



Big Heads and Buddhist Demons: The Korean Musketry Revolution and the Northern Expeditions of 1654 and 1658

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Abstract

Boosted by superior firearms and competent riverine transportation, Cossack explorers of the Muscovite empire encountered little resistance in their eastward expansion across Siberia until they reached the Amur frontiers. The Cossacks arrived in 1643 and gained notoriety as Buddhist demons (*luocha* 羅刹) for plundering the Mongol-Tungusic tribes of the region during the latter half of the seventeenth century. There ensued an effective military counterthrust by continental East Asians, including the Manchus, a new rising power in North China; Amurian natives such as the Daur, Juchers, and Nanais; and Korean musketeers hailing from the Chosŏn dynasty. During the battles of 1654 and 1658, disciplined Korean musketeers known as Big Heads (*taeduin* 大頭人) outgunned the Russians and helped repulse their incursions into the inner reaches of the Amur region. These marksmen were products of the Korean Musketry Revolution during the seventeenth century, which revamped the Chosŏn army around *en masse* infantry tactics and firearms units. These tactical changes sparked broader institutional changes within and beyond the Korean military apparatus, triggering a drastic growth in army size and challenging existing practices of commerce, conscription, census taking, and taxation. These reforms, though decelerated around the mid-eighteenth century, attest to the capabilities of seventeenth-century Chosŏn to successfully adapt to the challenges of early modern warfare, which increasingly harnessed the power of firearms and disciplined soldiers. This narrative of the Big Heads and Buddhist Demons explores new ground in understanding transcultural trends of musket-based warfare and joins Korea to the burgeoning field of global military history.

Keywords

Chosŏn, Manchu, musket, Military Revolution, Sin Yu, Cossacks, Amur River

* All dates in this article are according to the Chinese lunar calendar. The reference used to convert Gregorian dates to the lunar calendar is Xue and Ouyang 1961. Russian dates according to the Julian calendar were converted to the Gregorian calendar by adding ten days to the former, which was the standard difference during the seventeenth century.

Introduction

Throughout the latter half of the seventeenth century, Russians and Manchus quarreled over the fertile Amur River valley of Northeast China. In pursuit of fur and provisions, Cossacks, Russian frontiersmen, advanced eastward over the Ural Mountains and reached the Amur by the mid-seventeenth century. They plundered Mongol-Tungusic tribes along the river belonging to the Daur, ¹ the Juchers, ² and the Nanais ³ and gained notoriety as “Rakshasas” (*luocha* 羅刹), a title that evoked man-eating demons in Buddhist mythology. ⁴ When the Manchus of the nascent Qing dynasty (1644-1912) heard the clamor, they sent troops to repel the Cossacks from their northern hinterlands. However, occupied at multiple fronts and lacking firearms, they had little success until musketeers from the Chosŏn dynasty of Korea (1392-1910) joined their forces. Dubbed as “Big Heads” (*taeduin* 大頭人) ⁵ for their distinctive helmets, these musketeers were excellent marksmen. During the Northern Expeditions of 1654 and 1658, their musketry fire broke through Russian ranks and helped thwart Cossack intrusion into the inner reaches of the Amur region.

The Big Heads’ bellicosity was no accident but an outcome forged in Korea’s military reforms during the seventeenth century. Pressured by invasions such as the Imjin War of 1592-1598, Chosŏn quickly revamped its military apparatus around firearms. Koreans learned from their warlike neighbors and combined Japanese musketry technology with Chinese infantry tactics to forge their own way of war. During the seventeenth century, the Chosŏn military raised elite musketeers, produced military manuals, reorganized the chain of command,

¹ Daur, also known as Dahuer 達呼爾 to the Manchus, were a group of Mongolized Tungus who established agrarian settlements on the upper Amur and Zeya and spoke a Mongolian language. Forsyth 1992, 104-5.

² Juchers, also known as Ducher to the Russians, Waerka 瓦爾喀 or Huerha 虎爾哈 to the Manchus, and Walga 日可 or Walhap 日哈 to the Koreans were a Tungusic people who lived on the middle and lower Amur, including the lower reaches of the Songhua River. Sin Yu, *Kugyŏk Pukchŏng ilgi*, 55.

³ Nanais, also known as Goldi or Olcha to the Russians, Heijin 黑斤 to the Qing, and Kyŏn Purak 犬部落 or “Fishskin Tartars” (*Ŏp’i Talcha* 魚皮獐子) to the Koreans, were a semi-nomadic people living on the lower Amur who subsisted mainly by fishing. Sin Yu, *Kugyŏk Pukchŏng ilgi*, 71. Also see *Hyojong sillok*, 14, 1655/4/23 (Chŏngch’uk).

⁴ Cossacks were known as “Rakshasas” (*luocha* 羅刹) to the Manchus and Nasŏn 羅禪 or “Big Nosed Tartars” (*Taebi Talcha* 大鼻獐子) to the Koreans. Guo 2010, 105-8. Also see Sin Yu, *Kugyŏk Pukchŏng ilgi*, 72-73; and *Sukchong sillok*, 13, 1682/11/24 (Imsul).

⁵ The title “Big Heads” (*taeduin*) was given to the Koreans by the Nanais, who served both the Manchus and the Russians and were allegedly known for their duplicity. Sin Yu, *Kugyŏk Pukchŏng ilgi*, 71.

and manufactured firearms. This trend of military strengthening was tested too early in the Manchu invasions of 1627 and 1636 but reached a pinnacle during the reign of King Hyojong (r. 1649-1659), which enabled the success of the Big Heads against the Russians.

Both in the prominence of firearms and the importance of transcultural borrowing, the Korean reforms of the seventeenth century resemble the Military Revolution of Western Europe.⁶ Historian Geoffrey Parker, the doyen of this famous paradigm, argues that Westerners pioneered and held the unique advantage of firearms warfare during the early modern era (1500-1800). In his model, adopting firearms catalyzed cascading changes in the European military, revolutionizing the system around professional soldiers, broadside ships, robust fortresses, and mobile artillery. Over time, efforts to sustain this taxing way of war accelerated European state formation and kick-started the West's world-stirring imperial career.⁷ However, this model has come under increasing revisionist pressure as a recent upwelling of comparative data on non-European warfare has reconfigured the Military Revolution as a Eurasia-wide phenomenon.

My proposition that the Chosŏn military underwent a revolution of its own draws from a recent movement in scholarship that one may call the Asian Military Revolution School.⁸ Historians of Asia, notably Sun Laichen, Tonio Andrade, Peter Lorge, and No Yŏnggu, have argued that guns wrought deep changes in East Asia. Sun Laichen argues compellingly that Zhu Yuanzhang, founder of the Ming dynasty, used gunpowder technology to subdue his enemies and established "the first 'gunpowder' empire in the early modern world."⁹ Stephen Morillo posits that Japan's Warring States Period (*sengokujidai* 戦国時代),¹⁰ which lasted from the mid-1400s to the early 1600s, witnessed an infantry revolution and a rapid adoption of muskets, including the development of the musketry volley technique.¹¹ Korean historian No Yŏnggu first suggested the possibility of a Korean military revolution, which allegedly had socio-political

⁶ See Parker 1996, Rogers 1995, and Yerxa 2008, 11-48.

⁷ Parker 2000, 387.

⁸ Sun 2000 and 2003; Swope 2005 and 2009; Andrade 2011; Lorge 2008.

⁹ Sun 2003, 75.

¹⁰ During the Warring States Period, an epoch of fierce interstate competition from the mid-1400s to the early 1600s, Japan fragmented into numerous states each led by a daimyo, a regional samurai landlord, whose survival depended on effective mobilization of military resources to maintain and expand his domain. The harquebus was introduced to Japan during this time and was quickly adopted.

¹¹ Morillo 1995, 95-100.

consequences such as state centralization, increase in the size of the standing army, and growth of the market economy.¹² Further, in a systematic comparison of English and Korean drill manuals, Tonio Andrade, Kirsten Cooper, and I have found striking parallels between European and Korean military changes throughout the seventeenth and eighteenth centuries.¹³

Nonetheless, firearms did not elicit the same experiences in Korea as they did in Europe. To begin with, the late Chosŏn dynasty enjoyed relative peace for nearly two hundred years, from after the foreign invasions of the early seventeenth century until the mid-nineteenth century, which slowed advances in the Korean military. Internally, Chosŏn's idiosyncrasies also impeded military reform: the unique presence of an anti-military, land-holding *yangban* aristocracy and the relative weakness of the Korean monarchy decreased the likelihood of radical reforms. Yet, despite the fact that the Korean Military Revolution was ultimately on a divergent path from the Western trajectory (for reasons we will return to in the conclusion), guns were a potent accelerator of change in seventeenth-century Chosŏn Korea. Eschewing Eurocentric indices of comparison, this article strives to examine the Korean experience with firearms as a variation on the theme of the gunpowder revolution, and as an intriguing counterpoint to the standard Military Revolution narrative of the West.

The Northern Expeditions of 1654 and 1658 provide an excellent forum for engaging continental East Asia with the Military Revolution model. Though the scale of the conflicts was negligible, they provide an extraordinary opportunity to explore transcultural military history: they brought together in juxtaposition Russian experiences of firearms warfare, naval maneuvering, and Siberian expansion; Chinese abilities for shipbuilding, siege warfare, and military mobilization; and the Korean tradition of musketry volley fire and infantry drill. This article aims to contribute a deeper understanding of these transcultural interconnections to the current scholarship, which treats the expeditions as mere prologues to later crises and diplomatic interactions.¹⁴

The Amur conflicts were a historical juncture not only in engaging military apparatuses from across Eurasia but also in bringing together various individuals and ethnic groups on the microhistorical level. In fact, the rich details of these human interactions allow ample room to pursue "global microhistory,"¹⁵

¹² No 2010, 2007, and 2002, 130-34.

¹³ Andrade, Kang, and Cooper (forthcoming).

¹⁴ Ravenstein 1861, Mancall 1971, and Weale 1907.

¹⁵ Andrade 2010.

thanks largely to the *Diary of the Northern Expedition* (*Pukchǒng ilgi* 北征日記), a chronicle by the Korean general Sin Yu 申瀏 (1619-1680) who led Korean auxiliary troops in 1658.¹⁶ This article incorporates previously overlooked Korean sources to craft a new narrative of the Amur frontiers in relation to the Military Revolution debate, and joins Korea to a new historical paradigm that configures East Asia, and the Eurasian continent, as a transcultural region marked by gunpowder-based warfare.

Rakshasas Salivate for Amuria

The stories of Big Heads, Buddhist demons, and Manchu bannermen¹⁷ abound with rich details about peculiar individuals and extraordinary meetings between ethnic groups. Korean general Sin Yu was a keen, judicious general who comes across as someone of upright morality. His Confucian moral values often conflicted with the uncouth, cunning individuals of the Qing army such as the Manchu commander Sarhuda 沙爾虎達 (1599-1659) whose avarice for war booty caused unnecessary casualties. Sarhuda's army was multi-ethnic, including the agrarian Daurs, whose fertile soil and rich crops made the Cossacks salivate, and the Juchers, who disliked boiled rice and soy sauce¹⁸ and threw themselves to the ground at the sound of gunfire.¹⁹ Messengers between the Cossacks and the Qing were the allegedly quick-tempered and duplicitous Nanais, or "Fishskin Tartars" (魚皮鞞獐子), who served both parties out of self-interest. It was they who named the Koreans "Big Heads" and walked around butchering Cossack corpses after the battle of 1658.²⁰ Lastly, there were the Cossacks, intrepid, free-spirited explorers who were lethal in battle but unpredictable in their allegiance to the Muscovite state. These intractable men were unified under their charismatic voevodas ("military commander" or "governor"), tough and astute officials sent from Muscovy who brought a team of clerks and assistants to facilitate their duties of leading military expeditions and collecting *yasak*, or fur tribute.²¹

In the seventeenth century, the Muscovite empire, boosted by its successful appropriation of the Military Revolution, was the most ferociously expansive

¹⁶ See Sin Yu, *Kugyŏk Pukchǒng ilgi*.

¹⁷ For details about the Manchu bannermen, see Elliott 2001.

¹⁸ Sin Yu, *Kugyŏk Pukchǒng ilgi*, 129.

¹⁹ *Hyojong sillok* 14, 1655/4/23 (Chǒngch'uk).

²⁰ Sin Yu, *Kugyŏk Pukchǒng ilgi*, 98.

²¹ Mancall 1971, 14.

realm in the world.²² The Russians crossed the Ural Mountains around the turn of the fifteenth century and expanded eastward with remarkable alacrity, devouring Siberia in the sixteenth century and reaching the sea of Okhotsk by 1638 (see Figure 1). The success of the Russian campaign was indebted to its military prowess, which harnessed the synergy of firearms, riverine transportation, and Cossack frontiersmen. Together with its aptitude for strategic control of river systems, the Russian military apparatus had a distinct technological and cultural edge over that of the Siberian natives.

By 1643, when Vasily Poyarkov and his fellow Cossacks were voyaging southward towards the Amur, extravagant tales of riches and wonders about the land of the Daurs had been circulating amongst the Siberian Cossacks.²³ These tales painted the Amur valley as an agricultural paradise, overflowing with food and resources. The Amur region was indeed fertile and its most prominent inhabitants, the Daurs, cultivated the soil, herded cattle, and engaged in active trade with Chinese merchants.²⁴ In stark contrast, the Cossacks lived in the permafrost and were constantly beset by harsh living conditions. As subsequent expeditions revealed the value of the Amur to them, these hungry conquerors raided native villages along the river. Initially, Cossack incursions resembled mindless razing but they had a professed purpose—to subjugate the Amurian natives to the Russian czar and to collect regular *yasak* from them. With mounting pressures from the Manchu military, the Muscovite state eventually attempted to establish permanent settlements and enforce more forceful forms of colonization.

In 1643, Poyarkov led the first Russian advance into the Amur. He was an audacious adventurer and a newly appointed Muscovite official in Yakutsk, the flourishing Russian town northeast of Lake Baikal that was known for its fur trade. On May 10, Poyarkov departed from Yakutsk with a half-pounder iron gun and 132 battle-hardened Cossacks, each armed with a flintlock musket.²⁵ Their initial navigation southward was slow and arduous, owing to the difficult shallows and rapids on the Aldan River and its tributaries. Even after eleven weeks, they still had not passed the Stavanoy Range and were compelled to establish winter quarters. Only when spring came and the river thawed was

²² Paul 2008. See also Stevens 2007.

²³ Weale 1907, 14-15.

²⁴ Forsyth 1992, 104-5.

²⁵ Mancall 1971, 21.

