen for that

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purpose. Some of the bees guard the home and drive away insects who would harm it. Some stand at the door and fan with their wings when the hive gets too hot.

Each little bee is armed with a sting at the end of its body. This it pushes into whatever annoys or harms it and leaves a bit of poison which is very painful. Did a bee ever sting you?

Other bees care for the home and the babies. Special little cells are made in the comb for the babies to be born and reared in. There they are loved and carefully tended by the bees who are the nurses. After the babies grow big enough the cells which have been their cradles are then used for honey cells. When so many bees have been born in one hive that there is no longer room for them, part of them fly away, swarm, we say, and make a new hive. This happens in every hive once or twice or perhaps three times a year.

Other bees gather pollen from the flowers and make it into bread to feed the family. Did you ever see any pollen? If you never have, watch the flowers next summer. See if you cannot shake a fine powder from the full-blown blossoms.

Do you remember the little song, "The alder by the river shakes out her powdery curls, the willow buds in silver for little boys and girls"? Watch by the brook next spring, early in March, when the song sparrow begins to sing and the little ice crystals tinkle downstream, and find an alder bush. Take a spray of this home, or some pussy willows, and put them in water in a sunny window and watch. By and by you will see

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the alder blossoms growing larger. See whether they look to you like curls or like fat worms. Soon you will find the window sill covered with a yellow powder. This is the pollen and it is in every blossom.

Unless this pollen falls upon a certain part of the flowers of each plant, called the stigma, there will be no seeds upon that plant.

What good are the seeds? Yes, they are what we plant to make more plants and without seeds we can have no more plants with their leaves and blossoms, and fruit which holds the seeds.

So when the bee comes to gather pollen for his family to eat he is one of the flowers' best friends. The wind blows the pollen from one flower to another, but the bee carries it, too. Look closely at the bee. If you have a pair of field glasses and can learn to look through them so you can find the bee with them you will be able to see more, but sit quietly and watch the bee as long as he stays near and you will find out a lot about how he is made and what he gets from the flowers and how he carries these things home.

First you will notice that the bee is covered with hairs. See if the hairs are all alike — those on its head and body and legs. Notice also what color they are. You will find that his body is covered with hairs almost like feathers and that his hind legs are covered with stiff hairs. When he flies into the flowers for honey these hairs brush off the pollen, and with the stiffer hairs the bee brushes it into the little hollows on each hind leg. These little hollows are just like baskets, and he carries the pollen home in them just as we carry our

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food home in a market basket. The bees fly from one flower to another until they have filled both their baskets with pollen. As they do this some of the pollen from one flower is brushed upon the stigma of the next flower as I told you it must be if we are to have any more seeds to plant. Watch and see if the bees usually go from one lilac to another lilac and from one larkspur to another larkspur and from one clover to another clover or from a clover to a rose and from a honeysuckle to a petunia. I have read that they go from a rose to a rose and then to another rose and then home, and next time to all clovers, but I wish you would watch and tell me whether this is so. When they fly home with this pollen it is stored away. Some of it is given to the baby bees for food and some of it is made into wax, of which the cells are made.

After men take honeycomb from the hive they sometimes take the honey from the comb. Perhaps you have had honey that comes in bottles instead of in the comb; do you remember any? Then they have the wax left which is used for a great many things. The hardest candles are made of beeswax, also dolls' heads are sometimes made of this, and I know you have seen it in my work basket.

On the under part of the body are four little wax pockets, and below the mouth is the honey bag. The lower part of the mouth is so wonderfully made that the bees can stretch it so as to reach to the bottom of the deepest blossoms. This rolls about and the nectar sticks to the hairs on it. Part of his mouth, the mandibles, the bee can use like scissors to cut his way into the

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flowers when he needs to, to tear the old comb, to work the wax into cells, and to feed the pollen to the young bees.

So when you see the bees buzzing among the flowers in the hot sun again remember that they are getting nectar and pollen to make into honey and wax, and bee bread for the babies at home. Remember, too, how they help the flowers and us.

When the cold weather comes they stay in the hive and sleep most of the time until spring comes again.

XXVIII

FISH

DID N'T we have a good time fishing? Was n't the water blue and the breeze cool? What fun it was to pull in the fish! I suppose people have always liked to fish, but how would you like to know that you would have no dinner if you did n't catch a fish for it? There have been times when people who lived near the water knew this.

Always there have been fishes; many kinds of fishes; some in ponds, some in rivers, some in lakes, some in little brooks, and some in the salt water, the ocean. Can you name any kinds of fishes that we eat that come from salt water? Most of the fish that the fishman brings comes from the salt water. He brings us fish sometimes with hard shells, what are those? Yes, clams and scallops and oysters. These and the lobsters all come from the ocean.

Did you ever see a fish try to breathe out of the water? Can a boy breathe in the water? Do you know why?

When we went fishing we had a pole and a line and on the end a hook, and we got into a boat and rowed along till we came to a good place to drop our line over, but one day when Brother went fishing he had no boat and no hook, line, or pole. He just stood on the bank of the pond and wished he had. Brother never likes to waste much time just wishing on a fine day when he can play,

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and so soon he went along the bank whistling till he found a birch tree, not very large. He took his knife, cut the tree, and trimmed off the branches. Then he fished, he told me — but only in his pockets — until he found a string. This he tied to the end of the pole. Under the edge of his coat collar he found a pin that he had “picked up for luck” the day before. This he bent and tied to the end of the string. On this he put a worm and then sat on the bank and fished in the pond until he got tired.

My, how he wished for a boat! He had learned to swim before we let him go fishing without Daddy or me.

While he was wishing, a log came floating inshore. He reached out with his pole and guided it in where he could reach it. Then he jumped on. What fun it was to float along, but he did n't have much luck fishing. He had all he could do to stay on the log, and it was n't many minutes before he was splashing along in the water trying to catch it again.

While he was splashing around, on and off the log, Roger and Gene came along and shouted, “Bring her in and we'll get some poles and push her along.” They had great fun sitting on the log pushing themselves about with poles, but they did n't dare go very far from shore because they tipped off so easily. Then they had an idea, and with great excitement pulled the log up on the shore and set to work. Roger ran home for some tools and they began to dig out the log. For weeks they worked on it all their spare time until they had hollowed the log so that they could sit in it as you can in a canoe. Then one fine day they slid it into the water and paddled around in

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their "dug-out." They went fishing more than once in this. One day when I went down to the pond to see where they were, I found them sailing in it. With a birch pole stuck up in front for a mast, to which they had fastened a big piece of cloth for a sail, the wind was blowing them along, while Brother sat at the back — stern, we say, instead of back of a boat — steering with one of the poles with which they had been pushing the dug-out along. Do you know what we call the front of a boat? The bow.

Daddy was much pleased with all this when we told him and he told the boys that when the first man went fishing he had neither boat, hook, nor line. He probably lay on a rock over the water and caught the fish with his hand. After he learned to make spears and bows and arrows he speared his fish or shot it. He learned to make his boat just as the boys had done, only for tools he had nothing but stones at first. Instead of digging out the logs often they burned them out. Probably his first sail he made by weaving grass or rushes together.

This was such a clumsy way of getting around that he kept on trying to make his boat better, of course. The Indians learned to use birch bark for their canoes, and after cloth was made the canoes began to be made of canvas as they are to-day, and instead of sticks we have fine varnished paddles. These canoes were made, not for the ocean, but for ponds and brooks and rivers, and were light enough to be carried from one to another.

The dug-out was too heavy for this. Some of these were hewed out of great cedar logs and would hold fifty people.

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One day Daddy took Brother down to the dock. [The dock is a place built for boats to tie to and for people to step on to and to unload whatever is brought in boats.]

A schooner had just come in with a load of fish from miles and miles away in the deep sea. What a fine sail-boat this schooner was! Brother thought of his log dug-out with a piece of cloth for a sail when Daddy pointed out five masts with different kinds of sails on each mast and named them from the topsail to the fore and aft.

He told him that there are schooners now with seven masts. These boats sail very fast when the wind is right, so when the fishermen get their fish they can bring it back quickly to the cities where people want it for food.

In the schooner were small dories, and Daddy told him that when they find good fishing ground men row out in these small boats and fish, sometimes a good way from the schooner and often all night. Then they row back to the schooner sometimes with the dory so full of fish that there is hardly room for the men. It is some task to get the boat back onto the schooner without upsetting it, especially if the sea is rough.

He saw them unload the fish, great barrels of cod and haddock and mackerel. Some of it was packed in salt and some of it in ice. These were loaded on to barrels or trucks and taken away to markets.

In the summer while they were at the seashore Daddy and Brother saw some fishermen busy one day on the shore by the little huts where they lived. They talked with them awhile and found that they were mending

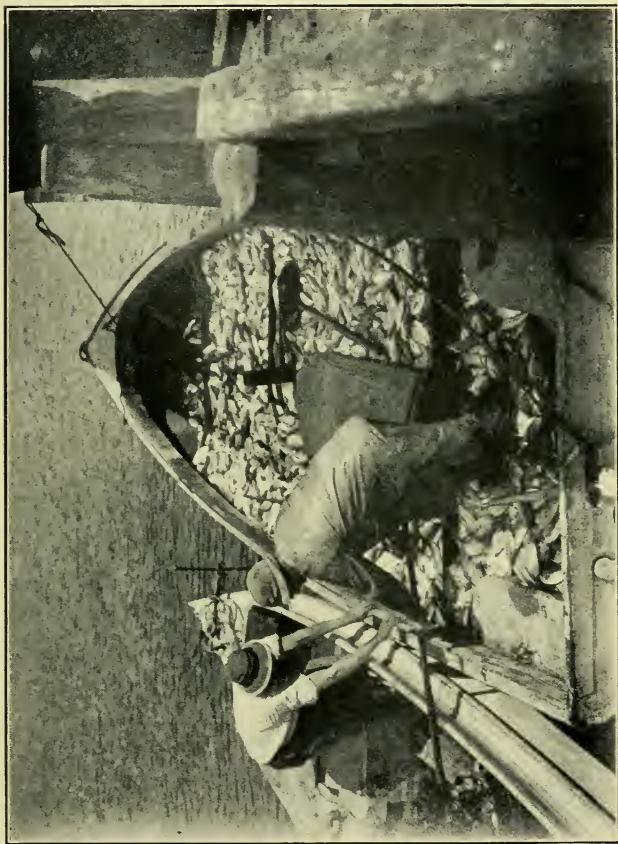
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fish nets. These nets are made of twine which is made from the stems of the hemp or flax plant, just as linen thread is made from flax. The twine is laid in lines; these lines are crossed by other lines of twine. Whenever the lines cross they are tied. Some of the nets are made with small squares; this is called a fine meshed net. Some are made with large squares and is called a coarse meshed net. All these nets used to be made by hand, but now like most other things machines do the work much more quickly.

Along one edge of these nets was a row of stones, some of them had little chunks of lead instead of stones, and on the other edge was a row of round corks tied on through a hole in the middle of each.

These nets are used to catch fish. The edge with the heavy stones or lead sinks and the edge with the light corks floats on the water. Just when men began to make nets we do not know, but we read many stories in the Bible of Jesus talking to the fishermen and how they cast their nets into the water. So we know it was long, long ago.

Men also learned to set traps made of sticks and catch many fish in these at one time. In the ocean there seems to be an endless number of fish, but in small streams fish like the trout and salmon are caught so fast that for fear there will be none left men take the eggs (did you know that fish lay eggs?), and, in places called fish hatcheries, hatch these eggs and care for the tiny little fishes until they are big enough to look after themselves, and then they put them into the streams again.



A BOAT LOAD OF MACKEREL

FISH

Men learned also to make hooks of all sizes and lines such as we buy in the sporting goods stores to-day.

Trawls are used in deep-sea fishing; these are long lines to which shorter lines, each with several hooks, are fastened.

Lead is fastened to the end of the long line so that it will drop deep down in the water. The shorter lines to which the hooks are fastened are some short and some long, so that they will catch fish in different depths of water as they trail along. The hooks are all baited and the long line coiled around in tubs. This keeps it from tangling until the fishermen are ready to drop it overboard. One schooner will carry miles of trawl with from 10,000 to 15,000 hooks.

When we have our salmon, or broiled mackerel, or codfish cakes served so daintily with a sprig of parsley or a slice of lemon, we never have a thought of the times when men had only their hands to catch their dinner and only a log for a boat to go after the deep-sea fish, nor do we think of the fisherman's family watching for his schooner to come into sight so that they will know he is safe at home again, after a long sail on the sea, often in cold, stormy weather, when the waves rise high above the boat and great skill is needed to keep it from dashing onto the rocks.

But the fisherman has his reward for his courage and good work, for he has the smell of the sea and the glory of the sunset, and a sense of the bigness and the wonder of the world, as he rides the great waves, trusting in their Creator; his family, too, have their reward for the sorrow of parting as he went on his dangerous trip, in

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the joyous reunion when he sails in with a "good catch." It's always hard to have Daddy go away, but if he did n't go we could have none of the fun of his getting home, could we?

XXIX

THE COMPASS

I REMEMBER when Brother was first old enough to join the Boy Scouts. How proud he was when he could pass all the tests and get his uniform. He had to know how to tie different knots, build a fire and cook, and a lot of other things beside.

One day he said, "Mother, will you see if I can box the compass? The Scout Master said we must learn to do it"; and he put something in my hand that looked at first like a little watch with a glass face. Then he began, "north; north by east; north northeast; northeast by north; northeast; northeast by east; east northeast; east by north; east; east by south; east southeast; southeast by east; southeast; southeast by south; south southeast; south by east; south; south by west; south southwest; southwest by south; southwest; southwest by west; west southwest; west by south; west; west by north; west northwest; northwest by west; northwest; northwest by north; north northwest; north by west; north."

How you laughed as he rattled these off as fast as he could talk! As he talked I looked at what he had brought me, and through the little glass face I saw a flat, steel needle, swinging over a little, round card with letters and marks and numbers on it. I noticed that the letters stood for the things that Brother had been saying when he "boxed the compass."

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As the needle swung, it pointed to these letters, and when one end pointed to "N," which stood for North, the other end pointed to "S," which stood for South, and on the middle of the right-hand side of the card was an "E" for East and on the left a "W" for West.

Brother said that the Scout Master wanted every boy to have a compass and hang it on his belt when he went into the woods so that he could find his way out if he were lost.

He told them that if they did n't have a compass, but had a little magnet, like the little horseshoe magnet that Father brought home for you to play with, they could rub a steel needle on that and carry it with them in a little bottle. This they could balance on a splinter of wood in a cup of water and the ends would swing around and point North and South.

Of course Brother learned long ago which corner of the house faced North and which South, which East and which West, and when he goes out in the woods he knows in which direction from home he is going.

Before I let him go to the store alone, I taught him to tell me his name and Father's name, and what street he lived on, and what number our house is, and what town he lives in, and what state. It was hard for him to say all this at first, and it was fun to hear him try. See if you can do it.

Before I let him go out into the woods alone, I taught him that the side of our house where the sun first shows in the morning is toward the East, and where we last see it at night is toward the West. Then, if he stood with his right hand toward the East he would be facing

THE COMPASS

North, and his back would be toward the South, and always to think when he went into the woods whether he was starting North, South, East, or West from home.

Another thing that helped him to learn North, South, East, and West was the weather-vane. He had a little sailor boy in a canoe, with paddles in his hands, on the piazza railing. As the winds blew these around, the little boy in his canoe sometimes faced one way and sometimes the other. I would look at him often and say, "Why, the wind blows from the East, so it will rain to-day," or, "The wind is South, so it will be warmer," or, "The wind is North, and it is so cold we may have snow," or, "The wind is West and the sky is clear, and it will be a nice day for a picnic."

But now he is a Boy Scout and carries a compass and can tell more than North and South and East and West. He can tell all the points between, and knows that if he is at the schoolhouse he must go North to get home, but not straight North. He must go a little bit to the East as well, and he calls that Northeast.

I want you to learn East and West first, and then, when you are as old as Brother, you can be a Scout, too, and learn to "box the compass"; that is, name all the points to which the needle can point.

There are places where you will need the compass more than in the woods, for in the woods there are things which you can learn to follow, and in the place of which I am thinking there is nothing but sky and water. Do you know where I mean?

Yes, on the ocean, and every ship has its compass. Out of sight of land on the ocean there is nothing to

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guide the ship but the sun and the stars, and the sailors depended on these until they learned to make and use a compass.

On stormy days and nights, when they could not see the sun and the stars, they had nothing to go by. So the compass is a very important thing on a ship, and it is made large and kept in a brightly shining case, called a binnacle, where it is watched day and night by the men who steer the vessel. The next time we go on a boat we will try and see the ship's compass.

XXX

COOKING

HOW would you like to eat all your food raw? Before people learned how to cook that is what they did. For there was a time when people did n't know how to cook or how to build a fire. If they had seen a stove which to use you have only to press a button, as you do with our electric stoves, they would have thought it magic and probably have run away from it frightened. When we read stories about the people who lived ages and ages ago we find that their houses were not as good as the homes which men now build for their animals and that at first they ate their food raw as wild animals do.

Those people of long ago were afraid of fire. Probably the first fire they saw was set by lightning as it ran down a tree in the forest. Once I saw a fire in the woods running from tree to tree. Men fought it so that it would not spoil the whole wood lot and kill every living thing in it or spread and burn a house just beyond the woods. The sparks flew and set fire to whatever they fell upon. How it roared and crackled and scorched if I got near. Then I understood why they feared it. Animals are still afraid of it and run from it.

Men learned after a time to keep it in the place where they wanted it; to make it when they needed it and to use it to warm them and to cook their food. Animals have never learned to do this.

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First men learned to put out fire so that it would not burn them and destroy their things. Then they learned how to make fire. Then in long, long years how to use it. Think what we do with it now.

At first their only fire was an open one on the ground, just like the one you have seen us build when we had a picnic and roasted our meat on a forked stick over it. What fun it is for a picnic! But we took the sandwiches and cake and other good things along in a basket. We could n't cook those over that fire.

Then do you remember how the smoke got in your eyes? When it rained or the wind blew it was very hard to cook in this way.

So after a while people learned to make a sort of oven in which they could roast things. They dug a hole in the ground and lined it with stones. Then they built a fire on the stones. When stones get hot they keep hot a long time and will heat or even cook things that are close to them. I should like to have seen the first man who saw a red-hot stone drop into some water and make the water hot. I have read that people used to boil food by putting hot stones into the kettle. There are places where the water comes from underground springs that are so hot that the water boils as it bubbles out of the ground. Perhaps sometime we can go to the Yellowstone Park and see one of these boiling springs and boil some eggs in it. Would n't that be a jolly place to have a picnic! Perhaps that is where the idea of boiling food first came from. At any rate, hot stones make whatever touches them hot as well as water, and so, after they had heated these stones in the hole that they had

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dug, people used to wrap whatever they wished to roast in leaves or skins and cover it in the red-hot hole until it was cooked. At many camps they do this now. At the logging camps, where the lumbermen stay when they are cutting wood, they often have what they call a "bean hole." It is made just like this, and in it they put pots of beans to bake.

Do you remember our clambake on the beach? We built a fire among the rocks and when they were very hot let the fire burn down to red coals. Then we covered the rocks with seaweed and put the clams, lobsters, and corn in, covered them with more seaweed, and left them until they cooked. It was great fun, we thought. The air was so sweet and the sky so blue and the waves lapped up on the beach. All we had to do when we had finished eating was to pick up things and burn them in our fire. No dishes to wash and no floor to sweep, and the great white gulls circled over our heads and laughed with us. Do you remember Daddy drew a deep breath as if he were drinking the wonderful sea air and the fragrance of the pitch pines as he feasted his eyes on the misty loveliness of the sea lavender and said, "Oh, yes, men have learned a lot and made wonderful things, but I wonder if it is n't better to live here in the open where the air is always pure and sweet than to shut ourselves up in musty houses and spend our lives dusting and cleaning the things which we put into them."

Then do you remember how gray the sky grew and the clouds rolled up and the waves began to roll in? How chilled we got as we rowed home! Was n't it good to cuddle down in the easy chair in a cozy warm room

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by a fire that did n't smoke and make our eyes ache, while Daddy read us a story? And did n't the supper taste good? How nice it seemed to have a clean, white cloth and pretty china and shining silver spoons and knives and forks and a comfortable chair at a table where your plate did n't slide around and the dirt and bugs did n't blow into your food and the wind did n't cool your soup too soon!

Do you remember how the wind blew the rain against the window? But Mother, all warm and dry, had no trouble with her cooking. The rain could n't reach the fire in the stove in her kitchen and the wind could n't blow the smoke in her eyes, for a stove pipe went from the stove to the chimney and all the smoke from the fire went through those straight out of doors and could n't get into the room.

She did n't have to heat rocks either to make the kettle boil. Just think how wonderful her stove is! There's a box for the fire, and she can put on coal and shut up the drafts and the fire will burn for hours without even looking at it again. Then there is the oven in which she can bake all sorts of good things. What does Mother bake?

On the top of the stove she can boil three or four things at once, and in the double boiler she can steam the cereal and pudding and things which are better when they are cooked for a long time.

In some countries, to this day, they have no stoves and have not yet learned to cook, but in other countries they learned to cook and serve wonderful feasts long before any books were ever written. You will learn about

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those things when you are old enough to study history.

In our country the Indians built fires in their tents, or wigwams, as they called them, right on the floor. Their floor, you remember, was the ground. The smoke, most of it — part of it blew in their eyes — went up through a hole in the top of the tent.

The first white people built an open fireplace in their houses, and a chimney from this through the roof. Over this fire they had cranes, long pieces of iron, on which they hung great iron pots and kettles and in these cooked their food. Then they built an oven in the chimney beside the fireplace with a door in front. In this oven, which was like a big box built of stones or bricks, they built a fire. When it was hot they swept out the ashes and put in whatever they wished to bake. Sometimes if it did n't keep hot long enough they had to take out the food and make another fire.

After men found coal in the mines and learned to get and use it, they made stoves in which they could burn it. Then they made big stoves or furnaces which they put in their basements. They made holes in the top of these and fastened one end of a great pipe to each hole and the other end to a hole in the floor of each room that they wanted to keep warm. Over the hole in the floor they put a register. This had small holes in it so that the heat could go through but no one could fall through. Then the whole house could be heated with one fire and all the dirt of the fire could be kept in the basement instead of in each room.

When they found coal men also found oil and gas. Some time we will talk about where they come from.

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When they learned that these would burn and give heat they made oil stoves and blue flame and gas stoves. With these you have only to touch a match and they burn, and when you need them no longer turn a little handle; no wood to cut or bring in and no ashes to carry out as in the wood or coal stoves and fireplaces.

Men watched the lightning and after many, many years and many, many men had thought and tried and tried and tried they learned what caused the lightning flash and named it electricity. Finally men learned enough about this great force to make it work for them. So to-day we have electric stoves, the most wonderful of all the things which have been used to cook food. Just press a button on one of these stoves and you can boil or steam or fry or roast or bake anything which you have to cook. There is a wonderful story in the Arabian Nights about Aladdin's Lamp which I will tell you some time. It is a fairy story, but I don't believe you will think it any more wonderful than our electric stove.

In the olden days men used to worship Fire. They did n't know what it was or where it came from but they said it was a gift from the gods. We do not know to-day what fire is, but we do know that if we are not careful of it, it is a very terrible and cruel thing, but if we are careful and learn how to use it, it is one of our best friends and helpers, in very truth a "Gift from the gods."

XXXI

FIRE AND SMOKE

By C. H. Claudy

WELL, Little Son," said Old Pops, settling himself on the small of his back in the big chair, so Little Son could sit on his lap, "Well, Little Son, what is the big puzzle to-night?"

[Think what it would mean if each father or mother took Little Son or Daughter upon his or her lap in the evening for a few minutes — THEIR FEW MINUTES — and allowed just one question. Suppose this question were answered so intelligently and so simply that the child could understand and be satisfied. What a bond of sympathetic understanding would grow up between parent and child.]

"The big puzzle," he said slowly, "is a very big puzzle. This is it: 'Why is fire bright, and what is smoke, and why does fire make smoke, and why is fire fire anyway?'"

Little Son had been thinking up that question all day. There were so many kinds of fire. There was the bright fire in the fireplace, and the little fire on a match, and the blue fire in the gas stove, and the red fire on the Fourth of July, and the green fire on the beach last summer, when the driftwood was burned up — and there was the white smoke from a cigar, and the black smoke from the chimney, and the blue smoke from a wood fire

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— it really was a good deal of think-work to get it all in one question. Little Son was proud of his big puzzle.

“Humph!” said Old Pops. “There you go again. Now we’ve got to travel on a great, great, great long journey and go away, way, way off, back to the time when Old Father Gravity first made a world out of the Mess. Of course, we could go farther off, but that is far enough. I’m afraid if we went any farther we might n’t get back in time for bed.”

Old Pops laughed at this, and so did Little Son. There was n’t much reason to laugh, of course, for Little Son knew that all the while he was taking that long journey he would really be right there, plastering up and down his Old Pops’ lap. Old Pops are sometimes rather foolish.

“All right,” said Little Son. “Let’s start.”

So they started.

“Away back in the time when Mother Nature and Old Father Gravity first came to agree on what they would do with the Mess,” began Old Pops [this refers to the story about the beginning of the world in the book from which this story is taken, “Tell Me Why Stories about Mother Nature,” in which he explains what gravity is], “there was a great deal of bother about things that would n’t do as they should do. The fish for instance did n’t want to be fish. They thought they would rather be birds. And the birds were n’t a bit satisfied — they thought they’d rather be fish. And the animals were n’t satisfied either — some of them wanted to be people! And then the other things, too — the water that wanted to run up hill, in spite of Old Father

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Gravity, and the mountains that did n't want to stay mountains, and the air that did n't want to stay air, but wanted to get into a lot of things where it had no business — Mother Nature found her nice round world that Old Father Gravity made, very unruly. All the living things and all the things that just are without being alive — they all wanted to do their own way.

“So after Mother Nature had had a few very serious times with her unruly children, she became first distressed, then displeased, and finally very provoked, indeed.

“‘This won't do at all!’ I suspect she said, although of course I was n't there. ‘I must have some rules that everything will obey — the birds and the fish and the animals and the rocks and the water and air and the stones and everything! Old Father Gravity does n't care as long as none of my rules interfere with him, and he is left alone in the Middlemost Middle of all to hold things down. But I care. Why, there is n't any order at all! It's all just as mixed up as it can be — or almost as mixed up. Therefore' — and I suspect Mother Nature thought a long time. But when she spoke, she spoke, I think, in a tone which made everything mind at once. There was n't any question about Mother Nature having her own way. And all the laws that she made were very wise and very good and sometimes very, very hard for us to understand. First she made it a law that fish should be fish and not birds. Of course, those that were half birds already stayed that way — and we have flying fish to this day. And of course those animals that were n't satisfied and wanted to be fish had to be left

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that way, just as they were and so we have whales, which are animals that live in the water, and seals and crocodiles and alligators and things like that. And the animals that wanted to be people — well, they only got as far as being monkeys, but some monkeys do look a lot like real people, and their hands are sometimes almost as cunning as a person's hands.

“But when Mother Nature said, ‘Now, this is the law,’ why, everything just turned in and minded.

“Now one of the Laws Mother Nature made concerned the air. This live part is called by a funny name — and we might as well call it by its name, even if it is funny. It is Oxygen. Oxygen had a great desire to go and live with lots of things that did n't want it at all! It liked to go and live with wood, and with certain kinds of gas and with animals. And when it did so, it usually first ate up the things it lived with, and then turned them into something else. Not at all a nice sort of person was Oxygen, until Mother Nature came along and made a Law for him.

“This was the Law.

“There are certain things you can live with all the time — plants and animals and everything that lives and breathes and moves. And while you can change them and eat them up, you must do it very, very slowly, so they can have plenty of chance to grow as fast as you eat! And there are other things you can live with only once in a while. The time you can live with them is only when you get Friend Heat to come and introduce you. Friend Heat is wise, and if he says you can, you can — and if he says you can't, you can't.

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“So Oxygen just had to do as he was told.

“But he commenced to look around at once for Friend Heat. Now Friend Heat comes from the Sun, and from Lightning, and is n't this funny the meal Oxygen makes off what he lives with! But Friend Heat has many forms and in turn he made a law, and he said:

“‘When I say you can live with Tree, or Wood, or Coal, you must let the people that will be in the world know it, so that when I come out they can use me. And to do this you must shine brightly, as much like the Sun as you can. And I will call that bright shining by a new name — Fire — and whenever you live with anything I say you can live with, there shall be this bright shining thing. And where that is I shall be, too.’

“By this time Oxygen did not know just where he was, or what he could or could n't do. So he begged Friend Heat to tell him something he could live with and let him find out. And Friend Heat asked Mother Nature to help him, and, sure enough, down came a bit of lightning out of the sky, and Friend Heat in it, and straight away Oxygen and a Tree began to live and play together. And true to his promise, there was the bright and shining thing like the sun — the Fire. And wherever and whenever Friend Heat had made Oxygen and the Tree to live together, there was Fire and there was Friend Heat.

“Now, we have to go back a little. One of Mother Nature's first laws was this:

“‘Nothing must be lost. There is only just so much in the world, and there must n't be any loss. I've got to

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do with what I have, and I can't afford to throw away any of it!'

"So when Oxygen and the Tree lived together, and the Fire came, and the Tree was what we called 'burned up,' both the Tree and Oxygen knew that they had to obey Mother Nature. So while there was n't any tree when Oxygen and Fire got through, the things the Tree was made of had not been lost. Some of them were down on the ground in the form of Ashes — and some of them were up in the air in the form of Smoke. And some of them were left on what was left of the Tree in the form of Black Charcoal. And if Mother Nature had cared to, I have no doubt she could have found out that every bit of the Tree and Oxygen were still on the Earth or in the air.

"But I don't suppose she did, for she was busy doing something else.

"'Here you Ashes,' she said, 'you get to work. I've sent for Wind, and when he scatters you, you set to work and help some plant to grow. And as for you, Smoke, up there in the air, why you can have a little playtime, but then you just settle down on the Earth and help something to grow, too. If you and Oxygen and Fire and Tree are going to play, you've got to get to work in between times.'

"And it has been that way ever since. We can't really burn anything up so it is no good any more. We can burn it up so it's no good to us, but somewhere, and somehow, and sometime, it will be good for something else.

"But I am forgetting about the Smoke. You see,

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Mother Nature told Oxygen what he must do, and told Friend Heat what he must do, but she did n't say what everything else must do with them. So there were some parts of the Tree that thought they'd rather play by themselves than with Oxygen and Fire — thought they'd rather go up in the air than down on the ground as White Ashes. So they struggled and fought and got loose from the Tree as Oxygen and Fire were playing, and because Friend Heat always goes up before he goes out, they just hung on tight to him, and climbed up in the air with him. And there the Wind got them, these tiny, tiny parts of the Tree, and whirled them away until finally they got tired and dropped to the ground again — and it has been so to this day. And that is what Smoke is — tiny, tiny pieces of whatever it is that is burning up, which have gotten clear away from Oxygen and Fire and Friend Heat, and are taken up into the air. For Friend Heat, like all of Mother Nature's people, plays fair. He does his best to make Oxygen and Fire and Wood and Tree and Coal play together and change each other and have a good time, but when he finds that some part of Coal or some part of Tree is anxious to play by itself without Friend Heat or Fire, he says to them:

“Jump on — I'm going straight up in the air — and if you can get up before Fire and Oxygen get hold of you, I won't stop you!”

“And so we see Smoke nearly every time we see Fire — sometimes we see Smoke when we can't see Fire — and that is when Oxygen and Fire and Friend Heat get tired and worn out and just work hard enough to loosen

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up parts of the thing that's burning and not hard enough to change it into White Ashes.

“And, of course, the less hard Fire and Heat and Oxygen play, the less hot the Fire is, and the harder they play the hotter Fire gets. That's why the blue flame of the gas stove is hotter than the yellow flame of the firelight — because there they are playing so hard that the smoke is burned up! And they played so hard because Man has arranged the gas stove so as to get ahead of Gas. The stove is made so that Oxygen gets all mixed up with the inside of Gas, instead of just waiting to play on the outside as he must do with wood in the fireplace. And so Fire is hotter and Smoke is all burned up, and the ashes are all burned up, too!

“And so now you know the answer to the Big Puzzle of to-night. You know Fire is the bright Light we see when Oxygen and Tree or Oxygen and Coal are living together, and that they have been told they could by Friend Heat. And you know that Smoke is little, little tiny, tiny pieces of Tree or Coal or whatever it is that is burning, getting away to play by themselves in the air. And you know that Ashes is what is left of Tree or Coal, that Oxygen is tired of playing with or living with. And most of all you know, that though Tree burns and Coal burns and goes away in Smoke and Friend Heat and Ashes, it is n't really gone from the world, but is out and free, and that sometime, somewhere, somehow, it will come down to the earth again and be of use to Mother Nature.

“For that is one of the greatest of her Laws that she

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made to rule the world and make all the things in it live and be together for good."

"Well, but, Pops," said Little Son, "why did —"

"I don't know," said Old Pops, smiling and looking at his watch. "I don't know. All I know is that we have had the big Puzzle and taken a long journey, and that my middle is most broken in two with you sitting on it, and that there is Mamma looking over the banister and saying something about a bed and a Teddy Bear!"

And so I don't know, any more than you do, just what Little Son wanted to ask when he said, "Why did —"

XXXII MATCHES

FIRST men learned how to put out fire so that it would not burn them. Then, when they found what a blessing it was to them, after they had learned to use it they learned to make it when they wanted it.

To-day, when we want to start a fire, what do we do? I am glad you said that: "Ask Mother if we may." I hope you will always do this, for fire can burn you badly and has burned many a little child to death who has played with it when his mother did not know. Many a house has been burned, and I know of one little boy who set the barn on fire just because he lighted a match there and dropped it. He did n't mean to do any harm, but the match dropped in the hay and before he could stop it or get help the whole building was on fire. If he had only asked Mother first. Some other little boys whom I know tried to roast potatoes once in the hay mow and the whole barn burned, and how the cows and horses suffered!

But what do I do when I want to start a fire, or sometimes when I am watching and let you start it, what do I give you to start it with?

Yes, a match. This is a little piece of wood with something on the end which lights when you rub it against something rough. When we touch this little flame to dry paper or chips or shavings the fire flames up and kindles the wood.

MATCHES

Now it is a simple matter to start a fire in this way, but not so very many years ago men did n't know how to make matches.

When we went on a picnic Daddy had plenty of matches in his pocket and in a second after we had laid the fire it was lighted. The day that Brother went with the boys he forgot his matches. He wanted to roast his potato, so they said to him, "Be a good scout and start a fire without any match." So he started his fire in the same way that the Indians did, for they had no matches either. He found some dry grass and two dry sticks. He rubbed the two dry sticks together till his wrists ached and drops of perspiration ran off his forehead and his cheeks were as red as the fire he was trying to make. Then he threw the sticks down and began to whistle while the boys laughed and said, "Be a good scout and eat 'em raw." Then he tried rubbing the two sticks together again. I won't tell you how many times he stopped and whistled, but before the ends of the sticks became so hot that they made a little spark of fire was long enough to prove that if a good scout never gives up then he is a good scout. This spark of fire he held against the dry grass which he had ready and the grass began to burn. Quickly he whittled some shavings from a dry stick of wood and put them on the burning grass. Then, as the shavings blazed up, he put on dry twigs and branches of pine wood and the boys shouted, "Hurrah for a scout who can build a fire without matches. You sure are a 'heap good Injun boy.'"

The Indians found other ways to light a fire. They

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made a fire-stick. That was a piece of board with a row of holes in it which they rested upon the ground, and a stick which was whirled in one of the holes. Around the holes they placed strips of dry bark from the trees, or pith.

Pith comes from the inside of plant stalks. Cut open a golden-rod stem, or a sunflower stalk or almost any of the weed stalks that have heavy stems, and you will find some pith. Perhaps you will like to play with this pith as I did when I was a little girl. I used to take a glass rod and rub it with a silk handkerchief and then hold it over the pieces of pith. As I moved the rod back and forth the pieces of pith would dance and come up to meet the glass.

As the Indians whirled a stick very fast in one of the holes in the board it got hot enough to light—ignite, we say—the dry bark, or pith, and with this they could start the camp-fire.

The Eskimos improved this a little. They used the same kind of a fire-stick, but at the top of the stick which they whirled they set in a little piece of bone and above this a piece that they could hold with their mouth. They wound a strip of skin, a thong, about the stick and fastened this to a bow, like your bow with which you shoot arrows. With the point of the stick in the fire-stick and the other end in his mouth the Eskimo whirled it around with the bow instead of whirling it with his hands.

When the white men came they brought with them a still better “strike-a-light.” They had a little skin pouch, something like a tobacco bag, in which they car-

MATCHES

ried the dry bark or pith. They had also the end of a horn. You have seen a cow's horn? This was filled from the pouch which kept the pith dry. This pith they called "punk." They held the horn in one hand and with the other struck a spark into it by hitting a piece of a file on a piece of flint. Flint is a very hard stone, and you have seen a file in my tool-box. Did you ever see a horse strike a spark by hitting his iron shoe on a hard stone in the road when he was running? They found other ways, too, to strike a light. Whenever we have a chance to go to a Museum anywhere we will see if we can find any of the things people used in those days before we had matches or just pressed a button when we want heat or light.

Of course, when it was so hard to start a fire people were very careful not to let it go out. If by chance they did they used to send the children to the neighbor's, perhaps he lived a mile or more away, with a pail to "borrow" some live coals. How would you like that?

After a while men learned to make what they called a slow match. This was made by twisting a long rope of bark, usually cedar bark. This burned very slowly and could be kept for hours when they went out for a trip.

Always wishing for an easier and better way to light a fire, after many years a match was made, but it was not such a match as we have to-day. To light it the head had to be put in a little bottle of acid. Of course it was a bother to carry a little bottle around all the time, so a better way had to be found, and now we have a match that we can light by just striking its head. How pre-

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scious they would seem to the people of old, and yet they are made in such quantities and are so cheap to-day that we even waste them and leave them about so carelessly that they have started many a fire which has burned valuable buildings and whole families before it could be put out.

To make them, narrow strips of wood are cut, split, and rounded off. (Again dependent on the lumberman and the forest.) Then they are dipped in something called phosphorus and dried. Drying these inflammable — what does inflammable mean? — things is dangerous work, for they will not dry unless they are put in a dry, hot place, and if they become too dry or hot they will catch fire. To prevent this they are fanned while drying. When dry enough, so that their heads will not stick together, they are packed in boxes and shipped to the stores to be sold to you and to me.

