

Cartoons for China's Ancient Science and Technology

Stories of Four Inventions

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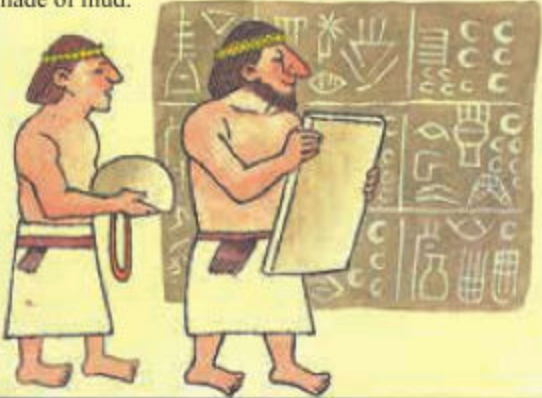
Alchemy and Gunpowder

Papermaking

Before the invention of papermaking, various materials were used for written records.



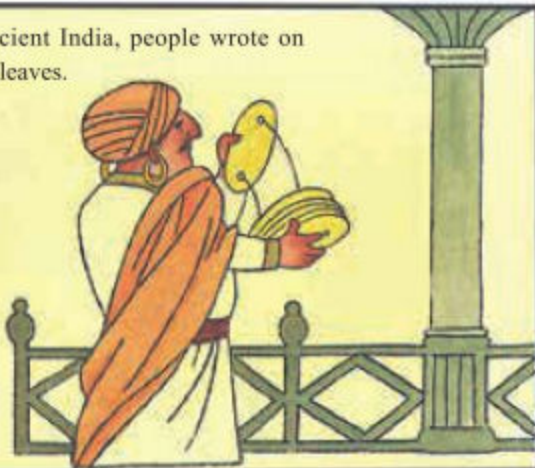
The ancient Sumerians carved characters on boards made of mud.



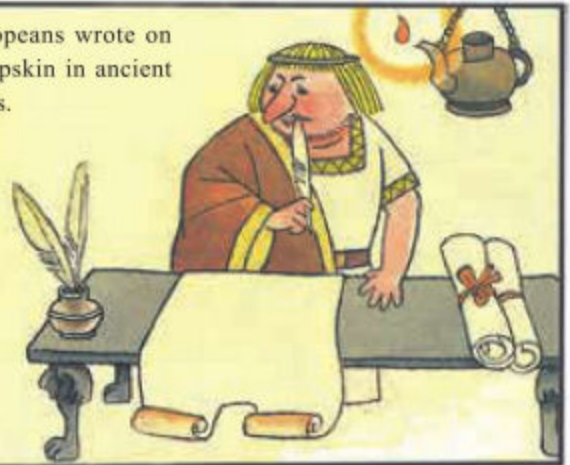
The ancient Egyptians wrote on papyrus which grew around the Nile.



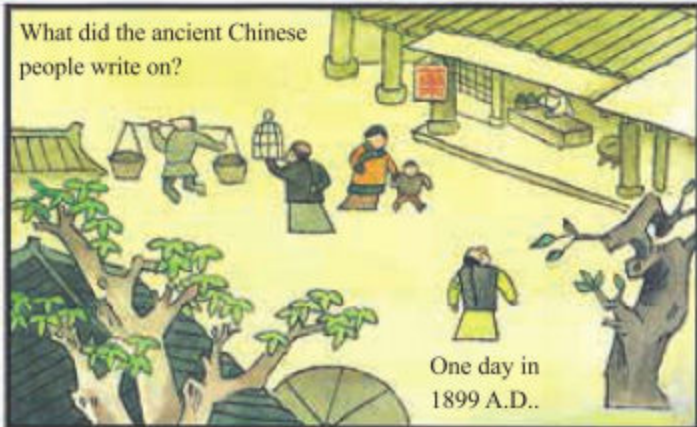
In ancient India, people wrote on palm leaves.



Europeans wrote on sheepskin in ancient times.



What did the ancient Chinese people write on?



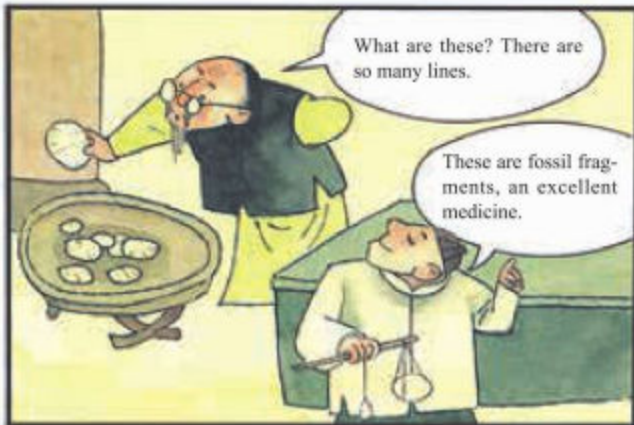
One day in 1899 A.D..