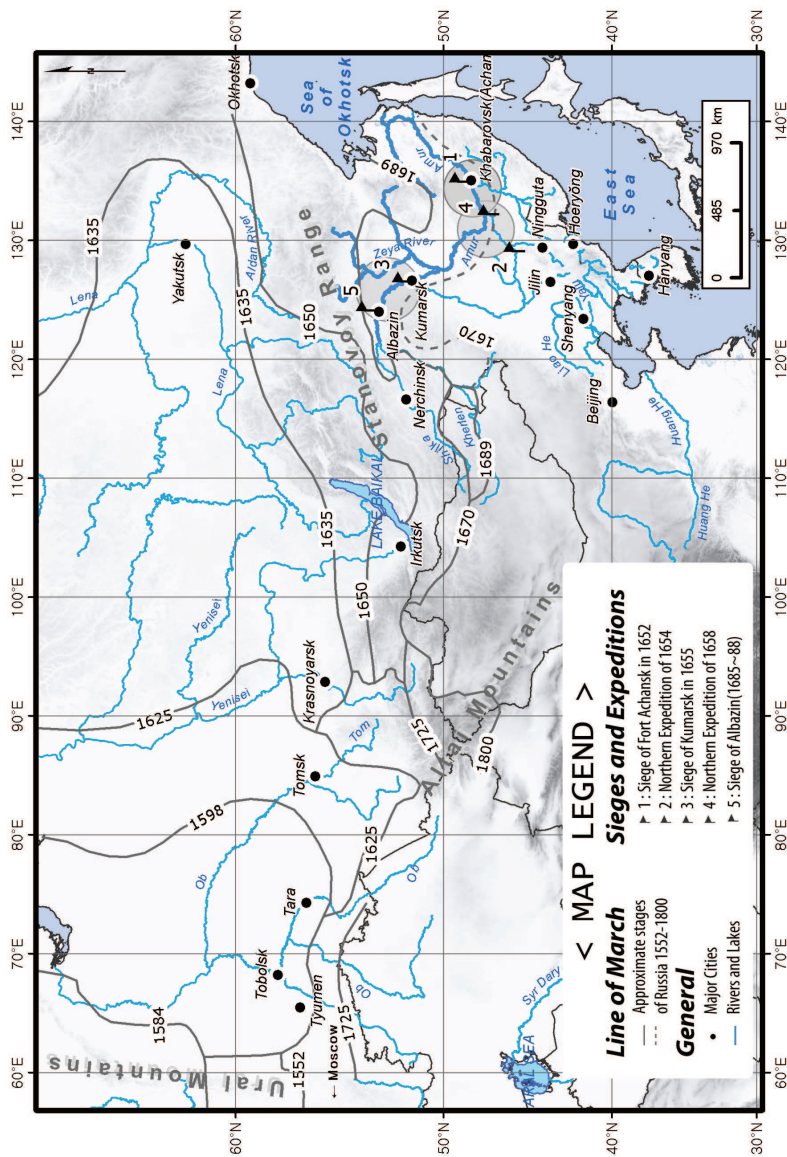


Figure 1: Map of Russian Eastward Expansion into Siberia, 1552-1689

Poyarkov able to continue his journey southward to the Amur, eventually reaching a small Daur village on the Zeya River.²⁶

The Daur welcomed the Cossacks, but their relationship quickly disintegrated as Poyarkov and his men returned kindness with violence. As provisions diminished, Poyarkov kidnapped Daur leaders and attempted to coerce resources out of their village, which led to a violent backlash from the natives.²⁷ Accounts of cannibalism further damaged the reputation of the Cossacks among the Daur. Some of Poyarkov's men allegedly endured hunger in the winter by feeding on native captives and deceased fellow Russians.²⁸ As Daur resistance grew, Poyarkov and his men sailed further south to avoid conflicts. They continued to explore the middle and lower reaches of the Amur before returning to Yakutsk in 1646.²⁹

Poyarkov's first incursion having set the tone, later Russian expeditions were characterized by forceful tribute collection and constant peregrination. Russian control over the region, therefore, remained minimal and fleeting in nature. However, this pattern of activities was born out of necessity more so than of will. Due to the flight of the natives, especially after Poyarkov's plundering, the Russians had to shift their positions accordingly lest they run out of provisions. While dwindling resources and troublesome natives posed great obstacles, Poyarkov and his successors built *ostrogs*, or fortresses, at strategic points to effectively project their influence along the Amur. They were often, if not always, outnumbered, but their superior firearms and military engineering skills conferred a salient advantage against the natives, particularly when their guns were fired from behind defensive structures. Thus, the Russians relied on their *ostrogs* as temporary bases for wintering, storing provisions, and further raiding. The next important Russian explorer, Yerofey Khabarov, first established effective strongholds in the region, which proved indispensable in the first encounter with the Manchus.

Khabarov replaced Poyarkov as the leader of the Russian expeditions. During his first journey in 1649, Khabarov reached the upper Amur region, originally inhabited by the Daur, and found that their villages had been deserted to avoid contact with the Cossacks. Consequently, this exploration did not yield immediate profits but still served as an important reconnoitering mission: Khabarov discovered more convenient river routes and recognized the need to

²⁶ Ravenstein 1861, 10.

²⁷ Ravenstein 1861, 10.

²⁸ Golder 1914, 36-37.

²⁹ Weale 1907, 18.

sail further down with larger forces. Upon meeting a few horsemen during his journey, Khabarov was also reminded of how the Amurian natives perceived the Cossacks. As historian Frank Golder elaborates in his account:

So deeply and so horribly had Poyarkof's deeds impressed themselves on the inhabitants of the Amur that the mere mention that "the Cossacks are coming" was enough to bring to their minds pictures of torture, abduction, death, and cannibalism.³⁰

Buoyed by the growing Muscovite interest in the Amur, Khabarov set off again in 1650 from Yakutsk. During the summer of the same year, Khabarov and his fellow Cossacks sailed southward and eventually reached the fortified Daur village of Yakesa 雅克薩.³¹ Using firearms and gunboats, Khabarov subjugated the Daur and erected Albazin—the first Russian settlement on the Amur—upon the ashes of Yakesa. Feeling ever more confident after the conquest of Albazin and a streak of successful *yasak* collection, Khabarov claimed that in "Albazin alone there was enough grain on hand to last five years, and that the natives of the Amur could be made to supply a quantity large enough to feed twenty thousand men or even a larger number."³² Indeed, Albazin would later become a focal point of Russo-Qing relations in the late seventeenth century.³³

In early June of 1651, Khabarov sailed down the Amur from Albazin with over two hundred Cossacks and at least three large cannons.³⁴ After four days of sailing, his ships reached a large Daur settlement ruled by prince Guigudar. This village was no ordinary Amurian town: it was fortified by a triple line of defensive structures and garrisoned by a Nanai-Jucher army of more than eight hundred, in addition to fifty Manchu cavalrymen.³⁵ Nonetheless, the Russian advantage in firearms was decisive in the ensuing battle. The first volley killed twenty Amurian tribesmen and caused the rest of the natives to retreat behind their fortified lines.³⁶ All throughout the night, Khabarov's artillery baraged the walls of the village and obliterated all three walls by daybreak. The

³⁰ Golder 1914, 40.

³¹ Later renamed Albazin, Yakesa was a fortified village of the Daur people that Khabarov conquered in 1645. Its exact location is still disputed, but the most credible estimation places it in the upper Amur region, further down from the Zeya tributary.

³² Golder 1914, 44.

³³ Mancall 1971, 24.

³⁴ Mancall 1971, 24.

³⁵ Weale 1907, 20.

³⁶ Weale 1907, 20.

Russians then charged inside and killed mercilessly.³⁷ Khabarov later wrote proudly of this victory in his report:

With God's help . . . we burned them, we knocked them on the head . . . and counting big and little we killed six hundred and sixty one. Of the Russians only four lost their lives and forty-five were temporarily disabled, a small price to pay for the plunder which included two hundred forty-three women, one hundred eighteen children, two hundred thirty-seven horses, and one hundred thirteen cattle.³⁸

After the battle at Guigudar's village, Khabarov sailed further down the Amur, continuing his brutal conquests against other Amurian tribes until he reached Achansk 烏扎拉, a large settlement of Nanais, or "Fishskin Tartars" (魚皮獐子).³⁹ As described by Korean general Sin Yu, the Nanais were "quick-tempered savages who did not even know the calendar and aimed their arrows against anybody, even slashing at their family members."⁴⁰ Initially, the Nanais were welcoming to the Russians when they arrived around late August of 1651 and established a temporary fortification in the vicinity. Nonetheless, given their truculence, the Nanais' revolt was only a matter of time. On September 5 a combined Nanai-Jucher army surprised the Russian camp, availing itself of the moment when some of the Cossacks had left the group. More than eight hundred strong, the attackers outnumbered the little Russian army but were defeated in the end, shot down in retaliation by the defenders.⁴¹ The Russians suppressed these unruly people and built a formidable fort at Achansk, which they later named Khabarov after their vovoda.⁴²

Soon after the establishment of Achansk, the Manchus confronted the Cossacks and reasserted their hegemony over the Amur region. The Manchus had been aware of Russian encroachments as early as 1643, but the severity of the situation only dawned upon them eight years later when desperate natives sent a plea for help. The Shunzhi Emperor, the reigning Manchu leader at the time, acquiesced and launched an expedition against the Cossacks in Fort Achansk. An elite force of about 2,000 men, armed with bows and several muskets and siege guns, was promptly mustered in Ningguta 寧古塔, a prosperous Manchu garrison town in the Mudan River valley. Then, General Haise 海色,

³⁷ Weale 1907, 20.

³⁸ Golder 1914, 45. The translation is by Golder.

³⁹ Weale 1907, 21-22.

⁴⁰ Sin Yu, *Kugyók Pukchǒng ilgi*, 72.

⁴¹ Mancall 1971, 14.

⁴² Weale 1907, 21-22.

the garrison commander of Ningguta, and his men departed for Fort Achansk, probably with inflated confidence and unaware of Russian military prowess.

At dawn on February 25, 1652, General Haise and his men commenced the bombardment of Fort Achansk. With their siege guns, the Manchu army successfully breached the Russian walls and seemed to be carrying the day. However, when the overconfident Manchus attempted to capture their enemies alive, a Russian sortie delivered a fatal blow to the attackers. The Cossacks availed themselves of this moment and retaliated fiercely with their cannon and muskets, effectively repulsing the Manchu charge. In the end, the Russian army emerged victorious, killing seven hundred at the cost of ten according to Khabarov's report.⁴³ The Manchus had suffered a shameful defeat despite their numerical advantage and retreated to Ningguta. Certainly, the Manchu bannermen posed a new military challenge to the Cossacks; however, even a brief moment of hesitation or imprudence—as in Haise's mistake of trying to capture the Cossacks—could reverse the trend of the battle, given the Russian capability to employ firearms swiftly and systematically.

The Manchu defeat aroused the Qing court to action. Haise was executed for his incompetence and Sarhuda, a formidable Manchu commander with abundant battle experience and acumen, took his place. Sarhuda was a decorated general in the Qing army, having served Nurhaci, Hong Taiji, and the Shunzi Emperor in battles against the Ming forces and, during the invasion of 1636, against the Koreans.⁴⁴ His appointment to Ningguta kick-started an aggressive projection of Manchu power against the Russians throughout the rest of the seventeenth century. Over the Amur River, shadows of war were looming large as Sarhuda drilled his troops and sent word to request Korean musketeers.

A Korean Military Revolution?

If you believe the world is divided into separate regions, that their talent and nature are distinctive, and that they are not mutually comprehensible, then how is it that [during the Zhou period of ancient China] the steel-clad soldiers of the Wu state learned the way of chariot warfare from [its rival state] Chu and ultimately used it to subdue the Chu? Regardless of whether one talks of antiquity or not, there were no muskets during recent times in the central plains of China; only from the Japanese pirates did the Chinese in Zhejiang Province start learning the way of the musket, with which [Chinese

⁴³ Mancall 1971, 25.

⁴⁴ Hummel 1943, 632.

general] Qi Jiguang drilled his troops for many years until it became a Chinese skill, and with which he thereupon defeated the Japanese.⁴⁵

As the Imjin War of 1592-1598 engulfed the Korean peninsula, Yu Sŏngnyong (柳成龍), Chief State Councilor of the Chosŏn dynasty at the time, urged the Korean military to retaliate against the Japanese invaders with muskets.⁴⁶ Yu drew from historical as well as current examples to underscore the importance of military “adaptation and progress” and exhorted that, though musketry warfare was a foreign skill, it should be adopted and enhanced upon.⁴⁷ Under Yu’s supervision and thereafter, the Chosŏn state quickly tuned into global currents of firearms warfare—via surrendered Japanese soldiers, Chinese exiles, and Dutch castaways—and started a process of military reform that revamped its armed forces around firearms and disciplined soldiers. Throughout the seventeenth century, Koreans combined Japanese musketry technology with Chinese infantry tactics and forged their own way of war, which depended heavily on musketeers.

The Imjin War was an unprecedented catalyst for Chosŏn military reform. The megalomaniac leader of unified Japan, Toyotomi Hideyoshi, invaded Korea in 1592 and stirred a war that would engage massive armies, embroiling as many as 900,000 soldiers and three belligerent states.⁴⁸ The Japanese troops swept through Korean defenses with their capable musketeers and captured the capital within three weeks. They excelled at both musketry tactics and close combat but their naval forces paled in comparison to those of Chosŏn, which wielded superior cannons and threatened their supply lines. The war escalated further when Ming China sent auxiliary troops and helped turn the tide of the war. The Chinese brought artillery that dwarfed Japanese firepower in set-piece battles. Further, their Southern Troops (南兵), infantrymen drilled in the revolutionary tactics of the Chinese general Qi Jiguang 戚繼光, were lethal to the Japanese.⁴⁹

During the Imjin war, the Sino-Korean allies realized that Japanese aggression was largely enabled by Hideyoshi’s superior musket units. Particularly shaken was Korean King Sŏnjo, who had witnessed Japanese musketeers blast through his army. When one of his officials downplayed the efficacy of

⁴⁵ Yu Sŏngnyong as quoted in Yu Hyŏngwŏn, *Pan’gye surok*, 12:10b. See also Palais 1996, 519. Unless otherwise indicated, all translations are mine.

⁴⁶ Yu Hyŏngwŏn, *Pan’gye surok*, 12:10b, as cited in Palais 1996, 519.

⁴⁷ Palais 1996, 519-20.

⁴⁸ Sŏ 1987, 285.

⁴⁹ Swope 2005, 16-18.

Japanese musketeers, Sŏnjo retorted in fear that they could use the volley fire technique. He said: "If the Japanese divide themselves into three groups and shoot alternately by moving forward and backward (若分三運, 次次放砲), how can we fight back?"⁵⁰ Despite the fact that the Japanese musketeers were special forces, only constituting about twenty percent of the Japanese army,⁵¹ their lethality was enough to make a deep impression on Sŏnjo. Indeed, he once stated that "the invariable victory of the enemy lies in their [use of] firearms (且賊之全勝, 只在於火砲)."⁵²

Sŏnjo's fascination with firearms was not empty-minded or without justification. With close reading, we can see that his rationale for championing firearms was precocious. In a discussion with his officials in 1593, Sŏnjo advanced an argument to procure more firearms by foregrounding the importance of firepower. He alluded to the legendary Xiang Yu, a paragon of martial prowess in ancient China, and juxtaposed Xiang's prowess with firepower to articulate that even the most powerful warriors could succumb to the onslaught of disciplined gunners:

On the eve of war, nothing compares to fire attack [using guns]. Even if we had Xiang Yu reborn into our times, he, without firepower, would not be a match for ten thousand enemies.⁵³

Xiang was powerfully built and towered over six feet, which allegedly allowed him to lift a *ding*, a bronze vessel weighing as much as a ton. His muscular power, of course, was exaggerated but its symbolic significance is stark in this context: Xiang's physical strength, the pinnacle of individual combativeness, is made subordinate to firearms, energy-intensive technology based on stored chemical potential. This passage suggests that Sŏnjo perhaps discerned the shift in the way of war towards one that increasingly favored firearms warfare and *en masse* infantry tactics.

With robust royal support, institutional changes followed swiftly. In 1593, a year after the outbreak of the war, Sŏnjo issued emergency decrees to institute the Military Training Agency (*Hullyŏn Togam* 訓練都監), a new central army

⁵⁰ *Sŏnjo sillok* 50, 1594/4/17 (Ūlch'uk), as cited in Andrade, Kang, and Cooper (forthcoming), 17.

⁵¹ No 2002, 73-75.

⁵² *Sŏnjo sillok* 39, 1593/6/29 (Imja).

⁵³ *Sŏnjo sillok* 36, 1593/3/11 (Pyŏng'in). The original text is as follows: 臨戰之制, 莫如火攻。脫使項羽再生於此時, 無火攻, 則不得為萬人敵矣。

designed specifically to raise musketeers.⁵⁴ To meet urgent demands during the war, this army attempted to recruit men from all walks of life and organized new conscripts with clearly stratified troop divisions.⁵⁵ It started with 500 soldiers in 1593, which, with sustained fiscal support, increased to 2,000 by the end of the war, to 4,000 by 1616 and 6,350 by 1658.⁵⁶ The agency became the first professional standing army established in Chosŏn Korea that employed salaried men and benefited from a governmental surtax. Unlike other soldiers in the Korean military who served in rotations to accommodate farming seasons, most soldiers in the Military Training Agency were permanent forces residing in the capital.