Who makes the boxes and how they are carried is another long story.

CLOTHING

XXXIII
CLOTHING

“How proud we are, how fond to show
Our clothes, and call them rich and new!
When the poor sheep and silk-worm wore
That very clothing long before.

“The tulip and the butterfly
Appear in gayer clothes than I;
Let me be drest fine as I will
Flies, worms, and flowers, exceed me still.

“Then I will set my heart to find
Inward adornings of the mind;
Knowledge and virtue, truth and grace;
These are the robes of richest dress.

“It never fades, it ne'er grows old,
Nor fears the rain, nor moth, nor mould;
It takes no spot, but still refines;
The more 't is worn, the more it shines.”

ISAAC WATTS, “Our Clothes.”

WE know that people cannot live without eating, and so Mother's first thought is to feed you, to give you not things that will make you sick, but what will build up a strong, healthy body. Then, what must you have? Yes, clothes.

So next she plans your clothing. She wants you to be comfortable, not too warm and not too cold, not pinched anywhere by clothing that is too tight and not bothered by things so large as to get in your way.

At night, so that you can sleep more comfortably,

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Mother says, "Take off your clothes and hang them up nicely, and put on your nightie"; a thin, cotton one in summer and a warm, woolly one in winter.

Then she tucks you under some other clothes. Yes, the bedclothes. First there is a thick, soft pad and then a smooth, white sheet to lie upon, and over you she draws another cotton sheet and some warm, woolly blankets and then a pretty spread and perhaps a big downy puff, if it is very cold.

Now have you ever thought where Mother gets all these things?

Yes, you did go to the store with her one day when she bought these things; and when she paid for them she told you that Father could n't stay at home and play with you as much as you wanted him to because he had to go and earn all the money that she spent for our home and food and clothes and the things that we like to have. But where does the store-keeper get all these things? Can't you think?

Well, first, have you ever noticed how any animals are dressed? Are all the birds dressed just alike, and are the fishes dressed just as the birds are? What sort of a suit does the cow and horse and dog and cat and hens and squirrel, etc., wear? Can you think of any animal that lives where the Eskimos build their houses of ice and snow? The polar bear. And what sort of a coat does he wear? Yes, a thick warm coat of fur and white as the snow that he lives in.

Do all these creatures make or buy their clothes? Did you ever see a Mother Cow sit down and make a blanket for her little calf baby? Did you ever see a

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Mother Hen go to the store and get a little yellow puff for her baby chick? Do you suppose the Mother Squirrel says, when she whisks around putting away nuts for the long, cold winter's food, "Now I must make some nice warm mittens for my little Baby Nutkins before the snow flies"? And Old Mother Fish, does she say, "I must go and get my child a nice rubber suit, he's out in the wet so much"?

This makes you laugh, but none of these creatures run around in their bare skin. They are clothed and very beautifully, too, as you will see if you watch them and try to tell me all about their clothes and how often they change them, and how and why; and how many colors each one wears.

People make or buy their own clothes, you tell me; yes, and they always have, or have gone without any. I have seen pictures of people who live in countries where it is never cold who wear nothing and some who had pictures pricked into their skins; they were tattooed, they said; and some others who wore just a wide belt or sash. Yes, if people want clothes to keep themselves warm or to look pretty, they must find them for themselves and put them on, but who does this for the animals? Yes, God, who made them. And I want you to take walks and find out for yourself how wisely He has done this. See how their clothes are made for the places where they live. See how warm the polar bear's coat is and how much it is like the white snow where he lives so that he can hide easily if anything is chasing him. See how much easier it is for fishes to swim than if they were dressed like the birds, and so on.

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In winter WE put on warm clothes, now what do the BIRDS do? Some of them go south where it is warmer. We call that migrating; and when it gets too hot where they have gone and warmer here, what do they do? Yes, come back again. That is why we have different birds in summer than we do in winter. We will put a little shelf where we can watch it this fall; and keep crumbs and suet and nuts and sunflower seeds and perhaps some hay seed or scratch food on it, and see what birds stay with us this winter. Next spring, early in March, we will put a bird-house with an entrance hole an inch and a half in diameter — remember about that hole — on a high post, where we can watch it. We will keep a pan filled with water near by, in which they can bathe and drink, and see if we can find out what birds make their nests in a hole, what ones build in the shrubbery and vines; how their babies are clothed all summer; whether they ever change their clothes and how they keep them clean and whole. What do animals do?

Did you ever go to ride and get all covered with horse-hairs, and did Father say, “Old Dobbin is shedding his hairs or changing his coat”? Many animals do this. Do rabbits wear the same colored coat all the year? Did you ever see a snake shed its skin and come out all bright and shiny? Perhaps you have found his old one in the woods or used as a lining in a bird’s nest.

When God provided animals with their clothing and left man to find his own, he provided all the things that man would need to use and gave him a mind to think out the way to do this.

At first men knew no way but to kill the fierce beasts

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that tried to kill them and to use their skins, or furs, to cover themselves. In hot countries, where furs were too warm, they learned how to make cloth and then how to color or dye it. At first the cloth or skin was wrapped about the body in one piece like a robe. Robes are still worn in some places though many of them are not as simple as at first; some of them are richly embroidered.

Then needles and thread were used, in a clumsy way, to be sure, but it was a beginning of finer things. They slightly pointed the bones of fishes or animals and tied on the sinews and used a little bodkin made of stone to pierce holes before they could put in the stitches. How different from our bright, sharp needles of all sizes, and thread wound neatly on little spools, fine or coarse, cotton, linen, wool, or silk in just the color to match whatever we wish to sew. And a thimble! Look in Mother's work basket and see how many things have been made to make sewing easy and pleasant.

But that is only the beginning. How long it takes to sew a little seam by hand!

Men said, "This will never do." So they thought out a quicker way and invented a sewing machine. Even that was not quick enough, and to-day if we should go to a factory we should find not only machines for sewing, but machines for cutting the different parts of each garment, machines for making buttonholes, and machines for sewing on buttons.

Some time we will talk about where the buttons came from and how clothes were fastened together before buttons were made; and what we have besides buttons to use now.

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You will see no one running these machines as Mother does hers by pushing the treadle up and down with her feet. It is as different as running a bicycle is from running an automobile. Men or girls just guide the machines and do not have to push to make them go.

Each man or girl does just one kind of thing all day long, some cut out one part and some another, some make buttonholes and some just sew on buttons while others do nothing but pack the clothes and others mark on the bundles where they are to go.

It takes many people to keep a big factory running, but when those can be found who are willing to do this work day after day, enough clothes can be made so that every one in the world can be comfortably and well dressed and most of them never even see the machines that made the clothes they wear. All they have to do is to go to a store and buy whatever they need and perhaps wear it home.

Some one had to work, though. No food or clothes are found in the stores unless many people have worked hard to get them there.

So is it fair for us to go to the store with money some one else has earned and buy these pretty things and then do nothing but play?

Think how many have worked hard and long to give these things to the world. When you go with me to buy some pretty clothes, try to think of all the people who have helped just to make the thread with which they are sewed. See if cotton or linen thread has been used and try to think back of the factory from which it was sent to the store to the field in which it grew.

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Think of all who helped to plant and pick it and ship it to the factories, as well as of the men who invented the machines, the miners who got the iron and coal and other metals which are used in making machinery, and the long chain of workers who built the factory.

Then to count all who have helped just in the sewing together of the pretty clothes which we shall buy we must think farther back than the field in which the cotton or flax grew.

For you must remember that all of your clothing, as does your food, comes from plants or from animals, and that for the life of these we are dependent upon the sun and the rain without which nothing can grow.

It is well to give thanks to each of these helpers and to choose our own place among them, but we must not forget that there are some things that no man can do for us.

No man can cause the sun to shine or the rain to fall upon the earth.

XXXIV

WOOL

“Baa-baa, black sheep, have you any wool?
Yes, Sir, yes, Sir, three bags full;
One for my master, and one for my dame,
And one for the little boy who lives in the lane.”

DO you remember when you came in shivering and said, “Where are my mittens? There’s ice on the pail of water.” Do you remember the mittens were all wrapped away to keep them from the moths and dust through the summer and so you put on your cotton gloves? In a little while you came in crying because your fingers ached with the cold, did n’t you? Then Mother got out the woolen mittens and you played out in the cold all the morning as happy as could be. What other clothes did Mother get out that were made of wool? At what time of the year do we wear these woolen clothes? Yes, the cold time. Do you know any other name for the cold time? The winter. Some time we will talk about the cold time and the warm time and the time when the farmer plants his seed and the time when he gathers the fruit and the grain, but now I wonder why we wear woolen things in winter. Because they keep us warmer. Yes, the heat of your body is kept in better by woolen clothing than by any other. How many things can you name that are made of wool? Baby’s shirt and stockings; Father’s suit, and yours, too,

WOOL

Mother's and Brother's and our coats, and stocking caps and mittens and leggings and blankets and the rugs and Baby's soft ball, etc.

Did you see Grandma knit your mittens? What did she use? Why, yes, I forgot those myself; bright steel needles. So here again the miner's work has to be done before Grandma could do hers for us. But what else? "I helped her, too, I held the yarn while she made a big ball of worsted to knit with."

You remember, then, what the wool looked like before Grandma knitted it into mittens, and we will try to find a picture of how it looked before it was made into yarn. [Show a picture of sheep.]

That makes you laugh; I wonder why? Because this is n't yarn like that which Grandma used, but just an old sheep. If you could feel of his coat you would see that it is as soft and woolly as any of these warm things you have just told me were made of wool, and here is a piece of a sheep's coat for you to feel of and look at. Do you know what they call a baby sheep? Do you know what they call the coat of a sheep or a lamb? No, not a jacket, but a fleece.

Sometime I'll tell you a story that the old Greek people used to tell their children about a golden fleece. [See "The Golden Fleece," Volume II, "The Children's Hour."]

But your mittens were red or gray and your blanket is white and your suit was dark blue, etc., and not at all like this dingy-looking stuff. Well, just as it is a long story from the iron and the coal in the mine to the fire in the bright kitchen stove, so it's a long story from

TALKS TO CHILDREN

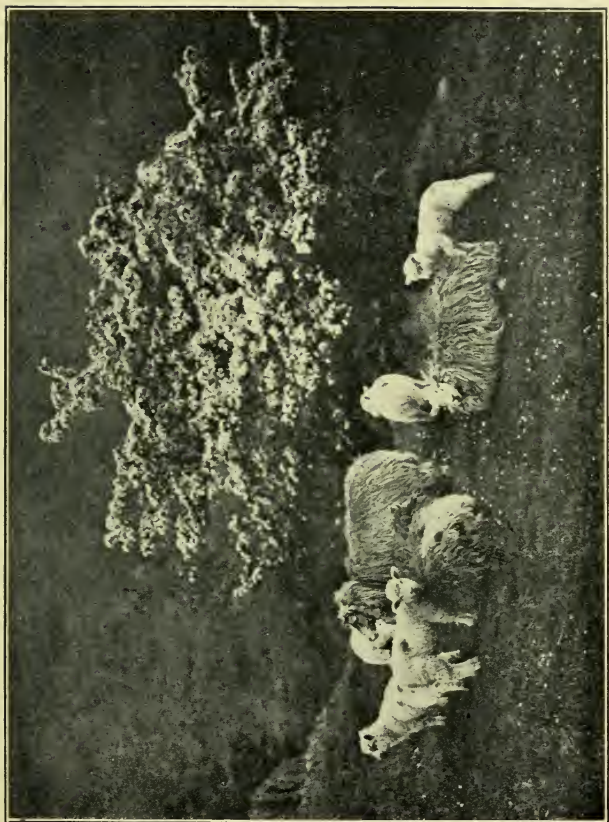
the wool on the sheep's back, the fleece, to your mittens and blankets.

When Grandmother was a little girl nearly every family kept a few sheep in their own yards. When the coldest part of the winter was over, just before they began to shed their coats as Old Dobbin does, so as not to be too warm in the hot days that come every year, just as you throw off your coat when days get warm, the men used to take the sheep down to the brook and scrub them clean, for they get their fleeces as dirty as you get your jacket, and sometimes they get them all matted together with burrs. We made baskets and nests with the burrs, you remember, and you saw how they cling. When they were dry, sometimes it took days for them to get wholly so, they took great shears (the miner helped here, too, you say) and sheared off their fleece. Every year they did this, for it grew again just as your hair does after you go to the barber.

The women then straightened it out with cards. A card is a square piece of board with sharp teeth and a handle. Drawn through the wool it acts like a comb and smoothes and straightens the wool.

Let us find a picture of what they used next. Perhaps you remember the one at Grandmother's or when we go to the Museum in the city again we will look for one — a spinning-wheel. You can find the place where the raw wool was put, I am sure, and as the wheel flew round and round the yarn was made.

Then it went to the loom, another machine — only a few families owned one of these — to be woven into cloth, or in many homes was knitted into garments by



SHEEP AND LAMBS

WOOL

hand with knitting needles like those you have seen used. Clothing made in this way was called homespun.

Of course, when people did all these things at home, there was little time for anything else. Think of all the books and papers, and theaters and clubs, etc., we have now. Why then even the children were kept busy on the farm and could go to school only a very few months of the year. And now think of the cities and how close the houses are in the big towns. There are whole families who never saw a lamb and many who have seen them only in parks, and their rooms are so small and crowded that they could n't get a loom into one. Of course, all these people cannot raise sheep enough to make wool for their clothes. They have n't yard enough to raise potatoes enough for one dinner. Some one else must supply them with clothing. Even the country people seldom make their own clothing now.

Great factories have been built and men have learned to use water to run machines. They have also learned to make steam and electricity do this for them in places where there are not great streams of water but where they want factories. Is this cheaper and easier than making them all by hand? Why? Can you think of any ways in which it might have been better to have done it all at home by hand in the old way?

The weaving of the cloth on these looms is quite the same as on the hand looms and that in turn is like the weaving of your little mats. If you ravel out a little piece of cloth you will see that there are threads running two ways. Those up and down are the warp, and those that go over and under are the woof. The woof is the

TALKS TO CHILDREN

thread that you draw through with your needle going over one or more of the warp threads or under one or more of the woof threads according to the patterns that you wish to weave. But remember that all weaving is the same, whether it is done on a great machine by water, steam, or electric power or by hand in a little mat. It is just over and under, over and under, the woof thread running through the warp threads. On your little mat you use a needle to draw through the threads but in the machines a shuttle is used. We will go to a factory some day and see the weavers work.

Just as the weaving and spinning is now done in great factories, so the sheep are no longer raised a few together on each farm, but in great flocks on ranches. We will read some time how these are tended by the shepherd, or herder as he is called, and how the dogs help to keep them from straying too far over the hills and plains where they might be eaten by the prowling animals, coyotes or mountain lions. The sheep are divided into bands of from a thousand to three thousand and once or twice a year the sheep are sheared. Very often now they are not washed before shearing; all this is done by bands of shearers who go from one ranch to another to do this work. They use clippers very much like those used to clip a horse and the fleece comes off much more quickly done by machinery in this way than when a man used the old-fashioned shears. One man can shear nearly two hundred sheep in a day. The fleeces can be washed much quicker after they have been cut. Then the wool is packed in bales and shipped to market.

But you say again that your blanket is white and your

WOOL

coat is blue and your mittens are red, and this wool from the sheep is not any of these colors. You are right. Men learned how to make dyes, which, boiled with the wool, would color it. Some of these came from plants and some, you remember, came from the coal tar that the miner found. We will talk about the dyeing and see how many colors you know some other time.

XXXV
COTTON

MOTHER must begin to make some thin clothes for summer; some blouses for Brother and some dresses and underclothes for you. See this pretty percale for the blouses, and is n't this a pretty gingham for a dress? And see, I found this calico in my box, and I'll show you how to cut out for your doll some aprons just like mine.

When I was a little girl my grandmother used to make all our sheets and pillow slips and sew them by hand; all the seams over and over. She used to ask me to sit on a little hassock in her room by the fire and learn to sew over and over on the long seams. She pinned the seams together and told me to sew between two pins each time. Usually she took it all out as soon as I had finished and told me to do it again the next day and make the stitches smaller and even. Then she would give me a peppermint that she had made. I learned to know just where she kept the box in the corner of her top drawer.

One day she asked me if I knew where the cloth came from that we were making into bedclothes, and then she told me all about it.

Every plant has seeds and these seeds are hidden away in some sort of a little box. Where are the apple-seeds hidden? In the core. Think of all the fruits and berries that you eat and where the seeds are hidden.

COTTON

Some time see if you can find the pine-tree seeds and the lilac-seeds and the seeds of each kind of flower that you have in the garden.

Now the cotton plant, which grows only in countries where it is warm all the year, hides its seeds in round pods. When the seeds are ripe, these pods, which look like brown nuts, burst open. Out of each one pops a bunch of white cotton. How pretty a great field must look with the soft, fluffy balls hanging on every stem; almost as pretty as when the snow clings to the trees in the country where the cotton cannot grow on account of the cold winters. Inside each little fluffy white ball, tiny black seeds are wrapped like babies in a blanket.

To make good cotton cloth these balls must be picked as soon as they burst, before the frost or the rain can spoil them. So men, women, and children, usually black ones, go out with great baskets and pick them. The sun shines warm, the sky is blue, and birds and negroes sing together as the baskets are filled and taken to the place where the seeds are taken out. It used to be a tiresome task to pick out all these tiny black seeds which cling tightly to the ball of cotton, but now a machine called the "cotton gin" has been made which takes them out very quickly and easily.

Then the cotton is tied in bales — big bundles, that is — and sent in ships to great factories to be spun into thread, which is wound on spools and sold. You often run over to the store to get a spool of thread for Mother.

Much of the cotton is made into cloth. As the cotton is spun it is wound on spindles and these spindles are put into the weaving machines.

TALKS TO CHILDREN

All weaving is done just as it is in your paper mats. A mat is made with the threads all going one way, and the threads are drawn, one at a time, in a needle, or many threads at a time in a shuttle, over and under the first set of threads. The pattern or weave of the cloth is not always alike, as you have seen in your mats. You can make many different patterns as you draw threads through, over one and under one, or over two and under one, or under three and over two, then under one and over one or two, etc. When the machine draws the threads through, how fast the shuttle flies! You can hardly see it, it goes so fast, and what a whirr it makes as it carries the threads back and forth, from left to right, from right to left! Some one has to watch each machine for fear a thread may snap or the wheels stop running or the shuttle become empty. That is why so many people work in the cotton factories.

When the cotton is made into thread and the thread is woven just as it is, we have unbleached cotton cloth. You have seen this. We made our sail from it. To make very fine white cloth, like our sheets and slips and dimity spreads, the thread is boiled and washed in powders to bleach or whiten it.

To make the cloth for dresses and aprons, etc., the cloth, as soon as it is woven, is run through a machine which clips off every uneven little thread and then run over a flame that singes off any little rough fibers. This is called "shearing" and "singeing."

Then it is either boiled with a dye to color it or figures are printed on it by running the cloth through great rollers on which the pattern has been cut and covered

COTTON

with dye of the colors the pattern is to be. Then the cloth is dried and cut into long strips which are rolled up and wrapped in paper and sent to the stores for you and for me and other mothers, who are fortunate enough to have such dear little girls, for whom to buy and cut out and sew together the pretty clothes for them to wear.

XXXVI

LINEN

“Oh, the little flax flower!
It groweth on the hill,
And, be the breeze awake or 'sleep,
It never standeth still.
It groweth, and it groweth fast;
One day it is a seed
And then a little grassy blade
Scarce better than a weed.
But then out comes the wax flower
As blue as is the sky;
'And 't is a dainty little thing,'
We say as we go by.

“Ah, 't is a goodly little thing,
It groweth for the poor,
And many a peasant blesses it
Beside his cottage door.
He thinketh how those slender stems
That shimmer in the sun
Are rich for him in web and woof
And shortly shall be spun.
He thinketh how those tender flowers
Of seed will yield him store,
And sees in thought his next year's crop
Blue shining round his door.

“Oh, the little flax flower!
The mother then says she,
'Go pull the thyme, the heath, the fern,
But let the flax flower be.
It groweth for the children's sake,
It groweth for our own;

LINEN

There are flowers enough upon the hill,
But leave the flax alone!
The farmer hath his fields of wheat,
Much cometh to his share;
We have this little plot of flax
That we have tilled with care.'

"Oh, the goodly flax flower!
It groweth on the hill,
And, be the breeze awake or 'sleep,
It never standeth still.
It seemeth all astir with life,
As if it loved to thrive,
As if it had a merry heart
Within its stem alive.
Then fair befall the flax field,
And may the kindly showers
Give strength unto its shining stem,
Give seed unto its flowers!"

MARY HOWITT, "The Flax Flower."

SHOW a piece of linen and a piece of cotton.] Can you see any difference between these? Can you feel any difference? [A very good game is to name, from feeling, different fabrics; cotton, linen, wool, silk, velvet, etc., and as he plays it is a very good time to find out how many colors the child knows.]

Let's wash and iron these two pieces, or two handkerchiefs or towels. [Don't name them to the child but be sure one is linen and one is cotton. Note how much better the linen launders than does the cotton. Then name the two.]

This is the linen and this is cotton. You have seen the cotton, and we have talked about how it was made into thread and then into cloth. Would n't you like to plant some of these shiny little seeds and watch the little

TALKS TO CHILDREN

plants grow that make the linen? We can plant some on a sponge in the house, and if we keep it moist in a sunny window you can see just how the little plants unfold and grow from these tiny seeds. You have seen these seeds before? Yes, I boiled some for medicine once when you had a cough, and once I made a poultice of them.

In the spring we will plant a little bed of flax in the garden. Imagine how beautiful a whole field of flax is with the tall, slender stalks, each one tipped with a pale blue flower, rising and falling like waves in the breeze. "Blue were her eyes as the fairy flax," sang the poet. When it has grown all that it will, we will pull a stalk and look at the strong fiber that runs all up and down the stem. This is what makes the thread. What do we make especially from the linen? Yes, handkerchiefs, shirts, collars and cuffs, napkins and tablecloths, etc. Andersen's story, "The Flax," tells you how the flax is made into thread and cloth, and so I will read it to you.

THE FLAX

By Hans Christian Andersen

THE flax was in full bloom; it had pretty little blue flowers as delicate as the wings of a moth, or even more so. The sun shone, and the showers watered it; and this was as good for the flax as it is for little children to be washed and then kissed by their mothers. They look much prettier for it, and so did the flax.

"People say that I look exceedingly well," said the flax, "and that I am so fine and long that I shall make a beautiful piece of linen. How fortunate I am! It makes

LINEN

me so happy, it is such a pleasant thing to know that something can be made of me. How the sunshine cheers me, and how sweet and refreshing is the rain! My happiness overpowers me; no one in the world can feel happier than I.

“To-morrow the sun will shine, or the rain descend. I feel that I am growing. I feel that I am in full blossom. I am the happiest of all creatures.”

One day some people came, who took hold of the flax and pulled it up by the roots. Then it was laid in water, as if they intended to drown it; and after that, placed near a fire as if it were to be roasted.

“We cannot expect to be happy always,” said the flax.

It was steeped, and roasted, and broken, and combed; indeed, it scarcely knew what was done to it. At last it was put on the spinning-wheel. “Whirr, whirr,” went the wheel, so quickly that the flax could not collect its thoughts.

“Well, I have been very happy,” he thought, “and I must be contented with the past”; and contented he remained till he was put on the loom, and became a beautiful piece of white linen. All the flax, even to the last stalk, was used in making this one piece. “Well, this is quite wonderful. I could not have believed that I should be so favored by fortune. How wonderful it is that, after all I have suffered, I am made something of at last. I am the luckiest person in the world, — so strong and fine; and how white, and what a length! This is something different from being a mere plant and bearing flowers. Then, I had no attention, nor any water un-

TALKS TO CHILDREN

less it rained; now, I am watched and taken care of. Every morning the maid turns me over, and I have a shower-bath from the watering pot every evening. Yes, and the clergyman's wife noticed me, and said I was the best piece of linen in the whole parish. I cannot be happier than I am now."

After some time the linen was taken into the house, placed under the scissors, and cut and torn into pieces, and then pricked with needles. This certainly was not pleasant; but at last it was made into little dresses for babies!

"See now, then," said the flax; "I have become something of importance. This was my destiny; it is quite a blessing. Now I shall be of some use in the world, as every one ought to be; it is the only way to be happy."

Years passed away; and at last the linen was so worn that the little dresses fell to pieces. "It must end very soon," said the sleeves to each other. "We would gladly have held together a little longer, but it is useless to expect impossibilities." And at length they fell into rags and tatters, and thought it was all over with them, for they were torn into shreds, and steeped in water, and ground into a pulp, and dried, and they knew not what besides; till all at once they found themselves beautiful white paper. "Well, now, this is a surprise; a glorious surprise, too," said the paper. "I am now finer than ever, and I shall be written upon, and who can tell what fine things I may have written upon me. This is wonderful luck!" And sure enough the most beautiful stories and poetry were written upon it, and only once was there a blot, which was very fortunate. Then people

LINEN

heard the stories and poetry read, and it made them wiser and better; for all that was written had a good and sensible meaning, and a great blessing was contained in the words on this paper.

“I never imagined anything like this,” said the paper, “when I was only a little blue flower, growing in the fields. How could I fancy that I should ever be the means of bringing joy to men? I cannot understand it myself, and yet it is really so. Heaven knows that I have done nothing myself, but what I was obliged to do with my weak powers for my own preservation; and yet I have been promoted from one joy and honor to another. Each time I think that the song is ended, and then something higher and better begins for me. I suppose now I shall be sent on my travels about the world, so that people may read me. It cannot be otherwise; indeed, it is more than probable, for I have more splendid thoughts written upon me than I had pretty flowers in olden times. I am happier than ever.”

But the paper did not go on its travels. It was sent to the printer, and all the words written upon it were set up in type to make a book, or rather many hundreds of books, for so many more persons could derive pleasure and profit from a printed book than from the written paper; and if the paper had been sent about the world, it would have been worn out before it had got half through its journey.

“This is certainly the wisest plan,” said the written paper. “I really did not think of that. I shall remain at home, and be held in honor like some old grandfather, as I really am to these new books. They will do some good.

TALKS TO CHILDREN

I could not have wandered about as they do. Yet he who wrote all this has looked at me as every word flowed from his pen upon my surface. I am the most honored of all."

Then the paper was tied in a bundle with other papers, and thrown into a tub that stood in the washhouse.

"After work, it is well to rest," said the paper, "and a very good opportunity to collect one's thoughts. Now I am able, for the first time, to think of my real condition; and to know one's self is true progress. What will be done with me now, I wonder? No doubt I shall still go forward. I have always progressed hitherto, as I know quite well."

Now it happened one day that all the paper in the tub was taken out and laid on the hearth to be burnt. People said it could not be sold at the shop, to wrap up butter and sugar, because it had been written upon. The children in the house stood round the stove, for they wanted to see the paper burn, because it flamed up so prettily, and afterwards, among the ashes, so many red sparks could be seen running one after the other, here and there, as quick as the wind. They called it seeing the children come out of school, and the last spark had come, and one would cry, "There goes the schoolmaster!" but the next moment another spark would appear, shining so beautifully. How they would like to know where the sparks all went to! Perhaps we shall find out some day, but we don't know now.

The whole bundle of paper had been placed on the fire, and was soon alight. "Ugh!" cried the paper, as it burst into a bright flame; "Ugh!"

LINEN

It was certainly not very pleasant to be burning; but when the whole was wrapped in flames, the flames mounted up into the air, higher than the flax had ever been able to raise its little blue flower, and they glistened as the white linen never could have glistened. All the written letters became quite red in a moment, and all the words and thoughts turned to fire.

“Now I am mounting straight up to the sun,” said a voice in the flames; and it was as if a thousand voices echoed the words; and the flames darted up through the chimney, and went out at the top. Then a number of tiny beings, as many in number as the flowers on the flax had been, and invisible to mortal eyes, floated above them. They were even lighter and more delicate than the flowers from which they were born; and as the flames were extinguished, and nothing remained of the paper but black ashes, these little beings danced upon it, and whenever they touched it, bright red sparks appeared.

“The children are all out of school, and the schoolmaster was the last of all,” said the children. It was good fun; and they sang over the ashes:

“Snip, snap, snurre,
Basse lurre,
The song is ended.”

But the little invisible beings said, “The song is never ended; the most beautiful is yet to come.”

But the children could neither hear nor understand this; nor should they, for children must not know everything.

XXXVII

SILK

“Silkworm on the mulberry tree,
Spin a silken robe for me;
Draw the threads out fine and strong,
Longer yet, and very long;
Longer yet — ’t will not be done
Till a thousand more are spun.
Silkworm, turn this mulberry tree
Into silken threads for me!

“All day long and many a day,
Busy silkworms spin away;
Some are ending, some beginning,
Nothing thinking of but spinning!
Well for them! Like silver light,
All the threads are smooth and bright;
Pure as day the silk must be,
Woven from the mulberry tree!

“Ye are spinning well and fast;
’T will be finished all at last.
Twenty thousand threads are drawn
Finer than the finest lawn;
And as long this silken twine,
As the equinoctial line!
What a change! the mulberry tree
Turneth into silk for me!”

MARY HOWITT, “The Silkworm.”

WE decided the other day that all our clothing came either from plants or from animals. Can you remember anything that we wear that comes from animals, and any things that come from plants? Which



POLYPHEMUS MOTH AND COCOON

SILK

of these came from countries that are cold all the year? [Flax.] And which from countries that are warm? [Cotton.] Now what do you suppose gives us the silk for your ribbons and dresses? Would you like to know where it lives? [Show a picture of the Polyphemus moth and caterpillar.] We will look under the oak, chestnut, or beech tree some sunny day in September, and we may find a great, beautiful, pale-green caterpillar. I know you will agree with me that you have never seen a prettier color and never knew that a worm or caterpillar could be so pretty.

If we do find one we will bring it home and put it in a box where it cannot get out but will have plenty of light and air; and watch it. We must be sure and bring home plenty of leaves of the tree under or on which we find it, and give it a fresh supply every day, until some time it will spin itself a warm covering and sleep; perhaps all winter. If we do not find the caterpillar under the tree we may find him rolled away in this covering, a cocoon we call it, and if we do we will bring it home and watch it. It will be a good plan to sprinkle it with water once in a while, every time it rains say, and if we are fortunate, just such a beautiful brown moth, as I have shown you in the picture, with one great blue eye in each wing, will burst out. Some men know all the moths by name, and when they see one flying about can say what family he belongs to, just as you know what the names of all your little friends are and whether it is Dana Draper or Dana Packard whom you see. This moth is Polyphemus; Telea is his first name. Some day I'll read you a story about Polyphemus, another story that the Greek

TALKS TO CHILDREN

people used to tell to their children, and if you listen and then look sharply at the big blue eye in each wing of your moth, perhaps you can tell me why he was named Polyphemus.

Now, while this is the silkworm which we find in America, not much of our silk is grown in America. Most of it is brought in great ships from France, Italy, China, Japan, and India, and grows in the warm parts of these countries. To-morrow I'll read you the story of the silkworm that lives there. If you would like to know about other moths and other spinners we will get some books that tell about moths and spiders and we will watch in the roads and fields for cocoons to bring home and find out more about them. You may have a box in your window with wire netting over the top if you wish, and we will make it pretty with mosses and whatever you like that we find on our walks, and in it we will watch all the cocoons that we find.

It was in China that silk was first made. A Chinese Empress, Yuen-fi — is n't that a funny name? — saw a worm feeding on the mulberry leaves. You know the mulberry tree we planted in our garden Arbor Day. How the birds love the mulberries! She saw it spin a tiny golden-yellow, peanut-shaped house and hide away inside. Then I wonder how she happened to think of it and plan a way to do it? She unwound the cocoon, which is what we call the house which the worm had hidden away in, then she made a sort of a loom and learned to spin into a thread this raw silk of which the cocoon was made. After a while many people in China learned to raise the silkworms and spin silken

SILK

thread and weave it into wonderful silks. Nowhere were such beautiful robes made as were these of silk.

Yuen-fi has been known in China ever since as "The Goddess of Silk," and every year when the mulberry leaves first appear the Chinese make offerings to her in their temple in Peking.

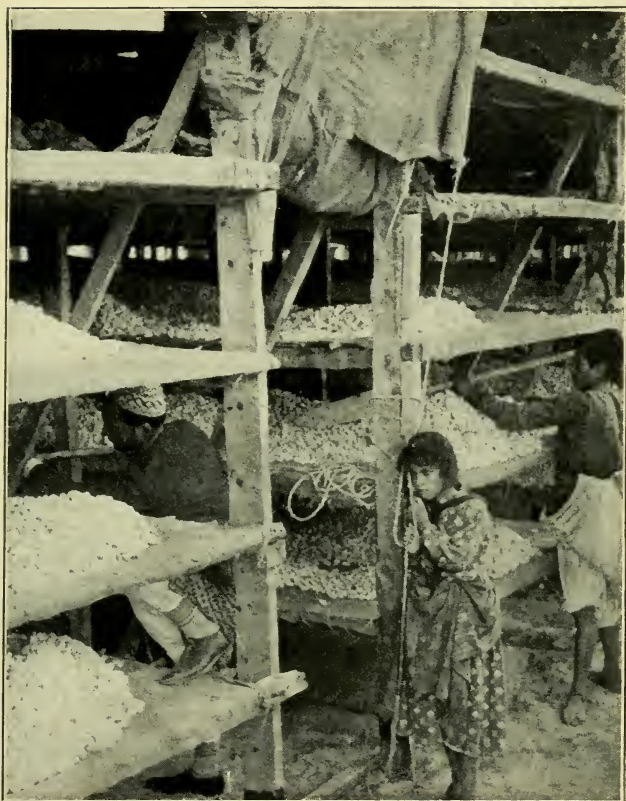
People all over the world have now learned how to make silk, and people in many places raise the silkworm and the mulberry trees for them to feed upon. The raw silk, as it is called, as it comes from the cocoons, is sold by men who raise silkworms as a business, and there are great silk factories where silk is made into cloth just as the cotton is in cotton factories.

Silk-raising is not easy. The little worms must be cared for most tenderly or they will die. They are so delicate that even too much noise will kill them. If the air gets just a little hotter or colder they will die, and they cannot even stand many odors. They will eat only the mulberry leaves. These must be only tender ones and warmed to just the same heat of the room in which the silk worms are kept. They eat more than any little boy, even, would believe they could. From the time the worm is born he begins to eat and keeps on eating steadily day and night. He has a pair of large jaws and makes more noise when eating than we think polite. He eats so much that about every five days he bursts his skin and it cracks off, leaving him in a larger one.

When he is about a month old he begins to spin his cocoon and hang himself up. Glands run the whole length of his body where the silk is made and these meet near the mouth in a spinneret in a place where he makes

TALKS TO CHILDREN

the thread which he winds up into his cocoon. If left to himself he will sleep for a month or so, and then burst a hole in the end and fly away — a moth, to lay eggs out of which in time will come more worms, to do as he has done. The silk raisers let the perfect moths do this, and that is how they keep getting more and more silk worms to make silk for them. If they want the silk they heat the cocoon very hot, which kills the moth quickly, for if he comes out he breaks the thread on the outside of the cocoon and spoils the silk. Then, as with the wool or flax or cotton, the silk must be reeled, spun, dyed, and woven into cloth before you can have your hair ribbon or silk dress.



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RAISING SILKWORMS

XXXVIII

LEATHER

OUR coats and mittens are made of wool, and where does that come from?

Our thin blouses and dresses and sheets are made of cotton, and where does that come from?

Our collars and tablecloths are made of flax, and where does that come from?

Now, what do we wear on our feet? What are they made of? Yes, our shoes are made of leather. Now, where does that come from?

It comes from the skins of animals. Sheep and cattle mostly, but skins of all sorts of animals and even fishes are sometimes used to make leather. Look at your shoes and look at a cow or a picture of a cow. They do not look much alike, but neither does a hair ribbon look like a piece of raw silk or a blouse like a cotton blossom, or a collar like flax.

When the animals are killed for food the skins are taken off and sent to a tannery, which is the name of the place where leather is made.

First they are salted, then put into great kettles, called vats, and soaked in lime and other things to take the hair all off. You know how hairy a cow's skin is. Then the skins are scraped and washed and soaked. To keep the skins from spoiling, and to make them strong so that the leather will wear well, they must be tanned. It was found out long ago how to do this.

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A liquid was made of water and oak bark, and the skins soaked in this for months; sometimes it took two years or more. Then it was found that the bark of some other trees, hemlock and chestnut, could be used as well as oak and the roots of sumac and palmetto. Now very often chemicals are used instead and the tanning is done in a few weeks.

Some of the animals have heavy, thick skins, and leather from these is used for the bottom, or sole, of heavy shoes. Look at father's tramping shoes and your play shoes and my slippers, and you will see how different the leather is in the heavy and light shoes and in the different parts of the shoes. Do you know what a baby goat is called? A kid. The tops of thin slippers are made from this skin. Kid is also used for gloves. Cowhide is heavy and is used for soles.

Before the leather is used it is colored. It is not dyed like cloth, but the color is put on with a brush.

Then the leather is tied up in great bales and shipped on trains or boats to market to be sold to people who make things of leather.

Can you think of anything we use that is made of leather besides shoes? [Gloves, harnesses, straps used in machines, bags and trunks, belts, pocketbooks, book bindings, etc.]

XXXIX

THE SHOEMAKER

THERE is a very old story of a king who lived before people knew how to make shoes. One day his horse fell dead, and he tried to walk over the sharp stones and briars. This was so painful that he decided not to leave his tent until there should be spread a carpet over the earth. All his people began to weave carpets and spread them on the ground. Then he went out but he soon came to the end of them and was angry.

At last one of his servants came and brought him a carpet for the whole earth that he might climb mountains and cross valleys and deserts and his feet need not be bruised or torn or scorched. This servant was not a magician. Now what kind of a carpet could he bring to the king in his hands?

I'll have to tell you that he had made the king a pair of shoes. Always men have needed something to cover their feet if they walked. In sandy, hot countries the sand would burn their feet if they were not covered, in mountains the rocks would bruise them, in the fields the brambles would scratch them, and in cold countries they would freeze.

What did the Indians make? Yes, moccasins of deer skin. Sometimes they made them very beautiful with beads and porcupine quills.

The Eskimos made fur moccasins, with leather lacings.

The Chinese and Japanese make shoes of straw or satin, and paint or embroider them.