Hello, Mr. Wang Yirong! Oh! You don't look well.



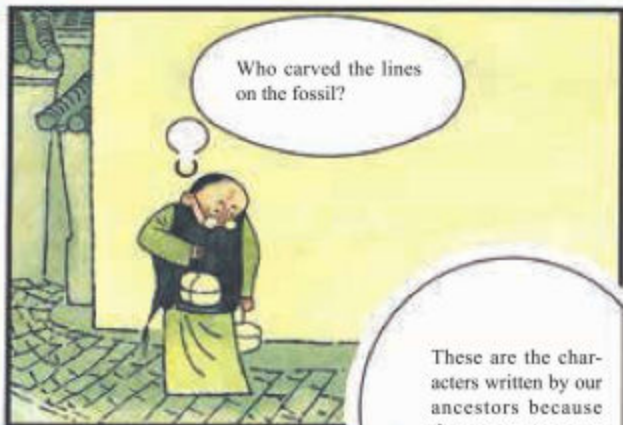
My malaria has come back again. Please give me some medicine.

What are these? There are so many lines.



These are fossil fragments, an excellent medicine.

Who carved the lines on the fossil?

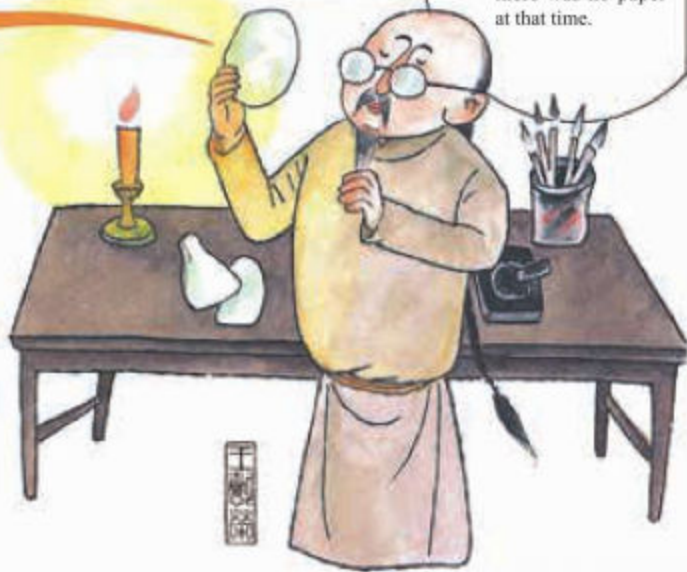


These are the characters written by our ancestors because there was no paper at that time.

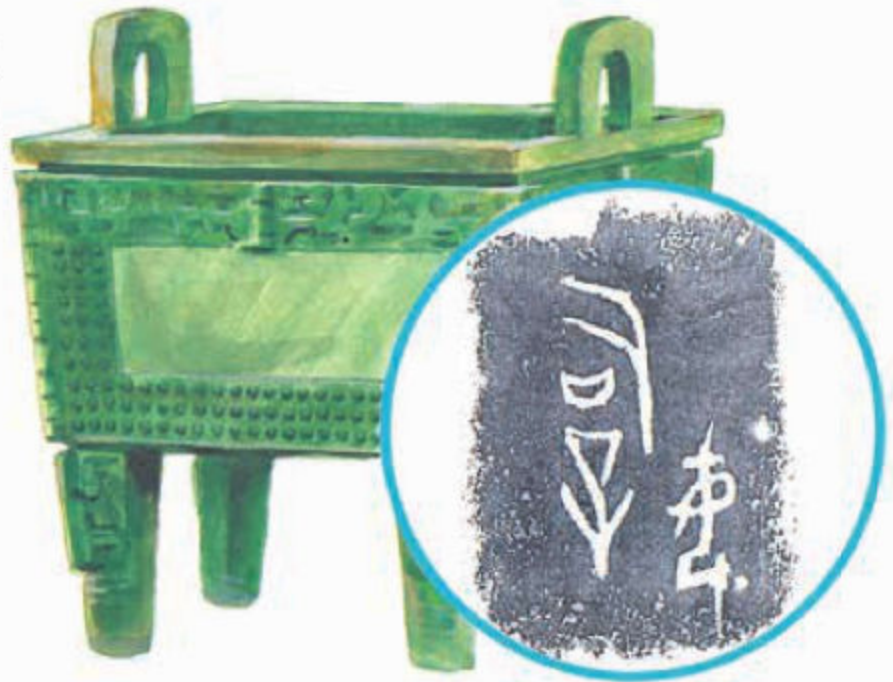
2



These are the inscriptions used for practising divination, in the Shang Dynasty, 3000 years ago. It's recognized as the most ancient Chinese characters carved on tortoise shells and bones.