Musketeers quickly became the core of the Korean military apparatus. In 1594, only a year after the outbreak of the Imjin War, they constituted 54 percent of the Military Training Agency and quickly replaced traditional units such as archers and cavalry. Musketry troops continued to grow within the agency, replacing all archers by 1682 and reaching 80 percent of the entire force by 1708, which amounted to as many as 4,000 musketeers.⁵⁷ Musket-based reforms started in the Military Training Agency and spread to other capital armies during the seventeenth century. For instance, in the aftermath of the Manchu invasion of 1636, another capital army known as the Anti-Manchu Division (*Ch'ongyungch'ŏng* 摠戎廳) restored its musketry troops to as many as 5,400 musketeers by 1639.⁵⁸ According to the *Clear Treatise of the Military Arts* (*Pyŏnghakt'ong* 兵學通) published in 1787, infantrymen serving in other capital armies including the Royal Division (*Ŏyŏngch'ŏng* 御營聽) and the Forbidden Guard Division (*Kŭmwiŏng* 禁衛營) were all musketeers by the end of the eighteenth century.⁵⁹

Changes were slower in provincial armies but similar. As early as 1596, the regional army of P'yŏngan Province had already raised 798 musketeers, which amounted to 30.2 percent of the entire army as opposed to archers who made up 48.6 percent.⁶⁰ Although longitudinal data from one particular provincial army are yet to be found, we know that a significant number of musketeers served at the Provincial Headquarters of Hamgyŏng, which by 1648 employed

⁵⁴ Kim 2003, 76-77.

⁵⁵ Kim 2003, 114-37. For details about the limits of conscription in the Chosŏn military, see Hur 2011.

⁵⁶ Kim 2003, 105.

⁵⁷ No 2007, 161.

⁵⁸ No 2012, 13.

⁵⁹ No 2007, 42.

⁶⁰ No 2007, 49.

more than 4,000 musketeers out of approximately 8,000 men in total.⁶¹ Further evidence occurs in the “Control the Ranks Army Roster” (束伍軍籍) of Ch’ungch’öng Province, a source which was only uncovered recently by researchers at the Land Museum of Söngnam, South Korea. Written during the early reign of King Sukchong (r. 1674-1720), this roster shows that musketeers were predominant in the Sog’o Army (束伍軍) of Ch’ungch’öng Province, constituting 76.5 percent of the entire force as opposed to archers who only amounted to 17.2 percent.⁶² Hence, available sources suggest the growing importance of musketeers in both the capital and regional armies of Chosön, and by extension, a radical shift in the Korean military apparatus from a cavalry-based to an infantry-based way of war.

Musketeers not only grew numerically dominant but also tactically central to the Korean army. After the Imjin War, the Chosön military forged their own method of musketry tactics based on Chinese general Qi Jiguang’s “Three-Unit-Technique” (*Samsu kiböp* 三手技法), a mutually-supportive infantry regime featuring three distinct types of infantry: the musketeer (*p’osu* 砲手), the archer (*sasu* 射手), and the swordsman/spearman (*salsu* 殺手; literally, the “killing unit”).⁶³ Korean drillmasters such as Han Kyo 韓僑 transcribed and fine-tuned Qi’s military manuals⁶⁴ for Korean usage, a process that eventually yielded Korean renditions such as the *Orientation to the Military Arts* (*Pyönghak chinam* 兵學指南).⁶⁵

In these Korean adaptations, musketeers played a more central role than they did in Qi’s original tactics. As laid out in the *Orientation to the Military*

⁶¹ No 2012, 131.

⁶² Kim 2007.

⁶³ Park 2007, 51-52.

⁶⁴ Qi Jiguang’s manuals include the *Ji xiao xin shu* 紀效新書 (*The New Book of Effective Techniques*) and the *Lian bing shi ji* 練兵實紀 (*The Veritable Record of Troop Drilling*). Koreans adopted both manuals but the former, *Ji xiao xin shu*, was the most influential in shaping Korean military tactics. *Ji xiao xin shu* comes in two very different versions, one published in 1560 and one published in 1588. A good edition of the former is the one edited by Qiu Xintian and published by Zhonghua shuju in 2001; a good edition of the latter is the one edited by Fan Zhongyi et al. and published by Shi shi chubanshe in 1998.

⁶⁵ The *Orientation to the Military Arts* (*Pyönghak chinam*) was the standard military manual used during the seventeenth and eighteenth centuries before the *Clear Treatise of the Military Arts* (*Pyönghakt’ong*) was published in 1787. The earliest known copy of the former is dated 1649 but some scholars speculate there were previous versions from the early seventeenth century. This manual includes a diagram labeled the “Continuous Fire Musket Shot” (*Choch’ong yunbangdo* 鳥銃輪放圖), which shows the sequence of musketry volley technique used by the Korean musketry squads. Multiple copies of this manual exist today. The version the author consulted was *Pyönghak chinam* 兵學指南, KDCP692, The National Library of Korea, Seoul, South Korea.

Arts, Korean musketeers fought at the forefront of the battle and served as the tactical axis around which other units revolved to provide protection. Musketeers were lethal but slow-firing, which left them vulnerable to cavalry charges and close-quarters combat. Thus, archers buttressed them at long range and swordsmen/spearmen units safeguarded them from encroaching enemies.⁶⁶ Much like the linear formations concurrently sweeping Europe, Korean military formations featured layers of soldiers advancing and receding in flexible ways,⁶⁷ allowing musketeers to fire and other units to provide cover at appropriate times.⁶⁸

As in Europe, the adoption of muskets necessitated more elaborate forms of infantry drill in Korea, particularly the musketry volley tactic. Albeit powerful and easy to use, muskets were slow firing and thus required the systematic use of volleys to deliver a continuous hail of death on the battlefield. In the face of a ground-shaking cavalry charge, musketeers had to divide into sequential lines and patiently wait for their turn to fire while tamping the barrel, pouring gunpowder, and juggling a lit match. To inculcate such discipline, an art of soldiering was required, one that instilled a sense of *esprit de corps* in the soldiers and turned them into a synchronized unit that could “keep together in time.”⁶⁹ As Parker underscores, achieving a drill regime with sufficient rigor to implement the volley technique was a hallmark of early modern firearms warfare, and certainly a milestone in the development of the Military Revolution in Western Europe.⁷⁰

Like their European counterparts, Korean musketry squads also developed their own way of volley fire. As early as 1607, only four years after the alleged Dutch invention of the technique, musketeer recruits in P’yŏngan province were trained according to the following instruction: “every musketeer squad should either divide into two musketeers per layer or one and deliver fire in five volleys or in ten.”⁷¹ In 1636, scholar Chŏng On 鄭蘊 (1569-1641) devised a new military formation called the “Three Layer Formation” (*samch’ŏpchin* 三疊陣), which involved archers and musketeers shooting in volleys.⁷² By 1649, more elaborate descriptions occur in the aforementioned *Orientation to the Military*

⁶⁶ No 2002, 78-79.

⁶⁷ *Sŏnjo sillok*, 49, 1594/3/25 (Kyemyo).

⁶⁸ Andrade, Kang, and Cooper (forthcoming), 18.

⁶⁹ See McNeill 1997.

⁷⁰ Parker 1996, 16-24 and 2007.

⁷¹ No 2012, 124, as cited in Andrade, Kang, and Cooper (forthcoming).

⁷² Chŏng On, *Kugyŏk Tonggye chip*, 305.

Arts. Based on diagrams in this manual, Tonio Andrade, Kirsten Cooper, and I have explained the Korean musketry volley fire as follows:

The Korean musketry squad (隊) consisted of a squad leader and ten musketeers. The musketeers were drawn up into a line of five pairs, each pair consisting of two men placed next to each other facing forward, with the squad's leader standing in front of the foremost pair. At first, the musketeers kneel with their muskets held against their chest. Then, when the enemy is within effective range, the squad leader blows his conch, at which the first pair of musketeers stands, advances just beyond him, fires, and returns to its original position to begin reloading. The squad leader then blows his conch and the second pair rises, advances just beyond him, and fires. It returns, and he blows his conch again and the third pair takes its turn, and so on. By the time the fifth pair fires, the first pair has reloaded and the volley continues.⁷³

As this shows, the Chosŏn military adopted Chinese general Qi's infantry tactics to lay the foundation of a Korean drill ethos and produced drill manuals containing diagrams for volley techniques.

Revamping the Korean way of war around firearms also triggered other cascading changes within and beyond the late Chosŏn military system, including growth in army size. Musket-based armies could recruit from an ever-larger pool of men because handguns were relatively easy to learn compared to other conventional weaponry such as the bow. This new way of war, coupled with enhanced drill regimes, allowed the late Chosŏn military to grow dramatically. It could mobilize men from all walks of life and quickly mold them—regardless of prior martial training—into a cohesive unit of killers. Unlike before the Imjin War, when soldiers were expected to provide their own weapons, horses, and living expenses, the new system had immense potential for growth as long as the state could handle its fiscal burdens.

An analysis of Chosŏn army size according to records of “army amount” (*kunaek* 軍額) corroborates Korean army growth during the seventeenth century. The Chosŏn military measured army size by *kunaek*, a composite number that includes both the number of regular soldiers (正兵) and support persons (保人).⁷⁴ For the total military forces of Chosŏn, this figure more than tripled, from 300,000 in the late sixteenth century to an unprecedented height of 1,040,000 in the early eighteenth century.⁷⁵ As shown in Figure 2, three capital

⁷³ This description is based on the diagrams and the text found in the *Orientation to the Military Arts*. For details, see Andrade, Kang, and Cooper (forthcoming).

⁷⁴ “Support persons” referred to those who financed the regular soldiers in lieu of direct service in the military. See Palais 1996, 394-442.

⁷⁵ Han'guk Yŏksa Yŏn'guhoe 2003.

armies of Chosŏn, the Military Training Agency, the Royal Division, and the Defense Command (守禦聽), had sustained growth during most of the seventeenth century, increasing drastically until the 1660s and 1670s and reaching a pinnacle around 1680. Army growth in the regional armies was also quite remarkable. As shown in Figure 3, regional armies doubled from 95,226 in 1600 to 200,000 in 1681.⁷⁶ Given that the proportion of musketeers increased while the total number of men also grew, army growth dovetailed with the Korean military's reform towards infantry- and firearms-based tactics.

Records of *kunaek*, however, only show paper army strength and cannot be used as the sole yardstick to measure reliable army size. First, the exact number of regular soldiers is difficult to distinguish from the composite count, which also includes the number of support taxpayers. Further, with the exception of the Military Training Agency, none of the capital armies was a professional standing army: they divided men among rotational duties, which compounds the composite count of soldiers on duty at any one time. Nevertheless, army growth is undeniable in light of fuller data on certain years as well as narrative sources. By the early eighteenth century, the capital armies alone employed 166,654 regular soldiers, which supersedes the high estimate of 100,000 for the total Chosŏn military in 1475. Further, in contrast to the nonexistence of salaried soldiers prior to the Imjin War, Chosŏn employed approximately 10,000 professional military men in the capital by 1672.⁷⁷ Finally, the increase of *kunaek*, most of which include the number of support personnel, also suggests that the Korean military was drastically expanding its fiscal foundation by procuring more tax revenue.

Managing a growing army of musketeers was dauntingly expensive, a venture that left the Chosŏn state in perpetual financial crisis during the seventeenth century. At a fundamental level, fiscal difficulties plagued most, if not all, early modern gunpowder states because firearms warfare encumbered its host states with unprecedented demands for standardized drilling regimes, competent officer corps, reliable firearms, regular supply of gunpowder, and distribution of military manuals. In Chosŏn Korea, the Military Training Agency was the most potent source of financial distress because it was a professional army that employed salaried men, manufactured firearms, and provided its soldiers with

⁷⁶ Han'guk Yŏksa Yŏn'guhoe 2003.

⁷⁷ *Hyŏnjong kaesu sillok* 26, 1672/9/19 (Sinmyo) as cited in Kim 2003, 321. The original text is as follows: 今則砲手數至五千五百餘人, 此外又有別隊千人, 御營兵千人, 精抄五百, 禁軍七百, 各廳軍官且近萬人, 比之丙子前, 則其數倍蓰矣.

food and clothing.⁷⁸ The sustenance of this agency alone used up one-fourth of the Ministry of Taxation's budget in 1595⁷⁹ and as much as two-thirds by the late seventeenth century.⁸⁰ Combined with costs from other capital armies, military expenditure as a percentage of total state budget in late seventeenth-century Chosŏn was probably comparable to that of France during Louis XIV's reign and the English Commonwealth in the 1650s, which were, respectively, 75 percent and over 90 percent, though the latter is an extreme anomaly.⁸¹

In order to meet these expenditures, Chosŏn armies turned to a variety of independent fiscal initiatives. The agency was the most active, managing numerous garrison farms inside and outside the capital for agricultural products and tradable goods⁸² as well as generating revenue through manuscript printing⁸³ and shipping transportation. Further, with special permission from the state, soldiers of the agency also worked as merchants after duty. Having moved to the capital with their entire families, these men and their kin established marketplaces in Seoul such as the one in the region of Ch'ilp'ae. Soldiers of the Military Training Agency constituted more than ten percent of the total number of households in the capital, and they developed highly competitive businesses, most notably in the area of manual industry.⁸⁴ Whether these economic activities bolstered the agency's treasury is not clear, but they certainly were potent accelerators of commercialization in the capital.

Despite these fiscal initiatives, the drastic growth in military expenditures necessitated institutional adjustments, particularly in the systems of taxation and state control. In 1602, Sŏnjo adopted a supplementary tax to finance the Military Training Agency. Known as the "three military skills rice tax" (*samsumi* 三手米), this surtax was gathered from five provinces to pay salaries for the Military Training Agency, a practice made permanent in 1606.⁸⁵ Military needs also accelerated broader economic reforms, most notably the promulgation of the "Law of Great Equity" (*Taedongbŏp* 大同法). As noted by historian No Yŏnggu, King Hyojong implemented the *Taedongbŏp* reforms to recover from the fiscal calamity of the 1650s, a state resulting partly from the destruction in the wake of the Manchu invasions but also from the financial burdens

⁷⁸ No 2007, 50.

⁷⁹ Song 2006, 26.

⁸⁰ Kim 2003, 149.

⁸¹ Parker 2000, 62.

⁸² Song 2006, 21-37. See also Kim 2003, 174-91.

⁸³ Song 2009.

⁸⁴ Kim 2003, 287-91.

⁸⁵ Palais 1996, 86.

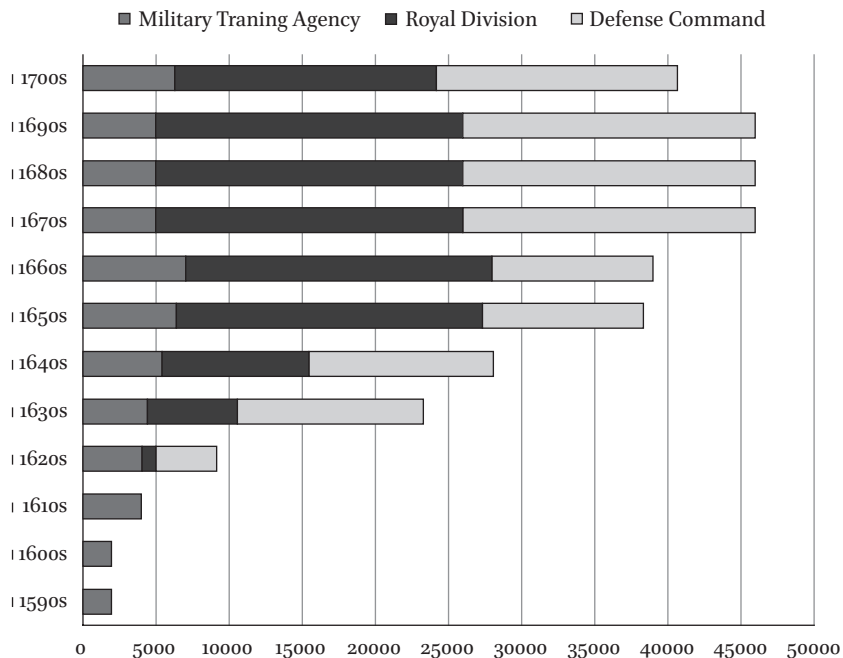


Figure 2: Central Armies of Chosŏn, 1593-1704. This graph shows the dramatic increase in army strength (*kunaek* 軍額) from 1593 to 1704 in three central armies of Chosŏn—the Military Training Agency (*Hullyŏn Togam* 訓練都監), the Royal Division (*Ŏyŏngch'ŏng* 御營廳), and the Defense Command (*Suŏch'ŏng* 守禦廳). The highest number of army strength was taken at ten-year intervals. (See corresponding table and citation for each data point in the Appendix section.) Although there was a total of five central armies in late Chosŏn, which came to be known as the Five Military Divisions (*Ogunyŏng* 五軍營), this graph excludes two armies—the Anti-Manchu Division (*Ch'ongyungch'ŏng* 摠戎廳) and the Forbidden Guard Division (*Kŏmwiŏng* 禁衛營)—because their data on army size were sparse and unreliable.

