during the Yuan dynasty, the astronomer Guo Shou jing built a platform out of brick 40 feet high. This truncated pyramid was itself the gnomon, for the shadow of a horizontal bar supported by the upper level fell upon the top surface of a low wall that extended perpendicularly from the pyramid’s north face for 120 feet. This is contradicted by the most authoritative Western accounts, which say that a high pole stood in the vertical slot on the pyramid’s north face and that this was what cast the shadow. But inspection of the monument reveals no sign of any structure or pit that might have held and supported such a high pole, and in any case the pyramid itself obviates the need for such a pole. Although this may be news outside of China, the little museum at the site shows how the observatory was used without a pole, and auxiliary equipment, based on descriptions in the historical records, has been refabricated to permit duplication of the measuring techniques of Guo Shou jing.

Among the observations carried out at the tower of the thirteenth-century Chinese astronomer Guo Shou jing were measurements of the shadows cast upon the long low horizontal wall by the sun at noon on the summer and winter solstices. Because the tower is about 40 feet high, the difference in length between the two shadows is great, and this permitted extremely precise determination of the length of the tropical year. (Griffith Observatory)