

With these words she vanished in a mist, leaving them in a state of astonishment not to be described.

Our story is all told, as much as any story can be told. Of course Mabel and her parents went to the cottage outside of the town; of course they found there a beautiful youth,—birch-bark boy no longer, but as fine a young fellow as one could wish to see,—who recognized Mabel at once, and gladly

accepted the father and mother, who said he must go home with them and be Mabel's brother. And, of course, they all were happy as could be to the very end of their lives.

But our boy, for some strange reason, though he could talk, and leap and romp like any other young fellow, never liked to go alone to the forest, and to his dying day he always shuddered when he heard the old proverb, "His bark is worse than his bite."

## HOW DOLLS ARE MADE.

BY OLIVE THORNE.

DARLING Rosabel came from the rag-bag.

From the rag-bag! you don't see how anything nice can come from such a place, do you say?

I fear you'll be shocked when I tell you that not only Rosabel, who is a "perfectly lovely" wax doll, but your own most precious dolly, if she's anything better than china, probably came out of the same dreadful place.

To be sure her head, neck, hands and feet are all of wax outside, and as only this covering shows, she is just as good and as pretty as though she were wax all through; and you know the old saying that "beauty is but skin deep." But, nevertheless, she *did* come out of the rag-bag, and I'll tell you all about it, while she sits there on the sofa, elegantly dressed, and looking as lovely as though she never even heard of such things as rags.

The true story of her life, since she was first created, would be very interesting; but it would make a big book, and I can't tell you half of it.

A new doll, did you say? Well, I know she has not lived long in her present shape, but you must remember that she was not always a doll; she was once wrapped up in a green bud, growing on a bush. She came out of that a long white bit of cotton, went through ever so many processes, and became cotton cloth of some kind; was bought and sold, and made up, and used, washed and ironed, and worn out as cloth, just to begin with. Think of all that probably happened to her before she even became rags!

That was only the beginning. After being worn-out rags she went into the rag-bag or the alley, made a journey on the back of a rag-man, went through a dreadful course of soaking and washing, and boiling, and bleaching, and pressing, and dry-

ing, and ever so much else, before she came out nice clean paper, ready for use again. Did you suspect your dolly had ever been paper?

Well, she was paper once, and who can tell what may have been her life while in that state, whether she was beautiful note-paper and carried loving-



THE MODELER AT WORK.

messages from one friend to another, or whether she was used for business writing, or for wrapping up confectioners' dainties, or whether she was made into a book or not, or did good or harm. She'll never open her lips to tell of her past life; but you may be sure she was put to some use as paper, and

could tell strange stories of what she has seen, if she could only remember—and talk.

You see she's very old, older than any of you,

turn around if he wishes. From a lump of soft clay, he has cut and shaped a doll's head and neck, and in another lump of clay near him, you see he has stuck his spare knives. When the model is finished, the modeler makes lines on it, with colored crayons, as a guide to the next workman, who is called a molder.

When the pattern, or model, is ready, there must be made a mold, in which to shape the paper pulp from the kettle. This is made by the molder. He takes the pretty clay model, when it is dry and hard, and lays it face up, in a dish of wet clay, pressing the clay into every corner up to the colored line which the modeler



MAKING THE MOLD.

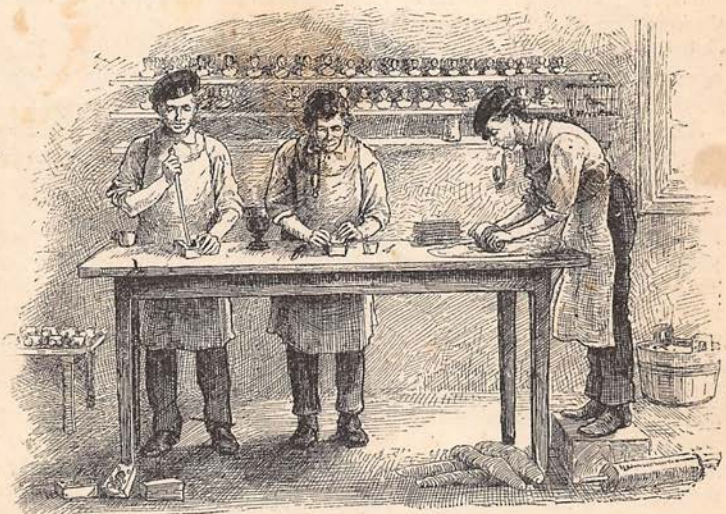
and I don't think it's respectful to old age to treat her as some of you do. I hope you'll mend your manners toward her, now that you know about her age and dignity.