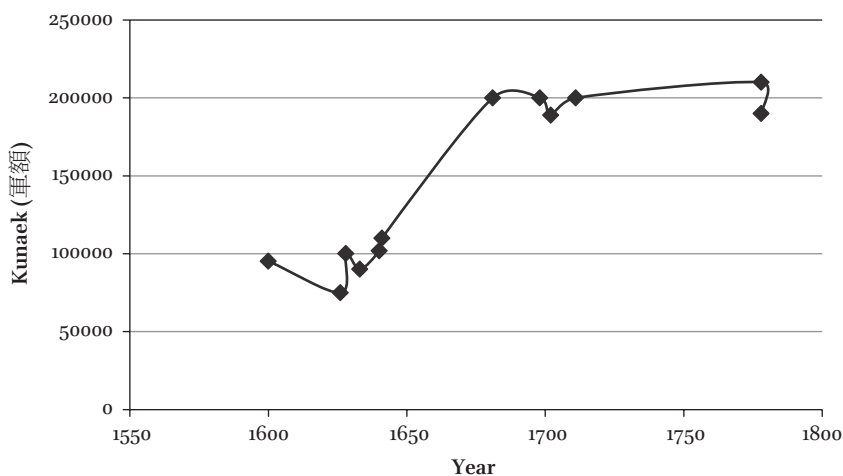


Figure 3: Regional Armies of Chosŏn. This graph shows the change in *kunaek* of Chosŏn's regional militaries, particularly their Sog'o Army (東伍軍), which were modeled after Chinese general Qi Jiguang's "Control-the-Ranks Method" (束伍法). See the corresponding table in the Appendix section and Kim 2001, 127.

of Hyojong's ambition of raising 10,000 elite musketeers.⁸⁶ The ensuing reform introduced a new uniform land surtax that allegedly reduced the burden of the commoner taxpayers as well as rectifying the existing inefficiencies of "indirect payment and regional differences of taxing."⁸⁷ To enhance such mechanisms of taxation, Hyojong also reinforced census-taking: during his reign, registered households increased from 15,760 to 23,899 in the capital alone and from 658,771 to 1,313,453 in total.⁸⁸ The wide-ranging impact of the musketry revolution on the Chosŏn state remains an intriguing matter of further research, but available sources suggest that Chosŏn was increasingly concerned with managing its military through centralized conscription methods and tax reforms during the seventeenth century.

But is this enough to suggest a Korean Military Revolution? I would say yes. In describing gunpowder-propelled military reforms, historian Peter Lorge defines a revolution as a "permanent change," one in which a "new idea or

⁸⁶ No 2007, 50-52.

⁸⁷ Choe 1963, 21-23.

⁸⁸ Han 1970, 309, as cited in Atwell 1990, 680-81.

device became ubiquitous and indispensable to an institution, society, or practice, particularly if the invention drastically altered previous functions.”⁸⁹ In accordance with this definition, Chosŏn underwent a revolution in military strategy and tactics during the seventeenth century: not only did the adoption of muskets permanently revamp the Korean military apparatus around a firearms-based way of warfare, but it also accelerated broader institutional changes across the Chosŏn state and society, challenging previous Korean practices of commerce, conscription, census-taking, and taxation. Yet, although Korean military reforms were radical by local standards, they can also be deemed “incomplete” from Eurocentric indices of comparison: the Korean Military Revolution was largely confined to a “musketry revolution” and, for reasons that will be elaborated later, was limited in other areas such as fiscal mobilization and social reform. In this sense, the Korean Military Revolution was at once efficacious and incomplete, successful in musketry reforms but limited in many other aspects of war-making.

From Invaded to Indebted: Facing the Manchu Juggernaut

Before Chosŏn musketeers fought as auxiliary troops for the Qing, the Manchus were their bitter enemies. During the Manchu invasions of 1627 and 1636, Korean musketry tactics were put to the test, perhaps too early, against the mighty Manchu cavalry. At the time, the Manchu army was an unparalleled juggernaut of war, superior in number and experienced in field battle as well as siege tactics. Its battle-hardened cavalry trampled Korean defenses in a blitzkrieg and subjugated the Korean King Injo to the Manchu leader Hong Taiji in 1636. Consequently, Chosŏn’s long-standing allegiance with Ming China gave way to a new patron-client relationship with the Manchus of the Qing dynasty. In this political transition, Korean musketeers played an important role as auxiliary troops embroiled in the Ming-Qing military conflicts: as their worth was increasingly recognized in continental East Asia, both sides coveted and exploited the Korean musketeers. Interestingly, musketry tactics seem to have improved and taken root ever more deeply in the Korean military as they were pitted against their nemesis—Manchu cavalry.

The first time Korean musketeers became embroiled in the Ming-Qing conflicts was through the Sarhū battle (薩爾滸之戰) of 1619 when they fired at the Manchus and fought alongside the Ming Chinese. During this conflict, Korean

⁸⁹ Lorge 2008, 20.

troops accompanied the Ming in a full-fledged attack on Nurhaci, Hong Taiji's father, at his home base, Hetu Ala. Participating in the battle were P'yŏngan Provincial Governor Kang Honglip 姜弘立 and his army of 13,000, including as many as 10,000 musketeers.⁹⁰ The allies significantly outnumbered the defenders but Manchu horsemen, using swift cavalry charges, crushed Ming forces equipped with matchlocks and cannons. On the northern front of the battle, Korean musketeers failed to deliver organized fire and were slaughtered after firing only one salvo. On the eastern front, in contrast, five hundred Korean musketeers stood their ground and fought effectively as vanguard forces. Breaking up into squads and firing volleys, they shot down many Manchus until their Chinese allies surrendered and obstructed the chain of fire. Ultimately, the Manchus prevailed and Kang Honglip surrendered with the majority of his troops.⁹¹

The Sarhū battle served as a barometer to redirect Chosŏn military policies after 1619. As Yi Min-hwan 李民奐, Chief Administrative Officer of the expedition reflected, muskets were no longer considered invariably effective, at least not in field battle without proper protection:

The musket is a military skill that allows shooting from great distances but is very slow to reload gunpowder and fire. If its use does not rely on a fortress or rough geography, the musket is never something to be tested against cavalry in the plains. Last year, our military bore the brunt of cavalry charges by only relying on musketeers and the enemy cavalry dashed into the heart of our formation even before our musketeers finished reloading.⁹²

At face value, Yi's proposition seems to support historian Kenneth Chase's suggestion that early firearms, due to their slow rate of fire, were invariably ineffective against nomads in Northeast China.⁹³ However, as shown above, Yi's argument is conditional: musketeers fail in open fields without reliance upon "a fortress or rough geography."⁹⁴ Further, from the measured success of the Korean musketeers on the eastern front, the Chosŏn military recognized that coordinated fire by disciplined musketeers could hold reasonably well against

⁹⁰ No 2002, 108-9. No cites Yi Min-hwan, Chief Administrative Officer of the Korean expedition, that there were as many as 10,000 musketeers. See also Kim 2013, 120-32.

⁹¹ No 2002, 108-9. See also No 2010, 178-80, and Kim 2010.

⁹² Yi Min-hwan, *Chaam chip*, j. 6, 建州聞見錄, as cited in No 2002, 111.

⁹³ See Chase 2003.

⁹⁴ Chase 2003.

the Manchu cavalry.⁹⁵ Hence, increasingly bent on developing rigorous drill and raising elite musketeers,⁹⁶ the Korean army devised methods of supplementing and protecting its musketeers with close combat units and cavalry, and, as shown during the Manchu invasion of 1636, sought to use fortresses and topography to its advantage.

Anti-Manchu tactics loomed large in the Chosŏn court during Prince Kwanghae's reign (1608-1623), in the crucial period between the Imjin War and the Manchu invasions. Like his father Sŏnjo, Kwanghae was a proponent of firearms: his military strategy was to reinforce northern defenses by procuring more firearms and fortifications. As one of his officials outlined, Chosŏn's best method of defense was to build a chain of strongholds along the Yalu River and garrison them with as many firearms as possible:

The only weapon that the barbarians fear is firearms. We must send more musketeers to both the upper and lower regions of the Yalu River in P'yŏngan Province and have them garrison each fortress there to stop the Manchus in their tracks. If they cross the river, they will gallop fiercely through the plains with their numerous cavalry, which is their talent. Our method of defense is thus to avoid their forte—to build fortresses and stand guard. If the barbarians encroach upon our strongholds, we must employ our firearms altogether to crush their vanguard. Then, since their cavalry's weakness is in siege warfare, we may be able to emerge victorious.⁹⁷

Indeed, Kwanghae reinforced fortresses in the P'yŏngan Province and expanded firearms manufacturing from the Armory of Muskets (鳥銃廳) into a Firearms Manufacturing Agency (火器都監), which managed production with unprecedented fiscal support and specialization of labor.⁹⁸

The next Korean king, Injo, replaced Kwanghae through a coup in 1623 and took a more pugnacious stance against the Manchus. Upon his enthronement, Injo prepared for a likely war with the Manchus. He strengthened the provincial army of P'yŏngan and formed a major defense line around 30,000 elite soldiers, including a 15,000-strong reserve army under General Yi Gwal 李适.⁹⁹ Nonetheless, an untimely revolt by General Yi in 1624 left Chosŏn's crucial

⁹⁵ No 2010, 180.

⁹⁶ No 2010, 180.

⁹⁷ *Kwanghaegun Ilgi* 129, 1608/6/23 (Kyŏngjin). The original text is as follows: 且聞此虜所懼，惟在於砲。平安一道上下江邊，多送砲手，防戍各堡，以礙此虜之來。虜若渡江，則平原馳突，萬騎齊發，此其所長，在我御敵之道，當避其所長，而嬰城自守，虜若近城，齊發銃砲，以挫其銳，則鐵騎圍城，此其所短，或可制勝。

⁹⁸ Yi 1998, 226-45.

⁹⁹ No 2010, 186.

northwestern defenses in shambles. Yi's rebellion was a frustrating setback to Korean military preparedness because his insurgent forces were special anti-Manchu units designated to counter the possible invasion. Further, remnants of Yi Gwal's insurgent group defected to the Manchus and allegedly facilitated the first invasion.

The Manchus found Chosŏn in this weakened state in 1627. Determined to eliminate the military threat from the rear, Hong Taiji sent 30,000 elite Manchu cavalry into Chosŏn. On January 14, 1627, the Manchu army penetrated the region of Ŭiju, a strategic defense point in P'yŏngan comparable to China's Shanhai Pass, and quickly galloped southwards. It took the Nŭnghan Fortress on January 21 and P'yŏngyang on January 24, forcing King Injo to flee to Kanghwa Province. But, as Korean resistance grew steadily and the Ming renewed activity in the Liaoning region, the Manchus grew weary and settled with peace negotiations about two months after the invasion.¹⁰⁰

Chosŏn was better prepared for the second invasion but the Manchus were also more numerous and powerful. In 1636, Hong Taiji launched a three-pronged attack on Chosŏn's northern defense line with a formidable army of 100,000 men, composed predominantly of cavalrymen but also including Han Chinese infantry and artillery divisions such as that of the Ming defector Kong Youde 孔有德. This time, Chosŏn's initial defense system was more successful: fortresses along the northwestern border repelled the intruders with their forbidding defensive fire. For instance, Prince Dodo's western division of 30,000 men struggled to take a stronghold garrisoned by 3,000 defenders in the region of Ŭiju and decided to march past it instead.¹⁰¹ Similarly, Hong Taiji and his main division avoided engaging directly with the fortress held by General Yu Lim 柳琳, a shrewd Korean commander who would later defeat the Manchus in the Battle of Kimhwa.¹⁰²

Once the Manchus circumvented the northern defense lines, they galloped fiercely into the heartland of Chosŏn. On December 14, only six days after crossing the Yalu River, their vanguard cavalry arrived at the vicinity of Hansŏng and obstructed Injo's plans of building a secondary home base in the highly militarized Kanghwa province. Instead, Injo had to flee to the Namhan Mountain Fortress where the fate of the invasion would be sealed. Upon entering the fortress, Injo had a total of 13,800 defenders, composed of three capital

¹⁰⁰ Kukpang Kunsu Yŏn'guso 1994, 306-35. The Manchu forces were predominantly cavalrymen but also included Han Chinese infantry and artillery divisions such as that of Kong Youde.

¹⁰¹ Kukpang Kunsu Yŏn'guso 1994.

¹⁰² Kukpang Kunsu Yŏn'guso 1994, 345-46.

armies—the Military Training Agency, the Defense Command, and the Anti-Manchu Division—and five prefectural armies.¹⁰³ Nonetheless, the fortress only contained enough grain to feed an army of 10,000 for a month, which was insufficient for the total population of 14,300 inside the fortress.¹⁰⁴ Injo's plan was, therefore, to hold out as long as possible while waiting for his provincial armies to break the Manchu siege.¹⁰⁵

The story of the Korean provincial armies hurrying to save King Injo is worth following in detail, but what is particularly intriguing for our purposes is to analyze rare confrontations like the Battle of Kimhwa where Korean infantry prevailed against the Manchu cavalry. The Battle of Kimhwa pitted Chosŏn's best provincial army from P'yŏngan, a region known to produce excellent marksmen, against Qing's eastern division. Led by governor Hong Myŏnggu 洪命耆 and vice-governor Yu Lim, the P'yŏngan army marched south to counter the Manchu siege and, on January 28, encountered 6,000 Manchus en route.¹⁰⁶ A total of 5,000 soldiers, the P'yŏngan forces, like other provincial armies, were composed of three types of infantrymen—musketeers, archers, and swordsmen/spearmen. Commander Hong's contingent was resolved to face the Manchu cavalry in the open field, and he organized his army into three echelons, respectively, in the order of musketeers, archers, and swordsmen/spearmen.¹⁰⁷ On the other hand, Yu, preferring to establish his base on higher ground, placed his infantry to the right of Hong's contingent on a hill that resembled “the bee's back,” one with a narrow middle section and isolated on three sides by the mountain.¹⁰⁸ Interestingly, Yu organized his echelons in reverse order, respectively, swordsmen/spearmen, archers and musketeers. Both contingents used wooden barriers to enclose their defensive area and to obstruct the cavalry.¹⁰⁹

In the early morning of January 28, 6,000 Manchus commenced an attack on Hong's contingent. Manchu cavalry numbering about 1,000, together with an infantry force of 3,000, attacked the Koreans with their cannon and bows, advancing and retreating three or four times.¹¹⁰ Hong's musketeers resisted

¹⁰³ Kukpang Kunsu Yŏn'guso 1994, 350-51.

¹⁰⁴ Kukpang Kunsu Yŏn'guso 1994, 351-52.

¹⁰⁵ Kukpang Kunsu Yŏn'guso 1994, 350-54.

¹⁰⁶ Kukpang Kunsu Yŏn'guso 1994, 380-82.

¹⁰⁷ Kukpang Kunsu Yŏn'guso 1994, 380-82.

¹⁰⁸ Nam Ku-man, *Yakch'ŏn chip*, j. 17, 統制使柳公神道碑銘, 1320. The original text is as follows: 自陣于其左柏田之阜。阜三面陡絕。一面連山。亦中斷如蜂腰。

¹⁰⁹ Kukpang Kunsu Yŏn'guso 1994, 380-82.

¹¹⁰ Kukpang Kunsu Yŏn'guso 1994, 380-82.

admirably, crushing the Manchu advances with defensive fire, until a few thousand crack Manchu troops circumvented the mountain and ambushed the defenders from the rear. Hong's contingent was defeated.

