CHAPTER 1

Instruments for the Emperor: New Frontiers, New Practices

各省輿圖、載入一統志，事殊重要。或一省有大圖而無小圖。或一省有里數程途、而無疆界。或一省有疆界、而無里數程途。各省皆不一例，何也。25

康熙25年 6月 12日

As for incorporating the maps of each province into the Descriptive Account of the Unified [Great Qing], this is a matter of great importance. Either a province has an overview map but no regional maps; or, a province has the road distances recorded, but not its borders; or, a province has its borders recorded, but not its road distances. All the provinces are inconsistent [in their representations], why is this?

July 31st, 1686

Towards the end of the seventeenth century, Jesuit missionaries’ participation in scientific and technical matters at the Qing court grew more organized and more specialized. Unlike earlier missionaries, the French Jesuits who reached Beijing in 1688 enjoyed both the support of French King Louis XIV (r. 1643–1715) and financing from his Académie royale des sciences. To aid in the explicit scientific goals, including systematic data-gathering of all kinds, that had become integral to the French Jesuits’ proselytizing mission, the Académie and their patrons provided them with state-of-the-art surveying instruments. This chapter follows the trajectories of those instruments from the Parisian workshops that crafted them to the French Jesuits who transported them to Asia to the imperial palace where the emperor demanded his workshops reproduce the Parisian instruments, and thence out into the field.

25 Kangxi chao shilu, juan 126. The (Da Qing) Yitongzhi (大清一統志) constituted the official imperial/dynastic geography.
As well as exploring the different uses and adaptations of these instruments across cultural and political boundaries, this chapter will also discuss the Kangxi emperor’s long-standing interest in cartography. The emperor paid careful attention to the lessons provided by the Jesuit Ferdinand Verbiest, one of his tutors, who instructed the emperor in European-style mathematics, of which practical geometry, the very basis for land surveying, was an important component. The emperor saw in these lessons a tool for the improved, more consistent mapping of his rapidly expanding empire. Thus, immediately after the arrival of the French Jesuit missionaries, the emperor displayed a keen interest in the Parisian instruments and in the methods of practical geometry implicit in their design, eventually ordering his Imperial Workshops to reproduce the Parisian prototypes. At the same time, surveying teams tried out some of the original instruments in the field, surveying the empire’s new frontiers and later prompting the emperor to order the precise measurement of one degree of latitude just south of the capital. This eventually led the court to re-standardize the Qing’s most basic unit of length, the chi, profoundly impacting scientific practice at the Qing court and paving the way for the consistent mapping of all Qing territories over the following decades.

This chapter focuses entirely on cartographic practice, although of course the practice is far from entirely extricable from its mathematical and astronomical underpinnings, known at the Qing court as “Western learning” or xixue 西學. Recent scholarship has devoted tremendous attention to Western learning under the Kangxi emperor, particularly with regard to the European-style astronomy and mathematics taught at court.26 No study, however, has yet comprehensively examined the practices of cartography or of land surveying during the Kangxi years. I therefore attempt in this chapter precisely such a discussion of the evolution of cartographic practice, separate from more theoretical concerns. I argue that the circulation of surveying instruments paved the way for the emperor to integrate selected new techniques of land surveying, as developed at the Parisian Académie, into the existing framework of cartographic practices at the Qing court, in effect establishing a new cartographic practice in East Asia. Surveying instruments thus lead into the exploration of cartographic practice at the Kangxi court, eliding when possible reflections on the instruments’ theoretical underpinnings in favor of their practical use in the field. In all, Chapter 1 will show how the Qing mapping project discussed in this study arose directly from converging interests among the Jesuit order, the Académie royale des sciences, and the Kangxi emperor and how the circulation

26 Jami (2012). Elsewhere, Jami proposed a distinction between “science as action” and “science as discourse.” Jami (2007). This study fully focuses on the former.