This is an ancient cooking vessel with two loop handles and four legs. The characters inscribed on it are called *jinwen* (writings on bronze).

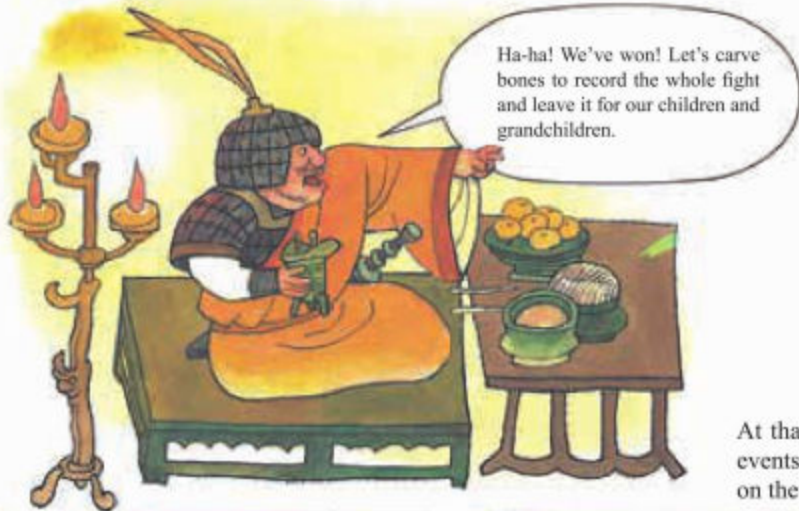


This is the *jinwen*.

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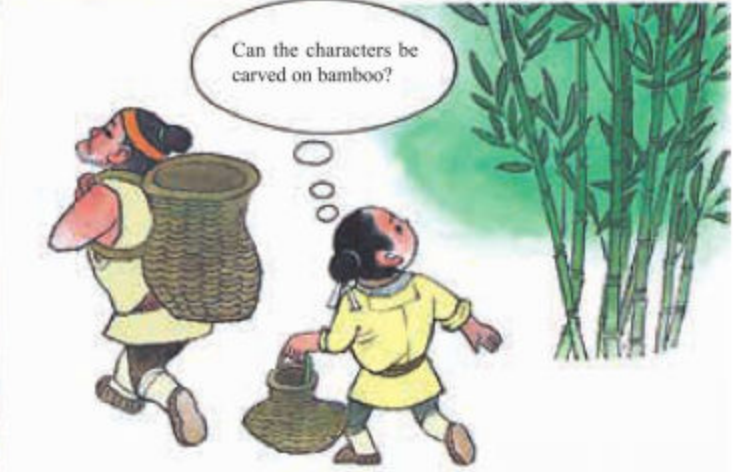
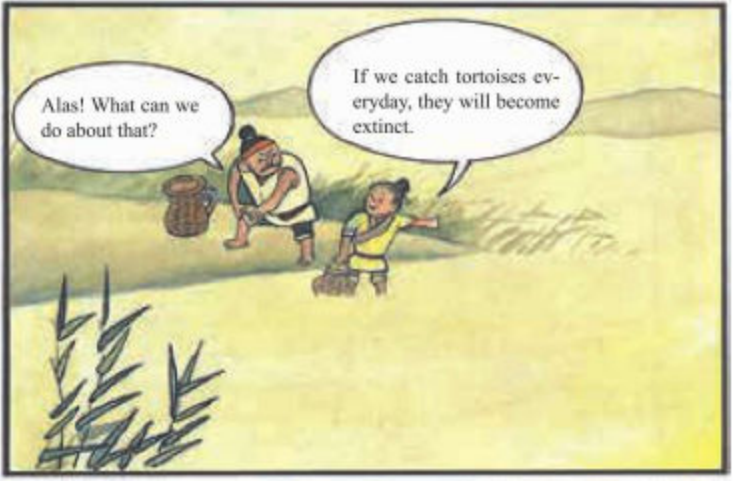


There were often fights among the tribes during the Yin-Shang Period in the 17th century B.C..