Overlooking the altercation below, Yu Lim failed to lend support to Hong due to other Manchu soldiers obstructing the path between the two Korean contingents. Instead, Yu, a shrewd and composed commander, braced his army up for imminent battle. Around early afternoon when the Manchus charged towards Yu's contingent, his Korean musketeers played a crucial role in deterring them: their controlled fire at close range obliterated the Manchu cavalry.¹¹¹ After the initial confrontation, the Manchus repeatedly attacked Yu's men throughout the day but were repelled by the fierce defensive fire every time. Here, the difference in Yu's arrangement of layers, which I mentioned earlier—swordsmen/spearman, archer and musketeer—came into play. Surprisingly, Yu ordered his musketeers and archers to hold fire until the Manchu cavalry were within the range of ten paces. Protected by the mountain and the close-combat units at the forefront of the battle line, Yu's long-range military units would then fire full force at the encroaching enemy less than ten paces away.¹¹² At this deadly close distance, the musketeers supposedly killed two or three with one bullet (九輒貫數三人).¹¹³

The Manchus continued their attack throughout the day, but Yu's parsimonious usage of munitions sustained the Korean defensive fire for the entire day. During the last Manchu attack in the evening, Yu ordered ten elite musketeers on a special mission to kill a Manchu general. Hiding in the forest outside the blockades, they opened fire on the enemy general who was mounted on a white horse and killed him.¹¹⁴ In the end, the Manchus were reduced to less than one-tenth of their original force and retreated around sunset.¹¹⁵ According to a Korean witness hiding in the vicinity, it took more than three days to burn their dead bodies.¹¹⁶

In the Battle of Kimhwa, the Korean infantry delivered controlled, sustained musketry fire and inflicted heavy casualties on Manchu horsemen. Further, as

¹¹¹ Song Siyöl, *Songja taejön*, j. 136, 記金化戰場事實, 50. The Chinese text is as follows: 兵使先已斫倒柏樹以爲柵。其前營之在柵外者已躡於初。監司餘兵。與賊相雜。突至柵外。兵使之砲矢亂發。賊與我軍俱殲焉。時則日已未矣。

¹¹² Song Siyöl, *Songja taejön*, j. 136, 記金化戰場事實, 50. The original text is as follows: 賊又衝突兵使陣。直抵柵外十餘步。然後衆砲竝發。賊一時如掃。一無遺者。

¹¹³ Nam Ku-man, *Yakch'ön chip*, j. 17, 統制使柳公神道碑銘, 1321.

¹¹⁴ Song Siyöl, *Songja taejön*, j. 136, 記金化戰場事實, 50.

¹¹⁵ Song Siyöl, *Songja taejön*, j. 136, 記金化戰場事實, 50.

¹¹⁶ Pak T'ae-bo, *Ch'ongjae chip*, j. 4, 86-87.

also shown in the battle of Kwanggyo, the ability of elite Korean musketeers for selective shooting is noteworthy: they were able to strategically eliminate Manchu generals, which caused havoc in the Manchu army. The success of Yu's tactics was in the excellence of his musketeers, the favorable location, and the carefully controlled volley fire of muskets and bows. However, despite having secured a decisive victory, Yu Lim's men could not linger. Yu and the remainder of the P'yongan provincial army resumed their march towards the Namhan castle. He arrived in its vicinity on February 3, but by then the Korean King Injo had already submitted to Hong Taiji.

The provincial armies never made it to the Namhan castle in time, but Injo and his men had resisted admirably. Shortly after he entered the fortress, Hong Taiji's main division arrived in the vicinity and besieged Namhan castle with 70,000 men. Notwithstanding the numerical disadvantage, the Koreans effectively repelled most Manchu attacks with their muskets and cannon, forcing the Manchus to limit their offensive to small-scale confrontations and to wear out the defenders.¹¹⁷ Indeed, as resources quickly diminished, the Koreans became demoralized and debilitated. Many Chosŏn soldiers and horses either starved or froze to death. Even King Injo had to skip meals.¹¹⁸

In January, the Manchus increased the frequency and intensity of their aggression against the starving defenders. They employed elaborate siege-works to attack the fortress from multiple fronts, but Korean sorties based on cannon fire and effective infantry tactics again thwarted the attempt. On January 24 in particular, the Manchu artillery barraged the Eastern Gate, garrisoned by soldiers of the Military Training Agency, but was frustrated by the lethal counterfire.¹¹⁹ The defenders returned concentrated fire against the Manchu artillery platform and managed to blow up its gunpowder reserves, killing dozens of gunners and a Qing general.¹²⁰ Later that day, the Manchus launched another fierce artillery attack against the Korean walls outside the South Gate, only to recoil from a tougher counterfire. The Manchu artillery was anything but successful. Some Korean walls crumbled under repeated bombardment, but overnight repairs made by the defenders only frustrated the Manchus further.

Despite Korean resistance, Injo's stand in the Namhan fortress soon came to a close. On January 27, the Manchus conquered Kanghwa Province and captured Injo's princes. This, together with famine, illnesses, and continued

¹¹⁷ Kukpang Kunsu Yŏn'guso, 355-67.

¹¹⁸ Kukpang Kunsu Yŏn'guso, 360.

¹¹⁹ Kukpang Kunsu Yŏn'guso, 363.

¹²⁰ Kukpang Kunsu Yŏn'guso, 363.

Manchu attacks, seriously demoralized the defenders of the fortress. The next day, Injo succumbed to the urgings of pro-Manchu factions in his court and surrendered to the Manchus, kowtowing three times to their leader Hong Taiji. Numerous concessions were made by the Koreans, and the Manchus of the nascent Qing dynasty replaced the Ming as Chosŏn's patron state.¹²¹

During the Manchu invasions, Koreans certainly faced no typical cavalry but perhaps the most lethal horsemen in the world. The Manchu army, superior in numbers and experienced in field battle, was a military juggernaut with no parallel in the world at the time. Its cavalry trampled Ming China, the world's first gunpowder empire,¹²² and erected a new empire in its place, a realm that would bring the vast Central Eurasian steppes under sustained control for the first time in history.¹²³ The Manchu military campaigns defeated the mighty Zunghar Mongols and other steppe peoples in the late seventeenth and early eighteenth century, a legacy of territorial expansion and consolidation that is still manifest in the current Chinese borders.¹²⁴

But Chosŏn was no easy prey. The Manchu victory was won with important contingencies that debilitated the Korean resistance. Firstly, the Chosŏn state was still mired in fiscal difficulties incurred by the Imjin War of 1592-1598, which significantly reduced the amount of cultivated land and undermined the state's mechanisms of taxation.¹²⁵ This fiscal predicament left the Chosŏn state in a bind when it sought to reinforce fortresses and supply sufficient gunpowder and munitions. Further, the untimely outbreak of General Yi Gwal's revolt in 1624 left Chosŏn's most crucial northwestern defenses in shambles before the first invasion. During the second invasion of 1636, numerous battles were lost due to logistical disparities such as the overwhelming numbers of the Manchus and the Korean lack of gunpowder and munitions.

In the end, despite Korean failure to rebuff the invasions, Hong Taiji spoke highly of the Chosŏn infantry and especially its musketeers: "The Koreans are incapable on horseback but do not transgress the principles of the military arts. They excel in infantry fighting, especially in musketeer tactics, and would be of great use when storming a fortress."¹²⁶ Indeed, Hong Taiji requested Korean

¹²¹ Kukpang Kunsu Yŏn'guso, 367.

¹²² Sun 2000, 75.

¹²³ Perdue 2005.

¹²⁴ Perdue 2005, 45.

¹²⁵ Perdue 2005, 671.

¹²⁶ *Qing Taizong shilu, Qing shilu*, j. 37, 494a, as cited in Liu 1971, 382. The original text is as follows: 朝鮮之兵、雖無馬上之能然不違法度。長於步戰鳥鎗以之攻取城池大為有用。

musketeers a total of eight times to join his fight against the Ming loyalists, and twice more against the Cossacks later. Among several battles against the Ming, the Korean musketeers were most lethal in the Jinzhou battle of 1641; they allegedly claimed 70-80 percent of Ming casualties¹²⁷ and devastated the Ming to the extent that they counted Korean heads for twice as much as Manchu heads.¹²⁸ These marksmen were the fruit of the Korean Musketry Revolution during the first half of the seventeenth century.

The Northern Expedition of 1654

As the Manchus withdrew from Chosŏn, they took Korean princes captive, one of whom later became King Hyojong, a martial king famous for his militarism. Upon Hyojong's return to Chosŏn in 1649, he was determined to take revenge on the Qing. He reinforced the Korean military with exceptional enthusiasm and conceived of grand schemes for "northern conquest" (*pukbŏl* 北伐), an ambitious irredentist plan to reclaim the Manchurian territories that had belonged to Korean ancestors.¹²⁹

The barbarians certainly have conditions for failure... all you officials suggest I not deal with military matters, but I will persevere because there is no telling when heaven-sent opportunities might present themselves. Therefore, I will raise 100,000 elite gunners, and cherish and care for them as if they were my children.

In this way, they will all be fearless before death. Afterwards, if we wait until a breach in their defenses, catch them off guard by advancing swiftly to the Shanhai Pass. How could there not be any loyalists and heroes in the central plains who will respond to this? Advancing until the Shanhai Pass is not too difficult, for the barbarians have not attended to their defenses. A thousand miles from Liaoning to Shenyang are left unguarded, lacking experienced mounted archers, and it would be as if entering an uninhabited region.¹³⁰

¹²⁷ *Injo sillok* 42, 1641/9/7 (Kyŏngjin).

¹²⁸ Yi Yŏ, *Yŏndo khaeng*, j. 14, 1656/9/8 (Kyech'uk). The original text is as follows: 搆能射命中。明師論功。虜頭半百金。麗頭倍之。東方將卒。

¹²⁹ Yi 1988.

¹³⁰ Song Siyŏl, *Songja taejŏn*, j. 116, 醒對說話, 138. The original text is as follows: 彼虜有必亡之勢... 群臣皆欲予勿治兵事。而予固不聽者。天時人事。不知何日是好機會來時。故欲養精砲十萬。愛恤如子。皆爲敢死之卒。然後俟其有罅。出其不意。直抵關外。則中原義士豪傑。豈無響應者。蓋直抵關外。有不甚難者。虜不事武備。遼瀋千里。了無操弓騎馬者。似當如入無人之境矣。

By “loyalists and heroes,” Hyojong referred to the dissident Han Chinese under Manchu rule as well as tens of thousands of Koreans who were forcefully taken away during the invasion. He believed that these men would rise up and join his ranks if his initial drive into Manchuria proved successful. Further, Hyojong speculated that the Manchus, preoccupied at the time with their southern front, were neglectful of their hinterlands in Manchuria where thousands of miles were allegedly left unguarded. Hyojong’s plan of action, then, was to march with his 100,000 gunners and conquer Manchuria.

Current historiography is divided on whether or not Hyojong’s plans of northern conquest were sincere, but Hyojong himself knew best the feasibility of his own plans. Having lived in Manchu barracks for eight years (1637-1645), he had developed keen insights into military matters:

Through the early trials and tribulations [that the Manchus] had me experience, I gained competency in things I originally was not capable of. From early on, they had me practice archery, horsemanship, and military formations. By allowing me to enter their camps, I became well acquainted with their terrain, roads, and towns. They had me stay for long enough, and I feel no fear towards them.¹³¹

Indeed, Hyojong championed the military over the civil and had a knack for martial arts, frequently riding horses and practicing the sword and the bow.¹³² During his years of captivity, Hyojong also participated in three major Manchu military campaigns against the Ming loyalists, including the Battle of Jinzhou in 1641, and probably understood the Manchus better than anyone in the Chosŏn court. Despite the seeming implausibility of Hyojong’s plan, which some scholars argue was just a pretext to strengthen his kingship, it was not chimerical, for it had a rationale of its own and hinged upon a considerable understanding of the Manchu military apparatus. Further, he was not a hopeless dreamer but an astute military strategist, an opportunist who was bent on increasing military preparedness while simultaneously using this very campaign to consolidate his political power.

Though Hyojong never fulfilled his dreams, his reign enabled a considerable strengthening of the Chosŏn military. Upon enthronement, Hyojong took extensive measures to reinforce the Royal Division, a firearms-based capital

¹³¹ Song Siyŏl, *Songja taejŏn*, j. 116, 醒對說話, 138. The original text is as follows: 且使予早罹患難。增益不能。且使予早習弓馬戰陣之事。

且使予入彼中。熟知彼中形勢及山川道里。且使予久處彼中。無有畏懼之心。予之愚意自謂天意於予。

¹³² Yi 1988.

army that had been founded by his father, Injo, in 1624. The Royal Division consisted mostly of musketeer units since its inception.¹³³ In accordance with his ambition to raise 10,000 musketeers, Hyojong designated this division as the main army for northern conquest and increased its number (*kunaek*) to as many as 21,000 in 1652.¹³⁴ Further, to increase the versatility of his military, Hyojong also instituted two special forces within the Royal Division—the Special Cavalry (別馬隊), which reinforced the anti-Manchu cavalry, and the Special Damage Troops (別破陣), which was an elite artillery division. In addition, Hyojong aimed to increase soldier numbers in the Military Training Agency to 10,000.¹³⁵ Although fiscal difficulties, crop failures, and famine thwarted his plans, the Military Training Agency reached its pinnacle during his reign, increasing to 6,350 soldiers by 1658.

During Hyojong's reign, Korean gunpowder technology continued to develop with the unexpected aid of shipwrecked Dutch sailors. Captured in 1626, Jan Jansz Weltevree, also known by his Korean name—Pak Yŏn, was the first Dutchman to contribute to the Chosŏn military: he allegedly served as a commander in the Military Training Agency and transmitted methods of manufacturing “Red Barbarian Cannon” (*hong yi pao* 紅夷炮) to Koreans.¹³⁶ Due to another shipwreck in 1653, Hendrick Hamel and his fellow Dutchmen were also conscripted into the Military Training Agency where they imparted their knowledge of musketry tactics and firearms manufacture to the Koreans.¹³⁷ Three years later, Hyojong had blacksmiths in the Military Training Agency develop a new type of musket based on the muskets that the shipwrecked Dutchmen brought.¹³⁸ Although records do not elaborate on this enhanced musket, it was almost certainly a flintlock—and thus an upgrade from the matchlock, which was already widespread in East Asia.¹³⁹

During this military buildup, the Manchus sent their first request for aid to fight against the Cossacks in 1654. Surprisingly, as historian Kye Sŭngbŏm points out, Hyojong was anything but reluctant to follow the Qing demands. As soon as word came, he willingly prepared his musketeers for the expedition, which is anomalous—considering the precedents of Korean resistance¹⁴⁰—and is

¹³³ No 2007, 42-43.

¹³⁴ *Hyojong sillok*, 8, 1652/6/29 (Kisa).

¹³⁵ Kim 2003, 108-11.

¹³⁶ Yun Haeng-im, *Sŏkche ko*, j. 9, 朴延, 148-49.

¹³⁷ No 2002, 156, 168.

¹³⁸ *Hyojong sillok*, 17, 1656/7/18 (Kapcha).

¹³⁹ No 2002, 147.

¹⁴⁰ Kye 2009, 150-233.

seemingly antithetical to his plans of revenge. His decision can be attributed to a multitude of factors including, as Kye explains, Chosŏn's lack of negotiating power and the reduced ideological burden of launching an "expedition" against Cossacks, another group of "barbarians," as opposed to one against the Ming loyalists.¹⁴¹

Still, the salient reason behind Hyojong's alacrity was related to the military. Firstly, the Korean court shared Manchu concerns about security in the Northern Manchurian lands. As shown in Hyojong's conversations with his officials, the encroachment of an unknown force was a legitimate concern to the Koreans, considering that only the Manchu town of Ningguta lay between the lower Amur region and the northern borders of Chosŏn.¹⁴² Secondly, Hyojong was curious about the geography of the Amur region and the martial capabilities of previously unidentified forces there such as the Cossacks and the Amurian tribesmen. From personal experience in the Manchu barracks, he would have realized that fighting alongside the Qing was an opportunity to gather valuable insights for his plan of northern conquest: his men could march into Manchuria without suspicion and learn about the Qing army, particularly about Ningguta. Indeed, after the first expedition, Hyojong inquired enthusiastically about the distances between strategic points along the Amur, the days required to travel amongst them, the size of the fortress in Ningguta, and the condition of the Qing navy.¹⁴³

Lastly, considering his militarism, Hyojong likely thought that the expeditions were a chance to test his men and accumulate experience in field battle. This is perhaps why he sent the best of his provincial musketeers—each selected out of twenty—and assured that they were equipped with the most reliable muskets and supplied with abundant gunpowder and ammunition. Such an active policy was unprecedented compared to previous cases of Korean aid troops for the Manchus, who were ill-equipped and sometimes even advised to fire empty rounds. Hence, contextualized in light of Hyojong's plans and the Korean military reform, the Northern Expeditions of 1654 and 1658 should be reinterpreted as an extension of Hyojong's schemes of northern conquest.