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You have seen the wooden shoes which the Dutch people wear. In Museums we shall find collections of curious shoes worn by people in all parts of the world. People in our country have worn shoes made of leather, and for many years these were made by men called cobblers. Each cobbler had his own little shop with a bench at which he worked, or perhaps a bench in a room in his own house. He cut the shoes out with a pair of scissors. He cut out of wood a block shaped like the foot which he wished the shoe to fit. This is called a last, and over this he fitted the pieces of leather. Then with a little awl he bored holes in the leather. He waxed the ends of thread to make it stiff, twisted the thread into a point, and pushed it through the holes in the leather. This is the way he sewed the parts of the shoe together. Then out of wood he cut little pegs and with these fastened on the soles.

Now there are great shoe factories, in each of which hundreds of people work all day. Different machines cut out each part of a shoe. Then these parts are put together by other machines, and thousands of pairs of shoes are made and put into boxes and shipped to stores each day. Shoes enough are made for all the people — think how many there are in the world — to have them and made so quickly and easily in the factories that they can be sold for very little money. Think how many kinds of shoes we have now, heavy ones and light ones, high ones and low ones, and slippers of all kinds.

We will read Grimm's story of "The Elves and the Shoemaker," "Cinderella, or The Glass Slipper"; the story of "Goody Two-Shoes," and "Hans Brinker."

XL

RUBBER

WE have talked about the wool for our warm clothing, cotton and flax for thinner clothing, silk for our ribbons and best clothes, leather for our shoes, and now, what do we have to keep us dry?

Yes, rubbers and rubber boots and mackintoshes. [You know where these come from because you have seen my rubber plant.] We keep the rubber plant in the house in the winter. What would happen if we left it out in the cold? Yes, it would freeze, because it grows in warm countries, such as those in which the brown and black babies live. What did we talk about that we get from there? [The cotton.]

It is a tall, slender tree, as you see, with leaves shaped much like our chestnut leaves, though having smooth edges, and being much thicker and more glossy than any of the leaves in this country. How did we get the maple sugar from the maple tree? In much the same way we get our rubber.

Men bore holes in the rubber trees, and put in faucets. What runs out of the faucets? No, not water, but milk; the milk is not good to drink, though. It is thick like cream, and sticks like molasses. The men take some sticks covered with clay, and dip these into the pail of rubber milk, and then hold them in the smoke until the milk turns stiff like molasses candy; then they dip the stick in the milk again. Every time the stick is dipped

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in the milk, some of it clings, until there is as much on the stick as a man can lift; the stick, being covered with clay, is easily pulled out, but the clay stays in. These great bunches of hardened rubber milk are put into ships and sent to the rubber factories in Boston and New York and other large cities.

When the milk stops running from the faucet, another hole is bored in the tree, and the faucet put in the new place, until the tree has been milked three times, when it is left to rest for three years to make more milk.

This hardened milk is rubber, all smoky, you remember. In the rubber factory they put these great lumps of rubber against saws that whirl very fast, and saw them up into cakes. These are put in a machine and chopped as fine as hash, after which the smoke and clay are washed out, until it is white as milk again.

After being washed and chopped fine, it is pressed out in thin sheets and put away to get perfectly dry, which takes many months.

When it is dry it is ready to be pressed into balls; but other things have to be mixed with it to make it gray, yellow, or brown, as you see in things made of rubber; for it will always turn black unless something is put in to make it another color.

After the rubber is made, other great factories are needed to make the things which we use that are made from it. Perhaps some time we can go to one of these factories.

You must see how many things you can find each day that come from the sap of the rubber tree.

XLI

BEADS

WHEN Brother was a little boy there were no kindergartens in the little country town where we lived. So one day when I went to the city I took him with me to visit one. There sat the children all stringing beads. There were round ones like balls, which they called spheres; and long, round ones with flat ends, like the can which the baking powder comes in, only very small, which they called cylinders; and square ones, with a flat face on top and a flat face on the bottom, a flat face in front and a flat face in back, a flat face on the right side and a flat face on the left side, which they called cubes.

These beads were made of wood and were colored. There were red ones — find me something red; there were orange ones, like the orange which you ate for breakfast; there were yellow ones, the color of a lemon; there were green ones like the grass in the summer; there were blue ones like — can you think of anything blue? And there were purple ones, like the crocuses and the violets and Mother's sweater.

The strings that they made did n't all look alike, for some of them were stringing all red spheres; some of them were stringing all blue cubes; some were stringing yellow cylinders; some were stringing first a cube, then a cylinder, and then a sphere, all orange; some of them were making a rainbow of spheres, playing they were

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little raindrops and the sun was shining through them, and when they had put on their string, first a red one, then an orange one, then a yellow one, then a green one, then a blue one, and then a purple one, they held it over their heads in a half-circle like a rainbow and smiled through it as the sun shines through the raindrops and makes the colored rainbow.

Some of them were doing harder things, for they were stringing three of one color, then two of another, then five of another; then beginning with three of the first color again and two of the next and five of the next, and so on.

None of the strings were alike; some of them were very pretty, and some of the children were careless and made mistakes so that there was no number or color plan at all.

On the way home we went to a store and bought some beads, but we could not find any wooden ones, so we bought a box of glass ones. Oh, they were pretty! They were so shiny and all colors, not just the six clear colors that we saw in the kindergarten wooden beads. Those colors we have learned to call the six standard colors, for all the other colors that we have come from them, some lighter and some darker, which we call tints and shades. When we have all the colors together so that you see them as just one, we have white. When there are no colors we have black.

These little glass beads were black and white and all the tints and shades between. They were all sizes, some so tiny that when we tried to string them only the finest silk in the tiniest little needle would go through, and

BEADS

some so large that we used an elastic corset lacing, with the little metal end serving for a needle.

When Brother was tired of stringing I showed him how to make some beads himself. He took some modeling clay and made spheres and cubes and cylinders. Then with a wooden skewer, such as comes in meat, he made a hole through each. Some of these he left to harden in the sun and some of them he baked in the oven. Then with his water-color paints he tinted them different colors and strung some of these.

All the children that came to play with him loved to string beads. The little girls used them for chains for their dolls. Some of them made several chains and put them all on one doll. That made me think of pictures I had seen of people who had lived ages ago and of some who live now in different countries from ours. Some of these people, whose pictures had been taken by people who had visited these countries, wore no clothes, but they wore strings and strings of beads for ornament.

Some of them had no beads but had made chains of flowers or leaves. In other places they had strung small seeds, and others had made holes in shells and strung those for chains and belts.

In some places they string fish bones and walrus teeth and elephant tusks, some of which are wonderfully carved.

One of the chains which, next to a daisy chain, Brother and his little playmates loved best to make was a pine-needle chain. He took the long needles of the pitch pine and pulled out all but one, then tucked the end of this one in beside where the other end was fastened, slipped

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another needle through the loop thus made and tucked the end of that one into the second as before, and so on, until a long enough chain had been made.

One day as he was making new patterns with the glass beads, I showed him a bag which Auntie had covered with beads in a beautiful pattern.

He had such fun with his beads that I became interested, too, to see what a pretty pattern I could make with them, and I made beautiful cuffs and trimming for a whole dress with the bright little beads.

When we went to the city again we went to the Art Museum and asked to see what they had that people had made with beads, and such beautiful things we found. Eskimos and Indians, black people and white, Christians and savages, people before history and people of to-day had loved and played with and made beautiful things with beads.

The next thing Brother wanted to know was where these glass beads came from, and I looked in the Encyclopædia, a book which tells about most everything under the sun, and told him what I found out. It was this:

Glass is melted — we talked about how glass is made before — and some of it colored. Many beads are not colored. You have seen them the color of glass. Two workmen dip in long blowpipes and lift out what they can hold on the end of these. They blow down their blow pipes, much as you blow soap-bubbles. Did you ever join your soap-bubble to Brother's? They do just that with their glass bubbles and then walk slowly away from each other while the glass is still soft, pulling it out into a long, long tube. Sometimes the tube is large

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around with a large hole in the middle, and sometimes a tiny little tube is drawn out, according to what sized beads are to be made. Then the glass is cooled quickly, and the long rods are cut up into pieces about as long as your ruler.

These are put on a sharp cutting machine and cut into the size that the beads are to be.

These are heated again and whirled about with sand and ashes, then washed and strung. Then they are sent off to be sold.

These are the cheapest kind of beads. You have seen gold beads and pearl and amber and coral ones, which not every one can afford to buy.

Where each of these comes from is a long story, but glass beads are made that look so much like these precious ones that unless you look sharp and are very wise you cannot tell the difference.

The pearl beads are made from pearls which are found in oysters. Not all oysters have pearls, but those that do are found sometimes in the ocean and sometimes in rivers. If a tiny object, sand or something else, gets into the shell of an oyster and bothers it, the oyster covers it up with some of the material out of which it makes the inside of its shell and so the pearl is formed. They are not always the same shape, size, nor color. They are white, pink, rose-colored, and some are black.

Pearls are sometimes, but very seldom, found in the oysters that we eat. There is another oyster, known as the pearl oyster, which is not good to eat. Its home is on the bottom of the ocean, and how do you suppose men can get them so far down under the water? They dive?

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Yes, they do; but even Daddy could n't dive so deep as that and stay down long enough to pick up a lot of pearl oysters without drowning.

Men go out in boats to the place where the oysters are. Then the diver puts on a rubber suit into which neither water nor air can get except in one place. That is in the top of his metal hat. Over the hole in the top of this hat is put a long rubber tube and the other end is fastened to a pump in the boat. With this pump men in the boat keep pumping air through the hole in his hat for the diver to breathe. Fishes — and the diver sees them all around him as he goes down to the bottom of the ocean — can breathe in the water, but a man must have air to breathe, else he will die, as will the fish kept out in the air.

When the diver is ready heavy weights are fastened to his feet so that he will sink, and a rope is tied around his waist so that the men in the boat can pull him up again when he is ready.

When he is so far under water, the water presses so hard upon him that he cannot stand it very long, any more than you could stand it to have a very heavy box press you down long at a time. Besides this there are sharks in the water, for which he must be on the lookout, and so the diver must work very quickly and gather oysters as fast as he can, for he can only stay on the bottom of the sea for a short time. Then he is drawn up again by the men in the boat. He goes down several times in one day.

We got some oysters to eat one day, and I remember how the sharp shells cut my hands and how sore they

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were for a long time. The shells were black with mud, too, so that they had to be washed before we could see what the shells looked like.

These pearl oysters are just as muddy. They are taken ashore and washed and then carefully looked over for pearls. Only one pearl in a good many oysters is found.

The shells are all saved and are used to make buttons, handles of knives and forks, buckles, jewelry, and those things which are made of mother-of-pearl, as this shell is called.

Coral comes from the sea, too, and is made by the little coral polyp, the tiniest little bug that you can imagine, that lives in many parts of the ocean. Fishermen sink nets for this and break off great bunches at a time.

Men have learned to make beads of glass that look so much like real pearl that they often pass for them. To do this they catch a certain kind of small fresh-water fish. Did you ever see a fish's scales? No, the Mother Fish does n't weigh her baby on them. They are what cover the fish. These scales are soaked, after being washed clean, and left for a time. Then the water is drained off and what is left is mixed with ammonia and saved. This is poured into thin glass beads. The best ones have besides this a little wax poured in.

Even better ones than these are made by not having the glass beads perfectly round. Instead, they are made uneven as the real pearls are; then they are held for a very short time in heated gas and instead of wax melted gum-arabic is poured into the bead.

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The gold beads are another whole story, and for the gold we must go to the miner, just as we went to the miner for iron and coal. In fact, the miner had to do his work before we could have our glass beads, for without a fire we could not make the glass nor melt it again to draw it out to be cut into beads.

So you will see, as you think about your beads and what other people have done with beads, that people tried to make themselves look pretty even before they knew how to make clothes. As well as wearing beads some of them had pictures pricked into their skins with thorns dipped into the juice of plants. Some people wore feathers in their hair and made belts of them; some wore rings, made of whatever they could find, in their noses or ears. We even read of places where the girls wear rings on their fingers and little bells tied to their toes.

Do you remember the Mother Goose rhyme that is like that?

“Rings on her fingers and bells on her toes,
She shall have music wherever she goes.”

All of these things do not seem beautiful to us, but I wonder if all the things that we make and wear would seem beautiful to those people. And I wonder if we are making the things that we use so that they will seem beautiful to the little children that some day will call you Grandfather (or Grandmother)?

LIGHT

XLII CANDLES

LET'S draw the shades and come and sit by the fire,
and I'll read you a story, dear."

"I'll draw this one," answered Spiff, and he bounded to the window, for there was no time in the day he liked so much as the hour when it began to grow dark outside and Mother cuddled him by the fire and talked or read to him.

With his hand raised to reach the shade he stopped and gazed silently up into the deep, dark sky.

"What is it, little Son?" said Mother as she joined him.

He turned, and the corners of his mouth reached for the twinkle in his eyes as he hummed,

"Dear Mother, how pretty
The moon looks to-night!
She was never so cunning before;
Her two little horns
Are so sharp and so bright,
I hope she'll not grow any more.

"If I were up there
With you and my friends," —

"Yes, dear, 'We'd rock in it nicely, you'd see,'" Mother went on with the song, "but we'd never forget how the song ends, 'And on the next rainbow come home,' would we?"

Then they drew the shade and cuddled up in the big

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chair by the open fire. Mother put in some dry pine and the fire flared up brightly. Then she reached to turn on the electric light, but Spiffie said, "Oh, don't light up. Let's just tell stories that the fire makes; it's almost as bright as day here anyway with all that blaze."

"In the days when people lived here in log cabins the fireplace fire was almost the only light they had," Mother answered. "In the woods grew pine trees which were cut up into sticks to burn and called fat wood because it was so full of fat that it burned with a great flame and smoke, just as fat does on the stove if it catches fire. In a corner of the fireplace was kept a flat stone, and this wood was burned on it so that the smoke would go up the chimney. It gave a light bright enough to read by and was called the pine torch.

"Every year in February we hang out our flag and tell stories of two great men who have been presidents of our country. One of these, Abraham Lincoln, was born in a log cabin, and read and studied by just such a light, a knot of pine wood in an open fireplace.

"His mother had another light which she made herself, and I believe this boy, Little Abe she called him, helped her. This was a candle. Nearly every family made their own candles, and every year they had a regular candle-making time. All through the year when meat was cooked, the fat was 'tried out,' that is, boiled with water enough to keep it from burning and then strained and put away.

"At candle-making time a great kettle was hung over a fire out of doors, and in it all the fat that had been saved was melted. This fat is called tallow. Near the fire two

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rods were stretched between two chairs or benches, or logs perhaps, and from these hung candle rods.

“The candle rods were sticks from which hung several wicks. The wicks were cotton strings a little longer than the candle was to be. Other things were used for wicks, where it was not easy to get cotton. Have you ever seen or gathered rushes near a stream of water? You remember the story of Moses and how his mother hid him in a basket in the bulrushes down on the river bank. Sometimes the outside of these rushes was stripped off and the stalks used for wicks. Candles made from these are called rush lights. Sometimes grass was twisted and used for the wicks instead of cotton.

“These wicks were dipped into the melted tallow, sometimes in a kettle, often in a long trough, and hung up for a few minutes to cool while another rod of wicks was dipped into the tallow. As they hardened they were dipped once more until the candles were as large as they wanted them to be. Then they were put away safe from the dirt and the mice. The longer they were kept the harder and better they would be. Such candles were called tallow dips. Can you see why?

“Better candles than these dip candles were made by pouring the melted fat into what were called candle moulds. These were tin or pewter pipes, several of them, in a frame that would stand. In each pipe or tube was a wick with a little stick at the end to keep it from slipping down into the mould as the fat was poured in. When the fat hardened the candle was pulled out by the end of the wick. Candle makers went about with these moulds from house to house and made candles for the different

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families, just as umbrella menders sometimes go about now to mend umbrellas.

“In many places in the woods grew bushes with berries which were full of fat. Do you remember when we picked some bayberries last fall and put them in the little blue vase? Those are the berries, and the bushes on which they grow are the bayberry bushes. I’ll rub my hot iron over some of them and let you see how the fat in them greases the iron and how sweet it smells. These berries were used to make candles. The berries were boiled in water and the fat skimmed off the top and saved and then used for making candles, just as the tallow was used. It takes bushels of bayberries, though, for one candle, and so this is sometimes mixed with tallow. Other things are used now for candles as well as these, and candles are made much more quickly by machinery and give a steadier and a clearer light. The best candles are now made either of paraffin or bee’s wax, which comes from the honeycomb.

“All sorts of holders have been made to burn candles in, and I think it will be interesting to find pictures of candlesticks of all times and countries and lanterns in which candles were burned, and when we go shopping or to museums to see where we shall find the prettiest ones, and of how many different things they are made. Of what are ours made? [Glass, brass, silver, etc.]

“Do you remember when the minister called one day he said that when he was a boy he lived away out in the country on a farm, and that as soon as it grew dark, very early in the winter, the only light they had was from the fire or from one candle which his grandmother always

CANDLES

held near the paper which she read? There was no chance for the rest to see to do very much, and so he dreaded the long evenings in winter. He said there were no books or games in the house for children and they were supposed to sit quietly when they were in the house.

“I remember two lamps that my grandmother had which she said her grandmother had used. One was made of glass and one of pewter, and she said that her grandfather had a sailing vessel in which he took long trips. He brought home whale oil which they burned in these lamps. The whales were caught in the seas in cold countries. Men went out in boats and harpooned the whales. Then they cut the blubber, which is the fat next to the skin of the whale, in great pieces. This they melted and then skimmed off the oil. This is the sort of oil that grandmother burned in her little pewter and glass lamps and is called whale oil.

“People have found very beautiful lamps made long before Jesus was born; made of stone, some of them, and some of gold or silver and decorated with precious stones, such as we have in rings to-day. Olive oil was burned in these lamps. Olives, you know, grow on trees in warm countries, and the oil is pressed out as cider is out of apples.

“The Eskimos fill hollow shells or stones with oil from the whale, walrus, and seal. We must find pictures of these animals that live in the cold seas so that we shall know what they are like. The Eskimo children in the summer help gather moss, and this is twisted into wicks for these lamps, over which they cook their food, as well as light their homes.

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“Not until men learned to make glass were there any chimneys, and the flame flickered and smoked and was not so very much better than a pine torch. They had no burners by means of which they could turn the wick up and down, but had to pull the wick up with their fingers.

“All this time in the ground was the oil which we use to-day in our lamps and in our oil stoves.

“In the mines was the gas which we use now and in the air all about us was what we consider the most wonderful light and heat of all, electricity; but how men found and learned to use each of these is a whole story in itself, and anyway here’s Daddy and it’s time to turn on the light and have supper.”

Mother pressed a button in the hall, and the steps were at once lighted for Daddy but Spiff asked if he might go to bed by candle light, so he could learn not to be afraid of the dark corners and could play with the shadows on the wall. [Read Andersen’s “Story of the Candle.”]

XLIII
KEROSENE

ALL children enjoy Robert Louis Stevenson's "A Child's Garden of Verses" from which the following lines are quoted:

"My tea is nearly ready and the sun has left the sky;
It's time to take the window to see Leerie going by;
For every night at tea-time and before you take your seat,
With lantern and with ladder he comes posting up the street."

[It was in the eighteen eighties that this little girl knew the lamplighter and in the nineties the electric lights were put into the little country town in which she lived. Young mothers nowadays will probably not remember these things, but by changing "mother's" to "grandmother's" or to "grandmother's grandmother's" time you can almost always reach the child's interest and give an idea of how far back in history things go.]

When I was a little girl every afternoon I watched for "Uncle Pat" with his lantern and his ladder, just as the little boy in Stevenson's poem watched for Leerie. He was

"Very lucky, with a lamp before the door,
And Leerie stops to light it as he lights so many more."

Always "Uncle Pat" stopped and put his ladder against the lamp post, reached inside the glass chimney, and lighted the lamp. Then he would look up to my window and smile and wave to me, put his ladder under

TALKS TO CHILDREN

his arm, and go on to the next lamp. In this way he trudged all up and down the main street of the town. There were no lights on the other streets and if any one who lived on them had to go home after dark they must carry a lantern or stumble along, feeling their way.

Twice a week "Uncle Pat" went around with a horse and wagon and brought home all the lamps, cleaned them, filled them with oil, then carried them back and put them in place on the lamp posts again.

One day I asked my mother where the oil came from that "Uncle Pat" put into the lamps and she said it was a long story and she was afraid I would not understand it anyway. She said her grandmother used to tell her about the times when the streets never had any lights at night except in the big cities, and there iron baskets were hung up at the street corners and pine torches burned in them. She said that she had been told that the Indians caught fireflies and tied them to their hands and feet when they had to travel or went out hunting at night.

Then she tried to tell me where the oil came from that "Uncle Pat" used to fill the street lamps and that we used to light our house. She said that down in the earth among the rocks are hidden wells of oil just as there are wells of water. Sometimes these wells, or springs of water, bubble up to the surface of the ground and sometimes the wells are driven way down and the water is pumped up.

The oil is shut up in beds of rock. Some kinds of rock have the grains, or little particles which make it, so tight together that nothing can get through, while some have the little particles not so close. Water, you know,

KEROSENE

can't soak into a piece of iron. It will just run off, but it will soak into a sponge and the sponge will hold a lot of water. If you squeeze a dry sponge and then soak it in water and squeeze it again you will see what I mean. We say the sponge is porous and the iron is not. In the same way some rocks are porous and some are not. So the oil soaked into the porous rocks and the hard rocks below and above held it in.

It has to stay there until some one comes along and bores a hole in the hard rock, and then out it bursts.

If you squeeze your Jack-in-the-box in very tight and suddenly loosen the cover he pushes out very quickly. If the Jack were very big and the box very small it would come out with more force than if he were smaller and the box bigger. It is just the same with the oil wells. Sometimes the place between the rocks which hold it in is not so big as in other places and more oil has been squeezed in than in some larger places. Then when the hole is bored the oil will spout out with a great rush, sometimes high up in the air, and flows for weeks before it stops. Some of the wells have fairly flooded everything within reach. Other wells seem to have too little force to flow out, and then the oil is pumped out.

The first of these oil wells were found by accident, and we are told that men soaked up oil in blankets from the top of lakes where it had flowed, and because oil is lighter than water it floated on the top of the lake. They squeezed the blanket and used the oil for medicine.

Sometimes this oil caught fire and men were frightened to see water burning, as they supposed it was.

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This oil, as it comes from the earth, is called petroleum and is dark colored and does not give a clear light. This is now refined, as they say, and several things taken out before it is clear and safe to burn in lamps and stoves.

Some of the things that come from the petroleum are gasoline, naphtha, paraffin, from which candles are made, lubricating oils (which are what we use to oil the sewing machine, lawn mower and any of the wheels that squeak and run hard), and kerosene, which is the oil that "Uncle Pat" used to fill the street lamps.

Before we can buy this kerosene it must be tested to be sure that all the things that explode too easily have been taken out and that it will give a clear light.

At first the petroleum was carried in wagons to the places where the kerosene was taken out, but now great iron pipes are laid from the wells, hundred of miles, to cities, and the kerosene is forced through the pipes by pumps. Great steel tanks are built on wheels and the oil is carried about in these to be sold. Great tanks are built on boats, too, and these go all over the world, carrying hundreds and hundreds of gallons of oil. The oil is pumped right into these tank ships and wagons.

That was what my mother told me about the oil that we used for light when I was a little girl, but before "Uncle Pat" grew too old to light the lamps any more I saw him one day taking the lamp off the post in front of the house and asking my father if he would like to have it set up in the back yard near the barn. After that "Uncle Pat" did n't come any more, but a brighter light flashed out from a much taller pole each night as it grew dark, so much brighter than the little kerosene

KEROSENE

lamp that I could have seen to read if I had been old enough to know how:

“And O! before you hurry by with ladder and with light;
O Leerie see a little child and nod to him to-night!”

Always when the light flashed out from the high pole, as if by magic, I thought of faithful “Uncle Pat” with his ladder and his lantern, who never failed us when the nights were dark, and although the electric light was much more brilliant and steady, for a long time I missed the radiance of his friendly smile as he nodded to me each night.

Mother told me to think of the electric light as the smile from the men at the Power Station, as we could not have this light if the men there were not doing their work as faithfully as “Uncle Pat” had done his.

XLIV

GAS

I HAVE told you how candles are made and where kerosene comes from. There is something else used to light our cities beside these, and this is gas. Many people will tell you that they can cook more quickly on a gas stove than on any other kind.

Just as with everything else, not one man but many, as they worked with one thing, saw other strange things happen, watched them, tried to do other things with them, and to find out how and why they were done. In the same way men learned to use gas and to get a bright, clear light and quick heat from it when they wanted it.

As soon as coal was found and used, men saw gas. In many coal fields gas escapes from the coal, — escape means gets away from, — forces its way out of the ground into the air, and bursts into flame. This is natural gas, and men learned to force it up through tubes and use it to burn instead of coal. That is not the gas we use and does not give the clear, steady light that we have to-day where gas is used for lighting.

Sometime when Daddy is here (for I do not like to play with gas or fire unless some one is here to help put out a fire in case it got away from us) we will take a clay pipe and fill the bowl with coal dust. Then we will plug the bowl with clay and put it in the fire. The heat will drive the gas through the stem of the pipe and we will light it and see it burn as it comes out.

GAS

Each city has its gas works where the gas is made and stored, and from there forced through pipes under the ground into the houses. There the gas is made much as it can be made in the clay pipe. Instead of putting the coal into a small clay pipe it is put into great iron tanks, called retorts. Under these burn hot fires, and the gas is driven off through tubes.

This gas will not give a clear light because it is not yet pure gas. With it are mixed several things. Some of them are ammonia, tar, and sulphur. To take out some of these things gas is whirled through water. To take out some others it is run through beds of lime, etc. Mother does not know why whirling it through water and running it through lime separates the gas from these other things that came out of the coal with the gas when the coal was heated, but when you grow older you can study chemistry, and as you learn all that has been found out about these things perhaps you can find out something which no one has thought of before.

The first gas that was used gave a dull, flickering light, but the gas that is now used for heating and lighting gives a clear, steady flame.

After the pure gas has been taken from the coal there are left coke, which makes a hot, quick fire, the things with which aniline dyes are made, and paraffin, out of which candles are made.

Until used, the gas is stored in tanks which are made in two parts. The lower part is kept full of water, and the gas is held in the upper part. Unless great care is taken the gas is liable to explode.

XLV
ELECTRICITY

ONE evening Spiff was listening to the "Country Fiddler in New York" on the phonograph. The fiddler says, "All the light they had in that room was a red-hot hairpin shet up in a bottle." He goes on to tell how he tried to blow it out and finally climbed up on the bureau, took down the bottle, and "shet" it up in the bureau drawer.

Spiff's brow began to pucker, and he looked hard at the electric light.

"Is that a hairpin in the bulb and what makes it shine like that and why does it stop shining when I turn it off?" he asked, turning the light off and on as he spoke.

"That's a hard question, Little Son," said Mother, and she unscrewed the bulb and let Spiff hold it and look carefully for "the red-hot hairpin."

Mother told him that electric light bulbs were all made of glass like the one he held, but that they were not all the same size nor all shaped as this one was, very like a bottle. He looked through the glass, and, hanging in the bulb so that they did not touch, were wires, fine as hairs, which did look something like hairpins, as the country fiddler had said. He saw that the ends of these thread-like wires were fastened to wires a little bigger and these bigger wires were fastened to some a little bigger which ran up through the bulb.

He saw that the end of the bulb was covered with



THE NATIONAL CAPITOL LIGHTED BY ELECTRICITY

ELECTRICITY

brass and made so that he could screw it into the socket on the wall.

Mother said that when the bulb was screwed in tight that the ends of the wires in the bulb touched the ends of copper wires that run through the wall and out of doors to other and much bigger wires that run all the way from there to the electric power station.

When we want water we turn a faucet, and the water runs through the small pipes in the house from the bigger ones in the street. These pipes run back to the water works or pumping station where the water is forced into them. Some time we will go and see how this is done.

Now there is in the world something called "Electricity" just as there is something called "Water."

Water will flow through pipes, but it will not flow through a pail unless there is a hole in it. Water will flow through a glass tube, but it will not flow through a bottle unless there is a hole in the bottle. Water will flow through a sieve, but it will not flow through a sponge. The sponge will soak it up and hold it. You can see the water and dip it up and pour it from one place to another.

Now electricity, in the same way, flows through some things, but not through others, and men have found out some of the things through which it will flow and some of the things which will hold it. No one can see electricity, though. All that can be seen is what it does. One of the things it will flow through is copper wire, and it goes through this like a flash. Water sometimes dawdles along, but electricity is always in a rush.

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When a lot of electricity goes through a very fine wire it goes through so fast that the wire gets very, very hot, so hot that it glows red, just as the end of the poker will if you put it in the fire and leave it long enough, or the piece of iron that the blacksmith heats to hammer into a horseshoe, and then it gets hotter still until it is white and as bright as a candle light, and then it gets so hot that it burns the wire right up.

When this happened men kept looking for a stronger wire. Finally they found the kind which is used now; but first they tried putting the wire into a little glass case out of which they took all the air and sealed it up before any more air could get in. Then no matter how hot the wire got, if the air could n't get at it, it just glowed and gave bright light, but did n't burn up. That is why the electric light bulbs are made of glass. They are air-tight cases for the tiny wires. Electricity runs through the little wire, but it cannot run through glass, and while wire will burn up if it gets too hot in the air, it can't burn up when the air cannot get to it, and so the electricity rushing through the tiny wire keeps it glowing until something stops it from flowing through the wire. The wires are put together so that when you press the button the little wires in the bulb connect with the wires which run to the power station and so the electricity runs through and gives light, but when you press the button again the wires are separated and the electricity stops flowing into the wires in the bulb.

The electricity in the power station comes from the dynamo, and I will tell you what a dynamo is. The air and the earth are full of electricity, although we cannot

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see it. We do not know how it came to be there any more than we know where air came from or water, but there it is. It first showed itself to men when ages and ages ago some one rubbed a piece of amber and tiny things moved toward it and stuck to it for a second.

If you rub a piece of amber to-day on a dry coat sleeve or with a silk handkerchief and hold it over some bits of paper they will begin to dance toward the amber.

Some clear, cold day if you rub the cat's back — you can see it better if you rub a black cat — bright sparks will flash.

Balance a spoon or any piece of silver on a cork so it can turn. Rub a stick of sealing wax with a silk handkerchief and hold it near the spoon. You can lead the spoon around in a circle as it tries to catch the wax.

Line a shallow cigar box with tin-foil. Cut tiny dolls out of tissue paper or dry pith. We can get the pith from the inside of weed stalks or sunflower stalks. Perhaps we can make them look like butterflies or birds. These we will put in the box. Then rub a piece of thin glass that will fit the top of the box with a piece of silk or soft leather and the little things in the box will try to touch the glass and have a jolly dance as they do it.

When you comb your hair on a clear, cold morning you may hear it crackle, and it will follow the comb if the comb is made of hard rubber.

Rub the comb hard and hold the end toward a feather and see the feather dance toward it and then away.

In the story of Aladdin when the African magician rubbed the lamp a genie appeared and said, "What

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wouldst thou have? I am ready to obey thee as thy slave and the slave of all those who have that lamp in their hands; I and the other slaves of the lamp.”

The genie not only said this to the magician and Aladdin, but to Aladdin's mother when she, all unsuspecting, rubbed the lamp.

Not by rubbing every lamp could Aladdin or his mother or the magician call forth a genie who could do for them what they wished done, but Aladdin found the right lamp. When by chance his mother rubbed the lamp and the genie appeared, she was so frightened that she fainted, but Aladdin boldly told the genie what to do and he obeyed.

So when the genie electricity was first called out by chance by some one rubbing the right thing, a piece of amber, men were afraid of it. They said amber was a magical thing and had a soul, for it could draw things to it.

Not until men became bold enough to tell it what to do did electricity carry us in cars, carry our messages through the telegraph and telephone, ring our bells, cook our food, heat and light our houses, and run our big machines so that things which we want appear before us almost as quickly to-day as when Aladdin commanded the genie to set things before him in the magical stories of the Arabian Nights.

But we do not call electricity a genie now. We call it a great force, that is, something strong enough to do things, just as steam is a great force, because it can run an engine and push our trains, and a waterfall is a great force because when it falls on a wheel it sends

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it spinning around to turn any other wheels that are fastened to it. Sometimes, instead of calling it force which does these things, we call it energy.

After Baby Brother has had his bath, he stretches and kicks against my hand. I love to watch him do this; do you know, every baby I ever saw does this and every mother I ever knew loves to hold her hand against her baby's feet and let him push. She loves to find that every day he pushes a little harder than before. Do you remember when Brother pushed one day, I said, "Is n't Baby growing strong?" You did this, too, and one day you scared Mother. You had been creeping about for some time and every morning I said to Daddy, "See how strong Baby is getting; why, he has so much *energy* he can almost pull himself up. Almost any time now I think he will walk." You were sitting on a puff near the open fire playing with a rattle. While I was sewing near by, you pulled yourself right up off the floor and took a step toward the fire, reaching out toward it. I was so afraid you would fall in that I screamed and rushed to pick you up and scared you so that it was a number of days before you tried to do it again. We shall always remember the day when you got energy enough to pull yourself up and take your first step.

It was something like the steam in an engine, this energy that you had gained by kicking and stretching until you could move your body along with it. The world is full of energy. It shows itself in steam, in Baby's strength, in little plants pushing themselves out of tiny seeds and up through the earth, and in electricity.

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After men had once seen electricity working, they began to find it doing things not only when amber was rubbed, but almost everywhere, and learned other ways of calling it out and how to make it do many things.

You had to learn to use the energy in you just right or it would hurt you instead of help you. Mother kept you from falling into the fire until you could walk alone.

When men began to use electricity it sometimes burned the thing they were trying to make it move and sometimes killed the men who were using it. Even now we have much to learn about it, and just as you must not build a fire unless some one who knows how to take care of it is with you, you must not touch the electric wires unless some one is with you who knows which ones are safe to touch. A little boy whom I knew was walking in a park in Washington. He saw a wire lying in the path and picked it up. It threw him to the ground and badly burned his whole side so that he had to lie there until some one found him, and a doctor took care of him for weeks. It was what is called a live wire; that is, a wire with the electricity still flowing through it, and the covering of the wire, which is always made of something that electricity can't flow through, had worn off. When he picked up the wire with the covering gone, the electricity flowed right through the wire into him and burned him. Enough electricity, as there is sometimes in these wires, would have killed him. Until you know what has already been learned about these wires never touch a wire which you find lying about unless some one who does know about them is with you to tell you they are safe.

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Before men learned about electricity they told all sorts of stories about what made it. When the thunder went rippety-boom-bing-bang and the lightning flashed they said that Jove was hurling his javelins to punish those with whom he was angry, and hid their faces in terror until the storm was past.

Some people do this now. When I was a little girl my mother asked me to go to the window and watch it through the glass with her. I hid my face at first until she told me that the One who takes care of us while we sleep will be just as near through the storm and that surely we could be no safer hiding our heads and crying than when we were watching the sky. Then I watched for each flash and tried to count between them and see how many I could count between each flash and between each thunderclap and flash, and found that the storm was more wonderful and brilliant than ever our Fourth of July fireworks had been and that it had n't hurt me half so much as my sparklers had when I set them off and took hold of the burned ends before they were cool.

In time there came men bold enough to face the lightning and see what they could learn from it and about it.

When you rub a cat's back in the dark in dry, cold air, you can see tiny sparks. Men came to believe that the flash of lightning was just the same kind of spark only a very much greater one and that both were caused by electricity. To find out if this were true Benjamin Franklin sent a silk kite up into the cloud and brought down a spark on a brass key tied to the string. When you study about these things as you grow older you will find out how he did this.

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This is what we have found out since Franklin brought down a bit of lightning on his wet kite string and proved that it was caused by electricity.

When water is heated just right it floats off and forms clouds, and when the clouds are cooled just right they come down again in a shower of water which we call rain.

Electricity sometimes gathers on clouds, too. Heat causes more and more of it to gather, and when the water-drops in the clouds stretch out and try to fill the air where the electricity is already gathering more and more, the electricity is crowded out and falls to the earth in a shower of electric sparks which we call lightning.

Men found electricity in another way, too. Do you remember the horseshoe magnet Daddy brought you one day? How you shouted and clapped your hands when the pins and tacks and little things made of iron and steel followed it around and clung to it! When you rubbed pieces of iron on it things followed that around, too, and Daddy said, "See, you have made a magnet by rubbing your magnet on these." When I was a little girl my father brought me a box of "magic fishes," and what fun I had! These little fishes each had a bit of soft iron in its mouth. There was a little bamboo rod to fish with, with a piece of bent steel for a hook, and as I hung the line over these fishes in a little dish of water they would jump to this hook and cling while I pulled them out of the tiny pond.

Long, long ago the first magnets were found, bits of iron in the ground, and they were called lodestones.

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As men played with them and found what things followed them, in time the truth came to them that in these magnets electricity was working as in the amber and the lightning. They learned from this to make the compass, without which sailors could not tell where to steer their boats when they could not see the sun or stars. Some time I'll tell you about steering by the North Star.

I've told you all these things about the magnets so you could understand how men learned to make the dynamos with which they gather up electricity in the power stations. If one takes a piece of soft iron and winds copper wire which has been covered with cotton or something, through which electricity will not flow, and whirls it very fast, electricity comes from wherever it is and runs through the wires. This is a dynamo and it is the dynamos in the power stations that call up the electricity which flows through wires fastened to these dynamos and then through smaller wires fastened to them and into the tiny wires in the bulbs here in the house which gives us our electric lights.

Of course a dynamo in a great power station is not made of one piece of soft iron wound with a little wire and whirled by a man. Many things have been added to the first simple dynamo which could send only a wee bit of electricity over the wires. No such bright light as we have to-day could be made with such a simple, little dynamo.

There are many great bars of iron and so many wires that you can hardly follow them, and great turbine engines whirl them around.

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These turbine engines are hitched to great waterfalls, and so the dynamos are kept whirling by the force of the water falling upon wheels which are fastened to them.

Think back to the time when all the light people had was a pine torch. What do you suppose they would have said if any one had told them that all they had to do was to harness up the waterfall and then, by pressing a button, a thousand lights would dance in a city miles away where an instant before all was darkness.

Yet this is what men have learned to do, and the story is more wonderful to me than the story of Aladdin and his lamp.

XLVI
SUNSHINE

“The spacious firmament on high,
With all the blue ethereal sky,
And spangled heavens, a shining frame,
Their great original proclaim.
The unwearied sun from day to day
Does his Creator’s powers display,
And publishes to every land,
The work of an Almighty Hand.

