

1067-01-132

Jiang-Ping Jeff Chen* (jjchen@stcloudstate.edu), ECC 226, Department of Mathematics,
720 4th Ave. South, St. Cloud, MN 56301. *Trigonometric Tables in China.*

Before the Jesuits arrived in China in late 1500s, Chinese mathematics did not use trigonometric methods. Trigonometric tables were among the powerful computation tools the Jesuits brought to China. The Jesuits used them to simplify computations in astronomy while Chinese astronomers, before the Jesuits, employed interpolations to meet the same needs. In a way, interpolation methods could be construed as Chinese equivalent to the tables. Although the Jesuits provided the basic principles of making the tables, there were technical details left unexplained, which made reconstruction utterly impossible. Chinese scholars in the 17th century, motivated to construct 'Chinese' tables, attempted to bridge the gap with various approaches. As these scholars were not Astronomic Bureau officials, their efforts to reconstruct the tables were for their own intellectual pursuit. In the 19th century, after the publication of several treatises which utilized power-series like approach to calculate the values of trigonometric lines from the length of the arc and vice versa, the trigonometric tables were then replaced by the utilization of these computational algorithms. The return to algorithms, though different ones, mirrored Chinese scholars' desire to follow the traditional practice. (Received July 26, 2010)