On March 26, King Hyojong sent Pyŏn Kŭp 邊爰, the second-in-command (北虞候) of Hamgyŏng province, and one hundred musketeers along with fifty-two logistics personnel on the Northern Expedition of 1654. The Big Heads

¹⁴¹ Kye 2009, 225-55.

¹⁴² Kye 2013, 218.

¹⁴³ *Hyojong sillok*, 14, 1655/4/23 (Chŏngch'uk).

departed from Hoeryöng, a northeastern border town in Hamgyöng province, and joined Manchu forces in Ningguta after eight days of travelling.¹⁴⁴ By the time the Koreans arrived in mid-April, the Qing had flexed its muscles and reinforced defenses in Ningguta with new forces and appointments. Particularly, their policy of relocating Daur villages away from the upper Amur into the valley of the Songhua River, a southern tributary of the Amur, was critical. This deprived the Russians of provisions and frustrated their efforts to establish permanent settlements.¹⁴⁵ Driven by pangs of hunger, the Cossacks abandoned the security of their fortresses and ventured into the inner reaches of the Amur valley where they encountered the Manchu-Korean allies in 1654.

In 1653, another Cossack conqueror, Onifrey Stepanov, had replaced Khabarov as the new voevoda and resumed activities along the Amur.¹⁴⁶ During the late fall of the same year, Stepanov and his hungry men sailed southward from the mouth of the Zeya River to gather provisions.¹⁴⁷ Their exact location is difficult to pinpoint, but Russian sources suggest they reached the lower reaches of the Amur and wintered at a Jucher village near the Nanai settlement.¹⁴⁸ When spring came, fifty more Cossacks from Lake Baikal joined Stepanov. With boosted confidence, they sailed towards the mouth of the Songhua River, a route his predecessor Khabarov had advised against.

On April 27, 1654, Stepanov and his men encountered the Manchu-Korean fleet after sailing three days on the Songhua River. Sarhuda's fleet was composed of 160 ships that carried a total of approximately 1,000 men.¹⁴⁹ In contrast, Stepanov's army had 400 men, composed of 370 Cossacks and some Amurian captives, and employed only 39 ships. Despite the apparent numerical disadvantage, the Russians held a distinct edge in shipbuilding technology and the combative competency of their individual soldiers. The Russian ships were significantly larger and more robust than those of the Manchu-Korean fleet: more than 80 percent of the fleet were extremely small boats that could only carry five and even the largest of the entire fleet could only carry seventeen people. Further, while close to half of the men on board the Manchu-Korean fleet were likely non-combatant mariners, each Cossack was an experienced fighter

¹⁴⁴ *Hyojong sillok*, 12 1654/2/2 (Kyehae).

¹⁴⁵ Perdue 2005, 88.

¹⁴⁶ Mancall 1971, 26.

¹⁴⁷ Mancall 1971, 27.

¹⁴⁸ Golder 1914, 51.

¹⁴⁹ Pak 1984, 27. See also Pak 1981, 62.

proficient with the musket.¹⁵⁰ Moreover, the Russians were already used to numerical disadvantage, for they had already suppressed countless Siberians and even the vast Qing army at Achansk with their firearms.

The records are unclear, but it seems that the Russian fleet outgunned the allies on water. Both sides exchanged fierce cannon fire and the Russian ships, owing to their large size and superior firepower, overpowered the allies. As Sin Yu's investigation in 1658 shows, the Russian warships had enormous bodies with a deck made out of thick planks and enclosed by layers of dense logwood. During his close examination of captured Russian vessels, Sin Yu noted later that these vessels were so robust that they could not be penetrated even using "Red Barbarian Cannon" (*hong yi pao*), then the most powerful type of cannon based on English and Dutch models.¹⁵¹ In contrast, the Manchu-Korean fleet comprised relatively tiny ships whose endurance and broadside firing paled in comparison with what the Russians had. Overwhelmed on the water, the allies abandoned their ships and fled inland.¹⁵²

Nevertheless, the Big Heads managed to secure a victory for the allies. Before the battle, Pyŏn Kŭp astutely suggested to Sarhuda that they station his musketeers on one side of the riverbanks, particularly, on a hill overlooking the confluence of the Songhua and the Mudan River.¹⁵³ Here, the Korean musketeers, along with 300 Daur and 300 Manchu soldiers, were to construct trenches and fire from higher ground. As the Russians closed in on the fleeing allies, Pyŏn Kŭp and his musketeers turned the tide of the battle by pouring volley after volley onto their climbing enemies. Taken aback, the Cossacks attempted to storm the trenches but were overwhelmed by the counterfire and eventually retreated to lick their wounds. As both Russian and Korean sources corroborate, the allies' fusillade from behind the trenches was lethal, inflicting severe casualties amongst the Russian ranks.¹⁵⁴ Using geography and defensive works to their advantage, the Big Heads played a crucial role in repelling the Cossacks.

¹⁵⁰ A large number of the Manchu army was non-combatants, including crews and servants who likely constituted most of Sarhuda's forces, except for the 400 gunners whose numbers were clearly shown. A particular observation of the Qing forces that went up to Nerchinsk in 1689 shows that only 1,500 out of 3,000 men were combatants. On the other hand, the Russians were mostly, if not all, combatants experienced in musketry tactics. See du Halde 1735, vol. ii, 308, as cited in Golder 1914, 54.

¹⁵¹ Golder 1914, 94.

¹⁵² Kye 2013, 224.

¹⁵³ Kye 2013, 223.

¹⁵⁴ Kye 2013, 225.

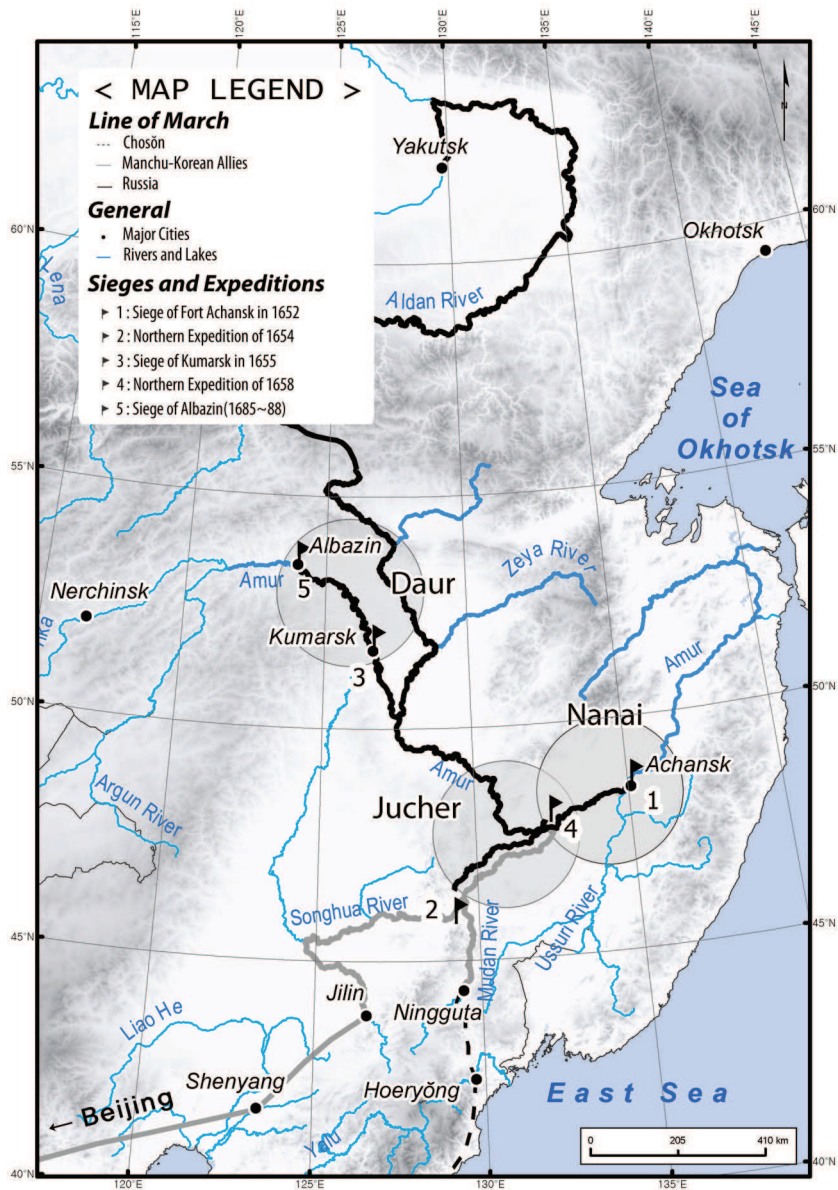


Figure 4: Map of the Amur Region. This map shows the sites of battles and sieges, major areas of Cossack activity, the distribution of the Mongol-Tungusic natives, and the marching routes of the belligerents.

The allies pursued the retreating Russian forces for the next three days. In the end, Stepanov's army fled up the Amur and even past the Zeya River where Stepanov had planned to establish a permanent fortress. Then the allies built an earthen fort on the Amur and retreated to Ningguta by June 13, completing an expedition of eighty-four days.¹⁵⁵ Later that month, Pyön Kŭp and all of his men returned to Chosŏn alive.¹⁵⁶ Pyön brought a sample of Russian gunpowder back to Hyojong as a gift, and Hyojong rewarded Pyön and the Big Heads generously.¹⁵⁷

This first clash between the Russians and the Manchu-Korean allies was not a conclusive victory. Though diminished and demoralized, Stepanov's forces were still alive and threatening and they continued to exert their influence along the Amur for the next few years. However, the Cossacks were certainly taken aback by the allies' counteroffensive, and particularly by the unexpected firepower of the Korean musketeers, whom they feared and referred to as "Big Heads." Four years later, during the second Northern Expedition, Sin Yu wrote of this encounter in detail:

In the year of *kabo* (1654), when our men went on an expedition [to the Amur], although there were no repeated engagements, the enemies could not withstand the battle and retreated after suffering many casualties. Thereupon, it is said that the enemies have come to regard the Big Heads with extreme fear after this encounter. That which is called Big Heads refers to men from our country who all wear feathered hats (毛笠). Hence, they called them Big Heads.¹⁵⁸

The Northern Expedition of 1658

After the battle of 1654, Stepanov established winter quarters on the Kumar River where he rebuilt an old fortress called Kumarsk that had been founded by his predecessor Khabarov.¹⁵⁹ Stepanov anticipated further Qing attacks in the spring and took particular care in constructing a redoubtable fortress that could withstand a Manchu siege. Kumarsk had earthen walls that could endure heavy artillery fire and four bulwarks reinforced by a "double row of palisades"

¹⁵⁵ Kye 2013, 226.

¹⁵⁶ Pak 1984, 28.

¹⁵⁷ *Hyojong sillok*, 13, 1654/7/3 (Kyŏngin).

¹⁵⁸ Sin Yu, *Kugyŏk Pukchŏng ilgi*, 71. The original text is as follows: 甲午我軍征後之時。雖無累次交戰之事。彼賊不能抵當且多死傷而逃走。故其後賊人至稱大頭人甚可畏云。所謂大頭者。我國之人。皆着毛笠。故謂之大頭云。

¹⁵⁹ Mancall 1971, 27.

that allowed for effective defensive fire from raised platforms.¹⁶⁰ The fortress was further reinforced by “a ditch six feet deep and twelve wide” and “iron spikes and spike traps,” in addition to a system of pipelines that channeled water around the fort to prevent fire.¹⁶¹ Although descriptions are insufficient to tell how similar this fortress was to the famous *trace italienne*,¹⁶² Kumarsk was probably an impressive stronghold that did not pale too much in comparison to the Italianate designs.

Stepanov’s meticulous preparations paid off in 1655 when a powerful Qing army of 10,000 men led by Mingandali 明安達理 besieged Kumarsk. On February 16, the Qing army appeared with “fifteen cannons, many matchlocks and storming apparatus.”¹⁶³ Despite their nomadic origins, the Manchus employed effective storming apparatus, constructed layers of batteries, and assaulted the Russian defenses by surprise. However, the outnumbered defenders resisted admirably and their defensive structures, together with their effective use of firearms, repulsed the Manchu assaults. After days of fierce fighting that yielded no conclusion, the Qing army retreated due to low provisions.¹⁶⁴

After receiving the news of the failed siege, Sarhuda probably realized that fighting the Russians behind their fortified walls was futile. He decided to meet the Russians again on the river, as he had done during the battle of 1654. To reinforce his flotilla, Sarhuda established shipyards on the upper Songhua River in 1657 and embarked on a massive shipbuilding project. A request for musketeers was sent to Korea once more, this time asking for two hundred musketeers and self-sufficient provisions.¹⁶⁵

General Sin Yu led the second expedition in 1658. An erudite man from a family of military elites, Sin was a keen, judicious general whose temperament was in stark contrast with Sarhuda who comes across as cunning and avaricious. Sin Yu’s diary bespoke his observant, meticulous personality and his consideration for his men and his country. He lamented over the loss of his men and took care to record the names of every injured or deceased soldier. Diplomatic and circumspect, he also sought the best interest of his country when Qing officers attempted to unjustly appropriate Chosŏn’s provisions or extend his army’s

¹⁶⁰ Ravenstein 1861, 29.

¹⁶¹ Ravenstein 1861, 29.

¹⁶² Also known as star fort, the *trace italienne* was a hallmark of the European military revolution. Its polygonal bulwarks eliminated dead zones in defensive fire and its low, earthen works could withstand heavy artillery fire.

¹⁶³ Ravenstein 1861, 28-29.

¹⁶⁴ Mancall 1971, 27.

¹⁶⁵ Sin Yu, *Kugyŏk Pukchŏng ilgi*, 14-15.

stay in Ningguta after the battle of 1658. In the end, Sin managed to minimize the costs of the expedition and to bring back a Russian flintlock as war booty, obtaining it only after pleading with Sarhuda for weeks.

On May 9, Sin Yu arrived at Ningguta with two hundred musketeers and sixty logistics personnel.¹⁶⁶ Having received the news that the Russians were lurking nearby, the Manchus and their Amurian allies were already busy making preparations. Only a day after Sin's arrival, Sarhuda ordered the allies to set sail towards the mouth of the Songhua River where the natives had been relocated away from the Cossacks. The allies benefited greatly from the help of the Juchers, who provided large, well-crafted ships and shared their knowledge of river currents.¹⁶⁷ After five days of voyaging, the Manchu-Korean allies ran into another group of Juchers who informed them that the Russians had arrived at the mouth of the Amur. The next day, the allies stopped at the mouth of the Songhua River where Jucher villages covered the landscape. Here, Sarhuda waited for fifty of his best warships carrying reinforcements from Beijing and Shenyang.¹⁶⁸

These newly constructed warships were part of Sarhuda's grand scheme of naval strengthening vis-à-vis the Russian flotilla. Shipyards were established on the upper Songhua, where the city of Jilin now stands, an area known to be bountiful in lumber resources. The Manchus employed Han Chinese shipbuilders to construct large warships that could stand up against Russian vessels in combat. Although Sin Yu seemed convinced of Russian naval superiority until the end, Sarhuda's undertaking was quite fruitful. His shipbuilding initiative employed six hundred Han Chinese craftsmen and carpenters who, over eight months, produced a flotilla of fifty-two ships, forty of which were large and made of thick planks and twelve of which were smaller but of the same design. After completing the construction, the shipbuilders served as mariners in the fleet. The Qing fleet also mounted fifty cannons of various sizes, which were operated by a hundred artillerymen dispatched from Beijing.¹⁶⁹ Having departed from Jilin on May 6, the flotilla made slow progress down the Songhua due to the river's lower water level.

The allies waited for fifteen more days at the mouth of the Songhua River. While the wait before an impending battle can perturb men, this idle time seems to have inspired reflection in Sin Yu. During this interval, his diary

¹⁶⁶ Kye 2013, 230.

¹⁶⁷ Sin Yu, *Kugyŏk Pukchŏng ilgi*, 67.

¹⁶⁸ Sin Yu, *Kugyŏk Pukchŏng ilgi*, 70.

