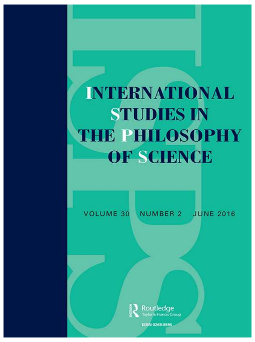

International Studies in the Philosophy of Science

ISSN: 0269-8595 (Print) 1469-9281 (Online) Journal homepage: http://www.tandfonline.com/loi/cisp20

A History of Chinese Science and Technology, Volume 1

Hao Qinggang

To cite this article: Hao Qinggang (2016) A History of Chinese Science and Technology, Volume 1, International Studies in the Philosophy of Science, 30:2, 188-190

To link to this article: http://dx.doi.org/10.1080/02698595.2016.1265861

Published online: 16 Mar 2017.

A History of Chinese Science and Technology, Volume 1, edited by Yongxiang Lu, Berlin, Springer, 2015, xvi + 491 pp., ISBN 9783662442562, €137.79, £117.00, US$179.00 (hardback), ISBN 9783662513873, €137.79, £117.00, US$179.00 (paperback)

A History of Chinese Science and Technology, edited by Lu Yongxiang, published jointly with Shanghai Jiao Tong University Press, is a three-volume work that collects the written versions of 44 lectures originally given at the Chinese Academy of Sciences (CAS). The lecturers are mostly based at the Institute for the History of Natural Sciences of the CAS though some experts from other units also contributed. The original Chinese version of this book won the 2010 China Book Award and the Shanghai Book Award (first prize) among other prizes. As Lu indicates in his editorial introduction, besides reviewing history of Chinese science, this book also aims to give a comparative answer to the question why Chinese science and technology have declined in history. Lu insists that traditional Chinese science and technology, as a significant part of Chinese civilisation, should be communicated more extensively to the world. This work is an attempt in this direction. This is a review of volume 1, covering astronomy, geoscience, mathematics, physics, agriculture, and biology. In the table of contents and some of the lectures, it is not hard to detect a perspective of 'Whig history' as they discuss Chinese classics in Western disciplinary terms.

This book opens with two lectures by Liu Dun on 'Vertical and Horizontal Beginnings'. In lecture 1, 'Several Important Frames of Reference in the Development of Human Civilization', Liu offers a vertical picture of the origin and evolution of world civilisations. He divides the history into periods: Germination of Civilization, Axial Period, Greco-Roman Civilization, Islamic Civilization, and Europe during the Period of Fourteenth Century AD–Seventeenth Century AD, so as to position Chinese civilisation in world history and point out the part that Chinese civilisation has played, especially in scientific findings and technological innovations. Liu Dun's lecture 2, 'Overview of Ancient Chinese Science and Technology', by contrast, offers a horizontal picture within selected periods, which explains the relation between the development of science and technology and its social and historical contexts, including the evolution of state politics, traditional thought, and exchanges with foreign civilisations. This is consistent with the vision of the whole book: not to be confined within Chinese history, but rather to look at China through the history of world civilisations. What's more, such a broad and clear overview also makes this book more readable.

Highly interesting are the three lectures by Jiang Xiaoyuan under the heading, 'Astronomy', because their comparative perspective provides us with an approach to understand the difference between Chinese and Western astronomy. First, on the basis of an overview of the study of the heavens in ancient China (lecture 1), Jiang discusses the special position of the study of the heavens in official histories of the dynasties, political affairs, intellectual pursuits, and imperial institutions. As an example, Chinese institutions devoted to the study of the heavens were government departments, and the scholars working in them were 'government officials who make up a part of the administration. They are entirely different in nature from gentlemen of remedies and arts who were ordered to serve the imperial palace' (48). This explains, to a large extent, why China did not have astronomy as this was developed in the West. Besides, it is possible to understand why there was strict prohibition on private study of the heavens in ancient China. With an organic view of nature in ancient China, man is an integral part of nature, or the heavens. Mastery of communication with the heavens is a necessary condition for obtaining monarchical power, and study of the heavens is the most important and direct means of reaching the heavens. In other words, study of the heavens 'was a source of monarchical power in ancient times, and it evolved into a symbol of kingship later on' (54). In order to maintain monopoly over study of the heavens, the monarch would surely make it his exclusive domain right after he assumed state power.

In lecture 2, 'Astronomical Observation and Calendar', Jiang compares different models used in ancient Greece, Babylon, and China to answer the fundamental questions of ancient astronomy. His explanation illustrates the difference between the civilisations; however, he does not touch on the question why a civilisation chose a certain model rather than another. Alternatively, why did a special model develop in one civilisation, rather than another? The answer to these questions surely contributes to the solution of the Needham question.