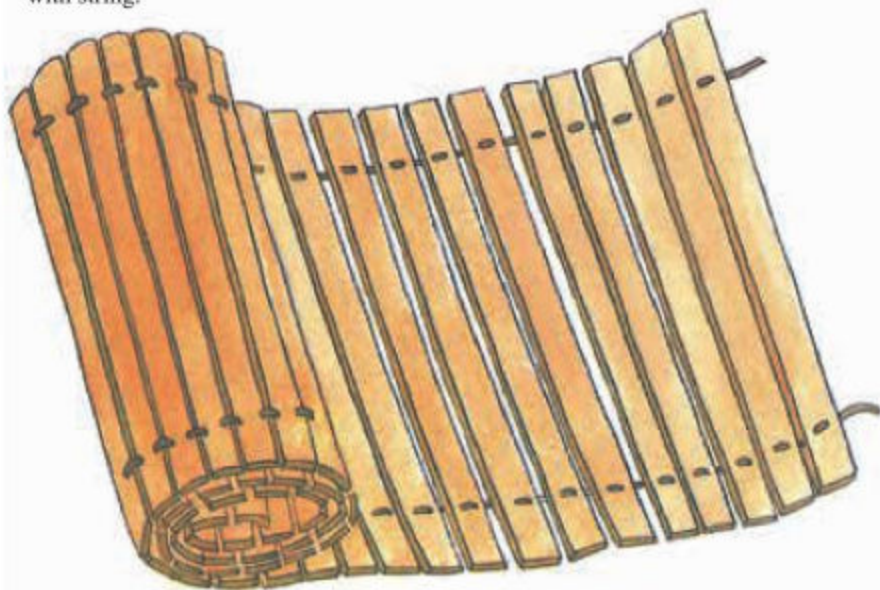
At that time there was no paper. The important events had to be carved on the bones or inscribed on the bronzes.

4





At the end of the Shang Dynasty, people began to use bamboo strips and wooden slats instead of bones and tortoise shells. The Chinese character “册” was in the form of four bamboo strips which were sewn together with string.



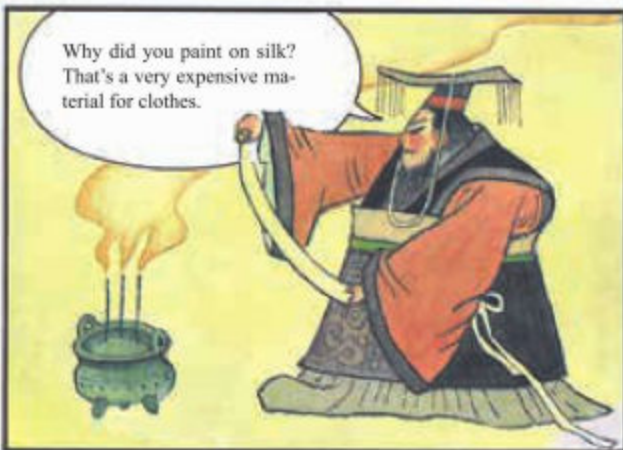


The bamboo strips were very heavy, so they weren't handy while being used. Everyday the bamboo-strip memorandum that the emperor would read weighed several hundred *jin*.

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Your Majesty, do the plum blossoms look good?



Why did you paint on silk?
That's a very expensive material for clothes.



Can I paint on the wooden strips on your desk?

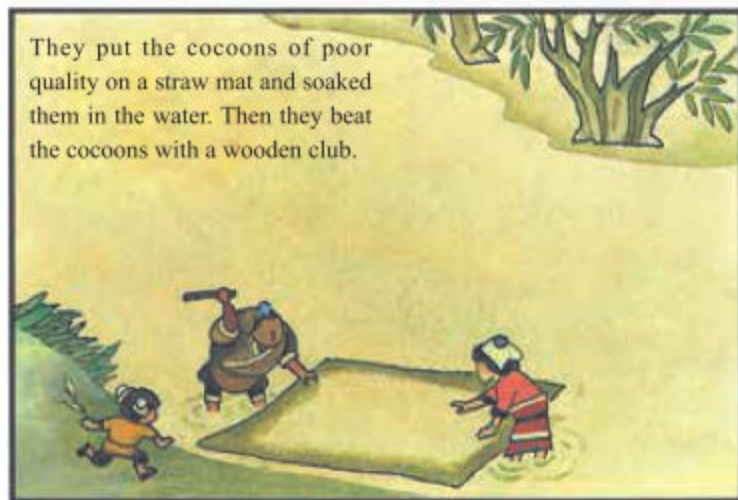
Ok, it's not your fault.

Bamboo strips are too heavy, while silk is quite expensive. What are we going to write on?



Then we'll have the money to send the children to school.

We have a bumper harvest of silkworms. Let's make raw silk from the best cocoons and silk floss from the leftovers.

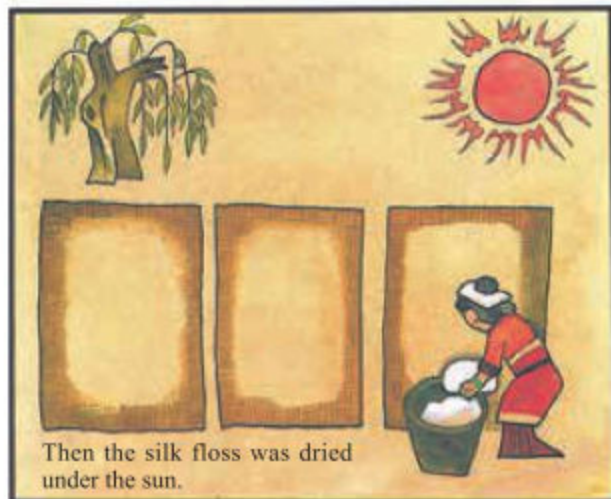


They put the cocoons of poor quality on a straw mat and soaked them in the water. Then they beat the cocoons with a wooden club.