When the paper of which she is made was old and soiled, and unfit for use, it was taken to a doll manufactory, in the little city of Sonneburg, near the northern border of Bavaria, and there it went through the operations that made it into this pretty doll. I can show you, as well as tell you about it, for here are some sketches taken for ST. NICHOLAS in one of those very factories.

The first thing, of course, is to make that mass of paper into a clean pulp, and we'll leave it boiling away in a big kettle, while we see what the doll-makers are doing, to get ready to use it. First they must have a model of Miss Dolly's head. A model, you know, is a figure made of the exact size and shape of the head, for a pattern.

Now look at the picture on page 228. The man is making a model. You see he has a narrow workbench which he can make higher or lower, or even

made. This being done, he builds a wall of clay around the mass, coming up some inches higher all around than the face of the model, which is left uncovered. The whole looks like a box half full of clay, with a face looking out of it. In the



WORKING THE PAPER DOUGH.

upper picture on this page, you see one man holding the clay walls together, while the other one pours over the face some melted sulphur which he has taken from the stove. Sometimes plaster of Paris

is used instead of sulphur, but it is not thought to be so good.

The mold is not done yet. The clay was put on merely to protect that part of the head while the rest was molded. When the sulphur is cold, the box is turned over, and the clay taken away, leaving Miss Rosabel with her face buried in sulphur. It's well she cannot smell; the visitors to the room who *can*, do not care to stay long.

Clay walls are again built up, and more sulphur is poured in to make a mold for the back of her head. The boxes on the floor in the picture are molds, as they look when done, and the open one shows you the two separate sides.

Now the mold is finished, and we must go back to our paper pulp, which we left boiling, you know. When soft and ready for use the water is squeezed out, and other things added—some powdered clay to make it stiff, and a little glue to make it sticky. These are worked up together till the mass is about like dough, and indeed it is made into loaves, as you see in the third picture.

The loaves are on the floor, under the table, and the man with the rolling-pin is rolling out the paper dough—papier maché it is called—for the other man to shape. He makes it a little thicker than pie crust, and then cuts it into pieces the right size for use, making a pile of them, with flour or powdered clay between to prevent their sticking together.

The man next to him is pressing one of these thin cakes of paper dough into the molds for Dolly's head, and the third man is making it fit more nicely into every crack and corner of the mold, with a tool of some sort, so that it will be a perfect copy of the original model. You see they are smoking. That is because they have to keep the room very hot so that the heads will dry quickly, and the heat makes the workmen so sleepy that they smoke to keep themselves awake.

See the half heads laid out to dry on the table, and the finished heads on the shelves behind the workmen.

But to go on, when the man has carefully fitted the sheet of dough into every part of the mold, he pares off the edges with a knife as you see a cook cut the crust from a pie plate, lifts the half head out of the mold, and lays it on the table to dry a little. When dry enough it is again pressed in the mold to give it a more perfect shape, and then is dried for the last time. The two halves being

finished, they are glued together, and Miss Rosabel for the first time takes an upright position on a shelf, where she stands till she is hard and dry, looking more like stiff pasteboard than anything else.

Miss Dolly is not very pretty in that state, I must admit. She is of a dingy gray color, with no eyes and no hair. However, she is not yet finished.



