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#### Mathematical Reasonings 2

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*Conjunctions between the sun and the moon, and pursuit problems. Mathematical reasoning in Chinese writings on astral sciences*

The first problem of the early 7<sup>th</sup> century classic *Mathematical Canon continuing the Ancients* ( 緝古算經 ), by Wang Xiaotong, deals with a computation related to the determination of the new moon. In his own commentary on this problem, Wang Xiaotong develops a reasoning on the correctness of the procedure. In this context, he argues that his procedure is similar to the one that the 1<sup>st</sup> century classic *The Nine Chapters of mathematical procedures* describes to solve a problem. Arguably the problem is the 12<sup>th</sup> of chapter 6. Interestingly, commentators on *The Nine Chapters*, Liu Hui in the 3<sup>rd</sup> century and a group working under the supervision of Li Chunfeng in the 7<sup>th</sup> century, also develop reasonings to establish that the procedures given by the classic are correct. The commentary on problem 6.12 thus accounts for the correctness of the procedure given in *The Nine Chapters*. Furthermore, the commentary on the procedure given for problem 6.13 likewise argues that the reasoning underlying this procedure is the same as for 6.12.<sup>1</sup> The talk will examine these various reasonings, and the grounds on which the various actors claim identity or similarity between procedures. It will also examine what can be derived from different uses of the term 率 *lǜ* in these various documents.

In this problem, Wang Xiaotong claims to offer a “new” solution for a problem addressed in the official calendar. The method he criticizes for its cumbersome computations and

<sup>1</sup> Wang Xiaotong’s problem, procedure and auto-commentary were for the first time for their greatest part translated into German and discussed in (Bréard 1999, 333-336, 41-43), respectively. (Bréard 2002) evokes the relationship between the problem from *The Nine Chapters* quoted and this problem by Wang Xiaotong as well as the relationship between pursuit problems and astronomical problems in other Chinese, Sanskrit and Latin sources. The overview given yields a very good starting point for an analysis of the relationship between pursuit and conjunction problems.

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suggests to replace by his own procedure, seems to be the one given in the *Wuyin yuan* calendrical system (戊寅元曆, enacted in 619), which Wang was appointed to examine in 623. Interestingly, only a few years later, in 627, Li Chunfeng is known to have criticized the same calendar and to have been accordingly appointed to the bureau of astronomy. These various elements will lead me to question what these documents tell us on the relationship between mathematical writings and writings on the astral sciences at the time.

### **Bibliography**

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