Mama, what are you doing?

I am making silk floss.



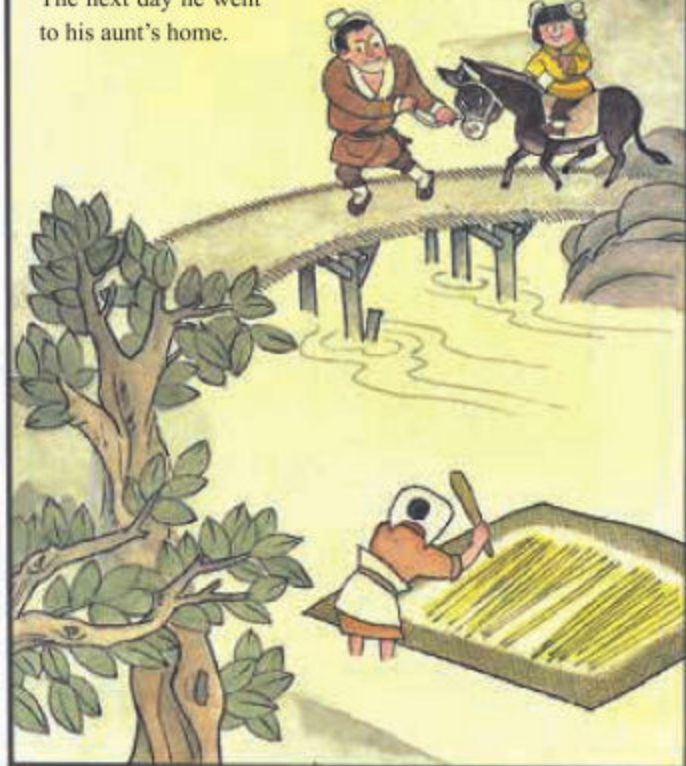
Then the silk floss was dried under the sun.



Mama, can I paint on the silk floss?

No, we have to send it to the palace. It'll be used as writing material. Go to your aunt's home and get some hemp slips.

The next day he went to his aunt's home.

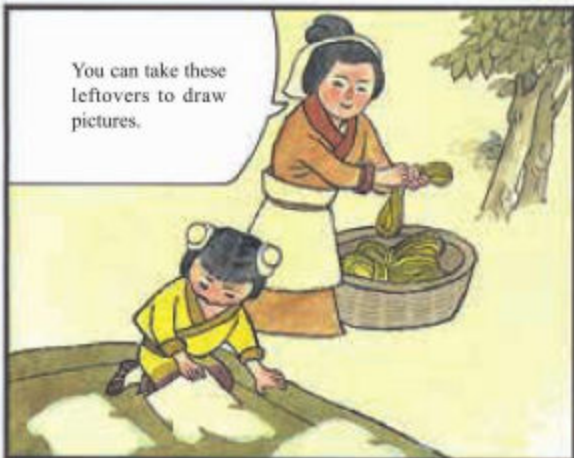


Aunt, are you beating cocoons too?

No, I'm beating hemp. Then spin it into yarn, weave it into cloth and make clothes with it.



You can take these leftovers to draw pictures.



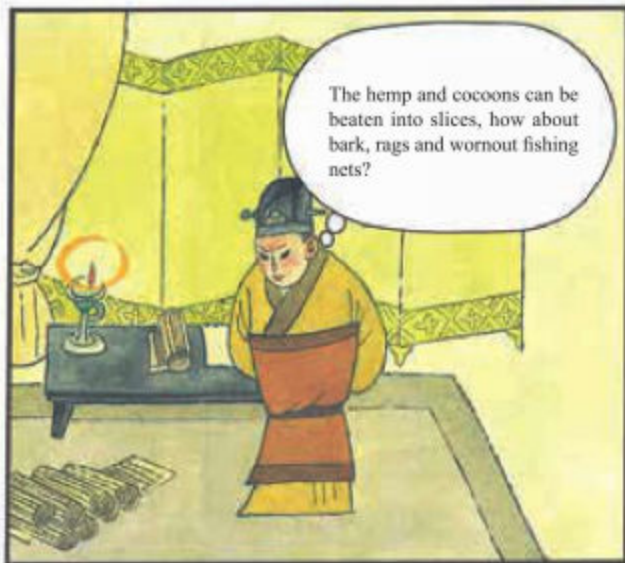
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More than two thousand years ago, people of the Western Han Dynasty found that after the cocoons and hemp were beaten, a thin layer of fabric was formed on the mat, which could be used to write on.