SMOOTHING AND COLORING DOLLS' HEADS.

Her next journey is to the eye-setter. A rough doctor he is, and the first thing he does is to cut off the top of her head, by running a sharp knife around it, and knocking the piece out with a hammer.

What for? Merely to put in her eyes, my dear; and a curious operation it is, too. If they were immovable eyes, like a common doll's, they would be simply glued in; but in a young lady of Miss Rosabel's pretensions, who meekly shuts her eyes when her mamma lays her down, there is much to be done.

In the first place, the eyes themselves, life-like as possible, have been carefully made of glass, in a large factory which turns out nothing but eyes. These the eye-setter now fastens to a piece of curved wire with a ball of lead on the end. It is the weight of this lead which makes her eyes close when her head goes down. Then the workman, with a sharp knife, cuts a hole for each eye, and goes on to put them in. I can't explain exactly how he makes them all secure, but there is plaster to hold them in place, and support the cheeks; a cork, or sponge, to keep the lead from hitting her chin; pieces of wood to prevent her head from being easily crushed, and various arrangements by means of which the whole is made firm and strong, and able to endure the hard knocks she may expect, in the rough life before her.

When everything is in, the cut-off slice of her head is glued on again, and Miss Rosabel has received all the furnishing for the inside of her head, that she will ever have. If your poor doll ever is so unfortunate as to break her head, you can look in and see all this machinery, if you like.

Now the inside is finished, the next thing is to put on her lovely complexion.

First must be removed any roughness, such as bits of glue at the seams of her head.

Women now go to work on Miss Rosabel's head, as you see in the picture on the opposite page. One of them is filing the roughness off, and the other is giving it a coat of ruddy flesh-colored paint, from the top of the head to the ends of the shoulders. Dolls who have hair made of the same material as their heads, like bisque and china dolls, have the hair varnished black, but Rosabel has real hair, so she is colored alike all over. A frightful-looking object she is, too, with color enough for a boiled lobster.

When she has received her color, and got dry, which she does under the hands of these rather sour-looking women, she proceeds to the next operator, who is the waxer. You see him below.

In the kettle is boiling clear white beeswax, and

one giving her a thin coat of wax, and toning down her flaming complexion into the delicate pink which you see. The reason she was painted so red, you know, is that she may have the proper tint when the wax is on.

I should have told you before that her hands and feet were made in the same way as her head, molded, and painted, and waxed.

In this picture you see the bodies of cloth or leather. They are made by families outside of the factory, and brought in all ready for the heads. Can your dolly cry? Rosabel can, and therefore her body is stuffed with hay, because sawdust, the usual stuffing, would get into her crying machine, and make her dumb forever after. To give her a voice, you must know, she has a sort of a bellows-like arrangement, such as you have seen attached to a toy cat, which when pressed would mew.

These parts are all made and put together outside of the factory and the finished bodies brought in. And now comes the next process, which is coloring her face. You thought she had color enough. Well, she has her flesh tint, but her lips are white and she has no eyebrows, nor lashes, and no brighter cheeks than firebrands, which will never do. She must go to the painting room.



THE WAXER.

into it you see Miss Dolly has been dipped, and is being held up to drain. If she had been intended for a cheap doll, she would have received but one dip, but being destined to belong to the aristocracy of the doll world, she received several dips, each

On the next page you will see one of the workmen in this room.

In this room is a long table with several workmen, each of whom does only one thing. The first one paints Miss Dolly's lips, and sets her down



PAINTING THE DOLL'S FACE.

on the other side of him. The next one takes her up and puts on her eyebrows. The third colors her cheeks. The fourth pencils her eyelashes, and so she goes on down the table, growing prettier at every step.

But she has yet no hair. Now Rosabel has a regular wig, made of real hair on a foundation of lace, and glued on, but many of the dolls in the factory have locks made of fine wool, which look like real hair. This wool is braided up tight, and boiled to make it stay wavy. It is curled over a glass tube, and glued to the head curl by curl, whether long or short. If it is yellow, it is the natural color of the wool; if any other color, it has been dyed.