“Soon as the evening shades prevail,
The moon takes up the wondrous tale,
And nightly to the listening earth
Repeats the story of her birth;
Whilst all the stars that round her burn,
And all the planets in their turn,
Confirm the tidings as they roll,
And spread the truth from pole to pole.

“What though in solemn silence, all
Move round this dark terrestrial ball?
What though nor real voice nor sound
Amidst their radiant orbs be found?
In Reason’s ear they all rejoice,
And utter forth a glorious voice,
Forever singing as they shine;
‘The hand that made us is divine.’”
JOSEPH ADDISON, “The Spacious Firmament.”

HANG a glass prism in the window. Some day it will put a rainbow edge on a commonplace minute. Let the child try to catch it as follows:]

“Let’s catch the sunshine.” Mother caught the light

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on a tiny mirror and flashed it on the wall and floor and ceiling. Spiff danced about gleefully and tried to catch it in his hands. Such a tricky little light-bird. Gayly he called it, but as gayly it danced away, deaf to all his calls and begging to come to him or at least to stand still a second. Finally it settled down in a spot on the rug, and he slammed both hands over it. Surely he had it then, but what did it do? He did n't know, but when he looked down to lift it carefully there it was laughing at him on top of his hands. He put his feet, his hat, his coat over it, but nothing could keep it down. On top of them all it gayly beamed at him.

He scooped it up in his hands and took it to Mother, only to find his hands empty when he reached her. He scooped it up in a pail, covered the pail tightly, and carried it to her, but where was the light-bird when he took off the cover? Right there on the floor still shining gayly.

And then he found that he could not catch the light-bird in his hands.

He took his little mirror into the garden while mother did her work. He came in again after a while, thinking hard. Mother could always tell when he was thinking very hard, and then she always waited for him to speak first. Then he said, "Mother, does the light-bird shine everywhere? It was in the garden and the playhouse and the barn and out on the sidewalk and I called to Walter and he said it was over in his yard. He said he could n't catch it either, and a lot of the boys had tried one day but none of them could." Mother told him to shut his eyes. "Can you see it now? Can you remember

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how it looked, dancing on the wall and flying from your hands as you chased it? Does it make you feel glad to think how bright it looked and what a jolly time you had? Then you have caught the light-bird after all. You could n't catch it in your hands, but you did catch it with your eyes and you hold it in your heart.

“Shut your eyes again. Can you remember when Father smiled at you this morning how he looked and how happy it made you? Then you caught his smile with your eyes and you can keep it always in your heart, although you never had it in your hands.”

A field of daffodils grew near the home of the poet Wordsworth. Years afterwards when he thought of these daffodils he wrote, “My heart with pleasure fills, and dances with the daffodils,” and this is what the song which is used in kindergarten means when you sing, “No hands can catch the light-bird, but eyes can catch, and hearts can hold, the light-bird on the wall.”

The light-bird comes from the sun. It is a bit of sunshine caught on the mirror and flashed here and there. No one person can take the sunshine for his own and hide it away. Some things only rich people can have, but sunshine and air and love cannot be bought, nor stolen, nor hidden away. There is enough for everybody, always, and they are the only really precious things. As you grow up remember this and try to find out what I mean by it.

You will find men building houses and shutting out the sunshine and air. You will find families living in them, and then there will be stories like the story of

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Little Benny Sunshine. His grandmother lived in a dark room in the basement of a city house. Do you know that many rich people own houses that are so close together that very little sunshine can get into the windows and let poor people live in rooms in the cellars because they can make money by doing this? Men let their children live in these dark houses away from the sunshine because they can get money in the city and do not know how to do the kind of work to get money out in the country and are afraid they will be lonesome away from many people. You know how well the plants grow in the fresh air and sunshine, and you remember the little plant that almost died when we kept it in the dark; and so these little children get pale and sick away from the sunshine. You cannot understand all this now, but try to remember that Mother wants you to love the sunshine and live in the sunshine and when you have little children, as I hope you will some day, to keep them in the sunshine.

I was telling you about Little Benny Sunshine, and there are many other stories very much like it. His grandmother was not very strong and the doctor told her that if she could get away from the cellar out into the sunshine she would get better. One day a kind lady took Benny and some other children out into the country for a picnic. Before they went home he thought of Grandmother and longed to take her some of the sunshine. He borrowed the lady's pitcher and filled it. This he carried carefully all the way home, but when he tried to pour it out on Grandmother's bed you know how disappointed he was. Grandmother was so pleased at what

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he had tried to do for her that her heart was more full of love for him than ever and she always called him "Benny Sunshine." You will be glad to know that when the kind lady came for her pitcher and heard the story, she found a new home for Benny and his grandmother where they could have the sunshine all day long.

SECOND TALK

"Hast thou named all the birds without a gun?
Loved the wood-rose and left it on its stalk?
At rich men's tables eaten bread and pulse?
Unarmed, faced danger with a heart of trust?
And learned so well a high behavior,
In man or maid, that thou from speech refrained,
Nobility more nobly to repay?
O, be my friend, and teach me to be thine!"

R. W. EMERSON

THIS little verse says beautifully what we mean when we say that we cannot catch the light-bird in our hands, but can catch it with our eyes and carry it always in our hearts. Suppose you shoot the birds and take them in your hand? How long does their beauty last? Where is their song, and how would you like a world without the bluebird's song? How much harder it is to name each bird as it flies than to shoot them. How much better to leave them to eat the bugs in our gardens and trees and to make the world beautiful than to hold them in our hands a few minutes, dead!

How long will a wood-rose keep bright and sweet in your hand? There you only can enjoy its fragrance and loveliness. Leave it on its stalk, and every passer-by may love it, too. Some kinds of flowers we shall have no

TALKS TO CHILDREN

more, for people have picked them and dug them up until none are left. What kind should we not pick now and why?

Bread and pulse was the simplest food that people in King David's time had. Some men drank wine and ate sweets until they were ill or drunk, but David, the shepherd king, lived on the simple foods that would make him strong and keep him well and was man enough not to take the other things which tasted better, but which would harm him. You remember what David did, and how he, a shepherd lad, killed the giant Goliath to save his country.

The rest of the verse means to love truth and right so much that we shall not think of praising a friend for doing well. That would seem as if we had not expected him to be fine enough to tell the truth always, to help others, and to do the right thing.

We might praise a little boy who made a letter very well the first time, but we would not praise Brother for writing his whole name well. We expect him to do this every time. We expect him to tell the truth, and so we do not praise him each time that he does this. We might praise a little boy who had no mother to tell him that this was what he should do when he first began to talk, or we might praise a little boy like that for saying "If you please" and "Thank you." We should n't think of praising you for doing that. You learned to do that so long ago that we should be more surprised if you forgot. How fine it would be to learn so well to think of others every time we speak or act that it would be as easy and natural to be unselfish as it is to

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breathe, and people would so expect it of us that they would not make us vain by praising us for it.

Emerson said he would like a friend like that and to be a friend like that, and when you play with the light-bird try and let love like that dance from your heart to mine and back again to fill our eyes with sunshine and the world with the brightness of our lives.

XLVII

THE RAINBOW

WE caught a bit of sunshine on the mirror and flashed a white light all about. Now let's hang this glass prism in the window and let the sun shine through it.

"Oh, it's another light-bird, but it's all colors," called Spiff, and he danced away after it just as eagerly as if he had never found out he could n't pick it up.

Mother took some colored crayons and his colored balls and a little book of strips of colored papers, and they tried to match up the colors that the prism had shown them there were in the white light that came to them from the sun.

Sometimes as it flashed about they found only two or three shades of one color. Then there would be more colors, and finally they got all the shades of a rainbow. With the colored chalk she made this on the blackboard, and they tried to name them together: red, orange, yellow, green, blue, indigo, and violet. After that for a long time when they went to walk they found the rainbow colors, in the grass, in the sky, in the trees, the birds, the flowers, and fruit, in people's clothes, hair, and eyes; color everywhere. When the big brother of one of Spiff's little playmates wanted to get into the Navy in the big war they said he was color-blind and they could n't take him. So Spiff worked hard to see the colors and name them, for he said with two good eyes

THE RAINBOW

and a tongue to tell their names he did n't want to be color-blind.

One day they were hunting for colors and Spiff felt something wet on his cheek. Then he felt it again and looked up at the sky.

"Why, where is the sun?" he said, for in an instant it seemed to him the sky had grown dark, and the wind blew his hat across the field.

"Oh, it's up there just the same as ever," said Mother, "but those black clouds have been rolling up for some time. I hoped they'd go by, but they've hidden the sun completely and we'd better run for that little shed." As they ran the drops of rain came down faster and faster, but they got under the shed before they got very wet and watched the rain and listened as it pattered on the roof. The air was soft and sweet and everything seemed to grow bright and fresh as the drops came down. It was just a little shower, and soon the sky began to brighten; and before the last sprinkle of raindrops stopped falling the sun shone again and they saw a wonderful colored arch in the sky. "A rainbow!" they called together, and Spiff found out that when the sunlight falls through the raindrops it makes the colors just as it did when it fell through the glass prism. They watched the rainbow until it faded away, for every one loves a rainbow. After dinner he blew soap bubbles, and when he floated them in the sunshine his joy knew no bounds, for here again were the rainbow colors floating in his bubbles. He never had known before that the water he used for his bubbles, and the water that he drank, had once been raindrops, and that when the

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sun shone through the water-drops the white light showed the rainbow colors just as when the sun shone through the falling raindrops the rainbow arched the sky.

Mother told him of the little Indian boy Hiawatha and read the verse about the rainbow:

“Saw the rainbow in the heaven
In the eastern sky, the rainbow,
Whispered, ‘What is that, Nokomis?’
And the good Nokomis answered:
’T is the heaven of flowers you see there;
All the wild flowers of the forest,
All the lilies of the prairie,
When on earth they fade and perish,
Blossom in that heaven above us.’”

THE WATER BLOOM

A child looked up in the summer sky
Where a soft, bright shower had just passed by;
Eastward the dusk rain-curtain hung,
And swiftly across it the rainbow sprang.

“Papa! Papa! what is it?” she cried,
As she gazed with her blue eyes opened wide
At the wonderful arch that bridged the heaven,
Vividly glowing with colors seven.

“Why, that is the rainbow, darling child,”
And the father down on his baby smiled.
“What makes it, Papa?” “The sun, my dear,
That shines on the water-drops so clear.”

Here was a beautiful mystery!
No more questions to ask had she,
But she thought the gardens’ loveliest flowers
Had floated upward and caught in the showers;

THE RAINBOW

Rose, violet, orange marigold
In a ribbon of light on the clouds unrolled!
Red of poppy and green leaves, too,
Sunflower yellow and larkspur blue.

A great, wide, wondrous, splendid wreath
It seemed to the little girl beneath;
How did it grow so fast up there,
And suddenly blossom, high in the air?

She could not take her eyes from the sight;
"Oh, look," she cried in her deep delight,
As she watched the glory spanning the gloom,
"Oh, look at the wonderful water bloom!"

CELIA THAXTER

XLVIII
THE MOON

“Oh, look at the moon!
She is shining up there;
Oh, mother, she looks
Like a lamp in the air.

“Last week she was smaller,
And shaped like a bow;
But now she’s grown bigger
And round as an O.

“Pretty moon, pretty moon,
How you shine on the door,
And make it all bright
On my nursery floor!

“You shine on my playthings
And show me their place,
And I love to look up
At your bright, pretty face.

“And there is a star
Close by you, and may be
That small twinkling star
Is your little baby.”

“Oh, Look at the Moon,” from *Mrs. Follen’s Little Songs*

DO you remember when you were a little baby, just beginning to walk? I remember very well the first time you ever noticed the moon. Daddy and I had taken you down to the Maine Coast for his vacation, and when we came back the trains were all late so that it was dark when we went home from the station.

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In the sky was a wonderful, great round moon making the evening "almost as bright as day," we said. You nestled cozily in Daddy's arms with your head in the little hollow in his shoulder, that was made for a little sleepy head to cuddle in, sound asleep we thought.

After a while we heard a little gurgle, and there you were with your eyes as bright as stars, staring wonderingly at the great round ball of light in the sky, stretching your arms and reaching longingly toward it. Babbling and gurgling to us, you said very plainly, "Moon, moon, Baby wants the moon." After that you saw the moon many, many nights, from your crib while you were very little, and when you got bigger you used to beg to look at the moon "just once more" before you got into bed.

When the moon was round and full you used to ask to have the curtain left up so it could shine into the room. You always loved the nights when the moon seemed to come up from behind the pine trees over in Rogers' woods, sometimes like a great red ball and sometimes like a great yellow one, but always big and round and shedding a glorious, kindly light over everything. Everything looked so beautiful in this soft light. Things that looked shabby and dirty in the daytime were beautiful in the moonlight. Even the weeds in the garden seemed lovely.

Sometimes you used to wish for the moon, to hold it and have it with you all the time for your own, but I told you it must stay in the sky and shine for every one on the earth, for other children loved it as much as you did. One day you asked me where it stayed when the

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nights were dark. You never asked me where it stayed in the daytime, but once Brother asked me that.

One night you looked at the moon harder and longer than I had ever seen you. The moon had come up early and it was a warm evening. We were in the garden watching some moths flying in the dusk among the fragrant sweet rocket blossoms. Do you remember the sweet rocket? The blossoms are very much like the phlox, only it is sweeter and blooms in May and the phlox comes later in the summer.

I was so interested in the moths that I had n't noticed how quiet you were or that you were thinking of something else until you said, "Mother, is the moon made of green cheese?"

"No more than the sun and the earth are made of green cheese, dear. There are lots of stories told about the moon, just as there are many stories told of everything which it is hard for us to understand. You remember some of the stories that I told you that different people in different countries and times told to explain how the sun was made, and I will tell you some of the stories told in the same way about the moon.

"First, I want to be sure that you understand what has been learned about the moon."

Then you said, "Yes, Mother, I want to hear about it all, but I think I could find out more about it if I could get up close to it, myself. The sky seems so near tonight that don't you suppose if I put the ladder up on the roof of the house — the great long 'stension ladder, I mean — I could almost touch the moon?"

Then you began to tease to stay up until Daddy could

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help you put the ladder up and just *see-ee-ee* if you could n't touch it.

We almost had an unhappy time, you teased so hard and so long and were so sure that you knew more than Mother, until she reminded you of the light-bird and how hard you had tried to catch the sunshine, and you agreed to let her tell you what she had learned about the moon before you tried to put the ladder up against the sky.

Mother said: Sometimes you have looked through Daddy's little magnifying glass or Grandmother's reading glass and things looked bigger and nearer and you could see them plainer than without it. Men have made telescopes through which they look into the sky, and the sun, stars, and moon become clearer. With this same sort of glass, a lens, through which you look in the telescope, fitted into a special camera, men have taken pictures of the moon. Some of these pictures tell us a great deal. They show mountains and melted rocks and craters. Do you know what a crater is? There are places on the earth where great masses of melted rocks and flames and gases burst out. These places are called volcanoes, and the cup-shaped hollows out of which all these gases and cinders and melted rock and water pour are called craters. Men are always trying to make cameras that can take pictures of things farther and farther away and have the pictures clear, and when we think that they have been able to take pictures of the mountains and craters on the moon we think that perhaps in time we shall be able to know exactly what is going on there.

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Although the moon looks so bright and shining as it floats in the sky and shines into our dark room, it is not really bright and shining and hot like the sun, but shines only when the sun shines upon it; so the brightness that it sends to us really comes from the sun. We say it reflects the light of the sun, just as a mirror reflects things. The mirror has no face in it, and yet if your face is in front of it, it shows your face. We say the mirror reflects your face, my face, the sunshine, etc.

So the moon reflects the sunshine but has no brightness of its own. The sun is always shining and always moving very slowly, much more slowly than the moon, about the sky in a great circle. We'll draw a circle on the blackboard as big as we have room for, and as we draw it you may play it is the sun moving. Now, if you could draw a circle as big as this whole world it would not be as big as the circle in which the moon travels, and the sun takes so long to go around once that no one has ever lived as long as that takes.

The moon is always shining, too, as it follows the earth, which is always moving around the sun. It takes the earth a year to go in a circle about the sun. We'll draw a little ball for the sun with yellow chalk and then you may draw a circle around the sun, playing you are on the earth and the earth is carrying you around the sun. It takes the earth as long as from Christmas to Christmas again to take you in this circle, and the earth moves so slowly and so steadily that you do not even know that you are moving. While the earth is making this circle about the sun it is turning over and over, first one side of it facing toward the sun and then the

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other. It turns over faster than it moves along in the circle, too, for it only takes a day and a night to turn over as it runs along. It seems as though we should be dizzy with all this whirling and making circles; but the earth is so big and solid and steady that we do not feel it at all, and the only way we know is that when we are turned away from the sun it is cooler and darker and when we begin to turn toward the sun it is warmer and lighter. The moon always follows the earth, and as it goes in a circle around the earth it is shining all the time, except once in a great while when the earth gets between it and the sun. It does this sometimes, for it takes the moon only a month — there are twelve of these from Christmas to Christmas — to go around the earth. As it goes around the earth it is turned always toward the earth, so we never see but one half of it — the half that is turned toward us.

Does the moon always look the same to us? How did it look last night, the last time you saw it? The night before Christmas? You remember:

“The moon on the breast of the new fallen snow
Gave a luster of noonday to objects below.”

Jean Ingelow wrote the following verse in a poem about the little bow in the sky:

“O moon, in the night I have seen you sailing
And shining so round and low,
You were bright, ah! bright, but your light is failing
You are nothing now but a bow.”

So many nights you have looked at the little new moon and called it a boat or a cradle, and once in the

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morning you saw a tiny, pale old moon in the sky after the daylight had come. You were washing your face just as I like to have you do in the morning, and when you reached for the towel you saw the moon through the window way up in the top of the elm tree, you told me. You said it made you feel all glad inside to see it at first, and then it looked so pale and thin you almost cried, because you thought the moon was sick.

Celia Thaxter saw the moon when it looked that way and wrote this poem about it:

“The moon is tired and old;
In the morning darkness cold
She drifts up the paling sky,
With cheek flushed wearily.

“A little longer and lo!
She is lost in the sun’s bright glow;
A thin shell, pearly and pale,
Mid soft white clouds that sail.

“Art faint and sad, dear moon?
Gladness shall find thee soon!
Sorry art thou to wane?
Thou shalt be young again!

“And beautiful as before
Thou shalt live in the sky once more;
From the baby crescent small
Thou shalt grow to the golden ball.

“And again will the children shout,
‘Oh, look at the moon, look out!’
For thou shalt be great and bright
As when God first made night.”

Let’s draw pictures of how the moon looked; first the little cradle, a tiny crescent, then a little bigger and

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bigger each night, till we have a half-circle; then bigger and bigger until it looks like a whole circle. Then it began to get smaller and smaller until it was a tiny crescent with its horns turned a different way from what they were when it was a new moon; then there were nights and nights when we could see the stars but we could see no moon.

At New Year's time we hung a calendar on the wall — here it is — and on it we find pictures of the moon showing when it will be new moon, first quarter, second quarter, full moon, last quarter, and dark of the moon.

We can make a little calendar of our own and each day paste on a circle or piece of a circle showing how big the moon is and a black circle when we can see no moon.

Let me show you with an apple how we find half an apple; then we will cut each half in half and see how many pieces we have. Each piece we call one fourth, or one quarter. Let us see how many pieces or quarters there are in one half; now how many quarters there are in the other half.

The moon at first shows just a little curve of a moon, then grows bigger and bigger till we have a quarter of the moon; then it grows bigger and bigger again till we have half a moon, which we call second quarter; then another quarter, which we call third quarter; and then one more quarter and it is full moon. All this time it is growing we call it a waxing moon and will turn the crescents with their points facing the left. You know which is your left hand, do you not? Show me.

As it grows smaller, the third and last quarters, we

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will face the crescents the other way with their points or horns facing toward the right, and we call this a waning moon.

Of course, there will be nights when the moon is shining that we cannot see it. Why? Yes, because it is cloudy or stormy and the clouds get between us and the moon. One night, do you remember, we saw a little cloud sail right across the moon, and for a minute the moon seemed to hide behind it.

One day I found some children playing they were the earth and the moon. The sundial in the garden was the sun. A long way off the one who was the earth went whirling around on one toe and as she whirled tried to move in a circle around the sundial. The moon child held a mirror in her hand and walked in a circle around the earth child, always keeping herself turned toward the earth child and watching to see the sun thrown from her mirror, which she held still in one hand all the time, upon the face of the earth child. They were having a merry time, as you can imagine.

This is a little like what is happening in the sky. Of course, the moon and the sun and the earth are millions of times bigger than they seem to us. Some time you will learn how astronomers — that is what we call men who study the sky — measure the moon and the sun and the stars and can tell how big they are and how far from each other and from us.

They began just as you will have to begin with one and one are two, and two and two are four, and then they were ready for harder things.

To-morrow I'll tell you some of the stories people

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told about the moon before they knew better than to try to make children believe it was made of green cheese.

There is the story about the shadows on the moon that Nokomis told little Hiawatha in her wigwam in the forest:

“Saw the moon rise from the water
Rippling, rounding from the water,
Saw the flecks and shadows on it,
Whispered, ‘What is that Nokomis?’
And the good Nokomis answered:
‘Once a warrior very angry,
Seized his grandmother and threw her
Up into the sky at midnight;
Right against the moon he threw her;
’T is her body that you see there.’”

The Indians used to count time from one full moon to another. We say, “It was so many months ago”; they would say, “It is so many moons ago,” for it is about a month from the time when we see one full moon to the time when we see it full again.

The Greeks and Romans told many stories of the goddess of the moon, just as they did of the sun god. She was the sister of the sun god, and most statues which they made of her have a half-moon on her forehead and a veil on the back of her head. The poets wrote about her, calling her Luna or Selene; a white-armed goddess with brilliant stars in her beautiful hair. In the evening she was supposed to rise out of the river, Oceanus, and drive across the heavens in a chariot drawn by two white horses.

Diana also was called a goddess of the moon, and there are many beautiful statues of her for us to find in Art

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Museums some time. She is usually pictured as wearing sandals and with a quiver of arrows over her shoulder. She was very pure and beautiful, and in some statues she is protecting animals; in some she is shooting them.

And last, I will read the Bible story that was told to the Jewish children. I have told you that as the earth turned toward the sun it grew lighter and warmer, and you have seen that sometimes the days are very long and sometimes they are so short that it is dark when you get up in the morning and dark when you eat supper. It is because we do not stay the same distance from the sun that we have different seasons and day and night; and the time that it takes for the earth to go around the sun we call a year, and so we have different years and months.

We will talk some time about the year and the seasons.

But this is the Bible story of the moon.

“And God said, Let there be lights in the firmament of the heaven to divide the day from the night; and let them be for signs, and for seasons, and for days, and years:

“And let them be for lights in the firmament of the heaven to give light upon the earth; and it was so.

“And God made two great lights; the greater light to rule the day, [what was that?] and the lesser light to rule the night: [and that?] he made the stars also.

“And God set them in the firmament of the heaven to give light upon the earth,

“And to rule over the day and over the night, and to divide the light from darkness: and God saw that it was good.”

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LUDWIG AND MARLEEN

WHEN I cried for something which it was as selfish and silly for me to demand for myself alone as it is to cry for the moon, my mother used to tell me an old folk tale called "Ludwig and Marleen."

I'll not tell it as it is written, but the story was about a little boy and girl who lived on the edge of a forest in Germany many years ago. They had no toys except what they found in the woods but there are always lovely things there to play with. Think of Hiawatha and the things he did, or some of the things you have found in the woods.

They lived in a little house. There were berries in the woods, and every day when they were ripe they went out with their pails to pick them. One day Ludwig heard a noise in the forest as of something in pain. It turned out to be a fox, but, unlike any fox he had seen before, it could talk. In return for helping him the fox asked Ludwig to name something which he would like, but Ludwig was a knightly boy and asked for nothing in return, until urged to do so. Then he asked to have his pail heaped with berries. When he returned home and told Marleen she was at first pleased to have a pail heaped with such splendid berries, but the more she thought about it the more she thought how foolish her brother had been to lose such a wonderful opportunity to have a pail always filled. So she worried Ludwig with her teasing until he went back to the forest, not believing that he should find the fox again. He did, however, and shamefacedly, in response to the "How, now, Little

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Brother, is not all well with thee?" with which the fox greeted him, make his request in Marleen's name and received the reply, "Very well, it shall be as she wishes." Marleen greeted him gladly when he reached home and showed her what the fox had sent to them.

But Marleen was soon unhappy again and the story continued with her forcing Ludwig to go back again and again each time demanding more and more; fine toys, a fine house, fine clothes, nothing was enough. Each time that he met the fox the same words were used in greeting and each time the fox replied, "It shall be as she wishes."

Each time Ludwig was a little more reluctant and each time Marleen was a little more insistent, and less happy and grateful.

The climax was reached when she demanded "the great shining ball in the sky." Ludwig reminded her that it is the moon and shines for all, but finally yielded to her commands and sought the fox once more. The story here is told so that the woods seem different. A hush is over all. When the greeting and request are made in the usual form, the fox replies, slowly and solemnly, "Tell Marleen that she can *not* have it," and disappears never to be seen again. When Ludwig returned he found Marleen in tears and nothing left but their own little cottage.

[Be sure with the children to tell it more simply and use the repetition of "How, now, Little Brother, is not all well with thee?" and, "Tell Marleen it shall be as she wishes." You can put in any demands that occur to you as likely.]

XLIX

THE STARS

““ When the stars go to sleep,
The babies awake,
And they prattle and sparkle all day;
Then the stars light their lamps,
And their playtime they take,
While the babies are sleeping away.

““ So good-night, little baby,
And shut up your eyes;
Let the stars now have their turn at play;
They soon will begin
To shoot through the skies,
And dance in the bright Milky Way.

““ No, no, my dear nurse,
I cannot go to sleep;
Since you've put the thought into my head,
Let us have with the stars
One game of bo-peep;
Then good-night, and a kiss, and to bed.' ”

“The Stars and the Babies,” from *Mrs. Follen's Little Songs*

WHEN Brother was a little boy he asked me nearly every night to say, “Twinkle, twinkle, little star.” Can you say all the verses for me?

One night we were in the garden, and as Daddy carried him into the house to go to bed, just at the door he turned his head and waved his hand toward the sky where, as we turned to look, we saw a tiny crescent of a moon with a star near by. “Good-night, Star,” he said, “have a nice sleep in your little moon cradle.”

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When he said his prayer he added, "And God take care of the little star-baby out there in his cradle in the sky."

In the hot weather we used to let him stay in the garden with us until after sunset when his room grew cooler.

As the sky grew dark and the stars began to show in the sky he was always the one to call us to look at the first one. The first time he saw it, it was near the new moon, and so when he first saw it each evening he would shout, "Here's the evening star-baby looking for its moon cradle."

How he loved to watch it and wonder about it! If I should tell you all the things he wondered about we should talk all night.

Sometimes it seemed so big and bright and beautiful and the sky so wonderful that he could n't find any words to say what he felt. Then he would sit and silently gaze into the heavens with eyes as big and shiny as the stars.

One night he said, "Oh, Mother, the evening star-baby is red."

Then I told him that way back in the time of the ancients, which is what we call people who lived ages and ages ago, that people had watched this evening star-baby and all the other stars and had tried to count them all and had named many of them.

Can we count them all? Can we count all the flowers or grasses or weeds or birds or even the hairs on our heads? Only God can do this, there are such countless multitudes of wonders that He shows us.

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There are men now who watch the stars and study them. We call them astronomers, and they have learned to call by name all those that the Ancients named. Besides these they have found some new ones and named them. When you have to think out something, instead of saying, "I can't do that," remember what a man who studies the stars did. He thought from something that he saw in the sky that there was another star somewhere, and after nights and nights of watching and studying he said to all the astronomers, "Point your telescope to a certain place" — and he named the spot — "at a certain time" — and he named the time — "and you will see a new star." They did this, and there, sure enough, was a star that no one had seen before.

When I was as small as Brother I never saw that the stars were not all the same color, so, of course, I was pleased when Brother told me the evening star was red. For it is not always the same star that we see first in the evening and the star that he saw that night was called Mars and is red.

The lovely bright one that came one night, almost before it was dark, sooner than any other star came in the evening, is called Venus.

When I told him his red star had a name and that the lovely bright one had another name, he was very pleased and wanted to know their names.

When we went in that night he waved his hand to the sky and said, "Good-night, Mars." Then he blew a kiss and said, "And here's a kiss for your sister star-baby, Venus."

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In the winter the sky was dark when he went to bed, and often he asked to have the curtain up so he could see the moon, for his bed was by the window and he could see a good deal of the sky.

He had been learning a little song about the bees, in which he played that his fingers were bees and counted them as they came out of the hive. In this way he had learned to count, one, two, three, four, five.

One night we heard him counting and saw him pointing to the sky as he did so. Then he called, "Mother, come here, quick. I see a bunch of tiny stars all together and there are five and one more."

"Five, and one more is six," I told him. Now let me tell you that these stars which he had counted six are such tiny ones that most people see them only as a misty blur, and most people see only four or five, although there are really more than six of them.

So I cannot tell you how pleased I was that Brother had seen them and counted six.

"Tell me about them," he said. "Who are they?" For since he knew Mars and Venus by name he felt as if the whole star family were his friends, and he wanted to call them by their names when he saw them in the sky playing. When they twinkled a lot he always wished he knew what they were playing or telling each other, for he said they were laughing so hard then that they shook, and he loved jolly things.

"The ancients called them the Pleiades," I said, and there is more than one story about them, but there is one that says that the Pleiades were seven sisters who, because of their grief for their brother who was killed

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by a wild animal, were allowed to become stars in the heavens.

After that he often said, "Oh, I hope the stars will shine to-night so I can play with the six little star-girls. What did you say their names are? And I wonder whether I shall see my red-faced boy evening star-baby, or the little girl-baby, Venus. Hurry and turn out the light and draw the curtain."

Sometimes when it was cloudy or rainy he wondered where they were and what they were doing.

Mother told him they were shining just the same up behind the clouds.

One night he looked for his six little girls. There were stars and stars, so many that he got tired of counting one, two, three, four, five and one, two, three, four, five, all over the sky. Even then he had n't begun to count the stars and stars and stars and stars that he could see, but he could n't find the six Pleiades anywhere or any stars together that looked a bit like them. There were twinkly stars and blue stars and clear stars and yellow stars and big stars and little stars and stars that looked like dippers and wagons, but no six little sister-stars that he could find. He called, "Mother," and she said, "If I'll find them for you, will you just look at them and say 'Good-night,' and then shut your eyes and go to sleep?"

Of course he would; and so I let him go and look out of my window on the other side of the house, and in another part of the sky the six sisters smiled and winked at him. He waved his hand to them and said, "Good-night, little girls, come over on my side of the sky to-

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morrow night. What did you tell me their names are, Mother?" he called from his bed a little later. "Oh, yes, the Pleiades sisters."

The next night when he went to bed he said, "Mother, how did my little what's-their-name sisters — yes, Pleiades sisters — get from my part of the sky over to your part of the sky last night?"

So I took him in my lap a little while, and we talked about the stars and what they are. I had told him long before this that this great earth on which we live is a great ball, always turning and at the same time moving in a circle around the sun. He had looked at an orange swinging and tried to fancy his room a speck not so big as the point of a pin, on an orange so big that the longest ride he had ever taken would be so short on this great orange that it would n't seem as if he had moved.

He tried to fancy this ball so big that he could n't think of anything so big, circling around another great ball of fire, the sun, and the moon, another great ball, swinging around the earth and all of them turning just right and never stopping.

Now I told him that the stars, too, are great swinging balls like the sun and earth. The sun is a star, too, no larger or brighter than many of the stars that we see, but so much nearer to us that it seems brighter and makes our world feel its heat more. If you get close to a lamp it will almost burn you, and you can see to read from its light, but if you go across the room it does not seem so bright nor so warm, and if you go across the street it will twinkle with a little light almost like a star. So the sun, which is a star, is nearer to the earth than

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any of the other stars. The farther away the stars are, the more they twinkle.

If we were on another star our world would look like a star to us. Because our earth is always moving and the stars are always moving, we do not see them in the same place every night. They are shining all the time; but we can see them only when the sun's light is hidden, as the earth turns us away from it because the sun is so near the earth that its light is much brighter. Sometimes when the sun shines we can hardly see the light which we forgot to turn off on the automobile, although in a dark night it gives a very bright light.

Great observatories are built now where men can study the sky and take pictures of the stars and draw maps of the sky with the groups of stars that are always seen together, for while the stars are seen in different parts of the sky each night, those that are seen together once are always seen together, as the six little Pleiades sisters, which Brother saw. They have telescopes, and with these men have found new stars and told others how to find them.

Some men will tell you that in these observatories men have seen things through their telescopes that make them believe that people live on your red-faced star-baby Mars.

When you grow up I hope you will buy books and read about these things and take time very often to look at the stars.

There is one star that has helped a great many people to find their way. The sailors depend on it a great deal as they steer their ships over the ocean; and that is the

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North Star. Sometimes it is called the Pole Star. It is the only star that seems to keep in one place in the sky, night after night, and year after year. When men see that, they know that if they go toward it they will be headed north.

Show me your right hand; your left hand. If you face the North Star your right hand will be toward the east and your left hand toward the west; your back will be toward the south. This is always so, and men depend a great deal upon the North Star.

Shakespeare wrote about it in one of his plays, "I am constant as the northern star." I hope some time you will read the whole play and be able to say about yourself, "I am constant as the northern star." It stands right there in the northern sky, pointing the right way to go, shining steady and true and has been ever since the time of the ancients, and before. Isn't that a record for us to think of when we want to scowl and run away from work!

Now we will look up in the sky and I will show you how to find the North Star.

I pointed out the Big Dipper and said: "Do you see four stars that look like a dipper and three more stars beyond one corner for a handle?" Follow the two stars at one end of the Dipper and straight above them you will see a bright star. That is the North Star. If you follow in a line with the North Star to the first one, you will find four stars which make the handle of another smaller dipper. The last one of the four which make the handle is the corner of the Little Dipper and the Little Dipper is pouring into the big one. The North Star is

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always at the end of the handle of the Little Dipper and you can always find it by following a line from the bottom of the Big Dipper through the two stars on the edge away from the handle.

I pointed out these two dippers again and again until one night he found them himself with the North Star at the end of the handle of the Little Dipper and in a straight line from the two pointers of the Big Dipper. We call them pointers because they always point right toward the North Star.

How he danced and laughed and how his eyes shone when he really found the North Star all by himself!

There is a beautiful legend of the Great Dipper which has been told again and again and in many different ways. It is about a time and place where all the people and animals and plants were dying of thirst, for there was not a drop of water to be had. A little child went out with a tin dipper and prayed that it might be filled with water for her mother.

When she arose from her prayer it was full of clear, cold water, and she ran with it so fast that she fell. As she tried to rise she saw a little dog beside her who was dying from thirst. She gave him a little of the precious water, so precious that she had drunk not even a drop herself. The dog was refreshed at once, and a wonderful thing happened to her dipper, although she did not see it. It had changed from tin to silver.

She hurried with the water to her mother; but just as she was about to drink she heard the moan of a servant who was trying to raise the mother's head that she might drink, and the mother put the dipper in her hands

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and bade her drink instead. Neither of them saw that the dipper changed from silver to gold. The servant instead of drinking was about to give the water to the others of the family when she saw a stranger enter the room as weak and sick from thirst as they.

She pressed the dipper into his hands, saying, "Sacred are the needs of a stranger in a strange land."

The dipper changed again. This time the golden dipper was studded with diamonds and from it gushed a fountain which could quench the thirst of the whole nation.

The stranger stood before them a radiant vision, then as it faded a silver trumpet proclaimed, "Blessed is he that giveth a cup of cold water in my name."

To this day, in that country, each child is given a tin dipper at birth, and as they grow up a few, just a few, find their dipper changed to gold and blazing with diamonds. These diamond dippers cannot be bought nor sold nor given away. Many foolish people try to get them and fail and bitterly blame others because their dipper does not change. Only by unselfish deeds can the change be made, and then the owners are not proud but thankful and happy.

After Brother had heard this legend of the dipper, whenever he used the diamond-studded dipper in the sky to find the North Star, he seemed to be thinking soberly and nearly always some kind act for Daddy or me followed.

TO THREE LITTLE KATHARINES

Oh, Katharines three,
Come sail with me
Where the ship of my Fancy flies!

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We'll wander free
Over land and sea,
Then sail away to the skies.
If I were a star,
So far — so far —
From this Earth where the children dwell,
My twinkliest beam
For that ship should gleam;
And my truest secret I'd tell
To the eyes that look
Through fancy. — No book
Nor telescope serves so well.

KATHARINE FAY DEWEY

THE SAILOR'S STAR

By Katharine Fay Dewey

“ONCE upon a time, so long ago that nobody can remember when, a beautiful ship was sailing along under a spanking breeze with all sails set. The name of the ship was the Jane Ellen, and she was named for the Captain's wife. At her prow was the figure of the mermaid, with long waving hair; and the head of the mermaid was like the head of the Captain's wife. But that was when she was young. Now she sat at home and knit; but to the Captain she looked just like the lovely mermaid, and he kept the Jane Ellen spick and span from truck to keel, — the finest ship afloat, as she was the best of wives.

“Now, as the ship was sailing along on this fine starlight night, and everything favorable, the Captain in his cabin felt a great jolt, then a s-scrape, and the ship leaned away over, and everything that could slid down to one side. The next minute it tilted the other way,

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and most of them slid back again, and then the ship went on as before.

“The Captain jumped up and put his head out of the cabin window and looked fore and aft along the deck. He saw a man coming toward him, and called, very sharply, ‘Mr. Morganwg!’¹

“It was the Mate of the Jane Ellen. He was young and big, and he had gray eyes and black hair and heavy black eyebrows that almost met over his eyes, and he could look very stern, but his eyes laughed; and he could sing, and if he had had time, he could have played on a harp, because he was a Welshman, and his name was Taffy. But he did n’t have time, because if you are mate of a ship like the Jane Ellen, you have a great deal to do, and have to be everywhere at once, to see that things are done as the Captain wants them.

“‘What was that?’ asked the Captain.

“‘We struck on Porpoise Rock, sir,’ said Taffy.

“‘Who’s steering?’

“‘Nelson.’

“‘Well? — he knew the rock was there, did n’t he? It’s marked on his chart plain enough. There’s no excuse, a bright starlight night like this.’

“‘Yes, he knew it,’ said the Mate, ‘but he says he did n’t make enough allowance for the stars moving. He says if there was one star, only, he could depend on to be in the same place every night, it would be all right.’

“‘Well, there is n’t,’ said the Captain.

¹ He called it “Morgan-ough,” but he was particular about the spelling.

