

Briefing - The Ming Dynasty of China

The Ming Dynasty of China was the superpower of its day.

Here are a few key facts about the Ming:

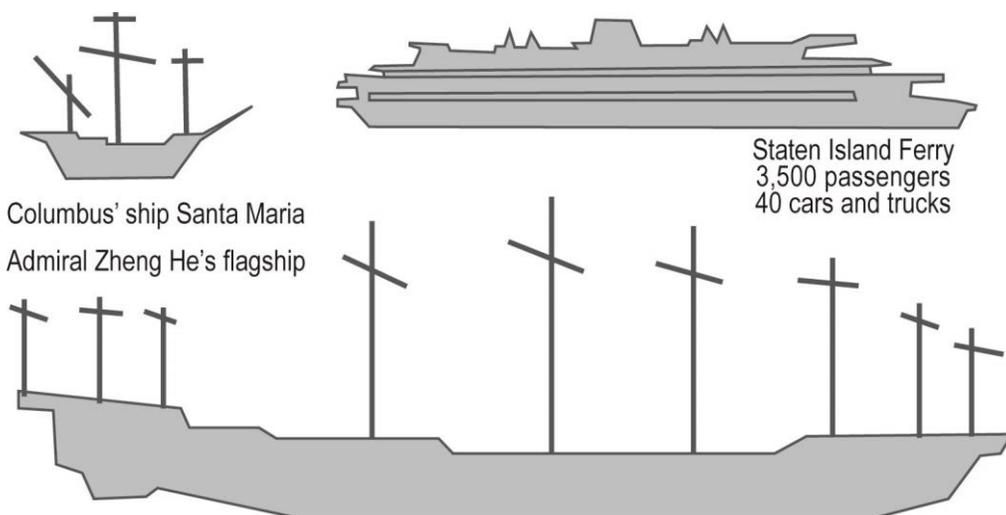
- The Dynasty lasted 276 years (from 1368 to 1644, longer than the United States so far).
- It had more than 160 million people (the size of the United States after World War II).
- It had a powerful navy and an army of more than a million soldiers.
- Ming printers used metal movable type, 230 years before Gutenberg in Europe.
- Ming scientists knew how to control gunpowder and use it for road construction.
- Ming military engineers built the first effective cannons and rocket launchers.
- Ming explorers used magnetic compasses and the first ocean navigation charts.

One Ming-era explorer, Zheng He, made several long trips in the early 1400s. That was 60 years before Columbus sailed from Europe to America. Zheng He's fleets traveled as far as Arabia and Africa. Some people think he may even have sailed all the way to South America. His flagship was nearly 500 feet long. Columbus's largest ship, the Santa Maria, was less than 100.

Early in the Ming dynasty, the government organized 165,000 workers to expand the Grand Canal. This "artificial river" was more than a thousand miles long, about 3 times as long as the Erie Canal. On this canal, boats could move millions of pounds of grain from the fertile Yangtze Valley in south China to northern cities like Beijing.

When the climate changed, however, even that enormous system was not enough to prevent starvation. And when the people ran out of food, they rebelled against the government. The huge army was not able to stop the anti-government riots.

To see why, read the Student Reading, "The Fall of the Mighty Ming."



Reading - The Fall of the Mighty Ming

In 1644, some soldiers ended a battle by eating the dead soldiers.

It's true - it really happened, and we can learn something useful from it
(not about eating people - about what can happen when the climate changes!)

The story is about the Ming Dynasty of China, the "superpower" in the year 1600.
(The background briefing has more facts about this powerful country.)

Here is the big question: If the Ming Dynasty was so powerful, why did it collapse?

Let's start with a science fact: Cold air usually has high air pressure. In 1583, the climate changed. The whole world got cooler. High air pressure pushed storms south of their "normal" position in Asia. North China became very dry, starting in 1584. Meanwhile, the storms caused big floods in southern China in 1585 and 1586. By 1588, half of the provinces of China had famines. People started to riot.

By 1594, there were reports of people eating animal skins and the bark of trees.

But wait . . . things will get a lot worse.

In 1600, the largest volcano in South American history erupted. The explosion was huge, at least ten times as big as Mt. St. Helens, the largest eruption in U.S. history. Clouds of volcanic ash blocked the sun. Temperatures dropped all around the world.