¹⁶⁹ Sin Yu, *Kugyŏk Pukchŏng ilgi*, 82.

provides valuable data about the military practices of the allies, particularly, about their way of musketry drill and the relative competence of the Big Heads. Sin Yu writes in detail about three musketry shot drills, which used a surprisingly narrow target (1.6 meter tall and 10 centimeters wide) placed 72 meters from the point of fire. During the first drill, forty out of two hundred Korean musketeers hit the mark. They showed improvement in the second drill with sixty-five hitting the target. The Koreans shot three rounds during the third practice, 123 hits in total with two musketeers scoring all three times and thirteen scoring twice. Calculating an average from these three drills and two others during the expedition, the Koreans scored an average of 25 percent accuracy, with the highest rate being 32.5 percent and the lowest 20 percent.¹⁷⁰

The accuracy rates seem low by modern standards but are actually quite impressive. Unlike the usual Korean practice of placing targets (7 feet tall and 2 feet wide) 120 meters away from the point of fire, the Big Heads—perhaps because they were elite recruits from regional armies—used an anomalously narrow target. Together with the difficulty of shooting anything 10 centimeters wide with a relatively inaccurate seventeenth-century musket, the Big Heads fared very well, a feat that seems to defy the principles of smoothbore ballistics and that would have been virtually impossible for a contemporaneous European shooter.¹⁷¹ Further, their marksmanship was superior to that of the one hundred Qing musketeers from Ningguta who were maladroit with the musket. According to Sin Yu's observations from the second drill, more than half of the Qing musketeers were not proficient in the technique and only very few of them hit the target.¹⁷² These comparative data suggest that the Big Heads significantly boosted the allies' firepower; there were twice as many Korean as Qing musketeers, and the former were far better marksmen.

Five days before the arrival of the warships, forty Nanais approached the encampment. According to Sin Yu, the Manchus regarded these Nanai defectors as potentially duplicitous, having served the Russians at Fort Achansk. Sin speculates that the Nanais, after hearing of a large Qing army, probably came to re-align their allegiance with the Manchus, and to offer military information from the Russian camp in exchange for protection. However, the Nanais' information seems to have been specious: they allegedly told the Manchus that the Russians were about to surrender because they had suffered significant losses in repeated clashes with the Qing and were low on provisions. The Manchus

¹⁷⁰ Sin Yu, *Kugyŏk Pukchŏng ilgi*, 73-75.

¹⁷¹ Hall 1997, 134-48.

¹⁷² Sin Yu, *Kugyŏk Pukchŏng ilgi*, 73.

distrusted these informers because they could be offering a false sense of security.¹⁷³ Nevertheless, through the migration of these people back and forth, important military information seems to have leaked out from both sides. Sin Yu also thought it was likely that the Cossacks knew the Big Heads had been dispatched once again, for many Nanais were already gossiping about this.

The long-awaited reinforcements arrived on June 2, and the flotilla set sail at daybreak three days later. Propelled forward by an auspicious wind, the allies advanced swiftly towards the junction of the Amur and the Songhua.¹⁷⁴ On June 10, after passing about ten kilometers beyond the mouth of the Amur, they sighted Stepanov and his fleet.¹⁷⁵ In the ensuing battle, a Russian army of about five hundred Cossacks was pitted against the combined Manchu-Korean forces of approximately 1,400 soldiers, a thousand of whom were mariners and infantry units such as swordsmen, spearmen, and archers, and four hundred of whom were gunners employing cannons and matchlocks.¹⁷⁶ As in the Northern Expedition of 1654, the allies were more numerous, but again, this discrepancy was probably mitigated by the large proportion of non-combatants in the allies' fleet and the relatively high percentage of effective Russian troops.

The allies pursued Stepanov's fleet as soon as it came into sight. The Russian ships then raised their sails and swiftly retreated five kilometers to line up in defensive formation along a riverbank. The Cossacks were roused to action, attentively watching the Qing fleet's movement. When the allies approached within 500 meters, both sides exchanged indecisive cannon fire. Here, the allies employed fifty cannons operated by a hundred Beijing artillerymen but, considering the impenetrable planks of the Russian battleships and the Russian artillery's formidable counterfire, this initial exchange seems to have had minimal bearing on the outcome of the battle.

The Manchu-Korean allies then closed in on the Russians with a three-pronged attack, pouring volley after volley of musket balls and arrows upon the Russian fleet. The Cossacks, who would also have been firing back with their flintlocks, were soon overpowered and broke formation. Some hid in the ships and others fled ashore. When Sin Yu's ship and the rest of the vanguard fleet surrounded the Russian vessels, the musketeers threw their hooks onto the enemy ships and jumped over to set fire to them.

¹⁷³ Sin Yu, *Kugyŏk Pukchŏng ilgi*, 77-78.

¹⁷⁴ Sin Yu, *Kugyŏk Pukchŏng ilgi*, 84-85.

¹⁷⁵ Sin Yu, *Kugyŏk Pukchŏng ilgi*, 87.

¹⁷⁶ Sin Yu, *Kugyŏk Pukchŏng ilgi*, 83.

However, Sarhuda halted this at once because he wanted to capture the Russian ships undamaged as war booty.¹⁷⁷ Sarhuda's hesitation exposed the musketeers who had boarded the Russian ships to immediate peril. The Cossacks hiding in the ships and in the bushes on shore took advantage of this moment and retaliated furiously. There ensued a lethal Russian fusillade, probably enhanced by the fast-firing flintlocks they employed, which killed seven Korean musketeers and many Qing infantrymen and mariners. Recovering from the Russian counterfire, the allies used fire-arrows on the Russian fleet and burned down seven of the Russian vessels. Meanwhile, forty Cossacks who had abandoned their ships boarded one of the deserted Qing vessels and escaped the encirclement. Qing ships pursued them, with Sin Yu's ship in the lead, and they eventually caught up with the Cossacks and slaughtered them all.

Before long, darkness fell and the allies camped across the river from the Russians, leaving three ships to guard what remained of the Russian fleet. Later in the night, some Russians managed to escape with a single ship.¹⁷⁸ The battle of 1658 left 220 Cossacks and Stepanov, their voevoda, dead. Qing casualties numbered 110 dead and 200 wounded. Eight Korean musketeers were killed and 25 wounded.¹⁷⁹

Despite their small numbers, the Big Heads were once again crucial in leading the allies to victory. Their exact role is difficult to separate from that of other Qing soldiers who constituted the majority of the allies' forces, but the Big Heads certainly deserve the lion's share of credit for the allies' superior firepower. Out of the four hundred gunners under Sarhuda, the two hundred Korean musketeers constituted half of the total number and were twice as numerous as the Qing musketeers. The Big Heads were also more efficacious, considering the relatively minimal impact of the Beijing artillerymen and the woeful inefficiency of the Qing musketeers.¹⁸⁰ In fact, the Qing musketeers not only lacked proper drill but also suffered from low supplies of gunpowder, even having to borrow ammunition from Sin Yu before the battle. On the other hand, the Russians were probably just as effective as the Big Heads—but they were outnumbered and had low morale due to a recent mutiny and shortage of provisions.

The Northern Expedition of 1658 effectively frustrated the Muscovite interest in colonizing the Amur. The fight killed Stepanov and more than half of

¹⁷⁷ Sin Yu, *Kugyŏk Pukchŏng ilgi*, 87-90.

¹⁷⁸ Sin Yu, *Kugyŏk Pukchŏng ilgi*, 87-90.

¹⁷⁹ Sin Yu, *Kugyŏk Pukchŏng ilgi*, 95, 100.

¹⁸⁰ Sin Yu, *Kugyŏk Pukchŏng ilgi*, 82-83.

his army, forcing the remaining Russian forces—as many as 220 Cossacks—to disperse. Most of these men escaped Russian control and became outlaws, depriving the Muscovite state of an entire army responsible for tribute collection in the region. When the fight was over, the Russians lost control over their frontiers on the lower Amur, all the way up to the region of Nerchinsk where a tiny contingent of seventy-six Cossacks guarded a few *ostrogs* in the vicinity. Before long, about half of these men deserted Nerchinsk, while natives of the region besieged this last Russian stronghold.¹⁸¹ Hence, although a group of independent Cossacks returned to Albazin in the 1660s, the Muscovite state withdrew much commitment from the Amur frontiers after 1658, leaving the region to be a “no-man’s land.”¹⁸²

The Northern Expeditions, though fought under the Qing flag, had a profound impact on the Korean military and its reputation in East Asia. To begin with, not only did the expeditions confirm Hong Taiji’s high regard for Korean musketeers, but they also reassured the Koreans themselves that their musketeers were excellent. In fact, fabricated editions of Sin Yu’s diary were widely circulated during the late Chosŏn period and contributed to a lasting, prideful historical consciousness amongst the Korean people about the expeditions. In addition, these expeditions allowed Hyojong to send troops to survey Manchuria, which would otherwise have been construed as a challenge to Qing hegemony. This brought in valuable information from the Amur frontiers regarding the belligerents’ military power and the habits and martial capabilities of other peoples living in the Amur River valley. Finally, this clash with the Muscovite empire—which had superior firearms, siege tactics, and fortress designs—stimulated the Manchu-Korean allies to strengthen their own militaries. Adapting to the challenges on the frontier, Sarhuda launched a large shipbuilding project, deported Daur natives from areas of contact with Cossacks, and mustered a large multi-ethnic army from the Qing’s neighbors. Technological transfers also emerged from these interactions. Pyŏn Kŭp brought back Russian gunpowder, and Sin Yu returned with a European flintlock.¹⁸³

In light of the encounters at the Amur frontiers, Chosŏn emerges as a nascent gunpowder state striving to project its power into Manchuria. Hyojong once said to an official who was concerned about the implausibility of his northern conquest movement:

¹⁸¹ Golder 1914, 54.

¹⁸² Perdue 2005, 88.

¹⁸³ Yi 1982.

Once a grand scheme has been drawn, the devotion to implement it becomes naturally more sincere. If your devotion becomes more sincere, your capabilities will accordingly improve. This is why I have steadfastly advocated for *pukbol*... if heaven allows me to live ten more years, I will, success or failure, certainly stage an uprising.¹⁸⁴

Hyojong did not live long enough to implement his plans. When he died unexpectedly of unknown causes in 1659, the militarism he had championed also lost momentum.

However, the northern conquest movement resurfaced in 1674 when the Qing state faltered due to the Revolt of the Three Feudatories (1673-1681). At the time, the Korean court feared that the Manchus would be driven from the central plains and, upon their return to the Manchurian hinterlands, cause trouble on Chosŏn's northern borders (寧古塔回歸說).¹⁸⁵ Anticipating another confrontation with the Qing, King Sukchong, Hyojong's grandson, rekindled hopes of vengeance.¹⁸⁶ Sukchong quickly fortified border defense lines, increased the size of the standing army, and renewed efforts to manufacture battlewagons loaded with firearms designed for use in the Manchurian plains.¹⁸⁷ Further, in 1676, he even held the largest military examination in Chosŏn history as an immediate means to supplement his military officer corps, yielding an unprecedented number of 17,652 passers.¹⁸⁸ However, when the Qing successfully suppressed the revolt in 1681, their power became uncontested, and the last of Korean hopes for northern expansion were also extinguished. Nevertheless, as shown thus far by the story of seventeenth-century Korean military dynamism, Chosŏn was clearly an active gunpowder state, a crouching tiger hoping to plunge into Northeast China when opportunities emerged.

The Amur conflicts present an important case study to assess the global implications of the Military Revolution model. The rapid pace of military innovations in the West conferred a decisive edge to Russia's eastward expansion until the Amur frontiers; however, upon arrival, the Russian forces fell short of outgunning continental East Asians who had achieved a commensurate level of firearms-based bellicosity. As the Amur conflicts continued into the late seventeenth century, the Qing emperor Kangxi launched extensive campaigns that led to settlement of the dispute with the Treaty of Nerchinsk in 1689, an

¹⁸⁴ Song Siyöl, *Songja taejŏn*, j. 7, 574, as cited in Yi 1982, 194.

¹⁸⁵ Hong 2010.

¹⁸⁶ Song 2007.

¹⁸⁷ No 2002, 178-204. See also *Sŏngjŏngwŏn ilgi*, vol. 272, 1679/9/11 (Kyemyo), and *Sukchong sillok* 3, 1675/4/21 (Kiyu).

¹⁸⁸ Park 2007, 57-58, 64.

agreement by which the Muscovites conceded Amuria to the Manchus and agreed to engage in trade instead of armed conflict. Borders were drawn and a *pax manjurica* prevailed, creating “breathing space” for the Manchus while indirectly frustrating Korea’s dreams of northern conquest. In this way, the Amur conflicts mark both the pinnacle and the denouement of the Military Revolution in continental East Asia.

Conclusions

Firearms were no passing fancy for Chosŏn. Pressured by repeated foreign invasions, the Chosŏn military adopted guns—particularly muskets—with exceptional alacrity and eagerness during the seventeenth century. During the invasions of 1627 and 1636, its fledgling musketeer troops struggled against mounted Manchus but their competence had already seen steady improvement, which was enough to impress the Manchu leader Hong Taiji who coveted these men and exploited them in his own war against the Ming Chinese and later, the Cossacks. The development of Chosŏn musketry tactics reached a pinnacle around the reign of Hyojong (1649-1659) when Korean musketeers fired at the Cossacks and gained recognition as Big Heads from their Manchu and Russian counterparts. These marksmen were products of the Korean Musketry Revolution during the first half of the seventeenth century.

But we must now return to the limitations of the Korean military reforms and the causes underlying their divergence from those of Western Europe: why did firearms development decelerate in Korea and in other regions of East Asia? Here, one could refute the revolution altogether and argue that the Korean adoption of firearms was impermanent. However, to maintain this argument in spite of the evidence presented thus far may be “presentist,” for it retroactively projects a deterministic trajectory of Korean military ineptitude into the seventeenth and the eighteenth centuries.

Further, the recent upwelling of new Korean data cautions us against sweeping statements about the Korean military in the late nineteenth century. For instance, in the “Arms Storehouse Chart” (武器在庫表), a weapons inventory from the late 1890s for the regional armies of the Greater Korean Empire (大韓帝國, 1897-1910), muskets and leaden bullets are the most dominant, amounting to an astronomical total of 100,428 muskets and 15,608,291 bullets, a figure that would likely double if those of the capital armies are included.¹⁸⁹

¹⁸⁹ Kim 1993, 113-35.

If firearms continued to be the mainstay of the Korean military apparatus, why did it falter in the late nineteenth century and succumb to the intrusion of the Western powers and Japan? Were there any “small but accelerating” divergences between the Korean and Western European ways of firearms warfare?¹⁹⁰

A possible divergence lies in the presence of powerful nomadic cavalry in Northeast Asia, as historian Kenneth Chase emphasizes. Chase argues that firearms development lagged in East Asia because early guns, due to their slow rate of fire and low accuracy, had little investment return when fired against nomadic cavalry.¹⁹¹ His argument does not focus on Chosŏn but still holds a modicum of truth for the Korean experience. Certainly, the Manchus posed an unprecedented challenge against Korean infantry during the Sarhū battle of 1619 and the invasions of 1627 and 1636, a challenge fundamentally distinct from that Europeans and Japanese faced: the former mostly fired against other infantries and the latter, against light cavalry with little shock power.¹⁹²

Yet, greater challenge does not necessarily indicate failure but rather stimulus for a more forceful response. Even after the Manchu invasions, the Chosŏn military rarely questioned the fundamental efficacy of guns and instead sought better ways to harness musketry technology by enhancing drill regimes, training elite musketeers, and safeguarding them with other types of units in field battle. During the Manchu invasion, Korean scholars such as Mok Naesŏn 睦來善 (1617-1704) recognized that muskets were far more effective than “arrows and rocks” (失石) against the Manchu besiegers of the Namhan Mountain Fortress.¹⁹³ Accordingly, in 1639, two years after the end of the second Manchu invasion, a royal decree had archers in the Royal Division turned into musketeers. Simultaneously, Injo also reinforced the Anti-Manchu Division and restored the musketeer squads to employ as many as 5,400 musketeers by 1639.¹⁹⁴ Thus, available sources suggest that Koreans stuck even more stubbornly to muskets after the invasions and that Manchu cavalry was not an impediment to Korean firearms development so much as a relentless source of challenge.

The consolidation of Manchu hegemony in East Asia, however, is an important geopolitical factor that eventually curbed Korean military reforms.

¹⁹⁰ Andrade 2011a.

¹⁹¹ Chase 2003, 1-23, 207-10.

¹⁹² Japanese musketeers seldom faced a foe like Manchu horsemen because cavalry within their borders were limited due to the horses' small physique. See Kubota 2010.

