

## [초EP-01] Geometrical Mind in Sky Charts

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It is often said that there is little geometrical mind in Korean history. However, a method to project the surface of a sphere onto 2-dimensional plain was applied to the representative Korean star chart or Cheonsang Yeolcha Bunyajido (天象列次分野之圖). The method, called the equi-distant polar projection, was explained in detail in ancient Chinese history book of the Tang dynasty, which was originated from older history. Another method of the Mercator projection was introduced by the famous engineer Su Song (蘇頌) of the Song dynasty. The description has quite geometrical thoughts, especially the concept of infinity or convergence appears. However, this type of sky projection method was not widely used in east Asia. When the European Jesuits came to China to evangelize the Chinese people, they found that the Chinese people paid much attention to advanced European astronomical knowledge. Thus, they introduced the European astronomical knowledges into China, and the star chart was one of them. The projection method of the new charts were quite different from the Chinese tradition. When the Koreans brought those new star chart from China, they must have known the geometrical description of the method. The method was described in detail in a volume of Chongzhen Lishi (崇禎曆書) or Xiyang Xinfu Lishu (西洋新法曆書). The explanation consists of three part. One is the quantitative way; another is a geometrical way using axiomatic systems; and the other is the practical method to draw star chart with the geometrical projection. However, when we see the Honcheon Jeondo (渾天全圖) that is thought to be duplicated by Kim Jeongho (金正浩), the new geometrical method was not so widely known to the Koreans. I will discuss the reason why the geometrical minds have not been widely adopted in the Korean civilization.

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## [구EP-02] 흠경각루 내부 메커니즘에 대한 고찰

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1438년 장영실은 경복궁 흠경각(欽敬閣) 내부에 자동물시계인 옥루(玉漏)를 제작하였다. 흠경각루(欽敬閣漏)는 수격식(水激式, 물의 흐름을 이용하여 수차를 운행하는 동력방식)으로 운영되는 것으로 중국의 수운의상대(水運儀象臺, 1092년경 제작)의 수격방식과 유사하다. 하지만 동력 방식을 제외한 내부 구조에 대한 것은 흠경각루의 외형모습인 가산 형태, 시보인형의 구성과 배치, 작동구조 등에 의해 결정된다. 장영실은 흠경각루의 내부 기어장치의 구성과 연결 등에 대해서 새로운 제작기술을 사용하였다. 우리는 수격식 동력 방식에서 내부 공간에 따른 각각 운행 장치들의 구성과 동력전달체계에 대하여 분석하였다. 또한 수차가 일정한 회전력을 갖도록 제어하는 천형(天衡) 장치에 대하여 고찰하였다.