By 1610, the growing season in China was nearly a month shorter than normal. All over north China, people moved away from fields that could no longer grow any food. The Manchu nomads to the north began to attack the Great Wall.

1620-1640 was the coldest time in 600 years. You already know that cold air makes north China dry. 1637 started the worst five years of drought in Chinese history. People stripped bark from trees. They even started digging up corpses for food. Rebellions started again in many areas, adding to the death toll. After one battle, the commander ordered the surviving soldiers to cook the dead ones and eat them.

Then, just when it seemed that things could not get any worse, another huge volcano erupted in 1641. This eruption had even more effect on China, because it happened nearby, in the Philippine islands. Heavy snow fell in south China (where the weather is usually like Florida). Meanwhile, north China got even drier. Grasshoppers invaded from the dry northern grasslands and ate what little crop was left.

Riots continued. To save the capital from the rebel forces, the Ming general opened the gates in the Great Wall and invited the Manchu army to come in and attack the rebels. The Manchu warriors easily defeated the rebels. Then they turned on the Ming army and destroyed what was left of it.

Some history websites say the fall of the Ming Dynasty was due to police brutality, bureaucratic rules, and other government policies. These are part of the story, but the real cause is simpler. When climate changed, and especially after the volcanoes erupted, China was no longer able to grow enough food to feed all its people.

Project: draw a causal diagram to show the relationships between temperature, drought, floods, volcanoes, rebellions, grasshoppers, and invading nomadic armies.

Six Statements about the Fall of the Mighty Ming

When you read, you should try to figure out the kind of knowledge in each sentence:

Fact. A fact is an observation or measurement about an object or place. It is something someone else could also see or measure. Here are some examples:

The air temperature at 2 o'clock was 53 degrees.

The population of China at the time of the Ming Dynasty was about 160 million.

Theory. A theory is a statement about links between facts. In most theories, one fact is identified as the cause of some kind of change. That change, called the effect, is also a fact that can be observed or measured.

The air will soon get warmer, because the rising sun will add energy to the ground, which in turn will make the air warmer.

The dry weather caused locusts to migrate southward from the grasslands.

Opinion. An opinion is a statement about whether we think something is good, important, or useful (or not!). Different people can have different opinions.

I like it best when the temperature is about 65 degrees – not too hot, not too cold.

The Ming Dynasty was the most important government in the world at the time.

Here are six sentences from the story about the fall of the Ming Dynasty.

- Circle F if you think the sentence is a statement of **fact**.

Then write whether you think the statement is true or false, and explain why.

- Circle T if you think the sentence is a **theory** about causes and effects.

Then write whether you think the theory is plausible (believable, supported by the facts, probably true) or not plausible, and explain why.

- Circle O if you think the sentence is a statement of the author's **opinion**.

Then write whether you think the opinion is reasonable, and explain why.

F T O **1.** A sudden worldwide cooling began in 1583.

F T O **2.** When the climate changed, even a canal was not able to prevent famine.

F T O **3.** Low air pressure pushed the storm tracks south of the "normal" position.

F T O **4.** In 1590, half of the provinces of China had major famines.

F T O **5.** This [Philippine] volcano had an greater effect on the climate of China, because it was closer than the one that erupted in South America.

F T O **6.** Rebellion was less important than climate change in causing famine.

Nine Statements about the Fall of the Mighty Ming

The reading about the end of the Ming dynasty in China is a mixture of historic fact, scientific theory, and personal opinion. For each of the nine sentences below

- Circle F if you think the sentence is a statement of **fact**.

Then write whether you think the statement is true or false, and explain why.

- Circle T if you think the sentence is a **theory** about causes and effects.

Then write whether you think the theory is plausible (believable, supported by the facts, probably true) or not plausible, and explain why.

- Circle O if you think the sentence is a statement of the author's **opinion**.

Then write whether you think the opinion is reasonable or not. Explain why.

F T O **1.** A worldwide cooling began in 1583.

F T O **2.** When climate changed, even a canal was not enough to prevent famine.

F T O **3.** Clouds of volcanic ash blocked the sun, causing temperatures to go down.

F T O **4.** By 1588, half of the provinces of China had famines.

F T O **5.** This [Philippine] volcano had a greater effect on the climate of China, because it was closer than the one that erupted in South America.