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“‘I know it,’ answered the Mate. ‘But you know yourself, it’s confusing to steer by them.’ Taffy spoke quite respectfully, but he often made suggestions to the Captain when no one was listening, and the Captain loved him like his own son.

“‘H’m!’ said the Captain. ‘You go and drop anchor right now. I won’t have any more paint scraped off from this ship. Then you come here and we’ll talk it over. Something’s got to be done.’

“‘Very well, sir,’ said Taffy, touching his cap. And a few minutes later a great quivering and trembling went through the ship as the anchor chains slid out; and then they lay quiet, rocking gently on the waves, and everybody went to bed except the Lookout and the Captain and the Mate.

“No one knows just what was said in the Captain’s cabin, or whether he or Taffy made the suggestion, but this is what happened:

“The next morning, just before sunrise, the Mate stepped out of his cabin and walked for’ard. He leaned over the fo’c’s’le hatch, which stood open, and called, ‘Bos’n!’

“‘Ay, ay, sir,’ answered the Bos’n from below. The next minute he stood beside Taffy on the deck.

“‘Assemble ships!’ ordered the Mate.

“‘Ay, ay, sir,’ said the Bos’n again. He had a whistle hanging from a string around his neck that he used for a signal to the sailors, but he did n’t use that now. Instead he took from a pocket inside his shirt another whistle. It was no larger than the first, but when he put it to his lips and blew, — the sound was so high and

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clear it seemed as if it must go all around the world! And before very long, — just as if it had gone, and was broken up on the way, and was coming back in little pieces, — from every direction came a faint, thin little answering whistle. And then the Captain and the Mate and the second mate and the four Quatermasters and the Bos'n and the sailors and the cook and the cabin boy — who were all on deck by this time — saw appearing, one by one, on the horizon, little specks, that as they came nearer, showed themselves to be ships of all descriptions, — schooners and brigs and barkentines and barks and frigates and luggers and full-rigged ships. And every time one of the little specks appeared the Lookout would call from the masthead, 'Sail ho!' and the Captain would say, 'Where away?' and the Lookout would answer, 'Two points on the weather-bow,' or whatever it happened to be.

"All the morning long, all these different kinds of ships tacked and jibbed and went about and missed stays and luffed and beat to wind'ard, and in all these ways drew nearer and nearer, until, just as the Quarter-master made it seven bells, the last one of them hove to, and the Jane Ellen lay surrounded by fifty-two ships of every kind you ever saw, — but none so fine as she!

"Then from the peak of the Jane Ellen fluttered a string of little flags, — red and yellow and white and green, — and the little flags said to the captains of the other ships, 'Will you please come aboard the Jane Ellen?' Then from every ship a boat put out, and was rowed to the side of the Jane Ellen, where a rope-ladder

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was let down to the water's edge. Her Captain stood on the deck by the rail, with the Mate standing by, and shook hands with every captain as he came over the side, and said, 'I'm glad to see you, sir!'

"When they all had come aboard and were assembled on the hurricane deck the Captain made them a speech, while the Mate went and told the cook to 'look alive with lunch, to have it ready when the "Old Man" gets through with the powwow!'

"This is the Captain's speech: 'I suppose you wonder why I called you together? Perhaps you noticed a big mar on the Jane Ellen's bows, where the good new paint is scraped off?' All the other captains nodded. 'That happened last night,' said our Captain. 'We ran on Porpoise Rock; and my quartermaster, Nelson, said he ran a-foul of it because he did n't make enough allowance for the stars moving. I've got as good quartermasters as any ship afloat, but I know — you all know — that kind of thing happens to all of us.' The captains nodded again. 'The trouble is n't with the man at the wheel, it's just here,' — and the Captain struck the palm of one hand with the forefinger of the other several times, and they all looked at it to see what it was, — 'He has n't the right kind of stars to steer by!' The captains all looked up at the sky, and blinked, because it was just noon and the sun was very bright, and then looked at one another, and one of them said, 'What kind of stars could we have? We've got all there are.'

"'Oh, these *stars* are all right, but they move about so! Night after night they go 'round and around!

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A man is almost too old to take his trick at the wheel before he learns to make allowance for it. Now, we've been fair and honest, and we've steered by these stars — and sworn by them — as long as there have been ships and sailors, and the Star People ought to do something to help us out. So I propose to send some one to put it to them fairly, and see if they can't keep one star always in the same place. Then we could start from that, and know where we were.'

"'How are you going to get up there?'" asked the same captain who had spoken before.

"'We'll show you after lunch,'" said the Captain of the Jane Ellen. 'That is, if you all agree.'

"'The other captain asked, 'Do you all agree?'" and they all nodded.

"'Then the other captain said, 'Three cheers for the Skipper!'" and fifty-one captains shouted, 'Hurrah!' three times. So that was settled, and they went down to the cabin for lunch.

"'Every one took a second helping until Taffy was almost discouraged. He was in a hurry to be through. But at last they were finished and back on the deck to hear what the Captain had to propose.

"'Now,'" said the Captain, 'we shall have to borrow your masts and some anchors.' They nodded, and the Captain called: 'Mr. Morganwg! You may set to work.'

"'At once, sir,'" said Taffy, and called, 'Bos'n!'

"'Ay, ay, sir,'" said the Bos'n, running up.

"'Call the men,'" ordered the Mate.

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“The Bos’n blew his ordinary whistle, and at the same time the captains began to go over the side of the Jane Ellen to return to their own ships. They all looked very smiling and good-natured but one man, — the one who had n’t cheered.

“When it came his turn to say good-bye, he just humped up his shoulder and growled, and then he turned around and said, very loud, ‘The rest of you can do as you like, but I’m blowed if you take my mainmast for any such foolishness!’ Then he went down the side of the ship and was rowed away.

“The captains who heard him looked perfectly disgusted, and Taffy said to his captain, ‘Shall I attend to him, sir?’

“‘Yes!’ said the Captain, and they all nodded.

“So, before they did anything else, Taffy and the Bos’n and his men went to the rude Skipper’s ship (it was a brigantine, the Wandering Willie), and they set all the sails, and tied the ropes in hard knots instead of just belaying them, as every one knows is seamanlike. Then they weighed the anchor, and got off as quickly as they could — and off went the Wandering Willie! And it had gone only a little way when the wind changed, and the Skipper shouted in the roughest voice, ‘Ease ’er off!’ And when the sailors tried, they could n’t untie the knots, and the ship keeled over, farther and farther, until, all at once, she turned bottom up, and every one had to swim back to the other ships! The crew were glad of it, because they were better off; and the rude captain, who could n’t swim very well, had to be thankful to be pulled aboard and allowed to ship before the

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mast on the Jane Ellen. And he learned in time to be a very good sailor.

“But while all this was happening, the work was going on on all the ships. The first thing they did, they brought twenty-four large anchors, and anchored the Jane Ellen, twelve on a side and her own two at the bows, so she could n’t even wobble. Then they drew up all the other ships in a long line, one after another, with a space between, and unstepped the mainmast of every ship. When every ship had her mainmast lying on the deck, beginning with the Jane Ellen, they spliced them all together, the top of one to the bottom of the next one. It took them all the afternoon and part of the next morning to do it.

“Meanwhile, other sailors had brought twenty mizzen-masts to the Jane Ellen, and, one after another, they were carried up her mizzen-mast and spliced to the top of the one below. When they were all in place some hoisting-tackle was made fast to the top, pulley-ropes were run through it and carried out over the other ships and fastened to the spliced mainmasts, about a third of their length away.

“By this time it was four bells in the afternoon, and everybody was pretty tired, so the Captain said they might rest for an hour, all except the cook, and he had to serve out grog. So all the seamen had their grog, and lay around on the deck and looked up at the tall mizzen-mast and the hoisting-tackle, and thought what a good captain they had, and that the Jane Ellen was the finest ship afloat.

“Six bells had hardly finished striking when the Mate

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jumped down from the rail where he had been sitting, and called, 'Bos'n!'

"The Bos'n sprang up and said, 'Ay, ay, sir!'

"'Pipe the men aft,' ordered the Mate.

"'Ay, ay, sir,' said the Bos'n again, and blew his whistle.

"The seamen all jumped up nimbly and came trooping aft to the foot of the mizzen-mast. There some of them brought a winch, and some more arranged the pulley-ropes and passed them around the winch, and carried them fore and aft, and arranged more tackle around the heel of the mainmast, and did a great many things to them that I don't know anything about, but the Mate did, for he directed it all, without stopping even to think. And the Captain came and looked on, and he looked as proud as if he had done it himself!

"At last everything seemed to be done, and Taffy asked, 'Are you all ready, Bos'n?'

"'Just waiting for Tom Green to sing the chanty sir,' said he. And in a minute, Tom Green came.

"He was n't a very large sailor, but he had one blue and one brown eye, and red and blue anchors and ships and stars and a weeping-willow tattooed on his arms; and he wore his sleeves rolled up high to show them. And he stood up on a water cask in the stern, and the sailors all stood ready, in long lines, with the ropes in their hands.

"Then the Mate said, 'Are you ready, Bos'n?' and the Bos'n said, 'Ay, ay, sir!'

"'Then hoist away!' ordered the Mate.

"The Bos'n blew his whistle, and Tom Green began to sing the chanty, and this is how it began:

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(TOM.) 'We have left our happy home
On the ocean for to roam.'

(SAILORS.) 'Yeo, ho! Away we go!
Round the world and back again. —
Yeo — heave-*hol*!'

(TOM.) 'And our wives and sweethearts dear,
May not see for more 'n a year.'

(SAILORS.) 'Fair winds! White sails flowing free,
Blue water 'neath our keel, —
That's the life for *me!*'

"I give you only one verse of it, but there were ninety-three, and it told all about their life on the ocean wave and what they wanted to do, and Tom Green made most of it up as he went along, — so perhaps he worked as hard as any of them!

"Now, every time when they sung the refrain, the sailors all pulled together on the ropes, and little by little — inch by inch, almost — the great long main-mast rose in the air. And on all the other ships the sailors stood watching, because they had nothing else to do, and they all joined in the chanty, and the sound of it mounted up through the clouds. There never was a chanty like it since the world began!

"It had been bright, sunshiny weather when the work began, but all the afternoon the clouds had gathered until the sky was completely overcast, like a solid roof of gray, and when the mast rose up, about one quarter of it pierced the clouds. At last it stood, straight and tall, the heel firmly fixed on the step above the deck of the Jane Ellen, and the top hidden from sight in the

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cloud roof, and a shout went up that must have reached the heavens! Then everybody drew a long breath, and went to rest, and waited for it to be quite dark.

“When it was time, and every one was on deck (the other captains had come aboard again), the Captain of the *Jane Ellen* looked up at the great tall mast, going up and up until it went out of sight in the clouds, and he said to the other captains, ‘Whom shall I send up to talk to the Star People?’ And the other captains said, very decidedly, ‘You’ll have to send an able seaman.’

“So the Bos’n picked out the very best able seaman there was, and he stepped out before the captains. He swayed his body when he walked, and hitched up his trousers, and he could dance a hornpipe better than any man aboard, and wrap his leg four times around a rope when he climbed. He was just the man to climb to the top of that great tall mast.

“The Captain looked at the Able Seaman, and said, ‘You go aloft there; and when you get to the top, you tell the Star People you want to talk to their captain. Do you understand?’

“The Able Seaman pulled his forelock and said, ‘Ay, ay, sir,’ and the Captain went on: ‘You tell him, we want *one star* that we can depend on, to steer by. We’ve steered by them ever since there were ships, and they move about all the time, and we can’t stand it any longer! We’ve done the fair thing by them, and now they can do the fair thing by us, or by Jiminy! we’ll throw the whole lot of ’em over, and they’ll be out of a job! — Do you understand?’

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“The Able Seaman pulled his forelock and said, ‘Ay, ay, sir.’

“‘Then, up you go!’ and the Able Seaman turned away and came to the foot of the great tall mast.

“There were two ropes that ran from the top to the bottom. He wound his leg four times around one of them, and took hold of the other and began to climb. And everybody watched him go up and up, and grow smaller and smaller until he was n’t nearly so large as a fly. And then he went clear out of sight in the clouds. And they could n’t have seen him at all, any of the way, if they had n’t thrown a strong light on him as he went up.

“Then — though there was nothing to see, and their necks ached — nobody could take his eyes from the spot where he disappeared. And before very long they saw a little speck, smaller than a fly, appear again and come down the great tall mast, — so tall it took thirty-eight minutes to come down from the place where it entered the cloud. The captains hardly could wait for him to get down.

“‘What did you find?’ asked the Captain.

“‘A lot of Star People — I dunno who they was,’ answered the Able Seaman.

“‘Well, — what did they say?’

“‘They wanted to know what that singin’ was, this afternoon.’

“‘But what did they say about the *star*?’

“‘I did n’t ask ’em.’

“‘Did n’t ask them!’

“‘No. I come back to ask what to say about the singin’. You did n’t tell me that.’

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“‘*Thunder!*’ said the Captain. ‘Did you come clear down here to ask me that? You get back, as quick as ever you can, and tell them what I said. Of course you’re to answer a civil question!’

“‘Ay, ay, sir,’ said the Able Seaman without winking; and he climbed up the mast again. And all the captains watched him as before, only their necks ached a little harder. He was gone a trifle longer, and then back he came. It only took thirty-six minutes this time, because he was more used to it (beside the time it took to go up, of course, and the time he was above the clouds).

“‘Well?’ said the Captain.

“‘I tol’ ’em it was the chanty. And I asked to speak to the captain, an’ a big man said they had n’t no captain, — they’re a Republic.’

“‘Then what?’ asked the Captain, as the Able Seaman paused.

“‘Then, I did n’t know who to ask for, — so I —’

“‘*Thunder-ation!*’ cried the Captain. ‘Did you come clear down here again, to ask me *that?* You go back — quick — and don’t you come down again till you finish your errand!’ And the Able Seaman said, ‘Ay, ay, sir,’ — and all the other captains looked at each other and said, ‘*Thunderation!*’ or some other word that meant the same thing.

“Then the Able Seaman climbed up the mast again, and nearly all of them watched him. But some of the captains who had short necks could n’t watch another minute, until one of them lay down on his back on the deck; then a good many of them did the same thing, and were more comfortable.

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“And this time he was gone a long time — so long, the Captain was just going to send up the second-best able seaman to see what was the matter, when they saw him coming down. It took a little longer, because the leg of his trousers caught in the third twist of the rope, and he had to unwrap his leg and twist it around again. It took forty-one minutes this time, and it seemed *forever* to the captains! Three or four of them waited at the foot of the mast, and caught at him as he slid down.

“‘What did they say?’ — ‘Will they do it?’ — they asked eagerly.

“The Able Seaman breathed hard. ‘You wait a minute — till I get — my breath.’

“They waited. Finally the Captain said: ‘Now?’ and the Able Seaman pulled his forelock and said: ‘I tol’em, sir, — just as you said, — an’ they all talked an’ talked —’

“‘*Who* talked?’ asked the Captain.

“‘I dunno their names. I ain’t no navigator. — There was the big man, an’ a woman sittin’ in a chair, an’ another man, and a feller with a head in his hand — all snakes! — an’ a big dragon kep’ pokin’ his blame head in all the time, — an’ some more people; an’ they all talked to onc’t.’

“‘What did they say? Will they give us the star?’

“‘I can’t make out,’ said the Able Seaman. ‘I guess they was willin’, but they did n’t seem to know what to do, and they was quarrelin’ about who’d do it.’

“The Captain looked around. ‘Mr. Morganwg!’ he said. (The Mate was there almost before he spoke.) ‘It’s no use. You’ll have to go.’

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“‘Certainly, sir,’ said Taffy, and his eyes shone when he said it, and he turned and walked to the foot of the mast.

“He weighed two hundred and eleven pounds, but he walked so lightly his feet seemed hardly to touch the deck; and when he sprang into the ropes and began to go up the mast, he made the Able Seaman look like an apprentice! And the captains all stood and watched him, and they were so pleased and so sure it would be all right, their necks almost forgot to ache.

“Up and up climbed Taffy, higher and higher, until it seemed to him a thick cloud came down and wrapped him about so he could see only a few feet ahead of him. But he knew it did n’t come down at all. It was he who had climbed up into the clouds. So he kept steadily on, and very soon it began to grow thin; and as he came out of it he saw a sight that almost took his breath away, and made him lose his hold of the rope. But he would n’t even look, but kept climbing on until he reached the top of the fifty-second mast, and with one leg wrapped easily around one rope, and his elbow resting on the gilt ball on the top of the mast, and his chin in his hand, he was as comfortable as a boy in an apple tree. Now he had time to look about him, — and he could take it, for the Star People were so busy talking among themselves they had n’t seen him come.

“Two persons seemed to be the center of the group. One was a tall, splendid man with a sword on his belt and a shaggy lion’s hide hanging carelessly over his arm. Set in his belt and on his head and in the clasp around

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his knee were great blazing stars, and two dogs were at his heels. This was Orion.

“Taffy knew him at once. The person to whom he was talking was a beautiful lady (not so very young), who sat in a massive, star-jeweled chair, and was alternately crying and scolding, while a man, evidently her husband, leaned over the chair and tried to quiet her. Near by stood a young man, looking very sulky; and from his hand swung a curious object. It was a woman’s head, with snakes instead of hair.

“They had once been quite stiff and wriggly snakes, and had stood up on end, each one of them, and squirmed, but now they were limp and raggy. And Taffy did n’t wonder when he saw how Perseus was absent-mindedly swinging it by one or another of the snakes, and letting it wind up and unwind again around his finger.

“Like Orion and his dogs, these people and others who crowded near were studded and decked with shining stars; and it was by their stars, that he knew so well, that Taffy recognized these Star People in their unaccustomed places.

“‘Yes, I *could!*’ the lady in the chair was saying. ‘And he is n’t the one to say, anyway!’

“‘What’s the matter?’ asked Taffy; and they all jumped, and then all began talking at once, so he could n’t understand a word they said.

“‘Hus-sh!’ he said, holding up his hand. And they gradually stopped talking, all but Orion. (And Cassiopeia kept on saying things to her husband — but that did n’t count.)

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“‘Who are you?’ asked Orion.

“‘I’m the Mate of the Jane Ellen,’ said Taffy. ‘And I want to know what’s the trouble. It does n’t seem much to ask for — just one star.’

“‘No,’ answered Orion, ‘it does n’t. And we’re all willing. But who is going to hold that star? — and how are we going to know it’s always in the same spot?’

“‘I should think you might agree about that easily enough,’ said Taffy.

“‘Well, we can’t,’ said Orion. ‘I can’t do it; I have other things to attend to.’

“‘And you won’t let any one else!’ broke in Cassiopeia. ‘You know how I just sit in my chair, and I’d love to hold it.’

“‘She can’t,’ said Orion. ‘Pretty thing for a woman to do!’

“‘I’m not a woman,’ observed Perseus.

“‘Don’t you say another word!’ said Cassiopeia. ‘And stop twirling that Gorgon! — You make me nervous. You know perfectly well, you have to keep away the monster from my darling child.’

“Perseus said no more, but he looked sulkier than ever.

“‘No, he can’t,’ said Orion. ‘And beside that, you’re used to seeing us move about. Now if one of us gives up his own place, it will mix you all up.’

“‘That’s true,’ said Taffy. And just as he spoke, something rubbed against his hand, — something that sent a little prickly shock through him at first, and at the same time, the very softest thing he ever had felt or imagined.

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“He looked down and saw a little bear — but such a little bear! His long fur was, in color, a beautiful blue-gray, and the tip of each hair seemed to have been dipped in moonlight or powdered with star-dust, for it shone and glinted in the starlight as he moved; and his eyes twinkled like two little stars themselves; and curiously enough for a little bear, he had a great long tail. And unlike any of the Star People, he had n’t a star on him anywhere.

“‘Hello, little one!’ said Taffy. ‘What are you doing here?’ And he bent down to stroke Little Bear. Little Bear leaned against his leg; and as his hand sank in the soft, soft fur, and again the electric tingles ran up his arm, it was as if they took the message to his brain: ‘Oh, dear Taffy, let *me* take care of the Sailor’s Star!’

“It came so clearly to him, Taffy spoke again: ‘Would you really like it?’ — and the answer came, like a long, ‘Oh-h!’ of rapture.

“‘See here,’ said Taffy to the Star People. ‘Why don’t you let this little chap have it? That would settle it.’

“‘Little Bear?’ said everybody. Then everybody looked at everybody else, and said, ‘Why not?’ — because they all loved Little Bear; and they were glad to find a way to settle the dispute and stop talking.

“Taffy told them what to do; and Cassiopeia was the first one to take a lovely star from the back of her dress, where it never had been seen by the sailors and would n’t be missed; and they all agreed that, if she could n’t hold the Sailor’s Star herself, she should be the one to give it. And they fastened that star on the very tip of Little

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Bear's tail. Then Orion and Perseus and the Big Dragon, who came and looked on, and the rest of them gave more stars to fasten on Little Bear, and he stood pressed against Taffy's knee while they did it; and his fur sparkled and shone and his two bright eyes twinkled, bright as any of the stars, while little electric thrills of pleasure and gratitude ran to Taffy's heart as his hand stroked the beautiful fur that was softer than anything in the whole World!

“‘There!’ said Orion, as he fastened the last star and pushed one of the dogs back with his foot, while Little Bear growled, a soft small growl. ‘He’s fine as a birthday cake! Now I want to know how you are going to be sure that star is always in the right place?’

“‘Easy enough!’ said Taffy. ‘You know where the North Pole is, don’t you?’

“‘Of course we do,’ said Orion, and the other Star People echoed: ‘Of course!’

“‘Then, all Little Bear has to do is to keep the star directly over that Pole. And he’ll do it,’ said Taffy, laying his hand on Little Bear’s head — and the message thrilled through it: ‘Oh, I will, dear Taffy! The Sailor’s Star shall never wander!’

“When the Mate stepped on to the deck of the Jane Ellen it was almost morning, and all the captains who were n’t asleep had such stiff necks they hardly could turn their heads to look at him. And when he touched his cap and said to the Captain of the Jane Ellen: ‘It’s all arranged, sir,’ they were so worn out they were glad to go back to their own ships and go to bed without asking a single question. It would n’t have been any

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use if they had, for the Captain took Taffy straight into his own cabin and shut the door; and that was the last any one saw of them that night.

“The next morning every one was as busy as a bee; and they worked so fast that before evening every mast had been put back, and the twenty-four anchors returned to their own ships, and they were all ready to sail.

“During the afternoon the clouds had broken up, and the sun went down in a clear sky. As darkness fell, the crew of each ship assembled on the deck, with every eye fixed on the Northern sky.

“Taffy stood beside the Captain of the *Jane Ellen* while the rose-red faded into yellow, and palest green, and violet, and a few large stars came out, one by one. Then, — faint at first, then, brighter and brighter, — the stars that told Taffy Little Bear was at his post! And a great shout went up from all the ships, that must have reached the sky! It seemed to Taffy that the stars glowed brighter, and he could almost feel the touch of soft fur, softer than anything in the world, and a little thrill went to his heart, that said: ‘You see, Taffy dear, I’m here!’

“Then the fifty-two ships set sail in every direction, and the *Jane Ellen* was alone once more. And all night long, as she went on her way, whenever Taffy looked up at the Northern sky, the *Sailor’s Star* hung over the Pole. But Little Bear swung slowly, slowly around it, watching, watching the ships that were sailing to all quarters of the world. And on every ship the sailors said:

“‘God bless the Little Bear!’”

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STAR OF BETHLEHEM

ONE of the loveliest star stories I know is the one that we find in the Bible about the star that the wise men followed.

When I was a little girl I used to watch the stars from my bed until I went to sleep at night.

Once I was sick and went to a hospital, and my bed was where I could not see the stars, and how homesick I was. After that I dreaded to go away from home, for I thought the stars shone nowhere else, and I loved them so.

After a while I did go away to live for a little while. I did n't get there until after dark, and then all the way up the street — can you imagine my joy — the stars shone down on me just as they always had at home.

I looked up and found the Great Dipper, and followed the two stars at the end, and found the North Star right at the end of the handle of the Little Dipper, and I knew that over that way was my home and mother, and the same stars were twinkling and winking down at her there as they were at me so far away, and I was n't lonely any more. I looked at the one I saw first of all and I just whispered,

“Star light, star bright,
First star I've seen to-night.
I wish I may, I wish I might
Have the wish, I wish to-night.”

And what did I wish? “Make Mother happy.”

The Bible story of the first Christmas tells about the stars, although this story was written so long ago that

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no one now living can remember about that first Christmas, so you see the stars must have been shining then for the people in that country so far away, just as they do for us now. The story begins like this:

“Now when Jesus was born in Bethlehem of Judea, in the days of Herod the king, behold, there came wise men from the east to Jerusalem, saying, Where is he that is born King of the Jews? for we have seen his star in the east and have come to worship him.”

The king told them to go to Bethlehem and find him, and the story goes on:

“And lo, the star which they saw in the east, went before them till it came and stood over where the young child was. When they saw the star, they rejoiced with exceeding great joy. And when they were come into the house they saw the young child with Mary his mother, and fell down and worshipped him, and when they had opened their treasures they presented unto him gifts: gold, and frankincense and myrrh.”

You see this story of the first Christmas tells you that it was the birthday of a baby. The wise men studied the stars even in those days so many hundreds of years ago, and when they saw a star that they had never seen before they tried to find out more about it. They went first to their great city and told the king about it. Then they went as far as the little town of Bethlehem and there, still studying this wonderful new star, brighter than any they had ever seen before, they found a little baby. His mother called this little baby Jesus, but the wise men gave him another name. They said that this little baby would live such a good life that every one

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who knew him would see how they should live. He would be so unselfish, so truthful, so pure, that others seeing him would learn for the first time how to live so that this world would be like heaven. There would be no fighting, nor hurting, nor stealing, nor fear, just loving and sharing, and growing, and so he should be called a Saviour because he would save men from sin and unhappiness. Sometimes he is called the Saviour now, and sometimes The Christ, which means the same thing, and sometimes Jesus, as his mother called him. That was the story of the first Christmas, part of it, and you see it was a birthday. Just as we remember your birthday and you remember mine and Daddy's, every one remembers this little Jesus' birthday every year at Christmas. We have a Christmas tree, and on the top a star to remind us of the story of the star that the wise men followed.

The stars have shown many things worth knowing to men who have been wise enough to watch them and study them.

[The mystery play, "Eager Heart" is one of the best Christmas plays to be found. I tell it to my children, each Christmas Eve, as a story, as follows:]

THE STORY OF EAGER HEART

(The Christmas Mystery Play)

WHEN people began to have plays they used to make them up about the saints or about Jesus. Those about the saints they called Miracle plays, and those about the Lord they called Mystery plays, and the one they wrote for Christmas being about Jesus was, of course,

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a — yes, a mystery play, and they called it **Eager Heart**. This is the story, then, of **Eager Heart**.

Eager Heart was the name of a beautiful woman. Perhaps you would not have called her beautiful. She had no fine clothes, nor high-heeled, dainty slippers, no diamond necklaces, and I am not sure that she even had curly hair or very white, small hands. I am sure that her hands were as clean as she could keep them and do all the work that she had to do to keep her little cottage bright and sweet, and her family well clothed and fed.

She did not live in a grand house, because she was not rich. Just a little home she had, but such a happy one it was. Every one helped. Daddy worked hard every day to get the money for the things she must have and the children were loving and sweet and helpful. **Eager Heart** cooked and sewed and cleaned, and in the evening they all talked and played together, and small though it was, it was a much nicer place than many a palace.

Now on a certain night, the story goes, every one expected a **GREAT KING** to pass through their village.

Every one was on the lookout for Him and had their homes ready hoping that He would come to them to rest.

Eager Heart, like the rest, prepared her home for His coming. The food, the best that she could get, was ready, and the table never was set better; the bed was all ready with her finest linen, fresh and spotless, and the lamp shone brightly in the window.

While she was waiting she heard steps coming to the door, and her heart almost stopped beating. As some one knocked at the door she caught her breath quickly and

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hastened to open it. What if it should be the King, and He had come to her humble home!

But no; there stood a poor, tired workman, and beside him, shivering with the cold, because so poorly clad, his wife and little boy wrapped in her shawl.

“Could we come in and warm ourselves and rest in your cottage just for to-night?” he asked.

Poor Eager Heart — to-night! And this was not the King; but she was sorry for the tired man and his shivering wife and little boy, and yet to-night; why, she had so longed to have the King for her guest, and only this one night would He pass her way.

She looked at the workman and said, “Oh, not to-night, not to-night. I am expecting a friend, a dear, dear friend, to-night; come to-morrow night, yes, and the next and as many more as you will, but not to-night; any night but this.”

The workman turned away and sighed. “That is what they all say,” he said. “No one wants us to-night. Every one is expecting a guest to-night, and there is no place for us.”

Eager Heart, sad and sorry, was about to close the door when she looked into the face of the little child. It was so wistful, so beautiful, that the next moment she had it in her arms and was leading the three weary people into her warm, sweet home. She fed them and laid the dear child on the bed that she had so fondly prepared for the King.

The people were gathering in the streets, singing carols and watching for the expected Guest.

After she had done what she could for the strangers,

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Eager Heart, too, went out to watch for the King. Her dream of having Him for a guest was gone. Now it could never, never be, and disappointed, she took her lamp in her hand, hoping to at least catch a glimpse of Him, and perhaps touch the hem of His garment as He passed.

There she found the people of the village, shepherds, who had come in from the plains where they had been tending their sheep, and Wise Men who had come from the East, and led them all, following a wonderful, brilliant star, brighter than any Eager Heart had ever seen, searching for the King whom they all knew would be found in this village that night.

Eager Heart followed the gathering crowd from street to street and from house to house. Down all the fine streets of the village, past many a palace and stately home, they passed until Eager Heart ran to catch up with the Wise Men, for they were passing down her own street and back to the door of her humble home.

Low above the cottage, hung the wonderful star, and here the Wise Men stopped, and both the Wise Men and the shepherds said that in that house they would surely find the King.

Eager Heart rushed forward. "Oh, no," she cried, "not in there, surely not in there, for that is my home, and I have just left only a poor workman and his family resting in the only bed that I might have offered to the King."

The Wise Men and the shepherds pointed to the star hanging low above her cottage and Eager Heart, trembling, opened the door.

The whole house was ablaze with light. There they

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found the Holy Family, and on the bed, which she had so lovingly and longingly prepared with spotless linen, was the infant King.

She fell at His feet in worship and wonder. The Wise Men left their gifts and led away the following crowd.



L

LIGHTHOUSES

WHEN we were staying on the Maine Coast the summer that David was just beginning to walk, do you remember how tired we got going around the road to the farm for milk for him?

How pleased we were when we found that we could row over from the point where we were staying, out through a narrow channel and across the open water to the shore where the farm was. There was a sandy beach — do you remember? — where we could land easily. Then it was just a few steps to the farmhouse and back to the boat, and we were saved that long walk.

We noticed that just beyond the little beach where we landed, a high, rocky ledge jutted out into the water. Great, jagged rocks, higher than our house, stood out in the sea, and the whole point was formed of solid rock.

When the wind blew hard we knew that we were not strong enough to guide our boat against it, so we never tried to go this way in bad weather. We knew the waves would dash the boat against the great rocks beyond our sandy beach, and it would either be smashed to pieces or a hole punched in it so that it would quickly fill with water and sink.

One day when we landed, we decided to follow a little path through the grassy field which led up to the top of the great ledge. It was a quiet, sunny day, and daisies nodded in the breeze as we passed. Cows were eating

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the grass, and we could hear the bell which the leader wore as she lazily moved her head about as she fed. Away up on the top of the ledge we found a white house with the tallest tower you had ever seen. Here and there all the way up there were little windows in this round tower. Near the top outside there was a narrow platform, built around the tower, with a railing. Above that was a room with the sides all made of glass and brightly shining in the sun.

As we started to go around the house to the tower a pleasant-faced woman, who sat by the kitchen window knitting, came to the door and invited us to go in, which we did.

There we found a happy family and a cozy home with plants blossoming in the sunny windows and everything freshly painted and brightly shining.

The mother was baking cookies, and the little boy was cutting out a sailor boy from some of the dough.

She asked us if we had ever seen a lighthouse before, and when we told her that we had not she said that she would take us up in the tower and show us the light.

Then we knew that the tall round tower was a lighthouse and that in the rest of the house the lighthouse keeper's family lived. They were a long way from neighbors and the village, but they had a garden and cows and hens and lived very happily. Many a time after that we went over to see the cows milked and to play with the lighthouse keeper's little boy.

The grandmother left her knitting and took us through a long, narrow hallway to the foot of the stairs that led to the light at the top of the tower.

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There she left us and told us that we would find the lighthouse keeper at the top cleaning the lamps.

So we climbed the stairs which went round and round, like the way into the spider's parlor, which you remember was up a winding stair. At each turn we found a tiny window which let in light enough for us to see our way up and through which we could peek out and look way off to sea. It was a long climb, and we were glad the grandmother had not tried to go with us. We kept on, however, until we came to the little round room with walls of glass which we had seen when we walked up through the fields before we went into the house.

Up here the daisies were so far away that we could not see them, and the cows looked as small as dogs, but we could see ships miles away out at sea; and when we looked through the great telescope which the lighthouse keeper showed us we could see plainer still.

Straight down below we could see the great, sharp rocks jutting out from the solid ledge, and as we looked at them we realized that no ship was ever built strong enough to run upon those rocks without being dashed to pieces.

While we were watching the lighthouse keeper cleaning the great lamps and polishing the reflectors behind them we had not noticed the clouds gathering in the sky until presently we heard a great bell ringing.

Then we looked at the lighthouse keeper and he said, "Fog bell, look out to sea."

Out where a little while before we could see so far, now we could see nothing but the gray fog. Not a ship



A LIGHTHOUSE
(White Island Light, Isles of Shoals)

LIGHTHOUSES

could we find. Down below, where we had watched the waves lapping the rocks we could hear them booming with a great roar, but we could see the rocks no more. The fog shut out everything from our sight.

Because fog and darkness hide the rocks so many times, lighthouses have been built in rocky places, or on sand-bars, where ships are liable to go or be driven against them. In these have been put great lights to shine through the darkness and bells to ring when the fog shuts them from view to warn the sailors to keep away from them.

Not all the lighthouses are as pleasant to live in as this one is, though.

There are great rocks in the ocean, always hidden by the waves, which can be reached only in a row-boat. There is no place for anything but the high tower. No garden can grow in such a place. In many of these places even the lighthouse has been swept away more than once and the keepers drowned when the great waves rolled in and beat upon it in a heavy storm.

In some places not even a tower can be built. In such a place a great ship with a light upon it is anchored as a warning to passing ships. This is a lightship and you can imagine how you would like to live in such a place, tossing about in wind and storm.

In some lighthouses now, electric lights are used, but not many can be lighted in this way. Some burn gas, but most of them use kerosene, and the lamps have to be filled and cleaned regularly. Before people learned to use kerosene, candles were used.

When ships pass these lights they usually whistle

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and the keeper learns to know the boats which pass often by their whistles.

The lights, too, are all different so that the captains of the boats learn to know which lighthouse they are passing.

They are all built differently, some of wood, some of stone, or concrete, or steel. It is not an easy thing to build a lighthouse so that it will not be washed or blown away by the wind and waves.

Then the lights are of different colors or shine differently. A machine shuts off the light and then lets it shine again so that the light winks different numbers. In some places there are twin lights.

High as these lighthouses are, the waves often dash up against the glass so hard that the windows are smashed.

It takes brave men and women to tend these lights. There are many stories told of the faithfulness and courage of the keepers.

In spite of the danger there are always brave men and women enough to be found to keep the lights flashing out over the sea and the fog bells ringing to warn the sailors off the rocks and the shoals and to keep their boats from being dashed to pieces.

TELLING TIME

LI

DAY AND NIGHT

THIS is the day the Lord hath made. Let us be glad and rejoice in it." This is what Brother learned in kindergarten.

We talked quite a bit together about what it meant and how much better it is to begin each new day cheerful and smiling than long-faced and gloomy. One little boy whom we know is no brighter nor any happier than any of the others, and yet we love to have him about for he has such a cheery grin, and when we say, "Let's do so and so," he almost always says, with that grin which makes us smile, "All right, then we will." He never seems to have time for a grouch or more than the beginning of a scowl, there are so many other things to do; and so we agreed to think of him as we said to ourselves each morning: "This is the day the Lord hath made. Let us be glad and rejoice in it."

Brother was only three years old at the time, and you were a wee, wee baby not more than half a year old.

A few mornings later you woke up and began to howl. How you did yell! Spiff slid out of his little bed and ran to your crib. He leaned over you and fairly beamed into your eyes. "No, no, Baby," he said. "Baby must n't. 'This is the day the Lord hath made. Let us be GLAD and REJOICE in it!' Baby must n't cry. Baby must smile and be happy."

One would have thought you understood, for never

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did I hear a sweeter gurgle than answered Brother's sweetly spoken words. Morning after morning he beamed you into happy waking.

But I started to tell you about day and night and why it is dark part of the time and light the other part. Years ago little Jewish children used to ask their fathers and mothers this same question. In the Bible we find what they told them about it.

"In the beginning God created the heaven and the earth. . . . And darkness was upon the face of the deep. . . . And God said, Let there be light: and there was light. And God saw the light, that it was good: and God divided the light from the darkness. And God called the light Day, and the darkness he called Night. And the evening and the morning were the first day."

This, the Jewish people told their children, was before any man was made to live upon the earth.

Every morning when we wake how good it is to find our room flooded with light. Often at night when you go to bed you beg me to leave the light on. You are afraid of the dark corners, because you cannot see what is in them, but I've never known you to be afraid in the morning when the light shows you those corners as they really are and just as they were last night when it was dark and you could not see them. You see we often say, just as was said at the beginning of the world: "Let there be light!"

Years before these stories in the Bible were told, children were asking where the light came from, and mothers and fathers were telling stories about it. Some of these stories we have to-day in books of Mythology,

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which were the Bible stories of the Greek and Roman people.

In the morning if you look out of the window [mention the east window as the front window in our room] just before the sun comes up, you will see the sky all rosy. Often we have watched the sun go down behind the barn [instead of barn speak of what you have seen the sun disappear behind] and then every cloud became rosy, with bright flames of color across the sky. Do you remember the night at camp last summer when the days were so long that we were in bed before dark and we watched the sun sink down like a great red ball into the sea? Do you remember we watched the sky grow rosy and the sea take on the same rosy glow and then the soft clouds roll along changing as we watched and making pictures for us of islands and mountains, castles and giants, and finally forming, we fancied, a whole circus parade? Were n't we glad there was a place where we could see so much sky and such beautiful colors, greens and purples that we had never dreamed of!

