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Ting Zhang, “Empires, Silks Roads, and the Dissemination of Ancience Chinese Technology”
Speaker Profile

Ting Zhang

Ting Zhang joined the History Department at the University of Maryland, College Park (UMD) in 2014. She received her BA and MA from Peking University and her PhD from Johns Hopkins University. She is a cultural and legal historian of late imperial China, with a particular research interest in print culture and the circulation of legal knowledge. Her current project, “Printing, Law, and the Making of Chinese Legal Culture, 1644-1911,” explores the production and reception of legal knowledge, and the role of legal information in the formation of early modern Chinese legal culture. For this research, she draws upon 131 different editions of the Qing Code and many other legal imprints, using sources in libraries and on-line digital open source collections.

Ting Zhang has received fellowships or grants from the Henry Luce Foundation/ACLS Program in China Studies, the Doris G. Quinn Foundation, the Chiang Ching-kuo Foundation, the China Scholarship Council, and the Association for Asian Studies. Before joining the University of Maryland, she has taught courses at Peking University, Johns Hopkins University, the University of Delaware, and UC San Diego. Her publications, in English and Chinese, include four journal articles, five book chapters, and two translations.

Abstract

“Empires. Silks Roads, and the Dissemination of Ancienne Chinese Technology”

by Ting Zhang

This sessions will trace the spread of Chinese technology - such as papermaking, printing, the compass, and gunpowder--to other parts of Asia, the Islamic world, and Europe. It will introduce the social and cultural context for Chinese technological innovations, how Chinese technology disseminated to other parts of the world by the means of empire expansion and trade routes, and how this technology change the world.
Empires, Silk Roads, and the Dissemination of Ancient Chinese Technology

Ting Zhang

University of Maryland, College Park
Yellow Sea
East China Sea
South China Sea
Plateau of Tibet
Himalaya Mountain Range
Takla Makan Desert
Gobi Desert
Mongolian Steppe
Da Xing’an Ling Mountain Range
Trade Routes

- The Silk Roads
- The Sea Routes
The Term: The Silk Road

- The trade routes linking China, India, and Mediterranean world, through central Asia.
- Ferdinand von Richthofen (1833–1905)
- “Not only silk and not only a road.”
- Silk, livestock, glass, precious metals, gems, ceramics, spices, paper, languages, technologies, styles, religions, disease, etc.
The Silk Roads and Empires

- 1 century BCE to 1 century CE: The Han Empire (206 BCE-220 CE)
- 2nd century CE to 3rd century CE: The Kushan Empire (30-375)
- 7th century to 8th century: The Tang Empire (618-907)
- 13th century: The Mongol Empire

*Map of the Tang Empire: 618-907*
Four Great Inventions

• “Four Great Inventions”:

• (1) Compass
  – Discovered between the 2nd century BCE and 1st century CE: Used in geomancy and fortune-telling
  – The earliest reference to a magnetic device used for navigation, 1040-1044

*Compass: A magnetic needle floating in a bow of water
Four Great Inventions

• (2) Gunpowder
  – Discovered in the 9th century by Chinese alchemist searching for an elixir of immortality
  – First true gunpowder formula was recorded in a military manual in 1044
  – Widely used in military campaigns since the end of the 12th century
Four Great Inventions

- **(3) Printing**
  - **Woodblock printing:**
    - Invented in 9th century
    - Buddhist texts
    - Dominant printing technology until the late 19th century
    - First printing revolution in China: the Song Dynasty (960-1276)
- **Movable type printing:**
  - Bi Sheng (990-1051)
Diamond Sutra
Single-page woodblock printing
Printed in 868
The British Museum
Four Great Inventions

• (4) Papermaking
  – Used for wrapping and padding since the 2nd century BCE
  – Cai Lun (50-121 CE), legendary inventor of paper
  – Widely Used as a writing medium since the 3rd century CE.
  – First paper currency was issued in the 11th century

*Fangmatan paper map (179 BCE-143 BCE)
Spread of Papermaking Technology

- Two stages:
  - (1) the arrival of paper and paper products
  - (2) the adoption of papermaking methods

- East/Southward migration

- Korea:
  - 3rd century: the importing paper and paper books
  - 6th century: the manufacture of paper
  - Refined papermaking technology and the “Jilin paper”

- Japan:
  - 4th century: the introduction of Chinese books by a Korean scholar
  - 610: the introduction of papermaking by a Korean monk travelling to Japan.
Spread of Papermaking Technology

- Dunhuang: 1st century
- Xinjiang (Eastern Trukestan)
  - Loulan: 3rd century
  - Turfan and Gaochang: 4th and 5th century
  - Khotan: Paper manuscripts in Chinese, Tibetan, Sanskrit, and ancient Khotan languages: 8th century
Paper (with Chinese characters) found in Gaochang Kingdom
Spread of Papermaking Technology

• The Arab world:

• Paper moved to the Arab world before the 7th century

• Paper manufacture in the Arab world began in the middle of the 8th century:
  - Samarkand: a paper mill was built in around 751.
  - Baghdad: a paper mill was established in around 794.
Spread of Papermaking Technology

• Africa:
  • Paper migrated from Asia to Africa in the 9th century and gradually replaced papyrus as the major writing medium.
  • Toward the end of the 9th century, paper was evidently more popular than papyrus.
  • Toward the middle of the 10th century, paper entirely displaced papyrus as writing material.
Spread of Papermaking Technology

• Europe: Two different routes

• One through Spain:
  – Spain was the first European country to develop a flourishing paper industry.
  – With the Arab conquest of the Iberian peninsula, paper appeared in Spain no later than the 10th century.

• One through Italy
  – Paper entered Italy not from other European nations but from the Arab world, perhaps from Damascus by way of Constantinople and Sicily.
  – The earliest paper mill is at Fabriano in 1268-1276.
Dissemination of Ancient Chinese Technology

- **Trade routes:**
  - Eastward: China → Korea → Japan
  - Westward: China → Central Asia → Middle East → Europe

- **Wars and conquests:**
  - The battle between the Tang army and the allied Turkic-Tibetan forces on the banks of the Talas River in 751
  - The Mongol empire
The Impact of Chinese Technology

- It is well to observe the force and virtue and consequences of discoveries, and these are to be seen nowhere more conspicuously than in those three which were unknown to the ancients, and of which the origin, though recent, is obscure and inglorious; namely, printing, gunpowder, and the magnet. For these three have changed the whole face and state of things throughout the world; the first in literature, the second in warfare, the third in navigation; whence have followed innumerable changes, insomuch that no empire, no sect, no star seems to have exerted greater power and influence in human affairs than these mechanical discoveries.

— Francis Bacon, 1620
The Impact of Chinese Technology

• “Gunpowder, the compass, and the printing press were the three great inventions which ushered in bourgeois society. Gunpowder blew up the knightly class, the compass discovered the world market and found the colonies, and the printing press was the instrument of Protestantism and the regeneration of science in general; the most powerful lever for creating the intellectual prerequisites.”

• ---Karl Marx