F T O **6.** Cold air had low air pressure which pushed the storm tracks south, causing drought in the southern provinces along the Yangtze River.

F T O **7.** War was less important than climate change in causing famines.

F T O **8.** 1620 started the worst five years of drought in Chinese history.

F T O **9.** The Ming general opened the gates in the Great Wall, giving the rebel army a choice of moving into Mongol country or staying and fighting.

Bonus point. Another book about climate change in Europe noted that more than 1000 women were burned alive after they were accused of being witches and causing crops to fail in the early 1600s. Which idea does this fact seem to support?

A. Climate change is a local event, confined to a single continent at a time.

B. Climate change is a global event, affecting the entire world at the same time.

Nine Statements about the Fall of the Mighty Ming

The reading about the end of the Ming dynasty in China is a mixture of historic fact, scientific theory, and personal opinion. For each of the nine sentences below

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Then write whether you think the theory is plausible (believable, supported by the facts, probably true) or not plausible, and explain why.

- Circle O if you think the sentence is a statement of the author's **opinion**.

Then write whether you think the opinion is reasonable or not. Explain why.

- F T O **1.** A worldwide cooling began in 1583.

This is a fact, and it is true. Many people observed evidence of this cooling.

- F T O **2.** When climate changed, even a canal was not enough to prevent famine.

This is an opinion; it sounds reasonable, but someone else could form a different opinion from the same facts and theories.

- F T O **3.** Clouds of volcanic ash blocked the sun, causing temperatures to go down.

This is a theory statement, and it is plausible.

- F T O **4.** In 1590, half of the provinces of China had famines.

This is a fact statement, but it is false. Half the provinces had famines by 1588.

- F T O **5.** This [Philippine] volcano had a greater effect on the climate of China, because it was closer than the one that erupted in South America.

This theory statement is plausible –things that are nearby tend to have more effect.

- F T O **6.** Cold air had low air pressure which pushed the storm tracks south, causing drought in the southern provinces along the Yangtze River.

This theory statement is not plausible, because cold air makes high pressure.

- F T O **7.** War was less important than climate change in causing famines.

This is an opinion, though the author does try to provide evidence to support it.

- F T O **8.** 1620 started the worst five years of drought in Chinese history.

This is a fact statement, but it is false. The 5 years of drought started in 1637.

- F T O **9.** The Ming general opened the gates in the Great Wall, giving the rebel army a choice of moving into Mongol country or staying and fighting.

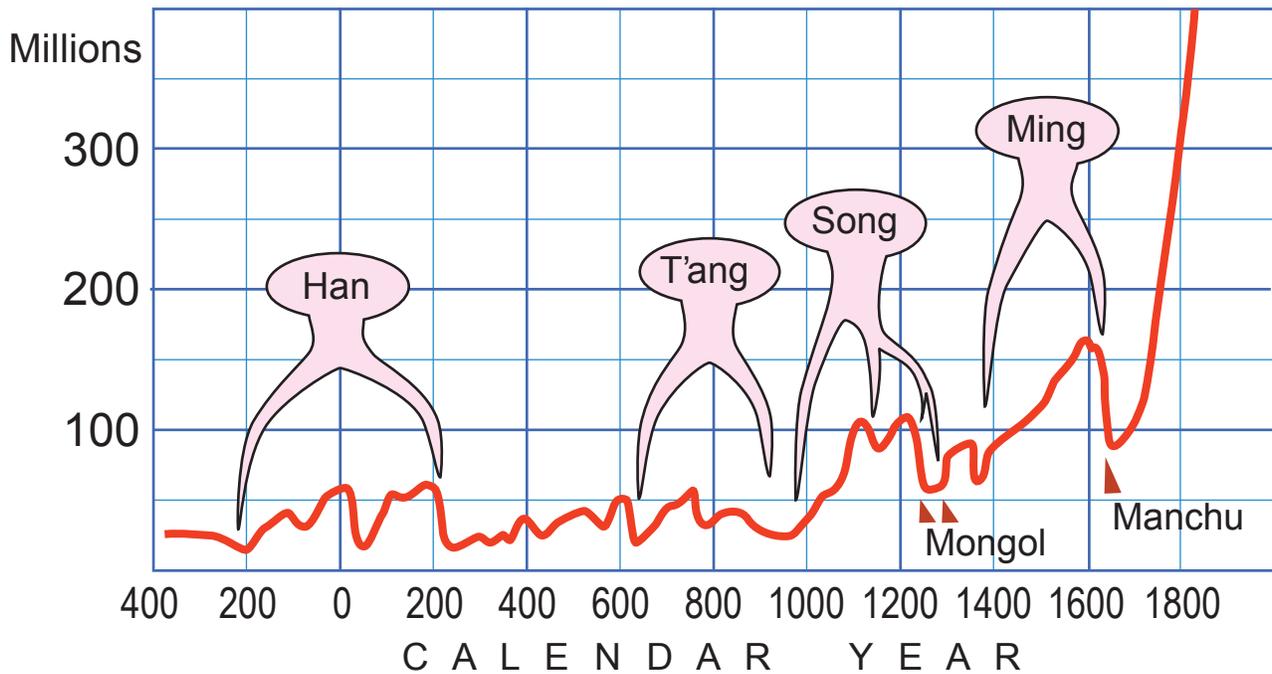
This is a fact statement. It is a fairly complicated sentence, and it is wrong.