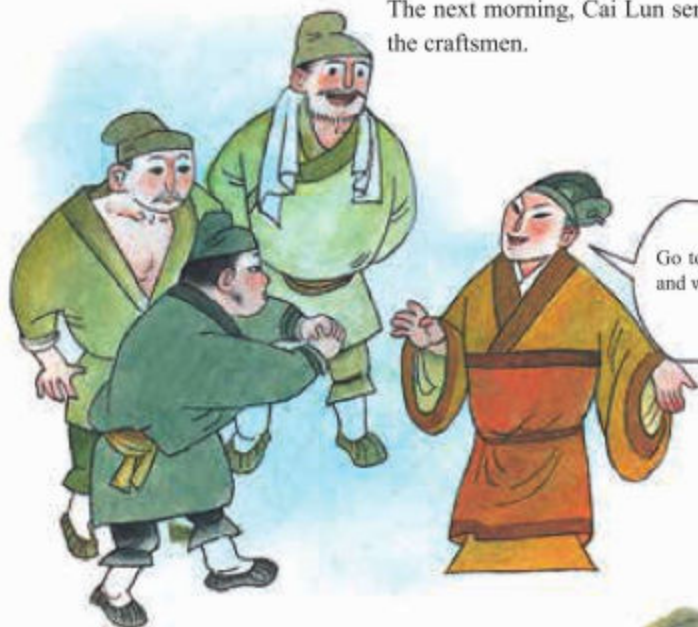


Modern archaeologists discovered map fragments of the Western Han Dynasty, drawn on hemp paper near Tianshui, Gansu. This is an entity of earlier paper found for writing.

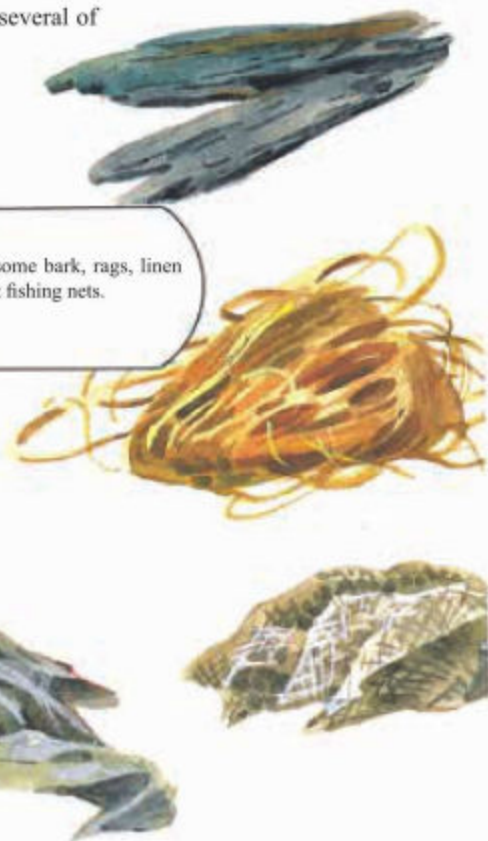
During the Eastern Han Dynasty 25A.D. – 220A.D., Cai Lun, who was an expert of papermaking in the period of Emperor He invented the technique of papermaking. At that time, he served in the court and was appointed as an official in charge of the imperial workshop.



The next morning, Cai Lun sent for several of the craftsmen.

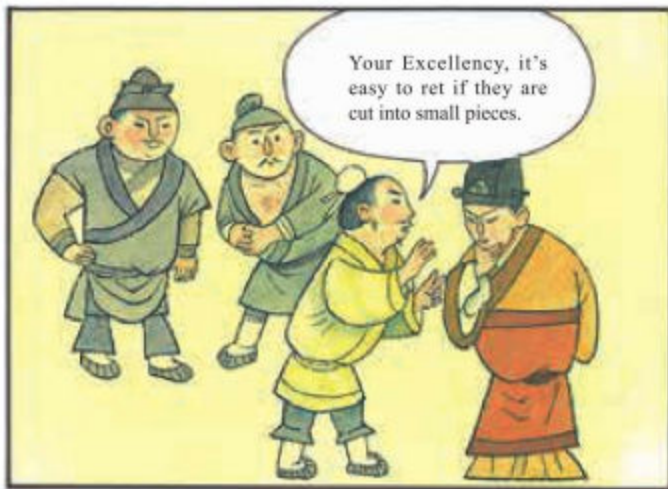


Go to find some bark, rags, linen and wornout fishing nets.