At night we see the colors in the sky after the sun has gone out of sight and those fade away as the darkness of night comes on. In the morning we see the colors just before the sun comes in sight, bringing with it the light of a new day.

Many beautiful stories have come to us that have been told about the coming and the going of the sun, and pictures have been painted and statues have been modeled to tell these stories.

The Greeks and Romans told stories very much alike. They said a glorious goddess — the Greeks called her

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Eos, the Romans, Aurora — with beautiful hair, rosy arms and fingers, rose from her couch very early every morning. Smiling she gayly wrapped a saffron-colored — do you know what saffron color is? Something between yellow and orange — mantle about her and harnessed her horses. Their names were Lampus and Phaëthon, which mean brightness and luster. Then she drove away in her chariot announcing day to the sleeping world.

As we begin to read we shall find many poems written about this goddess and often find her spoken of as “Aurora, rosy-fingered goddess of the dawn.”

Behind her, the story goes on, came the Sun-god; Sol, the Romans called him, Helios the Greeks called him. He was a handsome youth with flashing eyes and shining hair covered with a golden helmet. Every morning he rose out of the ocean in the east, and, drawn in a sun chariot by four fiery horses, crossed the sky and drove out of sight each night in the west.

The story never told how he got back again. Poems have since been written about this god, and in these he sails back in a golden boat. When I read them I wonder how they thought his horses and chariot got back to draw up the sun the next morning.

Where he went down in the west this god of the sun was supposed to have a splendid palace and a wonderful garden. It was called the Garden of the Hesperides.

The Indians told their children another story about the sunrise. They told of Waban. He was young and beautiful, and his cheeks were painted with the brightest streaks of crimson. With his silver arrows he shot away the darkness and brought the morning.

DAY AND NIGHT

In kindergarten many little children in these days sing about the sunshine each morning, and in one song they ask, "How did you wake so soon?" The answer is that the sun never goes to sleep but shines all night. As the world turns around the light is hidden until it turns the child back again where he finds the sun waiting always in the same place to shine upon the children each morning.

When I asked my mother why it is dark part of the time and what makes the sun come up in the sky on one side of the house and go down at night on the other, she told me that swinging in the heavens is a great shining ball, a million times as big as the earth, so large and so bright that I could n't think of anything so large or so bright. This is the sun. She showed me a ball and said that this earth on which we live is like a ball, too. It was very hard for me to think of the world in this way, but she made a little cross on the ball for the town in which we lived and on the other side of the ball a different colored cross for a town on the other side of the world, and then let my finger travel around the ball just as I could travel around the world.

Then she put a stick through the ball and turned the ball around. She held a candle so that it shone upon the mark on the ball which she had made for the town where we lived. I could see the mark and the light on that side of the ball. As the ball swung around, the light fell upon the other side of the ball, and it was dark where the cross stood for the place where we lived. Just so she said the earth was turning round and round as it swung in the air so that the sun shone on one side of it

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until that side turned away and then that side was dark and the side toward the sun was light. It takes the earth just a day and night to turn around, and it never stops; so we have first darkness, which we call night, and then light, which we call day.

So, although the sun is always shining, it is hidden from us every night by the earth itself getting between us and the sun. You can understand this better perhaps if I tell you that the earth is round like an apple only more times bigger than you can think. Suppose a light shines on one side of the apple. If a tiny mosquito lights on the side of the apple in the light and then the apple turns around while the mosquito stays right there, when the apple is halfway round the mosquito cannot see the light any more because the apple is between him and the light. As it keeps on turning he gets back into the light.

Men have learned a great deal about the earth on which we live, and the sun which gives it light, since the days when "God saw the Light, that it was good"; but they still wonder at the glory of the sunset, as it brings the darkness each night in which all things may rest and gain strength, and at the beauty of the sunrise each morning which brings with it the never-failing light of day in which all things work and grow.

LII

THE CALENDAR

HAPPY New Year," called Daddy, one morning a week after Christmas, on his way down to breakfast.

"Happy New Year, Spiff," echoed Brother, and later in the morning when Spiff went walking with Mother almost every one we met greeted us with the same cheery "Happy New Year."

That night Spiff said, "Mother, why did every one say 'Happy New Year' to-day?"

"Because to-day is the first day of January, and it is just three hundred and sixty-five days since the first day of January last year, and so we are beginning a new year. It's just the same as 'Good-morning,' which we say to each other at the beginning of each new day."

I took down the calendar which I had hung up last New Year's Day and showed Spiff the number at the top. He read the figures, 1-9-1-9. Then I showed him the new calendar which had been given to me for this year, and he read the number at the top of that, 1-9-2-0.

I told him that 1-9-1-9 meant nineteen hundred and nineteen years, and that 1-9-2-0 meant nineteen hundred and twenty years, and that these years had begun to be counted the year that Jesus was born. You know that last week we had a holiday and a Christmas tree and candles and presents because it was Jesus' birthday.

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When you had a birthday how many candles did we put on your cake? Yes, five. How many did we put on last year? Four. How many do you think we shall put on next year? Six. Why shall we put on six? Because you will be six years old. Last year there were four because you were four years old, and this year we had five because you are five years old.

Let us make a mark on the blackboard for every year that you have lived. Now let us try to make a mark for every year in the number on the calendar which shows us how many years it is since Jesus began to live. How many will that be? One thousand nine hundred and twenty. That is too many to make. I think so, too.

Now let us look at this calendar again before I hang it up. You see there are pages, let's count and see how many. 1-2-3-4-5-6-7-8-9-10-11-12. Now at the top of each page we shall find a name, and I will read them to you. January, February, March, April, May, June, July, August, September, October, November, December. These are the names of the months, and in each year we shall find these same twelve months. Let us look at last year's calendar and see if they are there. Let's look again at the new calendar. What do you see on each page besides the names of the months which are on the top, and the number which we said was the number of the years since Jesus was born?

Little squares, and at the top of each little square a letter, and in each square a number. Some of the pages have thirty-one numbers and some have thirty and one page has only twenty-eight. I know a little rhyme which

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will help us to remember which months have thirty-one days and which thirty and twenty-eight. It is:

“Thirty days hath September,
April, June, and November;
All the rest have thirty-one,
Except the second month alone,
To which we twenty-eight assign
Till leap-year gives it twenty-nine.”

These letters and figures mean something, too.

Do you remember when we talked about the sun and moon we found that the earth is turning over and over, and that it took just a day and a night to do this once? Do you remember that we found also that it is moving around the sun and that it takes three hundred and sixty-five days to do this once? There was something else we found out, too, which is that we see the moon full, that is, as a round ball, once a month.

This is why we have a calendar; to show these things. Men used to say, “In so many moons we will do so and so,” but it won’t do to tell time that way now. We plan our time to a minute, or if we are catching a train, to a second. So that one person could let others know just what time they meant to do a certain thing, or to be at a certain place, they called the time that it takes for the world to turn over, a day, and named seven of these and called that many a week. Then they called four of these weeks a month and twelve of these months a year, but that did not come out an even three hundred and sixty-five days, which is the time it takes for the earth to go around the sun, and so they added two days to some of the months and three days to some others and

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now we have a calendar to tell us the days of the week and month and year. On some calendars a picture of the moon is drawn so that if you want to know when there will be a full moon, or a new moon, or a half a one, you won't have to reckon from the last one to find out, all you need to do is to look on your calendar. If you forget what year it is, just look at your calendar. This saves trouble, too, for if there were no calendar you might think it was nineteen hundred and eighteen years since Jesus was born and I might think it was nineteen hundred and twenty-one years and Brother might think it was something else, and then who could prove what it is anyway?

I wonder if you can tell me the names of these seven days that are marked on the top of each page?

First, there is the day that we go to church. What is that? Then there is the day for washing when we start the week at school. What is that? Then the day for ironing. This is like "Going to see Miss Jennie Jones," is n't it? or "I went to visit a friend one day." I think it would be nice to make or find pictures of the things people do on each day of the seven and make a calendar of our own. We have Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday.

Each morning we have a new day. It is n't very long between the new days, is it? You can remember yesterday and the day before that. You can think back easily to the first of the week and remember what we did Sunday, and here it is Saturday night again and time to think of another week; but can you think back as quickly to last New Year's Day and to all the days

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between? So it was a very good plan to name only seven days and then number the weeks from moon to moon and name twelve months instead of having to learn a name for every day in the three hundred and sixty-five that make a year, was n't it?

There is something else in the year that the turning and moving of the earth around the sun gives us. If the sun stood still and the earth stood still we should always have the same amount of sunshine, and then the weather would always be the same instead of part of the year warm and part of the year cool, part hot and part cold, as it is now.

Do you know what we call the hot part of the year, when the grass is green and we like to go swimming? Summer. What is the cold part called, when we go coasting and skating? Winter. Then there is the time between summer and winter when the leaves turn red and gold, and the squirrels hide the nuts and acorns, and Jack Frost first comes and turns the gardens black with his chill breath, and this is called the fall or autumn. Between the winter and the summer is another time, when we watch for a flash of blue and hear a little caroling song to tell us that the first bluebird has come back from the Southland, where he has been staying all through the cold winter, and when this happens, and we hear also the frogs peeping down in the meadows, we are sure that spring has come. We call these the four seasons.

What a lot of things a year brings us! No wonder we take time to say on the first day of each one "Happy New Year!"

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Let us see if we can remember all the things that the calendar tells us.

First, the number of years since Jesus was born; then the names of the twelve months, the names of the seven days of each week, the number of the days in each month, the changes that we shall see in the moon, and the four seasons in the year. Each season has three months.

Almost every month in the year has one day that we keep as a holiday; a day when we need not work or go to school but remember some special thing that happened on that day. Can you remember any of the good-time days that we had last year?

Christmas? We could never forget that, could we?

Let's play a little game for the months of the year. We will have a grand procession. Shall we have paper dolls, or our little chairs, or shall we draw the people on the blackboard for our grand march? When you have as many as twelve children to play with again you can play this game of the months with them.

You think we had better draw them on the blackboard? Well, here is January. We will draw a little man for January, and what does he bring us? Ice and snow and sleds and skates? Yes, and best of all, the New Year. So let's have January lead our procession and carry either a little baby to show that the year has just been born or a banner with the new number on it. It's easier to draw a banner with the number of the year, so let's do that.

Now, we will draw February next, and what do we remember February brought us last year? Washington's

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Birthday. Washington was the President of our country, and so we'll remember him best by the flag of our country; so February shall carry the Stars and Stripes.

And what else comes in February? A day when the postman is busy and letters are full of love and surprises. St. Valentine's Day, to be sure; and in his other hand February shall carry a valentine.

Look on the calendar, and I will read for you what comes next. March. He brings no holiday. How could he? — for it's March that calls the bluebird back and the frogs and the crocuses; spring, with cleaning enough in the house and gardens to keep us all busy and happy the whole thirty-one days without having a holiday on any one of them. So March shall carry a caroling bluebird, for the bluebird stands for happiness, and we are always happiest when we are busiest.

Then April with Mother's birthday and Brother's, too, and showers to start the mayflowers; so we'll let April carry an umbrella and a loving greeting. Next in the procession we must have a queen and children gayly twining a pole with garlands and baskets and wreaths of flowers, for these are for May and Memorial Day. Roses and strawberries for June, and a grand hurrah for the Fourth of July. Fireworks, too, and a flag, of course, for the grand hurrah was because our country stood for Right and Freedom and the flag stands for our country.

August comes with hammocks and boats, berries and picnics, for it's vacation time and summer and brings a chance to rest and play.

Then comes September with baskets of fruits and

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vegetables, and ripened grain! Such loads of apples and peaches and pears and grapes, squashes and turnips, potatoes and the rest, golden corn and yellow wheat. What a load for September, the first of the autumn months!

Now, what shall we draw for October? Nuts and bright leaves. Nothing could be better, but we must have a pumpkin to make the children a Jack-o'-lantern, for the last of October brings us Hallowe'en; and how could we have a real Hallowe'en frolic without a pumpkin Jack-o'-lantern?

And now November and the winter months have begun. Have we anything left for November? Thanksgiving Day, of course, a day to give thanks for all that has gone before and especially for September's heavy baskets and stalks of golden grain; and what shall we draw for November but a turkey, of course?

And now let's count and see how many more we have. Let's count on our fingers as we name. January with its Happy New Year, February with its flag and valentines, March with its signs of spring and happy work — and did we forget the children's kites and marbles and jump-ropes? I believe we did — April with its showers, May with the Maypole and the day when we remember the soldiers who fought to keep our country peaceful, June the month of roses, July the month the boys love best of all, August for vacation, September for harvest, October with pumpkin Jack-o'-lanterns, November with turkey and plum pudding and all the family at Grandmother's house. That is eleven, so we have one more.

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December, last of all. But best you say, and why? For he brings the Christmas-tree with its glorious star, and stories of loving and giving, and of the "gladdest of birthdays of all the year."

And then it's best because it's nearest to another New Year which will bring us twelve new months with all these good times all over again.

All these days to grow in, too. Stand up by the wall, and I will put a little mark to show how tall you are. Next year we will measure again and see if you have grown any. [Or measure and weigh and keep the record each month on a card.] I want you to grow broad-shouldered and straight and tall this year, and I want you to grow two other ways. One of them I am sure you know. Yes, good. Here is a little prayer. I am going to pin it up on the wall beside your bed, and I will read it and let you say it after me every night and that will help. This is the prayer:

A BOY'S PRAYER

By William DeWitt Hyde

GIVE me clean hands, clean words, and clean thoughts. Help me to stand for the hard right against the easy wrong. Save me from habits that harm. Teach me to work as hard and play as fair in Thy sight alone as if all the world saw. Forgive me when I am unkind, and help me to forgive others who are unkind to me. Keep me ready to help others at some cost to myself. Send me chances to do a little good every day and so grow more like Christ.

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There is a poem that I used to read to Brother when he was six years old which helped him to grow good, and I will read that to you, too. It is called "If" and Rudyard Kipling wrote it.

Now there is one more way to grow and that is to grow wise. The best way to do this is to learn the lessons which Mother and Father and our teachers ask us to learn each day.

We must learn to read, for in books have been written all the things which others have found out about this world and how it is made and the things in it. People will read to you now that you are little, but how they will laugh at you when you are bigger if you cannot read for yourself. Letters will come to you, too, and these you cannot read if you do not learn your letters and their sounds now.

Then you must learn to write, because you will want to tell your friends things when they are far away, and you can do this if you try hard now to make each letter that the teacher asks you to, for you can write in a letter and mail anything which you wish to say. You must learn your number lessons before you can learn what men have found out about the stars or about flowers or birds or buying or selling things. Numbers are used in almost everything we do. You want to get some milk for your supper, and you cannot be sure you are paying what you should for it unless you can count the money. The man who keeps the cow has to know his numbers before he can measure the milk and give you a quart or a pint or as much as you want, whatever that is. He must know how many quarts of grain to

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give his cow. Men could n't build a barn for the cow to live in if they could not measure yards and feet and inches and add and subtract and multiply and divide, and all these things you will learn in your number lessons.

So when you have to say, once one is one, two ones are two, and make figures and write letters until you are tired, remember that you cannot grow wise unless you learn these things to help you and try to get each day's work all done in time. Then next New Year's Day I shall say, How my child has grown; strong and tall, wise, and best of all, good. Then what a happy Mother you will have!

THE NEW YEAR

By Hans Christian Andersen (adapted)

It was the last day of the Old Year. The snow was falling heavily, and twirling and whirling through streets and alleys. The windows were white with Frost. Snow slipped in masses from the roofs.

The people on the streets were in a great hurry. They ran through the blinding flakes, and bumped into each other, then ran on again. The Frost on the wagons and horses looked like powdered sugar.

But when night was come the storm died down. The air was calm, the Sky was deeply dark and transparent, and the Stars shone brightly like silver. Midnight drew near, — the last minute of the Old Year slipped away, the New Year was born.

And when the Sun rose, it sparkled on the Snow that crackled under foot. In the street some little Sparrows

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were hopping about, searching for food; but the Wind of the Old Year had swept the Snow clean. It was terribly cold.

“Tweet! Tweet!” said one little Sparrow to another. “People call this the Happy New Year! I think it is worse than the Old! I am very sad! Last night people rejoiced because the Old Year was gone. They fired guns and made a great noise to welcome the New Year. I, too, was glad, for I hoped that warmer days were come. But it is colder and freezes worse than ever! I think people must have made a mistake — it is not the New Year!”

“When Spring comes, the New Year begins,” said an old Sparrow with a white head.

“But when will Spring come?” asked the others.

“When the Stork returns,” replied the old Sparrow. “No one in town knows when that will be. Only the country people know. Shall we fly away to the fields and wait? Surely Spring will come sooner in the country.”

“That sounds very well,” said another Sparrow, who had been hopping about, chirping. “But I have found too many comforts here in town. I should miss them in the country. Where I live the family have placed three flower-pots by the garden wall, with the openings against the wall and the bottoms of the pots pointed outward. They have cut a hole in each pot big enough for me to fly in and out. I and my husband have built a nest in one of them, and there we have brought up our children. The people strew bread-crumbs for us every day, so we have plenty of food.

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No! I think my husband and I will stay where we are."

"But we will fly away to the fields," said all the other Sparrows, "to see if Spring is come."

And off they flew.

It was really Winter in the country. It was much colder than in the town. The freezing Winds blew over the snow-covered fields. The farmer, wrapped in his coat, sat huddled in his sleigh. The reins lay on his knee. He beat his arms across his breast to warm them. The horses ran and their sides sent up clouds of steam. The Snow snapped and sparkled.

And the little Sparrows hopped about in the road, shivering and crying.

"Tweet! Tweet! When will Spring come? It is a very long time in coming!"

"Very long, indeed!" sounded a loud voice over the meadow.

Perhaps it was an echo, or perhaps it was the voice of a strange old man who sat on a mound of Snow. He was clad in white. He had flowing white locks and a pale face. His eyes were large, and clear, and blue, like ice.

"Who is that old one?" asked the Sparrows.

"I know who he is," croaked a Raven. "He is Old Man Winter himself. He rules here still. He did not die when the New Year came. He is watching for the coming of little Prince Spring. Oh! how cold it is and how you shiver, my little ones!"

But the Sparrows did not answer; they only hopped about, still crying:

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“Tweet! Tweet! When will Spring come?”

Week after week passed by. The woods were dark and drear. The lake was frozen and gray. Icy mists hung above the land. Flocks of black Crows flew silently overhead. But one day a little Sunbeam touched the lake. The Ice softened and shone like silver. The Snow did not sparkle any more.

Still Winter sat on his white mound, ever gazing southward. He did not see that the Snow was vanishing and sinking into the earth, and that here and there green grass was springing up.

In the grass the little Sparrows hopped. “Tee-weet! Tee-weet!” they cried. “Surely Spring is coming.”

“Spring!” And a joyous cry sounded over the meadows and through the brown, leafless woods!

The moss freshened on the tree-trunks, and from the land of the South two Storks came flying with outspread wings, and on the back of each Stork sat a lovely child, a little boy and a little girl. They sprang to the earth and kissed the green grass.

They drew near to Old Man Winter, whose icy breath stirred the air. They threw their arms about his neck and kissed him. A thick, damp mist rose from the mound and like a veil wrapped itself about the two children. Then a soft Wind blew away the mist, and the Sun shone.

Old Man Winter was gone! And the lovely little children of Spring sat on a flowery throne. Then the little girl held her apron up; it was filled with blossoms. She cast white and pink petals over Apple and Peach trees, and showered the grass with spring flowers. Next, the

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boy and she both clapped their hands, and flocks of birds came twittering, and singing:

“Spring is here!”

How beautiful it all was!

And the little Sparrows hopped with joy, and cried:

“Now the New Year is really come!”

LIII

CLOCKS

FROM the time you were a baby you never got into Daddy's lap but what in a few minutes you were poking about for the vest pocket where he carries his watch. Up to your ear it would go, and then your eyes would dance, and up and down would go your lids just in time to the tick, tick, tick, tick, tick, tick, tick, tick of the little watch. How that little watch would rush along with its soft, hurried tick, tick, tick, tick, tick, tick, tick, tick, tick.

It sounded as if it were trying to catch up with something, and one day you said it was. You were holding Daddy's little watch while he held you by the fire, and once in a while you would look at the tall grandfather clock. The big hand on the face of the clock went around once in just the same time as the big hand on the face of the watch. When the big hand of Daddy's watch, tiny as it was, pointed to I on the face of the watch, the big hand of the grandfather clock pointed to I on the face of the clock. When the big hand on the watch pointed to II, the big hand on the tall clock pointed to II also. The little hands on each did not move as fast as the big ones did, but the one on the watch and the one on the tall clock always pointed to just the same number on each.

They did n't sound the same, though. The grandfather clock was very dignified, and very slowly said, tick—tock—tick—tock. While it said tick—tock twice,

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the little watch was saying tick, tick, tick, tick, tick, tick, tick, tick, tick, tick, tick, tick, tick, tick, tick, sixteen times.

“Just like Grandfather and Baby,” you said. “He has long legs and takes great, long steps, and Baby’s legs are short and he toddles along with little quick steps to keep up.”

That made me think of something, so I showed you the dining-room clock and told you to listen. You laughed, “That’s like me,” you said. “Listen, — tick-tock, tick-tock, tick-tock, tick-tock. My legs are not so long as Grandfather’s, but they are longer than Baby’s, and so they have to go faster than Grandfather’s, but not so fast as Baby’s to keep up.”

Brother had brought home some horse-chestnuts and I tied one to the end of a string almost as long as the grandfather clock was tall. Then I tied one to a string half as long and one to a very short string. These I tied to a chandelier and with a little push set them swinging. You may try the same thing if you wish. Let’s make two of each length and see what happens. Yes, the shorter they are the faster they go, and the longer they are the slower they go, and if they are the same length they keep the same time in swinging back and forth.

A cord swinging in this way is called a pendulum. Brother looked through the glass in the lower part of the front of the grandfather clock, and sure enough there was the pendulum, very long and swinging very slowly, just in time to the tick—tock, tick—tock of this same old grandfather clock.

In the dining-room clock there was a pendulum, too,

TALKS TO CHILDREN

about half as long as that in the grandfather clock, and it was swinging just in time to the tick-tock, tick-tock, tick-tock, tick-tock of the dining-room clock. We could n't see the pendulum in the little watch, but we could still hear the tick, tick, tick, tick, tick, tick, tick, tick, sixteen to one of the tick—tock of the steady, old grandfather clock.

While we were watching and listening, we had forgotten the pendulums we had made of the horse-chestnuts until Brother called to us to see that they had stopped swinging. We gave them a little push, and away they went, but it was not long before they had stopped again. The old grandfather pendulum and the pendulum in the dining-room clock went right on, and the little watch never stopped its tick, tick, tick, tick; but the pendulums we had set going had to have a little push once in a while or, just as when we were swinging under the apple-tree, they would go slower and slower till they stopped.

Did you ever have five pushes when you were swinging and then "let the old cat die"? That is the way we played with the pendulums.

"But why does n't the clock pendulum stop swinging?" you asked. "What keeps that going so steadily?"

A little wheel inside gives the pendulum a push as it turns around, and as they touch each other we hear a little click. That is the tick-tock which we hear when the clocks are going.

I'll not try to tell you all about the way a clock is put together, but I will tell you that there are different-sized wheels, all connected with each other and with

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the hands and the pendulum and the part that strikes. As these wheels turn around they push the pendulum back and forth and the hands around.

To keep the wheels turning there is a cord with a weight on the end, wound around a cylinder which is called a barrel. Did you ever wind your fish line around the pole with a sinker on the end? When you wind the clock you turn this barrel over and over, and the cord winds round and round it till the weight is up high in the clock. You can see this in a cuckoo clock which you wind by just pulling up the weights which are on the ends of chains hanging below the clock. Start the clock and the weights begin to drop slowly. This motion turns the wheels. When the cord is all unwound the wheels stop turning, and we say the clock has run down. It will not run until we wind it again.

They are so made that they do not need to be wound oftener than once a day, and many of them once in eight days. These are called eight-day clocks. You have seen Daddy go around the house the last thing at night sometimes to see if Mother has forgotten to put the cat out, lock the doors, and wind the clock, have n't you? So you see that nothing in a home runs itself, not even the clock, unless some one winds it.

The night we forgot the clock, we found how much we depended on it, for when we woke in the morning it was dark and rainy, and we had no idea whether it was six or eight o'clock or when to start for the train or school.

The first clocks were very simple, but those that are made now have springs as fine as hairs and a balance

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wheel instead of weights and a pendulum. Great factories have been built with a different machine for making each little part and a special room where all these parts are put together; and thousands of clocks and watches are made every day, so that there is hardly any little town so small or far away but that a watch can be found there and bought for as little as a dollar.

I know a man who has a whole room full of clocks that he has bought from time to time, and it is an interesting place to visit: so many different kinds of clocks, big and little, handsome and ugly, some so simple that you could put them together, and some with so many little parts so finely fitted that very few watch-makers could put them together again if they were once taken apart.

The one that I loved best was a tall grandfather clock, and for striking it had a chime of bells. Above its face was a half-circle marked off with numbers from one to thirty, as the clock-face was. Two circles showed each half of the world turning, and above two circles, for the moon, painted with jolly faces, turned, so that by looking at the figures above one could tell the date. The face of the moon showed whether it was full, half, or which quarter at that date.

The very first clocks had no pendulum and could run only when standing straight up and down. Of course, these could not be carried in any one's pocket. Brother used to tease to see the wheels go round in Daddy's watch. One day he almost did a dreadful thing. He knew better than to touch Daddy's watch unless he was told especially that he might, but one day he found



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A FAMOUS CLOCK
(Houses of Parliament, London)

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it on the bureau and he opened it to see the wheels go round just once. Then he thought that if he could only just get it out of the case, he could find out better what made the little tick. He looked hard to see how to do this, and was just starting when a little voice in the watch ticked out, "Do right, do right." This made him stop a minute, and that minute saved Daddy's watch from being ruined, and Brother from a very sad time. For I found him just then. I did n't scold him. He was very much ashamed to be found with the watch, for he knew he ought not to take it from the bureau; and I'll not tell you all we said about that; but he never touched the watch again, for he was not a bad boy and he did n't want to make Daddy and me unhappy.

Some time after that he found an old clock which was no longer of any use to tell the time. This we let him have to take apart and use as he wished. How pleased he was! Carefully he sorted all the wires and wheels. He noted the sawlike edges of these and how they fitted together, and how the springs unwound and pushed the wheels, and what kept the springs from unwinding with a jerk, all at once. He saved all the little screws and bars of steel.

Then he looked at the face and saw that that was metal like the wheels, and painted white. He played with the little hands, and turned them round and round before he took them off, to find how they were fastened in the center and to the wheel inside of the clock which turned them.

Then he tried to put them all together. Days and days he worked to do this, and he learned for the first

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time how much easier it is to tear things to pieces and spoil them than it is to make something worth while. Daddy's watch was safe now. Not long after this he learned to tell time all by himself, and on his next birthday one of his happiest surprises was a watch all his own.

No matter where he was he could look at his little watch and know what time it was.

One day we went on a picnic, and both he and I forgot our watches. We had planned to get back home at three o'clock in the afternoon to meet Daddy. How should we know when to start without a watch to tell us the time?

"We can't tell the time to a minute," I told him, "but we shall have to do the best we can as people did before watches and clocks were made."

"How was that?" he asked.

I looked about and found a straight stick. "It's lucky the sun is shining," I said, as I pounded it into the ground. "Now see that shadow."

"How long it is!" Brother called; "why, it's longer than the stick itself."

"Look at your own shadow," I called back to him; "it's longer than you are yourself."

Then Brother began to chase his shadow and make animals with his hands, and I told him Stevenson's poem, "I have a little shadow."

All this time the shadow kept creeping up and up on the stick. While he played, I kept track of it, and when there was no shadow at all on the ground, I called, "Let's eat our dinner now, for it's noon. Look at the stick."

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"Why, it's swallowed the shadow!" said Brother.

"Look for the sun," I told him. "It is the sun that shows the shadow, and when it is straight overhead you will see no shadow on the ground. This will be at noon."

When we looked closely we found just a tiny shadow there, because the shadow is not the same in all places in the world at noon.

"There is the sun now right up over our heads," he told me.

"That is how I knew it was noon and time for dinner," I answered.

After dinner the shadow peeped out on the other side of the stick and stretched farther and farther away. We watched the sun and the shadow, and as the sun sank toward the west the shadows grew longer.

"When the shadow is about half as long as the stick we must go," I said, "for three o'clock is about half the afternoon and the shadow will show us that."

When the shadow told us it was time, we gathered our things together and started. As we went through the garden on the way to the house, I said, "Let's stop at the sundial and find the shadow on that."

For the first time Brother noticed the shadows on the sundial. This, you remember, is a little stand with a face on top, something like a clock-face, with little marks to measure the lengths of the shadows at different hours. Standing up in the middle is a piece of metal which casts the shadows as the stick did for us at our picnic. Before there were any clocks these dials were used to tell the time.

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There was the shadow showing that it was about three o'clock, and we went on into the house and found that the clock said quarter-past three. So the shadow had told us the time fairly well, only it was lucky we had n't planned to take a train at just three o'clock, for at quarter-past it would have been gone, and as far as that train was concerned we might as well have been an hour late as a few minutes.

When we had our story-time we talked more about telling time without clocks. You wondered how people could tell time in the night with the sun-dial, and I told you about the moon-dial which was used with the moon and stars.

Another way that has been used to tell time is to watch a cat's eyes. Look at Kitty some time and you will see a dark spot in the middle of her eye. In the morning this is almost round, but at noon it is like a straight line. After noon it grows slowly wider until at night it is round again.

To tell time in these ways the sun must shine, and, of course, the sun did n't shine all the time for people before there were clocks any more than it does now. I don't mean quite that either, do I? For you remember that I told you the sun was always shining, only when we turn away from it we cannot see it, and when the clouds come between us and it we cannot see it.

So slowly other ways were learned.

King Alfred, we are told, watched a lighted candle and learned to tell time by that. Can you see how? He could try several, and learn on a sunny day how long it took to burn a certain part of the candle. By making a

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notch for each hour on the candle he would have a fairly good measure for the time.

Also water was poured into one vessel and allowed to drip one drop at a time into another one, and time measured in this way. An arrangement of this sort I found in the Encyclopedia was called a "clepsydra."

You have seen my three-minute-glass that I use when I boil eggs. This, you remember, is a glass which stands in a little frame, big at the top and bottom and squeezed in at the middle like a waist-line no bigger than a pencil. You did dress it up once, I know, with a bonnet on the top and a ribbon around the middle for a waist.

In one side there is sand enough to take three minutes to run down into the lower half. If you turn it over, the sand will run back again in three minutes more.

They were also made with sand to run for one minute. These were minute-glasses. Bigger ones were made which ran for an hour. Those were hour-glasses, and there were day-glasses.

Such glasses were used in England in many churches, and some with very elaborate stands can be seen there to-day.

Out of all these ways of telling the time grew the clocks and watches that we use to-day, but we still watch the sky for the time to set our watches.

In great observatories the time is determined by men who watch the sun, moon, and stars through telescopes, and their clocks are set by what they see. This time is made the standard time in one place and sent by telegraph to cities and towns. Most places, even small ones, have some signal each day by which the people there

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set their clocks and watches, for even the best of them lose or gain a little once in a while, and most people forget sometimes to wind them.

In our town we listen for the curfew at ten minutes of nine. You have heard us say, "Ten minutes of nine, look at your watch," have n't you? But not often, for at ten minutes of nine little folks should be sound asleep. My mother used to say, "Beauty sleep is before nine o'clock, so my little girl must get all she can."

So close your eyes, and to-morrow I'll tell you about the hours and minutes, and we will try to learn to tell time by the clock.

LIV
HOURS AND MINUTES

WHEN I was no more than three years old, my mother used to say, "Run and see what the clock says," and I would look at the clock and say, "The big hand is on one." Then she would say, "Where is the little hand?" I would come back again and say, "The little hand is on eleven." Then she would say, "Five minutes past eleven; time to see about dinner."

I remember all this so well! I don't remember ever telling her anything else but where the hands were at five minutes past eleven; and whether it was a game which we played or I only did this once or twice and always at about the same time of day, I do not really know, for it was a long time ago when I was three that all this happened. I do not really remember when I learned to tell time, but I do remember the day that Mother gave me a little watch for my own.

It had a little case that looked just like her gold one, and I could wind and set it without any key, just by turning the stem where the ring fastened onto my little chain. I was more pleased than with anything I had ever had and did n't notice that it did n't tick until I showed it to one of the big girls who was passing as I played in the yard.

"T ain't a real one," she said.

"Yes, it is, a really, truly watch," I said proudly and happily.

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“T ain’t either,” she said. “It don’t tick.”

It might as well have been night. The sunshine was all gone for me for that day, and as the big girl walked on, looking very wise, a sad and meek little girl took her “real” watch, which had now become nothing but a toy, out under the lilacs to tell her best doll all about it. Really there are some things that big girls do not need to tell little ones, even if they are quite sure they know all about them.

That night Mother said, “Where is your watch, dear?”

“I gave it to my doll,” I answered. “It is n’t a real one, you know.”

“I know,” said Mother, as if she expected me to say just that, and did n’t notice that I was trying hard not to show how disappointed I was. “I thought perhaps we could teach Dolly to tell time with it, it is such a pretty little one, and then when you are big enough to really use it you may have a real one.”

It was night now, but the sunshine had all come back to me, and I ran for Dolly and the watch.

Mother showed me the numbers round the face. She had taught me before this to name figures from one to twelve, but these numbers looked different. She told me that these were the figures that the Roman people had used and were called “Roman numerals”; “numerals” being another word for “numbers.” So all we did that night was to try to learn these. The next morning, when I did n’t know what to do, she told me to draw a circle and put XII at the top and VI at the bottom.

I made lots of these circles, and sometimes I put the Roman numbers, XII at the top and VI at the bottom,

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and sometimes I put the figures 12 at the top and 6 at the bottom. Then I made a tiny circle in the middle of my big circle, to show where the two hands on the clock-face are fastened on and turn. Then I drew a line with an arrow-point from the middle of the circle to XII and another partway to VI. These lines were to show the hands on the clock, and I made one shorter than the other.

The next day Mother told me to draw another circle as I did before with XII at the top and VI at the bottom, and the long and short hands. Then she told me to make a circle with XII and VI and no hands, but to look at my little watch, and halfway between XII and VI to put what I saw there on each side of the face that I had drawn.

I played this way until I had learned that XII was always at the top of the clock-face and VI at the bottom; IX halfway between at the left hand, and III halfway between at the right hand, and could draw a circle and make the four numbers. I drew the hands from VI to XII so that they cut the circle in halves and from III to IX so that they cut the circle in halves across that way.

Mother cut an apple in halves and showed me that the pieces were just the same size, and told me, when anything is cut in two pieces of just the same size, that each piece is called a half. She went further and cut the apple into four pieces by cutting each half into two pieces, each of the four pieces being the same size, and told me that each of the four pieces is called a quarter.

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Then I made another circle with XII at the top and VI at the bottom, III in the middle at the right side and IX in the middle at the left side, and drew a line from XII to VI and one from IX to III. This divided the circle into quarters.

Then we took the little watch — not for a good many days, though, and until I had learned to divide the circle very quickly into halves and quarters, and surely knew the Roman numbers for six, twelve, nine, and three, and where they belonged on the clock-face — then we took the toy watch, as I said, and turned the hands so that both hands pointed to XII.

“The little hand always shows what hour it is,” Mother said.

In every day there are twenty-four hours. Long ago men told time with twelve hours, and never counted the twelve which make the night, and they have counted in different ways in different times and places, but we count nowadays from twelve to twelve for a day and from twelve to twelve for a night, beginning to count one in the middle of the day and one again in the middle of the night.

When both hands point to XII right at the top of the clock it is twelve o'clock. Now turn the big hand to III and leave the little hand where it is. Remember the little hand points to what hour it is, so as long as the little hand points to XII it is twelve o'clock.

Now I want you to know that in every hour there are sixty minutes, so if you look at the little watch you will find dots between the figures, five of them between each two, and each one stands for a minute, so the figures

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are each five minutes apart. Let's count and see if there are five between each two figures. The little hand points to one hour all the while the big hand goes way around the clock, and then it points to the next number, for each number stands for an hour, and in one day and night the little hand goes twice around the clock, once for the twelve hours of the day and once for the twelve hours of the night. It does n't jump from one to the next number, but it slides along so slowly that we do not notice it has left XII until we see it at I. Brother says it kind of slides its base as he does in baseball unless some one looks too soon and catches him.

Now look at the watch. Here is the little hand telling us it is twelve o'clock, but the big hand has gone to III, and that is what part of the way round the circle? Yes, just a quarter, so we say it is quarter-past twelve. Now turn the big hand to the bottom. The little hand still stays at XII and tells us that it is twelve, but the big hand has gone what part of the way round the circle this time? Yes, half, and so we say it is half-past twelve. The big hand has been running past XII all this time, but turn it to the middle of the other side to IX and watch it go toward XII. When we drew the line to III and IX we said it made quarters, and it is just as far from XII at IX as it was at III, only it is on the other side. So, now, instead of quarter-past or after twelve, as it was at III because the hand was running away from XII, it is quarter before twelve because the hand is moving toward XII again.

For a number of days we played just this with the clock, until I could tell when it was twelve o'clock,

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quarter-past twelve, half-past twelve, and quarter of twelve. Then we put the little hand on I and the big hand on XII. Remember the little hand always shows what hour it is, and when it is on I it is one o'clock. The big hand begins at XII, and when it is at XII we know it is just on the hour and look to see where the little hand is, to tell us what hour. We kept the big hand on XII and turned the little hand to each hour of the twelve until we had learned them all.

When I could turn the little hand of my watch to each of the twelve hours and name it, and the big hand to XII and then to quarter-past, half-past, and quarter of any of the twelve hours, and tell which it was, I made five dots on the board and made a Roman number I beside them. Then next to that I made five more dots and put a Roman II beside them, then five more and a Roman III. Then I learned to count five-ten-fifteen.

It took days to learn that. Then I made twenty dots and put a Roman IV beside it. I learned that this was sometimes written IIII and sometimes IV. Next I made twenty-five dots with a Roman V beside it and thirty dots with a Roman VI beside that.

Then I learned to count by fives to thirty. It was n't hard, for we did this when we played hide-and-seek. In fact, I could count to a hundred this way.