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A. Climate change is a local event, confined to a single continent at a time.

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China's Population History



The Qin (pronounced Chin) was the first time that China was a single country. A dynasty is a ruling family. The Qin gave us the word "China," but the Dynasty did not last long. The Han Dynasty took over and ruled for more than 400 years.

1. Write the word Qin near the population line just to the left (older) than the Han.

The population at the beginning of the Han Dynasty was less than 20 million.

By the year 0, the population had reached a peak of about million.
 Circle: 30 60 90
 (That's more than California and New York put together.)

2. What happened to the population from the year 0 to the end of the Han Dynasty?

3. Put an X by the best generalization about the start of the four big dynasties:

- a. They all started at a time of high population and lost people for 100 years.
- b. They all started at a time of low population and had rapid growth for awhile.

The T'ang Dynasty started just after China lost more than half of its people. This was a big problem, but it was not the worst time in Chinese history.

4. What was the highest population near the end of the Han Dynasty? _____

5. What was the population shortly after the end of the Han Dynasty? _____

In 1234 the Mongols invaded northern China; the Song continued to rule south China. By 1279 the Mongols finally conquered the southern part and ruled over all of China.

6. Did the population go down more when the Mongols attacked the north or when they finally captured the south? _____

7. What was the highest population during the Ming Dynasty? _____

8. What was the low population shortly after the end of the Ming Dynasty? _____

Climate as an Influence on History - Truth or Myth?

There are many possible links between weather conditions, floods, locust attacks, crop yields, rebellions, enemy invasions, population migrations, and government collapse. Moreover, effects are not the same everywhere. For example, cold weather makes floods in South China, but it may cause rivers to dry up in Arizona.

Even though things are complicated, some cause-and-effect links are true all over the world. On the list below, circle the large T if you are pretty sure that the statement is generally true. Circle the small t if you think the statement is more often true than not. Circle the small m if you think it is more often a myth, and the large M if you think it is almost always a myth. Circle the ? if you are not sure, or you think it can go different ways in different places. Be prepared to discuss your reasons for your choices.

- T t ? m M 1. Lower annual temperature makes more floods in south China.
- T t ? m M 2. Lower annual temperature makes dry soil in North China.
- T t ? m M 3. Dry soil and withered grass (drought) make more locusts.
- T t ? m M 4. Dry soil makes cooler average temperature.
- T t ? m M 5. Dry soil makes higher yields of most crops.
- T t ? m M 6. Dry weather makes governments collapse.
- T t ? m M 7. Food shortage makes soil dry.
- T t ? m M 8. Food shortage makes rebellion more likely.
- T t ? m M 9. Government collapse causes food shortages.
- T t ? m M 10. Food shortage causes government collapse.
- T t ? m M 11. Locust attacks cause food shortages.
- T t ? m M 12. Food shortage causes migration to other places.