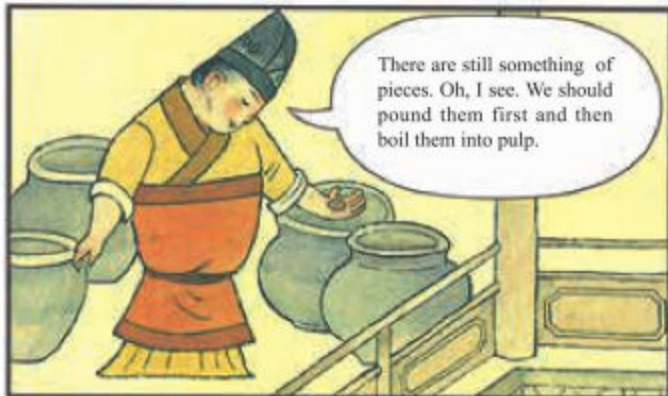
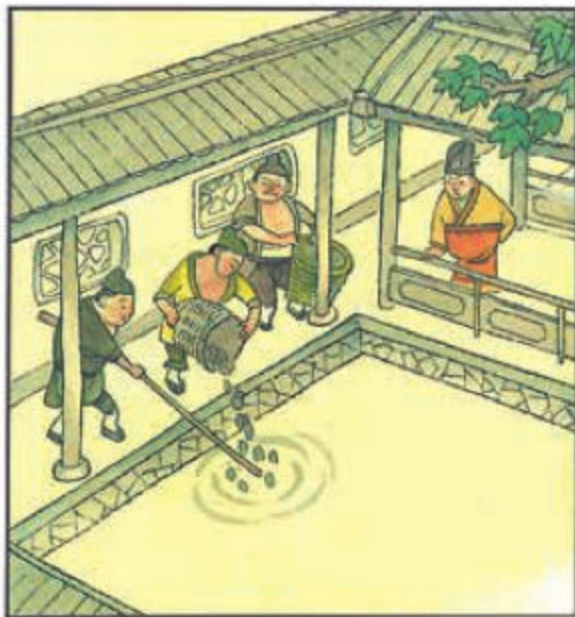


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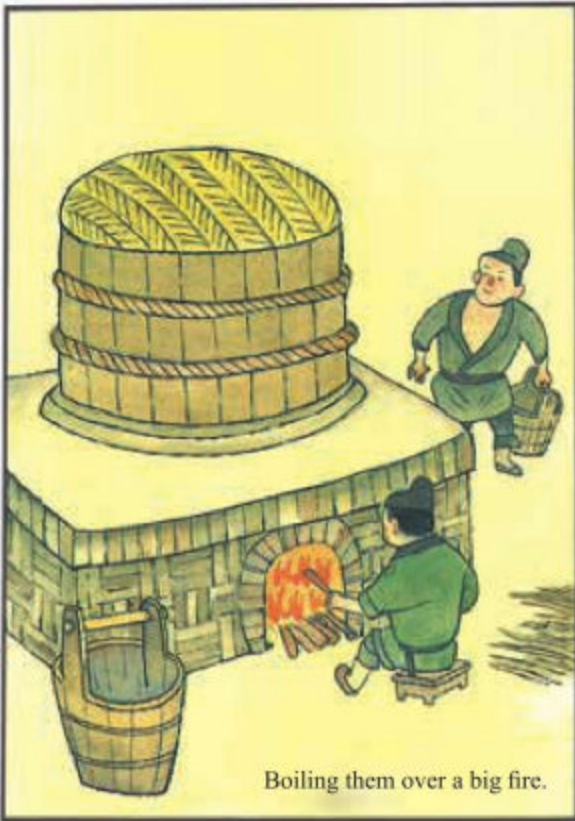
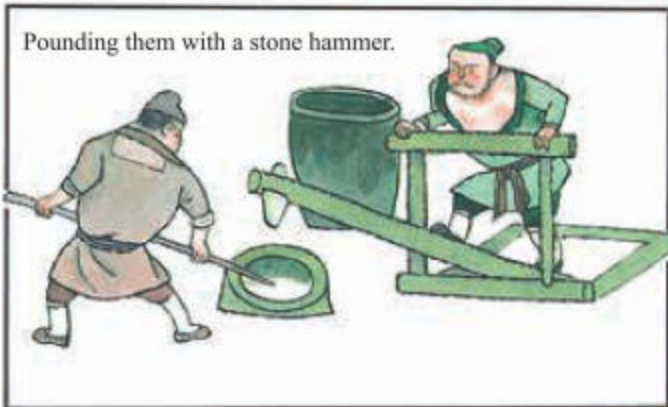




The small pieces of bark, rags, linen and wornout fishing nets were put into a pond full of water. Several months later, the pieces were rotten.