With the little dots and the numbers beside them I learned to count by fives the minutes past any hour that the little hand pointed out on the clock-face. I did it this way: one five is five and turned the big hand to

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I, which was at the end of five dots; it is now five minutes past; two fives are ten, turning the big hand to II; it is now ten minutes past; three fives are fifteen, turning to III; it is now fifteen minutes or quarter-past; four fives are twenty, turning the big hand to IV; it is now twenty minutes past; five fives are twenty-five, turning the big hand to V; it is now twenty-five minutes past; six fives are thirty, turning the big hand to VI; it is now thirty minutes or half-past.

The next thing we did with the little watch was to keep at this until I could turn the little hand to each of the twelve hours and the big hand to I, II, III, IV, V, or VI and tell whether it was five minutes, ten minutes, quarter, twenty minutes, twenty-five minutes, or half-past whatever hour the little hand pointed to.

Not till then did we begin on the minutes before the hour between six and twelve on the right-hand side of the clock.

Then we began at quarter of each hour, keeping the big hand at IX and moving the little hand until we could tell quarter before each of the twelve hours.

When we were sure of this, we put the big hand at X, and found that this was always ten minutes before whatever hour the little hand pointed to.

Then in the same way we learned that when the big hand was on XI, it was always five minutes before.

Not until I was a big girl did I learn that when the big hand was on VII it was twenty-five minutes of, and when on VIII that it was twenty minutes of.

When I could do this, for a present one birthday I had a real watch. Of course I was pleased, but I never

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had half the fun with it that I did with my little watch teaching myself and Dolly how to tell time so that I could have the real one.

To help you learn to tell time, I have this little cardboard clock-face which I bought at Milton Bradley's school-supply store. I have this one with the Roman numbers, and I have made one with the figures which you already know. I think it will be easier to learn first with the figures.

Your watch has two hands, the little hand which shows the hours and the big hand which shows how many minutes past or before an hour it is. When you were sick and the nurse felt your pulse, I saw a tiny little hand on her watch and this little hand went way around the watch while the big hand moved from one little dot to the next. You know we watched the big hand that tells the minutes go round the clock once while the little hand that tells the hours was going from one number to the next.

We know that every day and night has twenty-four hours, that is, twelve hours from noon to midnight, and that every hour has sixty minutes; this little hand that is on some watches ticks out sixty seconds in every minute.

There is a little verse about this that we will learn:

“Sixty seconds make one minute —
How much good can I do in it?
Sixty minutes make one hour —
All the good that's in my power.
Twenty hours and four a day,
Time for work and sleep and play.

HOURS AND MINUTES

Days three hundred sixty-five
Make a year for me to strive
Right good things each day to do,
That I wise may grow and true."

With clocks and watches to tell us when to get up in the morning, when to wash and eat and work and play, when to read and when to sleep, I wonder why mothers have to say "Hurry" so much and teachers have to put so many tardy marks on report cards.

There is a story about Dilly-Dally, a little girl whose real name was Edith, which you will like to hear some time. She never was on time for breakfast. She dawdled over her dressing until her mother was sad, and had to scold her every morning. She never was on time at school, and lost half her work, she wasted so much time when she had writing to do. She was so late one day that she missed a picnic, and finally the teacher forgot her real name, and she was known as Dilly-Dally wherever she went.

The story tells how ashamed she became of this and how she learned to be on time for everything until she could have her own name, Edith, back again.

LV
THE SEASONS

DON'T we have a fine time when we can go out on a hill and see the whole great arch of the sky? There are the wonders — the sunrise and sunset; the rainbow and the clouds; the moon and the stars.

From these men have learned to divide time and name the parts. You know what makes day and night. We talked of how the day was divided into hours and minutes and seconds.

Then came weeks, and, as the moon changed to our sight, from a crescent to a sphere, came the months, and then the years.

In every year we have, too, four seasons. Can you name them?

Spring, summer, autumn — or sometimes we call this one fall — and winter. As the earth turns and whirls, sometimes we are near the sun and sometimes farther away. The nearer the stove we get the warmer we are, and so with the sun: the part of the earth that is nearest the sun is warmest. For this reason there is not the same kind of weather at the same time all over the earth. When we are having summer, in South America, where Mrs. Clayton has gone, the people are having winter, and when we have winter they will have summer.

In some places the snow never melts, and in others it never gets cold enough to snow. You remember Jack, who came from Southern California, had never seen the

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snow fall, and came to our town to spend a winter so that he could play in the snow. And what fun he had!

When you get older and study geography you will learn more about the seasons and what each brings.

Tell me some of the things that we always see and hear in the spring. [Speak of frogs, pussy willows, snow-drops, bluebirds; of how the gardens are ploughed and planted and everything cleaned indoors and out.] Think of what we have in the summer. [Haymaking, hot weather, long days, swimming, bare feet and no hats; when gardens are green and beautiful, and fresh berries and vegetables are picked.] What do we remember about the autumn? [Nuts and rosy apples; the squirrels busy gathering food, the birds fly south, the bright-colored leaves fall and are raked up or burned; this is the harvest and Thanksgiving time as barns and cellars and jars are filled with the winter's food.]

[Talk about winter. Trees are bare; most of the summer birds are gone; a few others come; the gardens are all asleep; Jack Frost freezes the water and ground, and snow covers everything over. We coast and skate and wear warm clothes.]

TRAVELING

LVI

TRANSPORTATION

HOW do animals get from place to place? [Walk or run.] Do fishes do this? [Swim or float.] What about the birds? Can they run or walk? Yes, and they can hop and fly.

[Talk about the birds that migrate, and point out that no matter how long or hard their journeys have been, they have found or made nothing to carry them from place to place, although they have been taking these journeys for so many years. The "National Geographic Magazine" with its pictures of plants, animals, and people of the whole world, is invaluable for mothers to show to their children.]

How do the birds carry their food and the materials of which they build their homes? Watch the ants and bees and birds. Sit quietly in the yard or fields and woods and watch patiently, if you would learn any of these little creatures' secrets.

Now what have men done? Do they still have to walk wherever they go and carry on their backs whatever they use? For a long, long time, when the world was new, we believe they did, but just as they have learned other things they learned to tame the wild deer, dogs, goats, horses, oxen, and camels, and even elephants, and to ride upon them.

Do you remember the story of Mary and Joseph? What did they ride on? The donkey. It took a long time for their trip, the donkey travels so slowly.

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Then men learned to harness the animals to wagons of one sort and another, those with wheels for smooth roads, with runners for ice and snow, so that more people and more things could be carried in one trip and much more quickly.

How many ways can you ride to the city? [Trolley car, steam train, automobile, bicycle, carriage.]

Yes, it is easy now to get about and easy to get things from all parts of the world. Think what we had for dinner. Where did all these things come from? See how many we can name and tell where each came from. How different from the time when men carried everything in their hands or on their backs or head. Did you ever see any one carry things on his head? Have you enough poise to do this?

Now think of the great freight trains hurrying back and forth and motor trucks whizzing to and fro, taking what grows in one part of the world to the part where it does not grow and bringing back what does grow there. So that now we can have, at any time of the year, in any place, almost anything that we want.

What do we care now if Jack Frost freezes everything up out of doors? With coal from the mines and green things from the sunny South, we can shut old Jack Frost from our homes. And if people in any hot country need it, they can have part of our ice. All these things have been made possible because men have learned to think and to work. And how we enjoy these things! But we can have them only so long as the miner will mine and the farmer will farm, and only if all the men that work on the railroads will faithfully do their part to

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keep these wonderful vehicles running. (Do you know what a vehicle is?) If any of these men in the long chain of workers strikes and won't work, what then?

What happens if the miners won't work in the coal mines or in the iron mines?

What happens if the men who work on the trains won't work?

What happens if the farmers are lazy and won't plough and plant their fields or milk their cows, or if they cannot get men to dig the potatoes and pick the corn and cut the wheat?

Suppose no one will pick the cotton that grows in the sunshine of the Southland; what will the men and women who earn their money in the cotton mills do in the winter when the mills cannot run without any cotton to spin and weave, and so these people cannot earn money to pay for coal to keep them warm? What will you and I do for cloth to use at home?

Ralph Waldo Emerson wrote a poem "Each and All," and in it he said,

"All are needed by each one;
Nothing is fair or good alone."

So the man in the city needs the farmer in the country; the man who works in the cotton factory in the North needs the black man in the South who picks the cotton; the engineer on the train needs the miners who get the coal and iron from the ground; the college professor cannot teach without the food, clothes, heat, and trains which all these men working together provide.

"*All* are needed by each *one*."

LVII

THE WHEELWRIGHT

WHAT goes round and round like this? [Roll one forearm around the other, then the hands and then quickly the fingers, playing they are big wheels, little wheels, and middle-sized wheels. There is nothing a child will enjoy more than to play turning these wheels, making, with his arms, large and small circles winding one over the other. It is not easy to-day to find the shops where children can see things made and thus gain respect for the men who, by their knowledge, strength, and skill, make them. When I was a little girl we could find a blacksmith hammering out and fitting the horseshoe and the iron rims for wheels. We could find the shoemaker's shop and see all the tools with which he worked. Now machines have replaced tools, and it is not easy to find a place where one man makes anything from start to finish. A wheelwright's shop is a thing of the past, and yet wheels make up so large a part of our lives that it will be well to let the children understand a little of what they owe to them and the men who first taught the world to make and use them.]

You roll your hoop, push your little wheelbarrow, ride your "kiddie" car or tricycle, carry a load in your express wagon, go to ride in the automobile, look at the clock to see what time it is, eat your dinner, look at your picture books, wear pretty clothes, take a trolley

THE WHEELWRIGHT

car to the station, ride to the city in the train, and never once do you think of a wheel. Stop and think a minute. What one of these things could we have if there were no wheels in the world?

Can your watch run without wheels? Just see them go round. Think of the wheels in factories that must turn before you can have your clothes, food, or books made, and of the wheels of trains that must turn to bring these things to you. Think of the wheels that are used by the farmer to plough the ground and plant the seeds and grind the grain before you can have flour out of which bread is made, and think of the wheels that he uses to harvest the hay for the cow to eat before you can have milk which is brought to you in wagons or on trains, if you live in the city.

To be sure, there are places where people live very simply, where a goat is driven to each home and milked there. There are places where when men want boards they tie them to a donkey, flat against each side, and he carries them. Other things they put in bags and hang these from the saddle. When the donkey comes to a stream of water and there is no bridge, he swims across with his load.

There are people who carry great loads, from a jar of water to a load of wood, on top of their heads. They stand so straight and walk so carefully that it does not seem hard to balance it there. Suppose you try to carry something this way. Please do not take anything that will spill or break. Better try a little basket at first.

But we are not willing to go back to this way of living. Look at your little wheelbarrow. I remember how

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pleased you were with it when Daddy first brought it home to you. It was luncheon-time and you had taken your first bite when he came in with it. There was no more luncheon eaten that day and no nap taken either. The wheelbarrow went to bed with you and you patted it lovingly until it was time to play again.

The little wheelbarrow goes along easily enough as long as the wheel turns round and round, but what happens if the wheel breaks?

Yours did one day, and you know that the wheelbarrow was not much good without the wheel.

Can you remember how you felt when you first saw that wheelbarrow? How do you suppose the man felt who made the first wheelbarrow that ever was made?

I do not know who made the first wheel or for what it was used. Probably it was a great, round, flat stone, something like a grindstone. Wheels are pictured and spoken of in the stories of the very first people of whom we can find any trace of how they lived or what they made or used. When the wheelbarrow was made, with its wheel of wood, that was the beginning of what we see done with wheels to-day. Wood wore out easily, however, and when men learned to use iron an iron rim was added.

Look closely at the wheelbarrow or little cart. In the center of the wheel is the "hub" with a hole in it. Through this hole is put the stick or axle on which it may turn, and by which it may be fastened to whatever it is to move by its turning. From the hub to the rim run the spokes, and outside the wooden rim is the iron one. This outside rim is called the "tire."

THE WHEELWRIGHT

The men who made wheels were called "wheelwrights," and wheelwrights and blacksmiths were very necessary people. When the roads were only paths in the grass, horses wore no shoes, or at best soft leather ones, but when they began to draw wagons, as they did soon after the first wheelbarrow was made, there came the need of better roads. Wheels run better on smooth, hard roads, and so smooth, hard roads were made. Then horses needed iron shoes and wheels needed iron rims, and men learned to make these and with them to go farther and farther away from home. So people in one part of the world learned about what was going on in other parts of the world and to trade with each other.

The blacksmith heated this iron and hammered out tires for the wheels and iron shoes for the horses and nails to put them on with.

The wheelwright carefully shaped his rim, spokes, and hub from the wood that the lumberman brought from the forest. With an auger he bored the holes in the center of the hub for the axle, and other holes in the sides of the hub and rim into which he fitted the spokes. Then he nailed on the iron rim and tried out the wheel to see that it was perfect.

Longfellow wrote a poem about the "Village Blacksmith" and it tells us what fine, strong men these were who swung the heavy hammers and shaped the glowing iron so that horses could travel and draw heavy loads to help the world. The miners, too, who worked in the dark, each one with a lamp on the front of his cap, down in the damp ground, and the iron workers in the dirt and heat of great furnaces in the foundry, where the

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iron is melted and got into shape so that the blacksmith can use it, are workers whom the world cannot get along without. [Read the story of "The Little Gray Pony," by Maud Lindsay, in Volume I.]

It is not often, to-day, that we can see a blacksmith shoe a horse or a wheelwright do his work. The wheels that these first wheelwrights made in their little shops have made it possible to have great machines. In factories these machines, run by wheels, make wheels of all kinds. Big wheels and little wheels, wooden wheels and iron wheels, and wheels of other metals are here. So many people are working, each on a different part; so many wheels are turning to keep the machines going, that you and I get so confused that we cannot see how it is all managed. But these wheels turn, and at the end of the day hundreds of new wheels will be ready to ship away to be used. Not only simple wheels with spokes and an iron rim are made, but flat wheels of solid metal with edges like the teeth of saws, called "gears." These fit one into another as do the tiny wheels in a watch. Think of the wheels on a fine automobile, with rubber tires filled with air, because of which little jar can be felt as you ride along. See the difference between that and the wheel on the old farm wagon.

We might talk about wheels all night and still find things that we had not spoken of. Watch the wheels of the world go round and see what more you can learn. So important have wheels become in business that I have heard men say, when they wanted to show how necessary something is, "Why, without that the wheels of commerce would stop." What does that mean?

THE WHEELWRIGHT

When the wind blows the wheel of the windmill around, the windmill will work. When the water turns the water-wheel around, the grindstones in the gristmill will grind the grain. When the factory wheels turn, the machines will make clothes, shoes, etc.; when the wagon wheels go round, the wagon will move.

Take the wheels off your cart or automobile or tricycle, and then you will see what we owe to the wheelwright.

When Brother built a boat and wanted to get it to the pond, it was so heavy that he and Nonnie could not move it. What did they do? They found a pair of old wheels that had once been on a wagon and got the boat onto the rod which went from one wheel to the other. With Brother holding the end of the boat off the ground, away they went wheeling the boat as easily as if it were light as a feather.

When you wanted a little cart you tied a string to a box and dragged it along. Then you set your box on a great wooden spool. The two ends rolled like wheels, and how pleased you were as it rolled along!

The next time I saw it you had the box on two spools and had a four-wheeled cart in which you seemed to be able to carry more things, and it did not tip over so easily.

LVIII

HOW STEAM WORKS FOR US

“London Bridge is broken down,
Dance o'er my lady lee;
London Bridge is broken down,
With a gay ladye.

“How shall we build it up again?
Dance o'er my lady lee;
How shall we build it up again,
With a gay ladye?

“Silver and gold will be stolen away,
Dance o'er my lady lee;
Silver and gold will be stolen away,
With a gay ladye.

“Build it up with iron and steel,
Dance o'er my lady lee;
Build it up with iron and steel
With a gay ladye.

“Iron and steel will bend and bow,
Dance o'er my lady lee;
Iron and steel will bend and bow,
With a gay ladye.

“Build it up with wood and clay,
Dance o'er my lady lee;
Build it up with wood and clay,
With a gay ladye.

“Wood and clay will wash away,
Dance o'er my lady lee;
Wood and clay will wash away,
With a gay ladye.

HOW STEAM WORKS FOR US

“Build it up with stone so strong,
Dance o’er my lady lee;
Huzza! ’t will last for ages long
With a gay ladye.”

Mother Goose — London Bridge

AWAY across the country in four days! That is, from Boston to San Francisco. In a train as comfortable as a fine hotel.

Across the ocean in a week in a steamer even more comfortable! This is what we can do now.

Yet we know that once man had to walk or catch a wild animal to ride on if he wished to go anywhere.

Then there were no railroad tracks, no, nor roads, just a trail through the forests, and if men came to a stream of water too deep or too wide to wade or swim across he could go no farther. But he learned to cut down a great tree and let it fall across the stream and cross on that. He learned to tie several logs together and keep this sort of raft fastened on the side of the streams that he used often to go back and forth on. This was the first ferryboat. Then he learned to make better bridges and bridges that would last longer than wood. He made them as he did his houses of brick or stone or concrete, and more and more beautiful.

It is hard for us to think of those times as we whizz across these bridges in cars heated and lighted and pushed along by steam engines.

It is hard for us to think of men crossing the great ocean in little boats with nothing but oars and sails to move them along. You know how hard it is to row a boat in bad weather. You know how hard it is to walk

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when the wind blows hard, and it is just as hard to sail when the wind blows against the way you want your boat to go instead of behind your boat to push it. So many times, too, there is no wind, and at other times there is so much that the waves dash into the boat. Yet men did cross the great ocean many times in sailboats.

Some day you will read how Columbus crossed the great ocean and found this country of ours before people on the other side of the ocean believed there was any land on this side. They thought the world was flat, with nothing but their land and the ocean, and that if you sailed far enough you would fall off the edge and keep on falling forever. Columbus watched the great ocean and dreamed, and wanted to see what was beyond where he had been. Then he thought, as he watched the sky curve where it met the water as far as he could see, that the earth was like a great ball swinging in the sky and turning round, and that was why he saw the sunset and the sunrise and day and night. When it turned, the part that was toward the sun was light and we had day, and when that part turned away it was dark and we had night, but the other part was then toward the sun and was having day. How he wished that he could sail and sail, and see for himself if he were right.

Of course, people said he was crazy, until he told his story to the Queen of Spain. She gave him money enough to get three ships, and with these he sailed across the ocean, found this country where we are living to-day, and proved that he was right. But he did not come across the ocean in those sailboats in a week. It took him ten weeks (that is longer than the summer

HOW STEAM WORKS FOR US

vacation when Brother's school is closed — a whole summer), and his sailors were scared all the way, and wanted so much to turn back that they were just going to kill him, if he went any farther, when they found land.

Since then men have learned what steam is and how to use it in an engine that will send a train across the country in four days and a boat across the ocean in a week, that it took Columbus all summer to cross in a sailboat.

Now what is steam that works these wonders for us?

Steam is water just as ice is water. Only ice is water changed by cold so that little particles are made to take up less room, and steam is water changed by heat so that the little particles are made to take up more room.

If you want to learn something about steam, watch the teakettle. When James Watt was a little boy he used to stand for hours catching the steam from the spout of the teakettle on a spoon and watching the little drops of water into which it turned run together. He stopped up the spout when the water boiled and watched the lid as it was pushed up and down. When the water is changed into steam it cannot be seen, but as it becomes a wee bit cooler as it floats out of the spout into the cooler air, it is changed back, not into drops big enough to fall as water-drops, but into fine little particles of water-dust which we call "vapor."

If you will hold a spoon over the spout of the teakettle when the water is boiling, you will see how the steam pushes the spoon out of the way. This shows the force or power in the steam. Men have found ways to

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use steam in great engines so that it will push wheels around. When you see an engine pulling a long train of cars, you may know that it is steam which drives the engine. This is just the simplest kind of a steam engine. When you are older you will learn about the safety valves and the governor and exhaust pipes, and how the steam is connected to blow the whistle, and of many different kinds of engines. Now what makes the whistle?

Whenever you watch the teakettle remember the little boy — James was his name, James Watt — who watched his mother's kettle until he found out that the little drops of water, changed to steam, took up more room than when they were drops, and if they were shut up that they would stretch and push so hard to get out that they would push anything along that held them back; and that is why we are able to have trains and steamboats that go so fast to-day and machines in factories to make almost anything that we need.

LIX

HOW ELECTRICITY WORKS FOR US

WHEN we went down to the woods to see the old Indian mill that Brother and the boys found, do you remember that Daddy said there was a time, long ago, when men made all their tools and weapons out of stone, and that when we read about that time now it is always called the Stone Age?

What is a tool, and a weapon? Yes, and you cannot do much work, or take care of yourself, if animals or wicked men try to hurt you, without something to use beside your hands. The first things that were found were sticks or stones. The Indian mill, you remember, was a place where the Indians ground their corn into meal. It was a great rock, and hollows had been worn in it by rubbing the corn with other rocks.

When men found iron in the ground and learned to make tools and weapons of this, it was no longer the Stone Age, but the Iron Age. What did they make of iron? What do we make of iron?

As each kind of metal was found and used, there became what was called a "New Age." When you are old enough to study history, you will learn about all these different ages and what was found and used in each.

Men were not satisfied with tools that they had to use by hand. As they worked with these they got tired, and they wanted to do things that were too big and too hard to do with these small tools. So they thought out ways to make machines which would work for them.

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They learned to make the force that they found in the wind and the water turn the wheels, and so work these machines for them. That brought the age of machinery.

Then they learned how to make steam and let that turn their wheels. To-day men have learned to take electricity — which has always been in the air, just as coal and oil have always been in the ground, waiting for men to learn how to use them — and let that work for them.

Let us think what can be done in the home with electricity to-day. First, the house is wired and connected with the power station. Then by pressing a button much of the work of the household may be made easy if not actually done. At the door is an electric bell. In the basement is an electric heater which warms the house and all the water needed. In the laundry is an electric machine which washes and wrings the clothes and irons the flat pieces, such as towels, sheets, napkins, etc. For the other pieces there is an iron which is heated by pressing a button.

The sweeping is done by an electric vacuum cleaner which makes no dust. There is no dust or dirt from the electric heater either. No one has to run down to the cellar for coal or carry away the ashes from the electric stove in the kitchen as Brother does from the stove in which we burn coal. If the house is too warm, a button is pressed, and an electric fan whirls around and cools it. If things are spoiling in the ice-chest, just press a button and this electric refrigerator becomes cool enough to keep the food sweet. The iceman does not have to call, and there is no water or dirt from the ice to wipe up.

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To do the cooking no fire has to be laid; just press a button and wait a few minutes and the oven is hot enough to bake and you can boil or broil food.

You do not have to turn by hand the ice-cream freezer, nor work the food chopper, the egg or cream whipper, or the churn; just press a button and a little electric motor keeps them whirling till you press the button again to stop them. A motor runs the sewing-machine also.

If a person needs a hot-water bottle there is no need of filling a rubber bag with water, which must be heated first and perhaps may leak and wet the bedclothes; just put an electric pad beside the person and press a button.

Electricity has given us the telegraph and the telephone so that we can talk and send messages to people in any part of the world in almost no time.

Suppose a storekeeper wants some oranges to be sent from California, where they grow. He can telegraph or telephone to the man who has them to send them right away. The message will reach him in a few hours, and he can put the oranges on an express train. In a week, or perhaps less, the storekeeper will have them to sell. Suppose the storekeeper had to walk, or to ride a donkey, to California, find the place where the oranges grow, and then bring them back before we could buy any?

Wires called "cables" have even been put under the great oceans, and we can send messages across the sea as well as across the country.

This age in which we are living is called the "age of electricity." Wonderful things have been done with

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this great power, and we have no idea of what is yet to be done with it.

To draw great trains full of people and of things which we use with the steam engine, is almost too wonderful to believe, but to make steam there must be loads of coal carried along to keep the fires in the engine burning, and where the coal burns there are soot and smoke and cinders. So in some places electricity has already taken the place of steam on the railroads, and may in time do so wholly. It is cleaner and there is less danger of setting things afire along the tracks, as sparks from the fire in the steam engine often do.

When trains first ran from one city to another men were willing to walk or drive to the station. But the time came, first in the cities, when men said, "Why don't we have cars that will carry people from street to street so they can get off at whatever store or house they wish?" That was the beginning of the street cars.

At first these cars were drawn by horses. At certain places along the way there were barns where the horses were changed. There the horses were fed and kept when they were not drawing the cars.

Filled with people, these cars were very heavy. Over the paved streets or rough roads the horses could not possibly draw them. Even on a smooth road where wheels slip along easily I do not believe they could. But wheels run more easily on steel rails. What is steel? Yes, it is iron heated and cooled and hammered in a certain way, and it is very strong. Men had learned to get iron from the ground and to make steel. Out of this

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steel they made rails such as you see in the car track every day.

The laying of these rails is a whole story in itself. You can see how it is done some time when you are near a track. See how strongly and carefully the pieces of track are riveted together. Unless the road between two rails is smooth the cars will go bumpety bump. So the track has to be repaired every little while to keep the rails from springing apart and to keep the road smooth. The rails are laid just far enough apart so that the wheels of the car will fit on.

On this track two horses could easily draw the car full of people. Then they could be taken from the stations where the steam trains left them to the part of the city where they wished to go. But in time this was too slow. People learned to use electricity. Just as electricity could be sent from the power station through wires to light and heat houses, it could be sent through wires and steel rails to cars to heat and light and push them along. You have seen wires running from pole to pole. On these wires runs a little wheel. This wheel is held against the wire by a pole inside of which is a live wire which carries the electricity to the car. This is called the "trolley" and so we sometimes call these cars "trolley cars." If this little wheel gets off the wire the car stops, for then the electricity running from the power station through the wire has no wire between it and the car to carry it to the car.

Sometimes when the wire is coated with ice or is very wet in a heavy storm the car will not run well, for electricity cannot travel through ice. Sometimes it will

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jump over a little ice to the wire beyond and as it jumps you will see sparks.

These cars ran so well that there are few places in this country to-day without trolley cars. In many places they carry freight as well as people.

In cities the streets have become so crowded with other things, and so many people ride in the cars, that there is not room for all the cars needed, and so tunnels under the ground have been dug and tracks laid in these for the cars to run on. This is called the "Subway" and in this cars run quickly from station to station.

Great, strong, steel frames have been built in the air and tracks laid on these for cars to run high over the heads of the people in the street. Stairs and elevators and escalators — things not even dreamed of by my grandmother — take people up to a platform so that they may get into these cars. This is called an "elevated railroad."

On the electric cars the conductor sees that each one pays for riding, and rings a bell to signal the motorman to start or to stop the car.

The motorman is able to make the car go slower or faster and to stop or to start it. In doing these things he uses two handles. To put on the brakes he turns one; to make the car go he moves the other. As he moves these back and forth he gets more or less electricity or shuts it off altogether.

How much farther you can go in an hour in these electric cars than you can walk or go with horses! The trolley, too, never gets frightened and never gets tired. I remember riding in a horse car in New York City once

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and the horses became so frightened that they broke away from the car, raced around, and nearly came in at the other end of the car before they were quieted. Sometimes things go wrong with the electric cars, to be sure, but when they run smoothly it is a very comfortable way to get from place to place, with the warm cars in winter and the open cars in summer, and all for a fare of a few cents.

LX

MOTOR CARS

STEAM cars and electric cars run where the track has been laid. Now we have motor cars that whizz past the trolley car, needing no rails, going almost to the ends of the earth. Even in the far-away country roads you will find them carrying fruit, vegetables, eggs, milk, butter, poultry; whatever is raised on the farms to people in the city.

City people hop into their motor cars and in an hour or two are at the mountains or the seashore or their country place. Farmers not only have touring cars to ride in, but they have great motor trucks to carry from the farm what is raised there and to take back to the farm what is needed by them. They have motors to which they hitch the plough, the harrow, or the planter which scatters the seed. And when the time comes for harvesting, these motors are hitched to the harvester and to the binder, which cut and bind the grain into bundles. They used to hitch horses to these and guide them through the field, but with these motors they can go all over the field in less than half the time it took with the horses.

You must plant and weed a little garden of your own this summer, and then you will see how much work a farmer has to do to raise vegetables and grain and how much time it takes to do it all with small tools.

To make the steam cars go there must be a fire in the

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engine and water must be changed to steam. Some one must keep shoveling on coal.

To make the electric car run there must be a power station and wires from that to the trolley, and usually tracks for both the steam and electric cars.

What makes the motor car go?

Gasoline, you say. You know, for Daddy always has it put in at the garage. They keep it there in a big tank and pump it through a rubber hose into a small tank in the automobile.

When we talked about kerosene, which gave us the best light we had before gas and electricity were known, you remember that it comes from petroleum, which is drawn from oil wells in the ground. Gasoline is also made from petroleum.

In every motor car there is an engine which pushes the wheels around to make it go.

It is arranged so that the gasoline, which is kept in a tank on the car, will flow as it is needed, being mixed with air as it goes into the engine cylinders. There are a great many parts to the engine which you will learn about when you use one. These parts are made so that the engine can be stopped or started, made to run faster or slower by letting little or much gasoline into the cylinders, or none at all.

There are engines where all this work is done by four cylinders and there are engines with as many as twelve cylinders. With them all working, burning gasoline and making little explosions to push, the cars can go very fast and smoothly, or if one cylinder quits work because some little part gets broken or out of place the

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car will still go from the push of the other cylinders. With this sort of an engine, which can carry its own electric power and gasoline enough in such a little space to keep it going so many miles, there is no end to what can be done with it.

See how many trucks, and what loads they carry, are whirling all over the world. These engines can be made and put into almost any sort of wagon, and so you will see motor cars made to carry one or two persons, like the motor-cycle, runabouts for two persons, touring cars for four or seven passengers or with seats enough to hold as many passengers as an electric car could carry. Some are open and some have closed tops with little heaters and lights in them. All of them carry lights outside, because they run so quietly and swiftly that if they could not be seen in the dark no one would be safe on the streets.

Some people think that in time they will take the place of the trolley car altogether, for it is expensive to lay tracks, the poles and wires are very ugly to see, and the motors can run almost anywhere.

They run best on smooth, hard roads, and so smooth, hard roads are being built for them to run on. Once we had very few good, hard roads, but that is not so now.

The motor cars run so easily that it is hard to remember sometimes that we have no right to go as fast as we can, because if we do we may hurt some one who gets in the way. I do hope when you are big enough to run a car that you won't feel that the whole road belongs to you because your car runs so well that you can take it.

When the fire alarm rings how every one hurries to

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put out the fire! I remember how the firemen used to rush two handsome strong horses into the harness at the engine house. Then away they would gallop with the steamer or the hook and ladder truck. How they used to dash along with their heads up, almost as excited as the driver, and doing their very best to get there in time to do some good. Now a man cranks a motor right in the engine house, and with a *clang, clang, clang*, or *honk, honk, honk*, they're off and at the fire in less time almost than it used to take to harness the horses.

The gasoline and the electric spark send the truck along quick as a flash to put out the fire.

This sort of an engine has been put into boats, and very few of even the small boats now depend upon the wind to sail them. A little motor can be bought now which can be used in a small rowboat. All there is to do is to turn a crank and the little motor will go *putter, putter, putter*, and carry the boat wherever you steer it.

Men have thought so much about how to get around easily and fast that all these machines have been made for us to rush about in. The danger now is that we shall rush so much that we shan't find time to stop long enough in one place to do anything when we get there, but because it is so easy to go, just to keep whirling along.

LXI

AIRSHIPS

WHENEVER I think of airships I think of the "Story of the Doodang" in the book of "Uncle Remus and the Little Boy." We must read those stories, for Brother liked them so much. It begins: "'I wish,' said the little boy, sitting in the doorway of Uncle Remus's cabin, and watching a vulture poised on motionless wing, almost as high as the clouds that sailed by, 'I wish I could fly.'" And then Uncle Remus told him about the Doodang.

Ever since boys and men have watched birds, and I'm not sure but little girls, too, they have had this same wish, but so far as lifting their own wings and soaring into the heavens is concerned the most they have been able to do is to dream till supper-time and then, as Uncle Remus told the little boy to do when his story was ended, "fly right in de house ter yo' mammy!"

Many people have just wished to fly like the birds. When it is cold and the flowers are frozen, so the gardens are no longer warm and beautiful places to sit in, they have wished they could stretch their wings and fly to the South. Others have played with kites and even gone up in the air in balloons, but I suppose the men who have done the most to make it possible to sail about in the air, just as we do in the water, are the men who have worked to make engines small enough, light enough, and strong enough to be put into wagons and boats and push them along.

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The gasoline motor has been made to work so well today that with one of these in a machine with wings men can fly hundreds of miles. Anything thrown up into the air falls back to earth unless there is something in it strong enough to pull it up, and this is what the gasoline engine does — pulls the airship wherever the man who is in it steers it. When airships fall and men are killed, almost always it is because something goes wrong in the engine. The better engines men learn to make, the safer it will be to fly in airships. Sometimes the man flying does something wrong in handling his engine, just as men do when they run automobiles. Engines have not yet been made that will keep an airship in the air unless they run very fast, and fast running gets an engine out of order more quickly than if it were not run so fast. It is easier, too, to manage a machine which goes slowly. Going so rapidly one must think and act very quickly. This is why it is so dangerous to fly.

I can remember when it was thought a joke to talk of flying. Then came the time when Daddy and I saw Grahame-White put his Blériot monoplane together and start it across a field in Atlantic. It ran along like an automobile on the ground. Then I held my breath, for the end of it started up in the air, and away he went, up, up into the air with a whirr of the motor and I heard it *putter, putter, putter* until it was but a speck in the sky and then went out of sight altogether. Then out came Wilbur and Orville Wright, and in a larger machine with two planes and four wings, called a "Wright biplane," they ran along the ground, — then up into the air they

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went and with a whirr and a putter of the engine sailed away out of sight, like another great bird.

Eagerly we watched the sky until both machines came back and down to the ground, where they ran along a little way and then stopped. I shall never forget the thrill of wonder with which we watched these men do what had always been called impossible.

Since then airships have been used so much that in the big World War they did a valuable work. Every night we read in the paper of those things.

When Daddy was in Washington he sent us a letter by airship. It left Washington in the afternoon and the next morning was in Boston to tell us all the things that Daddy wanted us to know.

Men are working all the time to make better engines and better machines, and who knows how long it will be before you will say, "Come and fly with me and see if we can catch the old woman who is sweeping the cobwebs out of the sky"?

Anyway you'd better fly into your bed now and sail away to Dreamland, for it's time the Sandman was here long ago.

MUSIC

LXII

THE FIRST INSTRUMENTS

WHAT a racket!" Did you ever hear any one say that when you were shouting and banging things? Do you remember when we went to visit the school, and all the children were racing and yelling in the yard as we went in? Do you remember what a scuffle of feet there was as they rushed up the steps to the *cling-clang* of the bell? Then some one banged loudly on the piano, and the children shouted the "Star-Spangled Banner" at the top of their voices. I remember you cried and wanted to go home; the uproar confused you so that you were very unhappy.

I do not know exactly why the noise made you so unhappy, for I have seen you bang two tin covers together or play with a stick on a tin pan by the hour, and smile like one entranced with heavenly music all the while.

I took you later to a kindergarten. The teacher was seated at the piano playing a lullaby. Every little head was on the table, and there was no sound but the sweet tones of the music. Gradually it changed from a lullaby to a rollicking dancing tune. Every little head came up. Each little boy and girl danced to another, and bowing low they skipped together in time to the piano. Whenever the teacher wished them to stop what they were doing, or to listen to her, she struck one chord of music and each child answered its call. We did n't see any pushing or hear any scuffling feet or clanging bell, and yet the children did not sit still long at a time. They

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played and worked and sang as in the other school. Yet you liked to stay here and the other place made you cry.

It is so with all sound. Some sounds please, and some not only do not please, but annoy, and from some sounds we just have to run away. Noise and music are much the same, just one sound after another; that is, a succession of sounds. But why, do you think, do we call some successions of sound noise and some music? "Sounds that please us are music and just banging is noise," Brother told me. But not all music pleases me, and the music of drums is much like banging and that of cymbals like clashing of two covers, and that has pleased many.

It is hard to tell the difference between music and noise, but we all know the difference just as we do between shouting and singing.

We can talk musically or we can shriek and roar. We can make different tones with our voice, too, some high and shrill and others deep and low and all the way between.

Out of doors, all about us, there are sounds; some that tire us and some that make us love the whole world; some that we call noise and some that are sweetest music.

Just what do you suppose made the first music in the world? The first, I mean, that was called music. Of course, it was a person who named it music, for nothing in the world but people name things.

Was it the wind whistling through the grass or reeds and playing in tune to the water singing as it hurried along?

Was it the call of a bird or a mother singing her babe to sleep and swaying to the rhythm of her song?

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I believe people sang before they played any instrument.

The oldest music we can find written is a chant which the Egyptians and Greeks sang. It is a little wail because people grow old and ugly instead of always staying young and beautiful. The Egyptians called it the "Mineros" and the Greeks the "Linos."

If we should read of India we should find all sorts of tales about music. Their music is very wonderful, and makes one think of gypsies and tambourines and wild things of the woods and fields, whirling leaves, swaying trees, and laughing brooks. They tell stories of a god of music sitting by his instrument. As he dreamed, gentle breezes played upon the strings and drew forth such sounds that ever after men and animals danced, the sun shone or was darkened, and the rain fell as the player willed. The "vina" is the name of the instrument which is the national instrument of India. It is made of gourds and a pipe with metal strings. Gourds grow on a vine like pumpkins. When they are dry they are hollow and are used for water jugs and such things in the countries where they grow. In some places now people raise gourds and put them out for birds to nest in.

Every baby loves a rattle. You remember some of those that you had.

Every boy loves a horn and a drum. What would Christmas be if Santa Claus forgot the horns and drums? Every Boy Scout wants a bugle, and as soon as a boy is big enough to use a jackknife he usually carries a whistle.

I remember the first whistle you ever had. We were

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out for a walk and in your pocket was your first jack-knife. We thought it would be nice to follow a little brook, and on the bank we found some willows growing. Did a boy ever pass the willows by a brook without cutting a switch? You did n't, anyway, perhaps because you had a new jackknife. Daddy did n't either, perhaps because he had a jackknife. His was n't a new one, though. Perhaps that is why he made a whistle instead of a switch of his branch of willow. He cut between two joints. Then he cut a notch in the little stick he had made. Then carefully he cut around and slipped the bark from just below the notch off the stick. Then he fitted it back on, and there was a whistle. He made more than one, but they were not all so good as the first one. The bark must be taken off with great care if the whistle is to work well.