Now that you have evaluated a number of statements individually, try to put several statements together into a more complete causal model. Put the following six words into the sentences below in their most plausible order, with the primary cause first:

Locust attack *Government collapse* *Drought* *Cool climate* *Food shortage* *Rebellion*

_____ usually causes _____ in north China;

this can cause _____. Together they can cause _____,

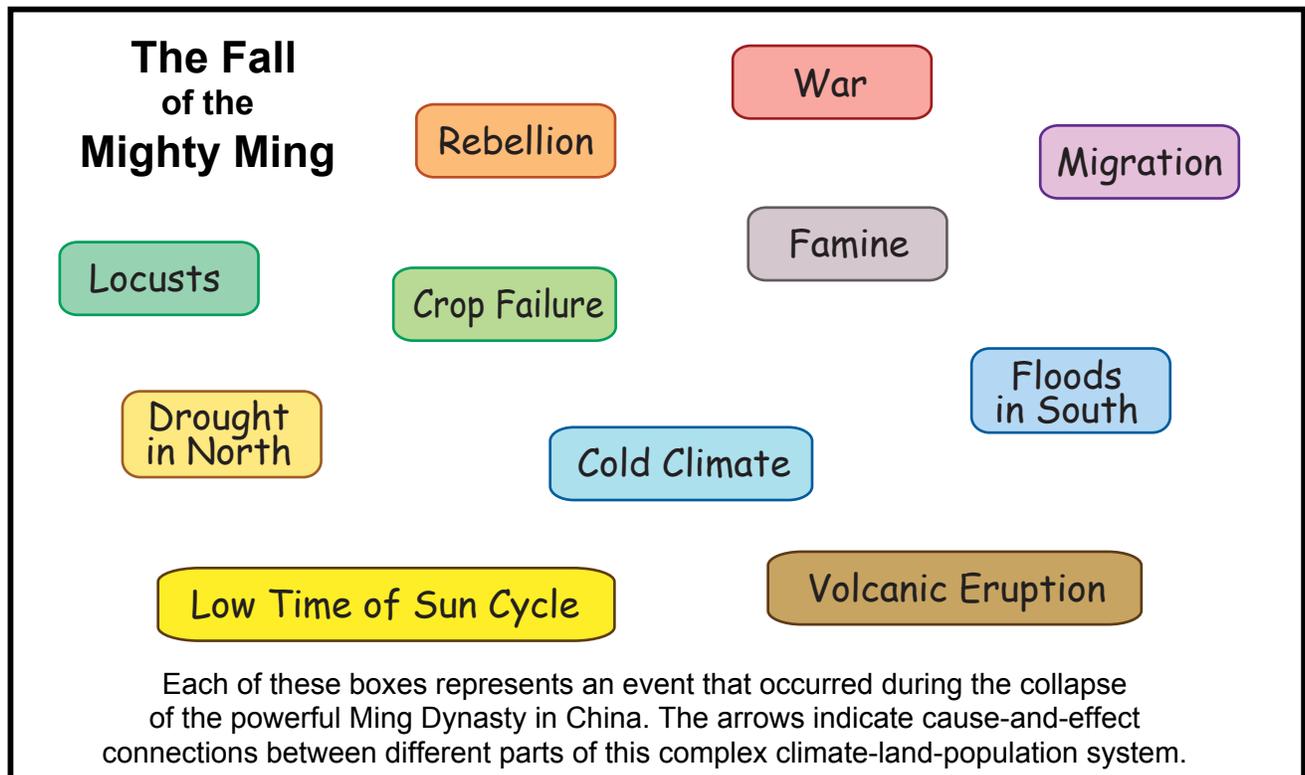
which can cause _____. The end result might be _____.

Cold Weather in China - A Cause-and Effect Model

The graph of China's population and the reading about the collapse of the Ming dynasty both point to the same conclusion - changing climate had effects on human history

To make a visual display of possible causes and effects, follow these steps:

1. Use the diagram below, or make your own on a separate piece of paper (if you would prefer to have the boxes arranged in a different way).
2. Identify things on the diagram that you think might be causes of other things.
3. Draw arrows from each cause to every event that is an effect of that cause.
4. Remember: a cause can have several effects, and an effect can have several causes.
5. Make your arrows thicker if you think the causal connection is really strong.
6. Remember: an effect of one cause can in turn be the cause of another effect.
7. Write a letter (A, B, or C) next to three arrows that you would like to discuss.
8. Write a brief explanation of the links you marked with letters.



A.

B.

C.