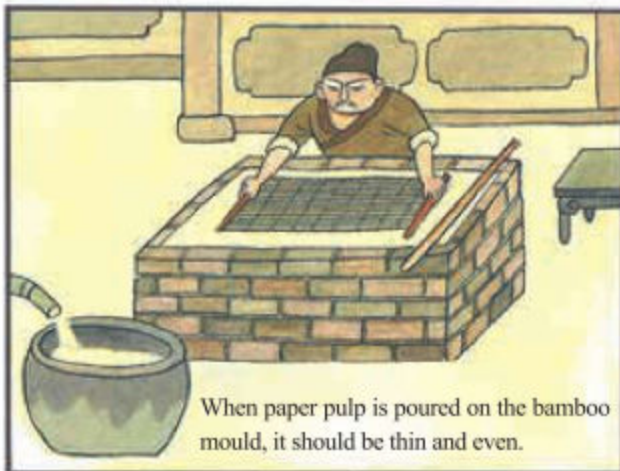
Pounding them with a stone hammer.



Be careful! Pouring paper pulp needs skills.



12

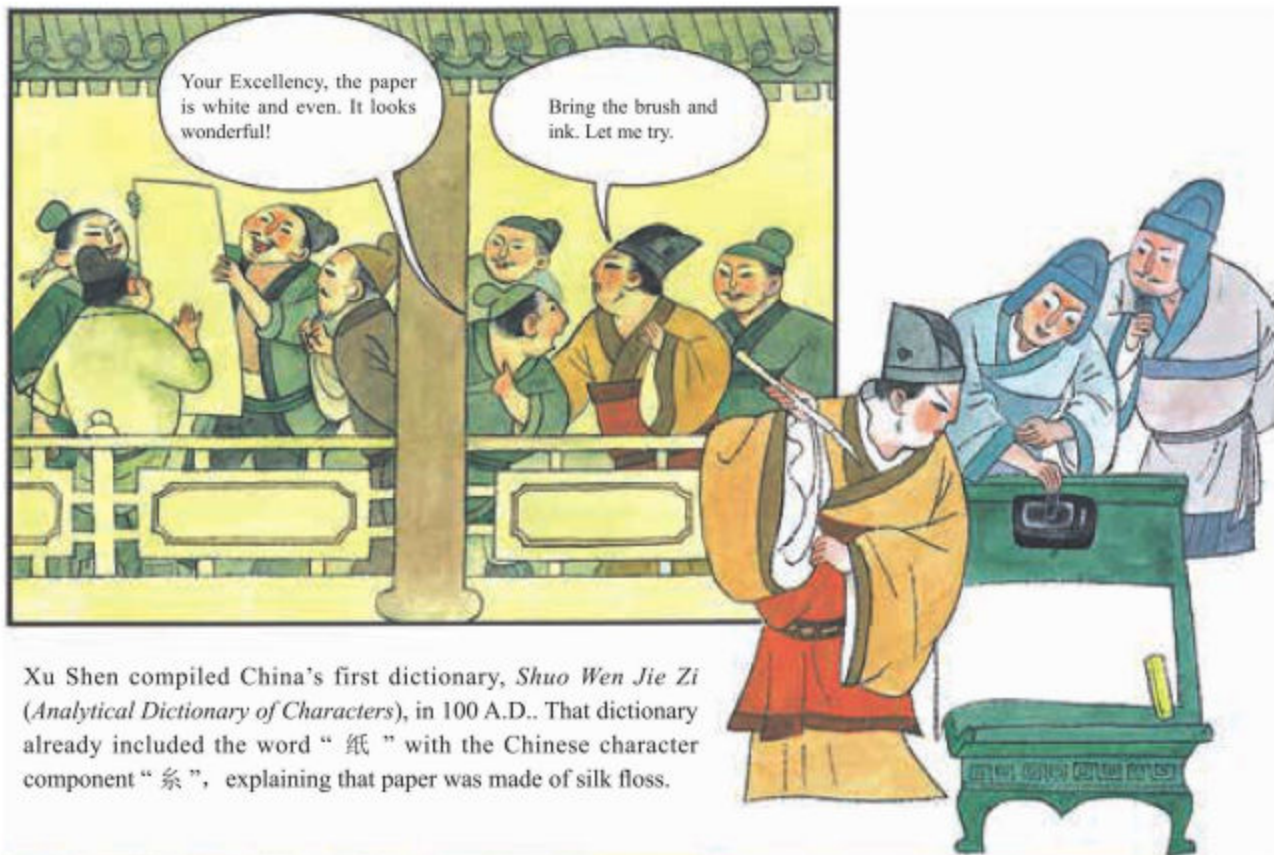


When paper pulp is poured on the bamboo mould, it should be thin and even.

And then the water should be squeezed out.



The last step is to dry paper sheets by putting them on the furnace wall.



Xu Shen compiled China's first dictionary, *Shuo Wen Jie Zi* (*Analytical Dictionary of Characters*), in 100 A.D.. That dictionary already included the word “纸” with the Chinese character component “糸”, explaining that paper was made of silk floss.

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