

SAW Three-Month Workshop:

Mathematical Practices in relation to the Astral Sciences

Abstract

February 13, 2015

Chen Zhihui

Calculating Ancient Chronology by Ancient Astral-mathematical Methods: Mid-Qing (Late 18th and Early 19th Century) Scholars' Studies on the Chronology of Confucian Classics

Abstract: As evidential research had become more and more popular during Qianlong (1736-1795) and Jiaqing (1796-1820) reigns in mid-Qing, several scholars considered using different methods, including mathematical methods, to investigate Confucian Classics. These scholars are also called Han scholars, as they largely believed in the conclusions made by Confucians (such as Zheng Xuan 鄭玄 127-200 CE, a great Confucian who commented on different Confucian canons) in the Han Dynasty.

In order to demonstrate that the 'Statutes in the Different Months' in *Liji (Records of Rituals)* had copied the initial chapters of the 12 'Monthly Records' in *Lüshi Chunqiu (The Annals of Lü Buwei, ca. 239 BCE)*, Jiang Sheng (江聲 1721-1799, a Han scholar who mastered the technique of textual criticism on Confucian classics), used the Western value for precession to calculate the chronologies of these canons in his *Hengxing Shuo (恒星說 Discourse on the Fixed Stars)*. The latter refers to a mathematical problem for converting Western unit system into Chinese traditional system. To solve the problem, *Hengxing Shuo* presents two different mathematical practices: a procedure by Jiang Sheng as well as a reasoning and computation made by Li Rui (李銳 1768-1817, a mathematician who specialised in the mathematics in ancient China). In Jiang Sheng's procedure, one can see some characteristics of the procedures used for dealing with the multiplication, the division and the conversion between the non-decimal units, such as dividing a quantity into two parts for recombination etc. It seems that the feature of computations by Jiang Sheng derived from the commentary tradition of Confucian canons, and examples of which, from 7th century commentaries on the *Rites of Zhou* and other texts on rites have been analysed by Zhu Yiwen (朱一文). On the other hand, Li Rui followed a different mathematical approach to deal with the same conversion problem. He did not reveal the operation and results at first, but constructed a strict reasoning system, and explained the reasons for each computation, which can be considered as a deductive computation based on the ancient mathematical book *Jiuzhang Suanshu (九章算術 The Nine Chapters on Mathematical Procedures)*.