Here is a picture of girls arranging the hair, and you see they seem to enjoy the work. Sometimes the hair is elaborately braided, and done up in style. I dare say you have seen it put around in a droll German coil, and held by tiny hair-pins. Generally, however, it is preferred in curls or loose waves.

Now the head is done; and how many people do you suppose have had a hand in bringing it from the paper pulp to the present state? You can't tell? Not less than thirty-eight, each one of whom never does but one thing, and thus becomes very skillful.

But though the head is finished, Miss Rosabel is not yet out of the factory. She must have her head, as well as her hands and feet, glued fast to her body; and then—last but by no means least—she must have a wardrobe. Cheap dolls have merely one garment, loosely stitched together by a machine at the rate of about two cents a dozen. But our dolly was sent to a regular dolls' dress-maker, and clothed from head to foot in a very pretty suit. Of course it is not in style now, for it was made several months ago, you must know.

The last picture shows the dolls going to the warerooms. You see how neatly they are packed in the basket cradle, and carried between two girls. In the warehouse Miss Rosabel was surrounded by hundreds and thousands of fellow dolls, many of them made in the same mold with herself, and as like her as twin sisters could be.

I have read of one of those warehouses, where twelve rooms were filled with dolls, of all sizes from one inch long to two feet high. One room was entirely filled with wooden-jointed dolls, an inch and a-half long, piled in a loose heap from floor to ceiling, and another room contained nothing but dolls' heads. There were millions of dolls in that one house.

You wish you could go there? It would be interesting to you. It looks very droll to see a cart going through the streets filled with dolls' legs,



DRESSING DOLLS' HAIR.

for instance, each one with clean white stocking and bright slipper painted on.

One wholesale house in that town buys thirty thousand of the inch and a-half babies every week the year round. For my part, I should think a few years of such work would nearly pave our streets with wooden dolls. A smart worker can make twenty dozen of this size in a day.

Would n't it be funny to live where almost the only business carried on is toy-making? Where grown up men and women spend their whole lives in inventing, improving, and making dolls that

there I found her last winter, on the day before Christmas, and brought her home to a little girl that I know.

I'm obliged to confess, before I finish, that Rosabel and others made in that factory are not the very nicest dolls made. There is the genuine wax doll, whose head is of wax all through, and whose curls, and eyebrows, and eyelashes are of real hairs, put into the head one by one. Such a doll, with her wardrobe, costs several hundred dollars, and is too nice to play with, though very pretty to look at. No doubt, you little city maids have seen



GOING TO THE WARE-ROOMS.

talk, and turn their heads, and shut their eyes, and creep, and walk, besides engines that run, and horses that draw a load, and steamboats that go—a million of dollars' worth in a year, and all to amuse the great army of little folks in the world?

The children who live in that fairy land, however, care very little for toys; the poor little creatures are all workers. When very young they begin to learn to make some one toy, or part of a toy, and they spend their whole lives at it. The pay is small, and every one of the family must help.

But to go back to Rosabel. From that warehouse she was packed in a box and sent on a sea voyage. Arrived in America, she was once more brought to light, set up in a shop window, and

them, with their beautiful trunks full of clothes, dresses of all sorts, shoes, gloves, parasols, jewelry, pocket handkerchiefs, brushes and combs, and nearly everything a grown lady needs in her trunk.

Do you wish you had one? Well, my dear, let me tell you a secret; you would n't enjoy it half so much as you do dolls you can play with, and dress and attend to yourself. They are puppets,—not babies.

The other dolls in your play-house, the bisque and china, are made in the same way as Rosabel, only the dough is of clay instead of paper pulp, and the heads are baked to make them hard.

So your pretty bisque dolls are made of mud, and your wax ones came from the rag-bag. Is n't it wonderful what changes go on in the world?