

Adapting and accepting the European astronomical system: A study of the mistakes in the calculation of eclipses using the Western methods in the late Ming and early Qing China

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European astronomy was used to reform the calendar with the assistance of the Jesuits in the late Ming China and became the official astronomical system in the early Qing dynasty. However, the process of widespread recognition and application of the Western astronomical methods was not smooth but full of obstacles. Taking the eclipse prediction, one of the focal points of attention at that time, as an entry point, this presentation will reveal the relevant historical details by discussing the mistakes that occurred in the calculation of eclipses by the Western methods. Firstly, the mistake in the process of predicting the solar eclipse in the 7th year of the Ming Chongzhen 崇禎 reign (1634) had a bad impact on the official adoption of the Western methods. Besides the reasons discussed by previous scholars, the serious consequences should be also related to the incredible explanation given by the Jesuits for the cause of this mistake. Secondly, the mistakes in the calculation of eclipses by the Western methods during the Chongzhen reign (r. 1628-1644) were not isolated incidents. Their occurrence was inseparable from human factors such as the carelessness. But fundamentally speaking, the root cause actually laid in the adoption of Chinese and Western astronomical systems in eclipse prediction results and calculation processes, respectively. Until the late period of Qing Kangxi 康熙 reign (r. 1662-1722), with the gradual application of the Western astronomical systems in both eclipse calculation processes and prediction results, as well as the improvement of eclipse calculation processes to reduce the influence of human factors, the mistakes in eclipse calculations by the Western methods were basically eliminated or almost completely avoided.

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