Chu Shih-Chieh Encyclopedia Article

Chu Shih-Chieh

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Chu Shih-Chieh

fl. c. 1280-1303

Chinese Mathematician

The career of Chu Shih-chieh advanced studies in arithmetic and geometric series, as well as finite differences. He produced two notable written works, both of which were destined to have an impact on mathematical studies in East Asia for centuries.

Chu (Zhu Shiejie in the modern spelling) was also known by the literary name of Hanch'ing. He appears to have come from the area of Yen'shan, near Beijing, and spent much of his career as a teacher travelling throughout China. As his reputation spread, more students came to him requesting instruction.

The first of his notable works, which appeared in 1299, was *Suan-hsueh ch'i-meng,* or *Introduction to Mathematical Studies.* As its name indicates, this was a book written for novices. The manuscript disappeared from China some time after his death, and was only recovered in the nineteenth century; in the meantime, it had spread to Japan and Korea, where it came into wide use as a textbook beginning in the 1400s.

By contrast to the earlier work, *Ssu-yuan yuchien* (Precious mirror of the four elements 1303;) was a book to challenge the thinking of mathematical scholars. The four elements referred to in the title were four variables in a single algebraic equation, which Chu expressed using what he called the "method of the celestial element."

Chu's transformation method for solving equations, which he developed up to the degree of 14, would not be equaled by European mathematicians until the nineteenth century, with the Ruffini-Horner procedure of Paolo Ruffini (1765-1822) and William George Horner (1786-1837). The book also discussed what came to be known as the arithmetic or Pascal triangle, actually discovered earlier by other Chinese mathematicians.

Chu's era was one of those periods of turmoil that have traditionally punctuated Chinese history. In 1279, the Sung Dynasty had been overthrown by the Mongols, whose Yüan Dynasty was destined to last fewer than 90 years before it too was replaced by the Ming, China's last native-born ruling house. Given the instability in the country at that time, it is perhaps no surprise that it would be many years before Chinese mathematicians made new advances.