The instruments that people who lived before history used have been found from time to time, and many of these may be seen in cases in museums. [In the Metropolitan Museum in New York there are splendid collections.] It is interesting to find that even the rudest savages loved what every child loves, — rattles, drums, horns, and whistles. They used bones of animals to make some of these. I have seen boys to-day use bones for clappers, and lines of children march to the clapping, while another boy played on a drum made of pigskin stretched tight across the top. Other rattles were made by stringing seeds or shaking gourds in which the dry seeds rattled.

In the "National Geographic Magazine" I have seen pictures of people in different lands dancing to

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music made by queer-looking drums and rattles. When we go to the Library we will look at some of these.

Once Daddy and I went to a Chinese theater and heard the Chinese make music. They seemed to like just a noise which did n't change very much. They love bells and chimes and clappers, gongs and drums. By pounding on a drum they think they can drive evil spirits away. We know that there are no evil spirits but selfishness and sin, and we drive them out of ourselves by trying very hard to do good and be good; but the Chinese have a great drum in their temples and believe that the booming of this will keep them safe and happy.

In the Chinese shops we find wonderful dinner gongs which are rung by playing upon them with little mallets. They make chimes of stones as well as of metal, getting different tones with stones of different thickness.

The Chinese learned to make wind instruments, too. Little bells hung by silken threads outside the door are played by the wind. We once had one that came from a Chinese store, outside the playhouse. From a brass ring were hung bits of glass and bells, and as the wind played in these they swung and played a tune. This was not the first kind they made.

Bamboo grows in China. This is light and hollow and can be cut in pieces of all sizes, some big around and some small as a lead pencil. They learned to make holes in a reed of this, and to play a tune by blowing in at one end and opening and closing the holes by putting their fingers over different ones as they blew; this was

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a flute. These are wound with silk ending in a tassel and look quite gay.

As the bamboo grows up thick it makes great forests, just as we have pine forests or forests of other kinds of trees, and these in time fall and break as other trees do. You can imagine how a forest of bamboo looks by thinking of the bamboo fishing pole, with leaves like grass; or, better still, think of a cornfield when the corn grows tallest and thickest.

As the wind whistles through these broken reeds it makes musical tones of varying pitch. Chinese fathers cut and bound these together for their children to blow upon just as Daddy cut the willow branch and made a whistle for you. If you should blow into one of these reeds you would find that the shorter the reed, the higher the tone that you would hear, and the longer the reed, the lower the tone. So on this pipe could be played a tune. Before you can sing or play an instrument you learn what is called a scale. We sing *C, D, E, F, G, A, B, C*, or *do, ra, mi, fa, sol, la, si, do*. Probably that pipe of bamboo, making one note for each length as it was blown upon, was the beginning of a scale of musical notes.

With this scale one person can think out a tune and write it. Other persons, who have never heard or seen the first one, can read what is written if they know the scale, just as you can read a story if you know your letters, and then they, too, can learn to play or sing it. In this way many people can enjoy the beautiful tunes which only a few people are able to compose.

The Chinese had trumpets, too. For these they used

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the horns of animals. Later they learned, as did people in other countries, to make them of metal. You see horns to-day made of brass and even of gold and silver.

You have seen Daddy play his banjo and Brother his violin. Do they pound these or blow upon them? What makes the music, then?

Strings. How or when men first learned that strings drawn tight if rubbed or pulled would give a different sound than would strings drawn loose, or that long strings and short strings did not sound alike, I do not know. Men hunted and used bows and arrows to get their food. Perhaps they learned this from the string on their bow as they twanged it in shooting or in fastening it. At any rate, among these early instruments is one with a number of strings and metal bells.

When we look at the instruments used in Egypt and read of them in the Bible, we find a great instrument with strings, more than twenty of them, made of animal skin, called "gut," and stretched over a massive frame. Some of these frames are of gold and inlaid with pearl or shell or ivory: some are made of the finest wood, polished and carved and adorned. This is the harp, and just as a grand piano to-day is found in the finest houses, the harp, centuries ago, was found in the palaces of kings and in the temples of Egypt.

Every Sunday in our churches we read in the Bible what are known as the Psalms of David. From them we learn of the music of the Hebrew people. In the one hundred and fiftieth Psalm, beginning with the third verse, we read of many of the musical instruments

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which these people used, and that their chief use was to praise God.

“Praise Him with the sound of the trumpet: praise Him with the psaltery and harp.

“Praise Him with the timbrel and dance: praise Him with stringed instruments and organs.

“Praise Him upon the loud cymbals: praise Him upon the high sounding cymbals.

“Let everything that hath breath praise the Lord.”

[Talk about what each of these instruments is and try to find pictures of them or real ones.]

The stories of Greek music are full of wonder tales of gods and goddesses. Myths of water sprites and wood nymphs, sirens of the sea, golden lyres, lutes and laurel wreaths, songs and dances by wondrous beings of great beauty, full of poise and rhythm, hold us spellbound.

Do you know what all this means? I can tell you what each big word means, but none of us will ever live long enough to find all the meaning in these wonderful stories. When you get older I'll tell you the stories of the Iliad and the Odyssey and of how Sappho played the six-stringed lyre. Of all the people of history I believe you will love the stories of the Greeks the best.

Do you know about the pipes of Pan? They were called the “syrinx,” and the Greek syrinx, made of reeds that grew by the river, is very like the arrangement of bamboo reeds which the Chinese made, and to which we trace the beginning of our musical scale.

Pan was a god of the woods and fields and especially watched over the shepherds. He was fond of playing pranks and dancing, and was the idol of the Greeks, who

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sang of him as "Ever holy, ever honored, ever young." He desperately loved a nymph named Syrinx who ran from him. In order to be saved, just as he was about to catch her, she was changed into a bundle of river reeds. These Pan cut down, bound together, and made the shepherd's pipes, known now as the "syrinx" or the "Pipes of Pan." The story goes on that with his pipes Pan made such wonderful music that he challenged the great god Apollo to play with him. Midas was judge and decided that Pan was the winner. To punish Pan Apollo made his ears grow like those of an ass. To this day Pan is pictured with legs of a goat, long ears and horns, and playing a syrinx, that is, a shepherd's pipe of seven reeds.

The Greeks thought of him as slipping about, not always to be seen by mortals, and playing mischievous pranks. When a person was very lonely, or afraid when no one was about, they said that it was the spirit of Pan that bothered him. We speak of a "panic," which means that the spirit of Pan upsets us so that we lose our self-control. There are stories of music in every country. We must read the sweet story of the lovely Saint Cecilia.

Each of the great composers was once a little boy like Brother, and we will read about them and how they learned to play and write such music as they did.

Now when you hear the pipe organ played in church think how much has been added to the bundle of pipes made from the river and bamboo reeds so long ago.

And when you listen to or play the guitar, violin, and piano, so truly tuned, think gratefully of the first man who twanged a string and of how much has been added

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to that first stringed instrument to make such pianos as we use to-day.

Remember, too, that if we cannot all have an expensive instrument on which to make music we can try to sing and to talk musically.

Men have learned to write scales and to print music so that we do not have to make up our own tunes, but we can try to learn the finest that have been written. How wonderful it would be to give to the world some new music so fine and beautiful that it would make people forget their troubles!

We must read the story of Stradivarius and how he lived to be over ninety years old, making violins to the very last. He strove to make the best violins that ever were made, and we are told that none better than his ever have been made. The older they grow, the better they are.

George Eliot, in a poem, makes Stradivarius say:

“When any master holds
’Twixt chin and hand a violin of mine,
He will be glad that Stradivari lived,
Made violins, and made them of the best.
The masters only know whose work is good:
They will choose mine, and while God gives them skill
I give them instruments to play upon,
God choosing me to help Him.”

In the “Tales of a Wayside Inn,” Longfellow has a poem about Ole Bull and how he played upon a violin made by Stradivarius.

Some time we will read James Whitcomb Riley’s poem called “My Fiddle.”

Music has been used by people in many lands to drive

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away evil spirits, and I am sure it will always do this if we remember the song that the shepherds heard the angels sing on the plains of Bethlehem, "Glory to God in the highest, and on earth peace, good will toward men." For we believe now that the only evil spirits are those in our own selves such as selfishness and spite.

[Read "Young People's Story of Music," by Ida Prentice Whitcomb. It is illustrated and deals with the music of different ages and countries in a simple, illuminating way, beginning with the early instruments and ending with the important composers and modern music. Much of it can be read to very small children.

For little ones starting to read there are the Art Music Readers beginning with a primer written by Frederick H. Ripley and Elizabeth Schneider, illustrated with song and picture. These stories tell of instruments, players, and composers in language simple enough for children learning to read.

"Instruments of the Orchestra and Precursors of the Violin" describes in detail all the modern instruments and how the keyboard of the piano was added to the early stringed instruments.

"A History of Music," by Stanford and Forsyth, is good for reference.]

LXIII

THE PIPE ORGAN AND THE PIANO

WE have a lovely picture of Saint Cecilia, seated at an organ. Angels drop roses as she plays. It reminds me of the verse of Tennyson's,

“There in a clear-walled city by the sea,
Near gilded organ pipes, her hair
Bound with white roses, slept Saint Cecily,
An angel looked at her.”

To this lovely Roman maiden, a devout Christian, legend tells us we owe the organ. She was very beautiful and cared nothing for dress and jewels, but always carried the Bible. When she sang angels came down from heaven to listen. She made many instruments before she made the one to please her, which we are told was the pipe organ, such as we hear in churches to-day.

The blowing of the organ is necessary to get the sound just as in the pipes of olden days. To-day the blowing of the organs is done by bellows. These bellows act as the bellows in the blacksmith's shop where he blows them to make the fire burn brightly. Sometimes a boy blows the bellows that sends the air into the organ pipes and sometimes they are fastened to the electric light wire and electricity blows the bellows.

Over the different pipes are little sliding covers. When the cover is pushed over the end of the pipe, that pipe does not sound and so by pushing these little covers off or over the pipes the player can get whatever sounds he wishes to make a tune.

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These little covers are worked by pushing up and down the white keys like those which we play on the piano. To play the organ the organist sits at this keyboard, and when the bellows at the back push air into the pipes, and the keys going up and down open the little covers on the pipes that give the right tone, the organ rolls out a glorious sound.

In the Psalms we read of praising God with the psaltery and the dulcimer. The psaltery was a wooden board or shallow box over which were stretched strings. These were plucked as you would pick a violin string.

The dulcimer was played by striking the wires with a little hammer. If you look inside a piano to-day you will find a board with strings stretched across it and little felt-covered wooden hammers resting against the strings. These are connected with the keys on which we play. As we press a key the hammer to which it is fastened hits the string beside which it has been resting. We will leave the top of the piano open, and you may watch these little hammers hitting against the strings and notice the difference in the sounds of the strings.

When a man comes to tune the piano he sees to it that these little hammers are in good condition, for sometimes the little felt part comes unglued and falls off. It may get under one of the strings and that string will not sound as it should, or perhaps not at all. He tightens or loosens the wires, just as Brother tunes his violin by tightening the strings.

We have square, upright, and grand pianos to-day. You know them by the shape of the case, but they work all in the same way by the little hammers pressed by the

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keys against the wires stretched across a board. The wires lie down in the square piano, but stand in the uprights.

There are many makers of pianos. The sweetness of tone in the piano depends upon the wood that is used and the care with which each part is fashioned and put together, just as in the case of the violin.

It is called the pianoforte from two Italian words *piano*, which means soft, and *forte*, which means loud. The pedals at the base gave it this name, for by pressing one the tone becomes soft, and by pressing the other, loud.

Before the pianoforte, people played on the clavichord and harpsichord, virginal and spinet, all of which were much like the piano, except for the pedals which changed the tone from loud to soft.

Much of the world's best music was composed on these instruments which were used before the piano of our day was made. Improvements are being made all the time on this, and I sometimes wonder what sort of instrument will make music a few centuries ahead of us.



MOZART AND HIS SISTER

LXIV

THE VICTROLA

IF we knew a few good songs and sang them often, I believe it would do a good deal toward keeping us sweet and happy. But when we get tired of singing or playing, or want to hear some great artist sing one of the finest songs that has been written, or a great violinist play, or hear an orchestra, is n't it wonderful that we can wind the victrola and as the record whirls around listen to the splendid music?

When you first heard the victrola you talked back to the voice that came from it and insisted that there was a man in there.

The Greeks thought the syrinx was the spirit of the nymph, Syrinx, singing in the pipes. They looked at the groups of stars in the heavens and imagined that the Pleiades sisters, and Orpheus with his lyre, beside many another of the gods and goddesses, had been transported there and beamed upon them from the stars. We have learned that when the wind whistles through a hollow tube, whether it be a reed or a piece of bamboo or one made of metal, a sound may be heard, and that the longer or shorter the tube, the higher or lower the sound, and that whether it be the wind or a man's breath that blows upon the tube, the blowing makes the sound.

Men have learned many things about the stars since the days when the Greeks told their fancies, and you have learned since the day when you first listened to it that there is no man shut up in the victrola.

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Less than a hundred years ago — that is longer than you can think of, but not long when you think of all the years since the world began — a man learned to make a machine that would catch each sound that was made into a large horn which was fastened to it. I cannot explain all about this machine so that you will understand, but I can tell you something about it. Each sound which was made in the mouthpiece pressed a steel needle down into little grooves in a cylinder which, covered with tinfoil, was turned over and over as the sounds were made. Can you believe that if the voice was loud the needle would press deeper into the tinfoil on the cylinder than when the voice was low, and so the holes were not all alike, but how deep they were showed how loud or soft the tones of the voice had been?

This was how a record was made.

Then the needle could be again started in the groove, and as the cylinder turned, the same sounds would come back from the record that the voice had just made in the horn.

This first machine was clumsy; the records sounded harsh, and the machine made a good deal of noise in turning. The cylinder was turned by hand. New and easy ways have been found to make the records now. You know what the records look like that we use to-day and that they are made of celluloid or hard rubber instead of tinfoil. You can see that they are round and flat like a disc instead of like a cylinder. The grooves in the first ones became worn away after being played a few times, but we play ours over and over, and some of them are so perfect that it is like hearing the real voice

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of the person who talked or sang or whistled to make the sound grooves on the record. The needles which run over the records have been made better, too, for just as a violin made by Stradivarius makes better music than a less fine violin, so the music of the phonograph or victrola varies with the machines, and the record.

When we buy the records for our victrola it would be well to choose them as carefully as our books, our pictures, or our friends, for they talk to us and what they tell us makes a lot of difference in our lives.

ART

LXV

THE LITTLE ARTIST

“ Oh, come, dear child, and we will draw.
Watch carefully and you shall see
A nest which birds build in the tree
High in the branches it must be.
Now here's a house for you and me
With doors and windows, chimney, too,
And steps. How many? Just a few,
One, two, three, four; we can't have more,
For these reach just to our front door.

“ Now here's a mirror on the wall,
When through the windows sunbeams fall
The Lightbird dances at its call.

“ Let's open wide the window now
And see the farmer with his plough,
His harrow, too, and wagon gay,
To load with grain, or fruit, or hay,
To take to market, harvest day.
Four wheels it has, but two are shown,
And now we'll show just one alone
Where hub and tire and spokes are drawn.

“ But lift your eyes up to the sky,
Behold the dazzling sun on high,
A glorious wheel with brilliant rays,
Send changing seasons, months and days.
A rippling brook we next will make,
A mill wheel for the miller's sake,
To grind the sweet and ripened grain
Which grew in sunshine and in rain.

“ The bridge we'll cross and as we go,
We'll watch the fishes down below.

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Then on we'll go with a hippety-hop
Until we reach the baker's shop.
'Oh, Baker, is your oven hot?
Then bake my bread but burn it not.'

"We now must close the barnyard gate
And feed the chickens where they wait
For us to fill their round, deep plate.
When we bring grass a rabbit peers
From out a hole. Oh, what long ears!
We'll draw them standing right up straight
And hurry, for it's getting late.

"And now before we say Good-night,
A ladder we'll draw to the moon so bright.
A long, long ladder, I'm sure 't will take
And so, one long as this we'll make.
We'll draw the moon, too, first a bow,
And then a big round sphere, so, —

"And last above the closed church door
A brilliant star. The wise men saw this star before
And followed till it led them on
To where a baby boy was born."

CHILDREN are fond of simple line drawing to tell a story. As you tell this story draw these things either in the air with your finger or in simple outline on the blackboard.]

Do you remember when you used to tease me to tell you little rhymes and with my finger draw pictures in the air, and then with your finger you would try to do the same thing?

All little children try to draw, and it is a good thing to do.

Whatever you try to draw you learn more about than in almost any other way. You know when Baby tries to

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draw a cow, his fingers at first never go where he wants them to. You have seen him try and try until he can do better and better. If you try to draw anything, you keep learning more and more about it, for you think more about it. The first cow you drew had almost nothing but horns. The first house you made had no door nor chimney. You never thought of steps. The first man you drew had just a round head and two straight lines for legs.

I have seen you draw with a stick in the sand or in the snow. Probably that is the way drawing started in the very first place. Men drew pictures to tell a story. Almost the only way we have now of telling what people did in the days before history is by the pictures that they left. We find these carved into rocks or on their tools or woven into the things which they made.

Far within deep, dark, damp caves, which were the homes of men who lived so long ago that all we know about them is what is found sometimes, men, who lived in the age when their tools were made of stone, carved pictures of animals with flint upon the limestone walls. Flint is a very hard stone. Strange shapes these were of animals such as we shall never see and whose names are almost forgotten now, such as we are told lived and fought with men in those prehistoric days.

Animals have left no pictures; they have never tried to make anything beautiful, or to make again the beautiful things of nature.

Even in those first days of the world these things that we find show us that men have always tried to make again the things which they have seen.

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We will go into our Art Museum, and there have been gathered these things that have been made by men in all the ages as they tried to make again, in picture, the things which were all about them.

As they tried to make these pictures of what they saw, they learned to make things to do this with.

At first man had nothing but the sharp point of a stone, and with this he scratched upon the wall of his home. Perhaps that is why I have to watch Baby or he will make marks upon our walls. Of course, you have a blackboard and paper and know better than to spoil our pretty wall-paper.

In the Museum you can see what other things he found and how well man learned to make pictures of all the things about him until we have to-day wonderful statuary and paintings.

From this we have gone on, to the camera with which we make an exact picture of whatever we wish, and now to the motion-picture machine with which pictures may be taken and shown of anything as it moves about.

Think of the baby's attempt to show what a cow looks like. Then think how men have learned, with the victrola and the camera, to reproduce for us a cow mooing and moving. I have seen pictures of animals with the breath floating from their nostrils and it seemed as if they were really alive.

Or think of the man that you drew with a head and two straight lines for legs, and then the pictures you have seen at the movies of men walking. If you should catch these men's voices, as could be done in the victrola,

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and set that going as the picture reeled off, you could hear them talking as they walked.

More than this has been done. The first pictures in those caves, scratched by the men of the Stone Age, were of animals, not men. They were queer, grotesque monsters.

Now look at some of the Old Masters. Instead of monsters we find pictured men and women and angels.

To-day even you children have pencils, paints and brushes, paper, canvas, sand, and modeling clay. These are tools for you to work with to make beautiful things. These tools are better than professional artists had once, and every school child is given lessons in using them. Before an artist can paint or draw or model anything he has to see in his mind just what he is trying to make.

Suppose you want to make a picture of a cow. You must know first how many heads she has, where her eyes belong, and must be sure and not put her tail on the wrong end. Once a drawing teacher came into the room when Daddy was a little boy and said, "How many legs has a hen?" One little girl piped up, "Four." The teacher smiled and said, "Are you sure?" "Oh, yes," she said, "I've seen them over at Mr. Bright's." Do you know how many legs a hen has? Before you try to draw a picture of a hen, be sure.

If artists wanted to make pictures of real things, they had to look at the real things first and then try to make a picture of the things as they really were.

The finest pictures are not always of real things. It is good for us to look often at beautiful pic-

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tures so that we may dream of beautiful and noble things.

At the movies there are very often horrible pictures. Pictures of shooting and wickedness, ugly, vulgar pictures. Would you like to have such pictures in your room? If you look at these often there will be no room in your mind for beautiful ones. Which are you going to choose to dream about?

I'd rather wander down by the brook and watch the meadow rue grow silvery as it dips under the ripples at the edge, or watch the water turn to gold as it winds over the shining, yellow sand in the golden sunlight and dream of King Midas, and how much more of worth was his little daughter's loving smile than all the gold that ever came from mines.

When I was three years old I used to do this with my mother. We walked through a great pine grove and picked the partridge berries and made pine-needle chains on the way. Then we would sit by the brook and dream, as I have told you. Do you know the meadow rue? We must go where it grows for our next picnic and see how it looks in the water. I know a little boy who saw too many pictures of ugly things, and he was afraid to go to sleep, for he knew he should dream of monsters and of burglars. How unhappy he was, and he wanted some one always with him in the dark.

I know a little girl who could hardly wait to get undressed, for she said perhaps she should have a lovely dream. It began one night, but she woke up too soon, and she hoped every night it would come back and finish itself.

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So when you draw, please try to make pictures of things that are beautiful and good to dream about, and when you look at pictures choose that kind. Then I know that your night dreams will be as pleasant as your day dreams. And now good-night to you, dear Boy, and happy dreams.

LXVI

HOW MEN LEARNED TO READ AND WRITE

RUDYARD KIPLING has written a book called "The Just-So Stories," and if I forget to read these to you I hope you will ask me often so that I shall remember to get them and do it.

One of them tells "How the First Letter was Written" and one "How the Alphabet was Made," and if we should talk about these things all night we could n't do it so well as it is done in these two stories.

The first letter was probably written by one of those men, of whom we have often talked, who lived in a cave. No one had ever written anything and no one knew his A, B, C's, for no letter had ever been made.

Now suppose you and I went down in the woods and I forgot to take a knife. There I found some beautiful pussy willows, but I could n't get the ones I wanted without a knife. Suppose Daddy was at home and you could run back and get it, but he would not let you have it unless he knew for sure that I sent you after it. What could I do? I could write him a little note and tell him to give it to you.

But suppose I had no pencil or paper, then how could I write it? I could take a flat, soft rock and scratch on it with a hard, sharp one. What else? I could peel off a piece of birch bark, squeeze out the juice of a berry, and dip the end of a stick into it and write with that. But

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suppose there were flowers, but no berries. At pussy-willow time we do not often see berries. Yes, we could burn some wood and write with the charcoal. But we are thinking of a time when Daddy cannot read, and I do not know how to make letters because letters have never been made. What could I do then to tell Daddy that I wanted the knife and where it was?

Make pictures; sure enough. And men did just that. Long before they learned to write with letters they made pictures.

It was a lot of work to write with pictures and hard to tell the story just right.

To-morrow you must write me a picture letter and I will answer it. Picture stories have been found from time to time carved on ivory and on many things which people in olden times used. There are whole stories carved on their tools and weapons and musical instruments.

Pictures took too long, as you see, also they were too easily misunderstood, so men learned to make marks. They got together and agreed that a certain kind of mark should mean one thing and another mark something else. Then these marks were all written down and saved, and those that learned them could write messages and read them. This was the very first of reading and writing and having an alphabet. Probably the first ones were marked out on the sand or maybe on snow. I have seen you try to print letters and draw pictures on both.

The Ten Commandments were first carved on tablets of stone.

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To-day people in each country make different marks for letters. You have our English alphabet on your blocks and in your books, and we put these letters together to make words.

Here is a German book, and a piece of paper with Japanese letters which came around the package from the Japanese store. Here is Daddy's laundry check with Chinese letters. Here is a Yiddish newspaper with the letters which the Jewish people use. The old Egyptians called their letters hieroglyphics, and men have found many things in Egypt on which these letters have been carved. None of them look like the letters of our alphabet, you see.

We cannot begin too soon to learn our letters, so that we can say them and sound them and put them together and make words, and then write them, so that we can send messages to people who go away or to the people at home when we go away, for ours is not the only alphabet to learn.

Think of all the others in the world! Perhaps some time, if you learn a little lesson every day now, you can learn to read French, Italian, Chinese, Japanese, Greek, Latin, Spanish, Yiddish. But remember that English comes first of all, and that that begins with A, B, C.

There are boys too lazy to try to do this unless they are scolded and punished, but I am glad my little boy is n't one of those, for I could n't let him grow up and not be able to read any stories of knights and fairies to his little boys when he is old enough to be a nice, big Daddy, could I?

For what would my little grandchildren think of a

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Daddy like that or of a grandmother who would let her little boy grow up in such a horrid way? People will read to you now that you are little, but what will they think of a big boy who cannot read or write his own letters?

And I hope my little boy will some time see all the countries in the world. I hope he can learn more than English, so that when he goes to see other countries and how the people live in each, he will know what the people say and write there.

Now bring me your alphabet blocks and we will see how many of the letters you can tell.

Here is plenty of room and a nice, smooth place on the floor. See if you can bring me the right one as I call each letter.

Let us build a house with blocks.
First we'll take the letter A —
This our Architect will be
To plan a house for you and me.
Letter B comes next in line:
He will bring the Bricks so fine.
Then C for Carpenter; just in time
To follow the mason with his lime.
Above the foundation, firm and strong,
The Carpenter will nail boards short and long.
D for the Doors through which we go,
E, Electrician, whom we all know
Wires the house where 't will not show.
F for the Fire with cheery blaze,
G for the Glass through which we gaze.
H is the House which we build with care:
'T will be a Home when the family's there;
Large or small, well-furnished or bare,
If they love one another and all play fair.

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I for the Ice-box and what we put in it;
J for the Joy we'll have every minute;
K for Kitchen, and L for the Lumber,
To make all the boards. 'T will take quite a number.
M for the Matches, the Miner, the Mason;
N for the Nails, and O for the Oven.
P for the Paper, the Painter, the Plumber;
Please hurry the next block, for Q stands for Quick.
Now bring all the rest, R, S, T, U, and V;
We'll need more than that, W, X, Y, and Z.
We'll pile these with care for the chimney, you see,
And there's a fine house, I know you'll agree.

[Any jingle will do. Make it up as you go along, a rhyme for each letter as the child brings it when you name it.]

When Cousin Carl was a little boy he had blocks with letters on them. On each block was a picture of an animal, and the name of the animal was written under it like this: On the block would be E on one side. On the other side the picture of an elephant and under it the word "Elephant" spelled. On another block there would be a "B" and on the other side the picture of a Bear with the word "Bear" under it.

One day he came to see us and saw a box of salt. On the box was the picture of an elephant and under it was written "Salt." He spelled it out — it was before he could talk very plainly — so he said, "S-a-l-t, Ephelant."

That is why I want you to learn the names of the letters and then the sounds. Then sound your words instead of learning them by pictures, and you can find out any word for yourself and won't say, "S-a-l-t,

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Ephelant," because there is a picture of an elephant near it.

[If you can get a Pollard Manual and tell your child the Johnny story in it, drilling on the sounds, he will learn to read happily and easily. Almost any normal child taught in this way can read any word found in the newspaper at the age of six. I have tried it with many children.]

TOYS

LXVII

THE TOY SHOP

IN Volume V of this series are words and music for games. Children like to go to a shop full of toys, but they like just as well to play that they go.]

One of the games that Brother loved best was one that we called the "Toyman's Shop." We just took hold of hands and walked about the room or the garden and finally chose a toy. This choosing, although it was all make-believe, was very carefully done. We knew that toys cost money and took up room. We knew that if we spent too much money for toys there would not be so much for other things. There were so many toys in the shop that if we took them all home there would not be room for them. We should have to sleep out of doors to make a place for them. That would not be very wise or pleasant.

There were so many toys that would break easily, and we knew how badly we felt when any one gave us something which broke almost as soon as we began to play with it because it had not been made strongly enough to use. We learned never to choose that kind.

There were plenty of toys which we wanted because they were so bright and pretty, but we soon learned that these became just clutter in our room at home and were "no fun."

I was pleased to see that almost always Brother, and whoever played with us more than once, chose trains

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and things that are used along the railroad to go with them. Almost never did they choose the ready-made station or signals, but they bought blocks. Almost every time we played they bought a box of blocks, for with these they could make almost anything they needed.

Brother liked balls, too. When he bought a ball for Baby Brother one day I was especially pleased, for he chose a pretty, soft one, and what could a baby have any better than a nice, soft ball to play with? Sometimes the children would buy rattles to take home to their baby brother or sister. Almost always, though, each child thought only of himself and chose the toy that he liked best.

When one of them did think of some one else and what he would like, the game seemed even jollier. When Roger was playing one day he bought a doll for Gene, who was a baby then. It was dressed like a clown, with bells jingling from its cap and toes. There were buttons all down the front of its jacket and something, I've forgotten what, pinned on somewhere. Such a howl of laughter went up from the children that had played the game with us before and knew how to choose a toy for a baby!

Why did they laugh? Of course, a baby's mother would never let it have a toy with buttons on it, for a baby always tries to put things in its mouth, and it would surely tug at those buttons until they came off. If they did n't get into his mouth they might go up his nose. Those bells and buttons and the pin would never do for a baby. Next time he chose a little rubber doll

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which squeaked when he squeezed it. This was much better for a baby.

After we had carefully chosen our toys, we took them home and played with them.

We had as much fun, all in make-believe, as if our toys were really the ones in the store, and had cost hundreds of real dollars.

We each showed, by making motions, what we had bought; tossing balls, and beating drums, skating, and rocking our dolls to sleep.

At other times we made a store in one end of the room and put in it all the toys we had. Sometimes we cut out pictures of toys from magazines and made a store of those. Then we took our box of toy money — shells, stones, and beads for money, as people used to do before men learned to make the kind of money which we use — and bought these toys.

Sometimes we played that Santa Claus was there and told us to look about and each choose one toy to please ourselves. How carefully we searched each shelf and corner to get the toy that would last the longest and be the most fun!

Spiff used to buy picture books, and David loved animals so much that he almost always bought a Noah's Ark. He taught Baby many words with these. He would say, "Run and get the cow for Brother," and she would toddle away and come back with the dog. Then he would say, "No, no, Baby. Brother wants a cow. This is a dog." One day I watched them, and found that there was hardly an animal in David's Noah's Ark that she had not learned to name in this way.

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Just before Christmas we always went to the real toy shop. There is almost nothing that Daddy or Mother uses to-day which we did not find there for you boys and girls to play with. These are smaller, of course, than those which grown-up people use, but very like them in other ways.

Even motors were there, so that you can run your trains by electricity. There are sets of wood and steel and tools to work with, so that you can build trestles and bridges and elevators. There are chemical sets, so that you can learn to put acids and powders together and make gas and dyes and even gunpowder.

There are pencils, crayons, paints and brushes, blackboards and paper, clay for modeling, all sorts of things with which to learn to make beautiful pictures and statues, useful things and toys, such as great artists never had to work with once upon a time.

How much people think of you children now! How they plan to make you happy and to give you things to play with so that hard lessons may be learned and seem like play.

I am thinking of a time when people used to say "Children should be seen and not heard." Quietly they had to sit while grown-up people talked. Instead of pretty picture books they had to sit still for hours and learn word for word long pages in the Bible. They very seldom knew what the words meant, either, which made it yet harder to learn them. A great stick waited for the child whose thoughts wandered away to the birds or dreams of playtime and who could not say his verses to suit the grown-ups.

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I am thinking, too, of a lonely little boy in Germany. His name was Frederick Froebel. His father was a minister. He seemed to be always busy reading and thinking, and had no time for games and stories with little Frederick who could not remember his mother.

Frederick had no blocks to build with, but one day he found some that the carpenters had left behind when they were building near his home.

With these he made houses, just as all little boys like to do. When he grew up he remembered how lonely he was when a little boy, and the rest of his life he spent trying to make people see that little boys and girls need toys so made that they can handle them easily and make and do the things with these which they see being made and done all about them. He tried to make people understand that no child is too little to want to learn to do things. So he spent his time watching little children play, trying to find out what kind of toys, stories, songs, and games pleased them most, and best helped them to learn, as they played, the things which men and women must know before they can be of use to the world.

That is why to-day we have these wonderful toy shops where you can go and buy balls and marbles, jump-ropes and dolls, furniture for the doll's house, animals, building blocks of all kinds, picture books, stories, and games. What more can a child need to keep him busy and happy!

Then came the kindergarten where children are shown how to use these things, and instead of long, lonely hours of wondering what to do, or sitting still and being afraid of a big stick if they moved, came happy

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times when they learned to count and do their number lessons with pretty beads and colored sticks and building blocks and piles of sand.

You are too little now to know what all this means, but my grandmother used to tell me how long she had to sit and say her number lessons over and over. Her only doll was kept shut up in the closet, and she could hold it only once in a while when she was very good, and then it must go up on the high shelf for fear it would get dirty or be broken.

Every afternoon she must be dressed up clean and go to walk, and her picture books and stories were great, heavy books with pictures of men in the Bible. How would you like that?

Now cuddle up close a minute and give me a hug, and for your number lesson get out your blocks and make a bench eight inches long and four inches high and two inches wide, and tell me how many blocks it will take. Brother learned all his numbers that way and never sat down for hours, and said one and one are two, two and two are four, as my grandmother hated to do. He could not have done this before blocks were made just right for him to learn to use in this way.

When you put your blocks away neatly in your closet, see if there is a toy there that you can spare to send away to the little boy I saw this morning who did n't have any nice ones like yours.

LXVIII

WHERE TOYS ARE MADE

AT first, like everything else, toys were made by hand at home. Before there were any toy shops this could easily be done.

Almost anything would do for a rattle for the baby.

Fruit or stones or nuts would roll, and Baby had a ball. A rag doll was not hard to make, and dolls could be made from corn-husks, strings, or even a potato dolly is better than none.

Children still like to make pies out of sand and mud and bake them in shells in the sun.

But when people got the idea of making things for children to play with, they kept thinking of ways to make better ones and easier ways of doing this. No animal we can think of ever made a plaything for its baby, did it? I have seen a dog play with a stick or a ball for hours, but I never heard of a dog making a ball for its puppy to play with. Monkeys are very playful, but they never make toys to play with. Men and women do this. They think about what they have and then work and make something a little better.

Look at a rag doll which you can make by rolling up your handkerchief, then look at the dolls in the toy shop. What a difference! Some can even open and shut their eyes and talk a bit, and the mechanical dolls can walk when they are wound up. Look at your little shell dishes and then at the kitchenware and china that are made for dolls to-day.

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For many years all our finest toys were made in Germany and Switzerland. Whole families worked on these, even the little children. They worked hard all day long, carefully making each little part, and putting them together with infinite pains. Lovely toys have come from Japan, too.

Now great quantities of toys are made here in America. Great factories have been built. These noisy, whirling machines make toys by the thousands. In Winchendon, Massachusetts, and South Paris, Maine, and I do not know in how many other places, there are toy factories. You would be surprised if you should go into one of them to see how your doll's furniture is painted.

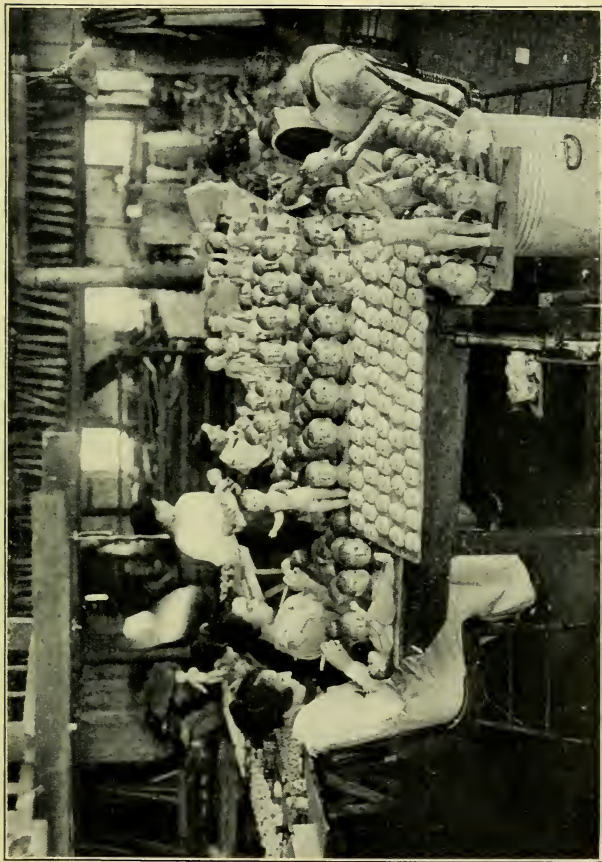
One machine has a long rod on which are slipped more doll's tables or beds or chairs than you can count. It takes only an instant to dip this rodful of furniture into a great tub of paint and out again. These are swished off, rod and all, to another place to be dried and another rodful dipped into the paint.

I never dreamed that a whole set of doll's furniture could be painted so easily and quickly.

So with the making of all the toys. Great machines cut out each part by the hundred. Then all the parts are put together by machines that work as quickly as they were dipped in paint, and they are ready to be carefully packed and shipped away to be sold.

In South Paris thousands of trees are cut each year and made into boards to be used in making these wooden toys.

For the metal toys — show me a metal toy — thou-



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WHERE TOYS ARE MADE

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sands of tons of iron and other ores must be taken from the ground.

Men are always trying to think of some new toy to make and sell, and planning ways to make them quickly and to save hard work. I want you to go into a toy factory some day.

Think of all the stockings which will hang beside the chimneys next Christmas Eve. Did you ever think of the millions of toys that must be made every year to fill these besides a lot more for the Christmas-trees? Then each of these children has a birthday, and some of them tease for toys in between, not to mention the Easter Bunny who, of course, tucks in a few toys along with the eggs which he brings.

Oh, of course, Santa Claus helps. It's lucky that, although Santa Claus and Mrs. Santa Claus are getting very old now, they never get tired of working for children. They love children, that's why. The world could n't get along without Santa Claus, but I know he's glad to have the toy factories help him out. With all the toy factories running double time there would be a lot of unhappy children if Santa Claus did n't keep busy and get around every time on Christmas Eve; but the world is big and children ask for more than they used to. I've seen him just before Christmas wandering around in the toy stores, or sometimes resting there, and trying to find out just what each child wants, so as to please him if he possibly can.

Yes, I remember you saw him last year and told him that you wanted a bicycle. Do you remember what he told you? That there was a strike in the coal mines and

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on account of that the factories where they were made had not been able to work all the time, and so you might have to wait awhile! Do you remember that he told you that if you did have to wait he'd see the Easter Bunny and ask him if he could n't help out? And Easter morning there was a bicycle with a note from Santa Claus in care of the Easter Bunny, saying that he was glad the factories were working again and that he could send the bicycle now.

So you see that Santa Claus does depend a great deal upon the toy factories and that they cannot work unless the men in the mines work first.





