

# Medieval China and the Power of Learning

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These terraced rice paddies are located in Yunnan province, China. Under the Song Dynasty, technology for growing rice rapidly improved, which allowed China's population to grow and new ideas to spread. Photo: Photo: Arterra/UIG via Getty Images

The story of Medieval China is an example of the power of collective learning to produce rapid advances in human complexity.

## The two “Great Divergences”

Historians sometimes call the Industrial Revolution the “Great Divergence.” This name refers to the sudden rise of industries that pushed Europe and North America ahead of most of the rest of the world for much of the 19th century and the early 20th century. The increase in population and the fast growth of connections between world zones certainly gave the West an advantage in collective learning and the harnessing of energy flows for quite some time. But this was only the “second Great Divergence” of the Common Era (CE). Thanks to collective learning, or shared knowledge, the “first Great Divergence” of the Common Era happened in China in the 10th and 11th centuries. It gave China a technological edge that lasted several hundred years.

Collective learning has two main drivers: population numbers and connectivity. High population numbers are important because, with a larger group of people, there is more potential for innovation. Connectivity is important because it increases the exchange of information between those innovators. When people exchange ideas, it increases the odds that someone will "connect the dots" and come up with a breakthrough idea, and share that idea across a kingdom, a region, or even the world.

## **The rapid growth of the Chinese population**

In the centuries before the Common Era (BCE or B.C.), China had many advantages in terms of collective learning already. They were already using efficient agricultural methods that would not be used in Europe for many centuries. These were able to support a larger population of potential innovators. As a result, China was the first to invent a number of important technologies. But at this time, the majority of the Chinese population lived in the north, around the Yellow River valley, where the main crops were millet and wheat – not rice.

Rice has an advantage over grains because it can support more people in a given land area. After the harvest, transforming grain into bread products takes a great deal of work, while preparing rice for human diets takes far less. Rice was already present in Southeast Asia for several thousand years, and had moved into south China. Meanwhile, the bulk of the Chinese population in the north continued to farm grains.

After 200 A.D., south China adopted new agricultural methods that allowed for more efficient rice production. This resulted in higher crop yields, supporting a larger population. At the fall of the Han dynasty in 220, foreign attacks forced more Chinese south to the Yangtze River basin. Intensification of rice farming and the growth of migration to the south continued for several centuries, gradually increasing the population.

Collective learning got another boost under the Song dynasty (920-1276 A.D.). The Song dynasty introduced better strains of rice into China from Vietnam and appointed farming experts to spread knowledge of new farming methods. The result was a rapid increase in the size of the Chinese population. By 800, the population was around 50 to 60 million. It reached 110 to 120 million by 1100. As a result, there were approximately double the number of potential innovators. Meanwhile, China had also developed woodblock printing, allowing information to be shared more reliably among a greater number of people.

## **Four centuries of rapid innovation**

The "first Great Divergence" between East and West in the Common Era made China one of the most advanced and productive societies in early history. Under the Song dynasty, farming methods improved and iron production soared to 113,000 metric tons per year. Song China was also the first society to use banknotes in addition to coin currency. The Song mechanized textile production, invented the magnetic compass, and made

advances in mathematics, geography, and mapmaking. All told, from 900 to 1300, China made tremendous advances. It became one of the richest and most advanced countries in the world.

## **Two divergences compared**

The “second Great Divergence” of the Industrial Revolution gave Europe and North America a lead that has lasted a couple of centuries. Some scholars believe the West surpassed the East roughly around 1850, others 1800. Yet the “first Great Divergence” of the Common Era gave China a massive lead in collective learning and technology that lasted much longer, from about 1000 to 1700.

The tremendous advance of collective learning in Medieval China highlights a puzzling question: Why did the Industrial Revolution not occur there several centuries before it did in Britain? Were the social conditions not quite right after the fall of the Song dynasty? Was China not well connected enough with the other world zones? Or, were a few key inventions required to kick-start the Industrial Revolution just not thought of, by pure chance, by the vast numbers of potential innovators in China? Having more brains humming away at a problem can increase the odds of a breakthrough, but it doesn't guarantee one.

As of now, there are many potential answers as to why the Industrial Revolution occurred when and where it did. A better understanding of them may help historians figure out where collective learning will lead next.

**Quiz**

- 1 Which section highlights the idea that it is surprising that China fell behind other countries in technological advancement?
- (A) "The two Great Divergences"
  - (B) "The rapid growth of the Chinese population"
  - (C) "Four centuries of rapid innovation"
  - (D) "Two divergences compared"
- 2 Which selection from the article highlights that China benefited from collective learning even before the "first Great Divergence"?
- (A) Thanks to collective learning, or shared knowledge, the "first Great Divergence" of the Common Era happened in China in the 10th and 11th centuries. It gave China a technological edge that lasted several hundred years.
  - (B) They were already using efficient agricultural methods that would not be used in Europe for many centuries. These were able to support a larger population of potential innovators.
  - (C) The Song dynasty introduced better strains of rice into China from Vietnam and appointed farming experts to spread knowledge of new farming methods. The result was a rapid increase in the size of the Chinese population.
  - (D) The Song mechanized textile production, invented the magnetic compass, and made advances in mathematics, geography, and mapmaking. All told, from 900 to 1300, China made tremendous advances.
- 3 Which of the following MOST contributed to China's population change under the Song dynasty?
- (A) China made advances in maps and geography.
  - (B) China used woodblock printing to share ideas.
  - (C) China used new rice and farming methods.
  - (D) China increased its iron production.

- 4 According to the article, which of the following MOST influenced both the "first Great Divergence" and the "second Great Divergence"?
- (A) the use of woodblock printing
  - (B) high population numbers
  - (C) the Industrial Revolution
  - (D) more efficient rice production