

## Ancient Science and Technology 中国古代科技

### *The History of Science and Technology in China*

The history of science and technology in China is both long and rich with science and technological contribution. In antiquity, independent of Greek philosophers and other civilizations, ancient Chinese philosophers made significant advances in science, technology, mathematics, and astronomy. The first recorded observations of comets, solar eclipses, and supernovae were made in China. The four Great Inventions of ancient China were among the most important technological advances, not known in Europe until the end of the Middle Ages. Much of the early Western work in the history of science in China was done by Joseph Needham.

### Questions

1. In architecture, the pinnacle of Chinese technology manifested itself in the Great Wall of China, under the first Chinese Emperor Qin Shi Huang between 220 BC and 200 BC. Also in the Qin Dynasty something developed which later became the mainstream weapon in Europe. What is it? What is the archeological finding that proves it?
2. One of the early technological achievements in China was the invention of the South pointing Chariot by Ma Jun (200-265AD). Which device of the chariot can be found in all modern automobiles?
3. Who invented the first seismograph detector? How does the device work?
4. Who developed the escapement mechanism of the clock which did not appear in clockwork in Europe until two centuries later?
5. What is the earliest known printed document in the world?
6. When were the first banknotes produced in China?

### *The Four Great Inventions of Ancient China*

The "Four Great Inventions of ancient China" are the compass, gunpowder, papermaking, and printing. Paper and printing were developed first. Printing was recorded in China in the Tang Dynasty, although the earliest surviving examples of printed cloth patterns date to before 220. Pin-pointing the development of the compass can be difficult: the magnetic attraction of a needle is attested by the Louen-heng 《论衡》, composed between AD 20 and 100, although the first undisputed magnetized needles in Chinese literature appear in 1086. Gunpowder was a byproduct of Taoist alchemical efforts to develop an elixir of immortality. By AD 300, Ge Hong (葛洪), an alchemist of the Jin Dynasty, conclusively recorded in his book the chemical reactions caused when saltpetre, pine resin and charcoal were heated together. In the 11th century Bi Sheng (毕升) invented of ceramic movable type printing .

### Questions

1. The Four Great Inventions had an enormous impact on the development of Chinese civilization. What are the far-reaching global impacts they have made?

### *Contacts with Europe*

The Jesuit China missions of the 16th and 17th centuries introduced Western science and technology to China. Meanwhile the Jesuits were very active in transmitting Chinese knowledge to Europe. Confucianism works were translated into European languages through the agency of Jesuit scholars stationed in China.

### Questions

1. Who was Matteo Ricci? What contribution did he make for the exchange of the Chinese culture and western culture?
2. Some outstanding European scholars began to be interested in Confucius doctrines after Confucianism works were translated into European languages. How were they influenced by Confucius and his works?

### Reading

Dingmin Wu, *A Panoramic View of Chinese Culture*, Nanjing: Yilin Publishing House, 2010

Lang Ye & Zhu Liangzhi, *Insights into Chinese Culture*, Foreign Language Teaching and Research press, Beijing, 2008

Ebrey Patricia Buckley, *Chinese Civilization: A Sourcebook*, 2nd Ed, 1993