In his lecture 3, 'Exchange and Comparison of Chinese and Foreign Astronomies', by comparing the 'canopy-heaven universe model' in China and the Indian model of the universe, Jiang concludes that there might have been exchanges between China, India, and ancient Greece, 'directly or indirectly?' (97). It would be very difficult to find any proof, but Jiang's comparative analysis provides a reasonable argument for the possibility, and illustrates the similarities between Chinese and Western astronomy. At the end of lecture 3, Jiang traces the path by which modern Western astronomy circulated to China and the exchange between Chinese and Arab astronomy brought about by the great Mongolian empire of the Yuan dynasty. This part scrutinises some commonly accepted but false historical beliefs, such as 'the so-called theory of "western doctrine with Chinese origin"' (115). Jiang offers 'Reasons for Being Unable to Develop as Europe Did—Kangxi's Merits and Faults in History'; however, it seems a bit arbitrary to attribute China's failure to develop modern astronomy to just one individual, Kangxi, even if he was a monarch with great power. Fan Dainian (1997) has a good overview of different arguments on this issue.

We turn next to mathematics with three lectures by Guo Shuchun and Tian Miao, who offer an overview of the development of traditional Chinese mathematics. Lecture 2, with a focus on the Song and Yuan dynasties, is especially devoted to a Chinese classic, *Nine Chapters on the Mathematical Art*, which was composed by several generations of scholars from the tenth to the second century BCE. Lecture 3, 'Classical Mathematics in Europe and Dissemination of Modern Mathematics in China', discusses what happened when Western mathematics encountered Chinese mathematics: what kind of impact did the introduction of Western mathematics make? How did Chinese mathematics develop under internal influence, such as political reform and the reform of the imperial examination system, and external influence from the West?

In three lectures on 'Physics', Dai Nianzu discusses the history of mechanics, optics and acoustics in China. He holds to a 'Whig history' perspective to discuss the Chinese classics 'with your mind sticking to the various physical concepts' (290). Setting aside the justifiability of looking at traditional Chinese classics from the viewpoint of Western modern physics, he goes deep into the history of Chinese physics to show us more details.

Zeng Xiongshen's lecture, 'The Foundation of Livelihood—Agriculture in Ancient China', goes through four periods of the development of agronomy in China. Zeng introduces the basic content of Chinese agronomy, some of the experts and books, the decline of livestock husbandry, and so on. His comparison between Chinese and Western agriculture points out that the larger animal husbandry sector in the West and raw materials for clothing play an important role in the differences between Chinese and Western agriculture. The challenges for Chinese agriculture that Zeng identifies are still significant today, such as the shortage of arable land, soil fertility decline, natural and man-made disasters, and so on.

In the final section, 'Biology', Guo Guihuan illustrates how the ancient Chinese gained, accumulated, and used their biological knowledge. His investigation into the Yellow River basin, the Yangtze River basin, and other areas explains why China became the most important centre of origin for cultivated plants in history. Guo's investigation also involves the import of cultivated plants from the West into China, which enriched the diversity of local crops in China.

This book devotes much effort to discussing why traditional Chinese science and technology took a route different from the Western and this surely contributes to one of the most important concerns of this work—to bridge Western and Eastern understandings of traditional Chinese science and technology. Despite the fact that to categorise traditional Chinese science into present-day Western scientific disciplines brings a risk of misinterpretation, there is an understandable reason for using it as the authors needed at least some terms at hand.

'Whig history', as Nick Jardine (2003) described, is 'present-centred historical writing', which takes the past as preparation for the present. However, we can hardly deem that the past of traditional Chinese science and technology can serve as prelude for anything in present China. Besides, this kind of formation of history of Chinese science and technology would lose, to some extent, the contexts of inquiries—the intellectual, social, and institutional contexts in which the issues were raised in ancient China.

This volume is definitely a work worth reading, not only for those in history of traditional Chinese science, but also for scholars concerned with comparative history and philosophy of science. It will help to enhance the mutual understanding between China and the West.

References

Fan Dainian. 1997. "A Discussion of the Reason of China's Falling Behind in Science." [In Chinese.] *Twenty-first Century* 12: 18–29.

Jardine, Nick. 2003. "Whigs and Stories: Herbert Butterfield and the Historiography of Science." *History of Science* 41: 125–140.

Hao Qinggang
Instituut voor Wijsbegeerte, Universiteit Leiden
xiaogang866@hotmail.com

http://dx.doi.org/10.1080/02698595.2016.1265861

Science After the Practice Turn in the Philosophy, History, and Social Studies of Science, edited by Léna Soler, Sjoerd Zwart, Michael Lynch, and Vincent Israel-Jost, New York, Routledge, 2014, vii + 347 pp., ISBN 9780415722957, US$145.00, £90.00 (hardback)

This book is presented in a jumbled edition that prevents a fluid and reflexive reading. It consists of nine articles of different extensions, each of which is commented on separately, resulting in a further nine items of different lengths: two of the comments are even longer than the works on which they comment, one is as long as the article it comments on, two are half as long, and only two have a reasonable extension for a comment (less than 10% of the original article). On top of that, the introduction and the acknowledgements take up 46 of a total of 350 pages, which means more than 10% of the book. This is what I call a jumbled edition.