¹⁹³ *Sŭngjŏngwŏn ilgi*, vol. 354, 1693/12/3 (Imsin). The original text is as follows: 曾於丙子, 入南漢, 目見守城之事, 則禦敵之具, 過於鳥銃, 雖有矢石皆不如鳥銃之爲妙。今者全不操弓之類, 抄定砲手, 似爲得當矣。

¹⁹⁴ *Pibyŏnsa tŭngnok*, vol. 13, 1649/2/13 (Kich'uk), as cited in No 2012, 131.

Throughout much of East Asian history, behemoth dynasties occupied the central plains of China and propagated a stable order by regulating their satellite states. China's hegemonic potential reached a new threshold during the Qing dynasty. The Manchus had an unusual aptitude for steppe warfare and military expansion, which helped them greatly expand the boundaries of their empire.¹⁹⁵ By the turn of the eighteenth century, after Ming loyalists, Cossacks, and the Three Feudatories were quelled, a *pax manjurica* had spread across much of continental East Asia. Although the Manchus continued their northwestern conquests well into the eighteenth century, their hinterlands in Manchuria were completely pacified. The significance of this geopolitical change was grave for the Korean military: from after the Manchu invasions until the early twentieth century, Chosŏn experienced no sustained armed conflicts, which created a lull in developing techniques of violence and led to an eventual rusting of its military aptitude.

As much as geopolitics drove history, Korean military reforms also decelerated due to internal reasons, particularly the financial ineptitude of the Chosŏn state. During the seventeenth century, Chosŏn was in a fiscal cul-de-sac due to astronomical increases in its military expenditures.¹⁹⁶ To the dismay of contemporary *yangban* scholar-officials, military expenditures devoted to the capital armies reached more than two-thirds of the state budget from around 1658 to 1704.¹⁹⁷ The size of the capital armies lay at the heart of the crisis, but the problem was exacerbated by contingent factors. Chosŏn state finances had not even recovered from the Imjin War of 1592-1598: the invasion had destroyed census registers and left the "amount of land under cultivation . . . less than a third of the pre-war amount,"¹⁹⁸ reducing tax revenues to only one-third of the pre-Imjin War standards.¹⁹⁹ All of this, combined with the climate change of the seventeenth century, crop failures, and shortage of arable land, left the Ministry of Taxation in a constant state of deficit and the commoner taxpayers in severe destitution. Hence, to rectify the situation, the Korean court honed in on the military as the main locus of debate for fiscal reform.

These fiscal difficulties, however, were not unique to Korea, and we must sharpen our inquiry through comparisons with other early modern gunpowder

¹⁹⁵ Perdue 2005, 56-64.

¹⁹⁶ Kim 2003, 269-70.

¹⁹⁷ Kim 2003, 269-338.

¹⁹⁸ Atwell 1990, 671.

¹⁹⁹ *Hyŏnjong kaesu sillok*, 24, 1671/12/06 (Musul), as cited in Kim 2003, 270. The original text is as follows: 昇平時稅入，常至三十餘萬石，而只頒百官之祿，無一養兵之費，故府庫充溢，露積紅腐。今則一年稅入，不過十萬，大半歸於將士之廩料。

states. Despite facing similar monetary crises, the European practice of military finance eventually broke through a threshold of efficacy in the 1690s when the Dutch accomplished a “fiscal revolution.” Parker attributes the success of the Dutch model to a form of “administrative devolution” that passed the burden of supplying standing armies to “private contractors and entrepreneurs.”²⁰⁰ Further, the success of the Europeans can also be attributed to external factors: the windfall gains of conquest and colonies from European maritime expansion fed back into their economy and stimulated further military spending. In stark contrast, despite the fact that Chosŏn invested immensely in developing firearms and engaged in multiple international conflicts, it benefited from little, if any, external sources of windfall economic gains. Then, geopolitics and conquests set aside, how were Korean military finances different and what internal factors contributed to the perpetuation of Korean deficiencies?

The most salient divergence is the unique presence in Chosŏn Korea of an anti-military, land-holding *yangban* aristocracy and its stalwart opposition to radical fiscal reforms. By the turn of the seventeenth century, the *yangban* aristocrats had achieved unassailable political, social and economic clout in Chosŏn Korea: they enjoyed exclusive rights to civil service examinations, leverage over monarchs, and most importantly for our purposes, exemption from military service and taxation.²⁰¹ Fundamentally, the *yangban* aristocrats harbored a deep-seated cultural bias against military men and patronized soldiers of all ranks as of lowly profession.²⁰² To the *yangban*, exemption from military service and taxation became so paramount as an emblem of their elite status that their “personal and family dignity” hinged upon this distinction.²⁰³ As historian James B. Palais has written, Chosŏn’s inability to curb the *yangban* elites and to levy taxes on them was a frustrating obstacle to Korean fiscal-military reforms:

It was certainly no secret to anyone at the time that the main reason why the financial support system for the military was in such terrible condition in the seventeenth and eighteenth centuries was because the tax base was shrinking as both bona fide *yangban* and commoner tax shirkers successfully gained exemption from tax payments.²⁰⁴

²⁰⁰ Parker 1996, 64-5.

²⁰¹ Palais 1996, 575-76.

²⁰² Palais 1996, 575.

²⁰³ Palais 1996, 571.

²⁰⁴ Palais 1996, 570.

Nonetheless, not all *yangban* scholar-officials were against military and taxation reforms. Nor were they immune to persuasion under strong monarchs such as Sukchong and Yŏngjo (r. 1724-1776). Hence, Chosŏn's failure to revamp its taxation system was not a *fait accompli* but rather the result of many contingencies that dismantled potentially radical reforms.

Chosŏn's efforts to resolve the fiscal crisis can be broadly categorized in two trajectories, one in decreasing military expenditures and the other in increasing state revenues. The former sought to constrict the capital armies, culminating in the Military System Reform (軍制變通) of 1704, and the latter to enforce taxation reforms, engendering debates from around the 1650s until the promulgation of the Equal Service Tax Reform (均役法) of 1750.²⁰⁵ As monetary difficulties exacerbated, *yangban* elites argued ever more strongly to reduce the military during the latter half of the century. Their rhetoric found increasing support as shifting geopolitics diminished the need for standing armies, and as they drew on the plight of the commoner taxpayers to bolster their arguments. Ironically, while the elites successfully chiseled away the size of the Chosŏn military, they were adamantly opposed to taxation reforms that sought to levy their own property, thereby forestalling a more fundamental revamping of the Korean fiscal-military apparatus.

The Military System Reform of 1704 was a practical yet temporary amelioration of the crisis. From as early as the 1650s, the Korean court debated the issue of reducing the capital armies.²⁰⁶ Prominent *yangban* scholar-officials such as Song Siyŏl pitted the concept of military sustenance (養兵) against the welfare of the people (養民) and upheld the latter, exhorting for the shrinkage of the military.²⁰⁷ These voices grew ever more stentorian after the death of Hyojong. Other officials directly linked standing armies to the destitution of the commoners, pinpointed the Military Training Agency as "depleting all peasant power in the state,"²⁰⁸ and argued that there was "nothing more imperative than reducing the military" to salvage Chosŏn finances from deficit.²⁰⁹ In 1704, echoing the words of his vociferous officials, King Sukchong sealed the debate with his Military System Reform, and reduced the five capital armies by a total of

²⁰⁵ Chŏng 1977, 5-13.

²⁰⁶ Chŏng 1977, 8-13.

²⁰⁷ Song Siyŏl, *Songja taejŏn*, j. 108, 472, as cited in Kim 2003, 302.

²⁰⁸ *Hyŏnjong kaesu sillok*, 2, 1671/12/06 (Musul), as cited in Kim 2003, 270. The original text is as follows: 且訓局恒食之軍過多, 國中民力, 盡歸於此。

²⁰⁹ *Hyŏnjong kaesu sillok*, 26, 1672/9/19 (Shinmyo), as cited in Kim 2003, 274. The original text is as follows: 今欲國之道, 莫先於減兵。

36,793 men.²¹⁰ His policy created some breathing space—albeit temporarily—for the commoner taxpayers. Later monarchs such as Yǒngjo and his grandson Chǒngjo (r. 1776-1800) continued similar policies, lowering the expenditures of the Military Training Agency to 38 percent of the state budget by 1800.²¹¹ Nonetheless, as Palais would agree, shrinking the Korean military was an “ad hoc marginal adjustment,” a modification of the system that assuaged the symptoms but failed to revamp the root causes of the deficient taxpayer system.²¹²

The potential for a Korean fiscal-military revolution lay with the fundamental reordering of the Korean taxation system, which would levy the landholding *yangban* elites in some form or another. Among various propositions put forth during the latter half of the seventeenth century, the household cloth tax (*hop’ojae* 戶布制) enjoyed the most royal backing and quickly gained currency among reform-minded officials.²¹³ The reform proposed the household (家戶) as the unit of taxation and sought to levy a cloth tax on the entire population irrespective of status. It included the *yangban* elites as taxable subjects in order to achieve a more equitable distribution of levies amongst the Chōson populace and sought to alleviate the plight of the commoner taxpayers.²¹⁴ Such a reform was perhaps only conceivable in the presence of military threats that often subordinated the status quo to meet immediate needs of state survival. Interestingly, the idea first emerged in the midst of King Hyojong’s mobilization for the northern conquest movement and found burgeoning support during the 1670s and the 1680s when military expenditures were at an all-time high and the Korean court anticipated another confrontation with the Qing.²¹⁵

During this latter stage in the 1680s, the household cloth tax was in the homestretch to implementation. In the landmark debate of 1682, eight out of fourteen officials within King Sukchong’s court espoused the reform, including “two of his top state councilors.”²¹⁶ Sukchong himself had also been championing the household cloth tax over other reform ideas. Nonetheless, at the brink of reform, the idea sparked a great commotion among the more con-

²¹⁰ *Hyōnjong sillok*, 40, 1704/12/28 (Gabo). The full title of the reform program in original text is as follows: 五軍門改軍制及水軍變通節目.

²¹¹ Kim 2003, 274.

²¹² Palais 1975.

²¹³ Palais 1996, 491-97.

²¹⁴ Palais 1996, 491-97.

²¹⁵ During the late seventeenth century, the Korean court feared that the Manchus would be driven from the central plains and, upon their return to the Manchurian hinterlands, cause trouble on Chosōn’s northern borders (寧古塔回歸說). See Hong 2010.

²¹⁶ Palais 1996, 497.

servative *yangban* scholar-officials, leading some to even resign in protest.²¹⁷ Further compounding the problem were severe harvest failures due to climate changes during the latter half of the seventeenth century, which would have been an inauspicious time to promulgate a new taxation law.²¹⁸ In the end, Sukchong decided to postpone the reform “until crop conditions improved in a few years,” which essentially “meant [the] permanent abandonment of the idea during his lifetime.”²¹⁹

A variation of the household cloth tax was revived once more in the early eighteenth century under the strong leadership of King Yongjo, but the battle had already lost momentum by then. More research is needed, but available sources suggest that Yǒngjo’s Equal Service Reform (均役法) of 1750 was another “ad hoc marginal adjustment”: it cut the military tax rates in half to decrease the burden on commoners but fell short of taxing the *yangban* elites.²²⁰ Nonetheless, Yǒngjo’s policy was a practical compromise. In the absence of external threats, the Chosŏn state had no reason to risk losing the support of its social elites and to exacerbate the burden on the peasants. In the end, the continuing exemption of *yangban* aristocrats from military service and taxation, together with the diminishing base of taxable commoners, drove Chosŏn off the fiscal cliff by the late nineteenth century.

Revolution is a change that stays and takes root, one that spreads its influence to broad reaches of its host society and state. Despite its financial shortcomings, the Korean Musketry Revolution orchestrated an enduring change in the Korean military apparatus around firearms, which had ramifications such as increase of army size, rigorous infantry drill, proliferation of military manuals, firearms manufacturing, and new attempts at fiscal-military initiatives. Strikingly similar to European developments, Chosŏn was particularly successful in the adoption of muskets and replaced the traditional cavalry-based system with new forms of *en masse* infantry tactics. Further, the growing fiscal and logistical demands of sustaining this way of war challenged the late Chosŏn state to adapt institutionally through new military surtaxes and centralized methods of census-taking. Nonetheless, despite this radical shift after the adoption of muskets, a subsequent “fiscal revolution” did not follow.

The Korean Military Revolution fell short of culminating because excessive military spending without proper fiscal and logistical backing reined back the

²¹⁷ Palais 1996, 483-97.

²¹⁸ Palais 1996, 469-578. Also see Chǒng 1977, 14-23.

²¹⁹ Palais 1996, 499.

²²⁰ Palais 1996, 8, 550, 979, 1015.

impetuses that were driving military reforms in Korea. The trend of reducing military expenditures was reinforced by the combination of *yangban* resistance to fiscal reforms, a diminishing base of taxable commoners, consolidation of the *pax manjurica*, and the lack of interstate warfare in eighteenth- and nineteenth-century East Asia. Nonetheless, at least during the seventeenth century, the Korean military reforms and their manifestation on the Amur frontiers attest to the capabilities of Chosŏn to adapt successfully to the challenges of early modern warfare, which increasingly harnessed the power of firearms and disciplined soldiers. The Korean variation on the theme of gunpowder revolution produced professional bodies of firearms military units, innovations in military tactics, and accelerated commercial and manufacturing activities, contributing to cumulative processes of political integration and consolidation in Korea.

Unfinished Stories: The Siege of Albazin (1685-1688) and the Treaty of Nerchinsk (1689)

The battle of 1658 concludes the tale of the Big Heads on the Amur frontiers. However, the story cannot be sealed without discussing later encounters at Fort Albazin. As the battle of 1654 was raging, a baby boy who would later be known as the Kangxi Emperor was born. Kangxi grew to become an emperor of great fortitude and secured Qing control of the Amur frontiers with renewed vigor. In the late seventeenth century, the Cossacks still lurked in the northern regions of Manchuria, in settlements such as Yakutsk and Nerchinsk, and maintained a formidable stronghold at Albazin, where a group of Polish exiles and renegade Cossacks had reoccupied the abandoned site in 1665. From this base, the Cossacks continued to raid the natives of the Amur region. To settle the matter for good, Kangxi launched two expeditions in 1685 and 1686.

After suppressing the Revolt of the Three Feudatories in 1681, Kangxi turned to the northeast and strengthened his grip on the Amur. The next year, he ordered three eminent Manchu generals—Sabsu 薩布素, Pengchun 彭春, and Langtan 郎談—to reconnoiter the vicinity of Fort Albazin.²²¹ On the pretext of hunting, these men led a small contingent to survey the distances of land routes, the shape of the Amur River, and the conditions of Albazin's walls.²²² After gathering information, Sabsu then built two wooden forts along the lower

²²¹ *Da Qing Shengzu Ren Huangdi Shilu, Qing shilu*, j. 104, 52a.

²²² *Da Qing Shengzu Ren Huangdi Shilu, Qing shilu*, j. 104, 52a.

Amur while Pengchun and Langtan submitted a memorial to the emperor requesting more ships, firearms, and men. Approving, Kangxi awarded these generals with promotions and sanctioned the military preparations.²²³

Kangxi's procurement of firearms and ships provided his army a clear edge during the first expedition. On May 21, 1685, General Pengchun, assisted by Sabsu and Langtan, led an impressive army of 15,000 men to Fort Albazin, which was guarded by 450 Cossacks and their newly appointed voevoda, Akekesay Tolbuzin.²²⁴ Compared to the Qing army during the Northern Expeditions of 1654 and 1658, Kangxi's forces ratcheted up a new threshold of military mobilization and firearms-based aggression on the Amur frontiers: it employed gunboats, elaborate siegeworks and as many as 200 pieces of artillery,²²⁵ fifteen of which were "from five to eight-pounders, [and] of European manufacture."²²⁶ Within a few days, Fort Albazin was demolished and its defenders subjugated.²²⁷

After the successful siege, Sabsu, in a gesture of generosity, allowed the Cossacks to retreat to Nerchinsk. Further, the Qing army only destroyed the fortress walls and left the region uninhabited and its crops undestroyed.²²⁸ However, despite the Manchus' generosity, Tolbuzin and his men returned to Albazin later that year. Boosted by new reinforcements from Siberia and Moscow, the Albazin Cossacks now numbered approximately 1,000 men and employed about twelve cannon.²²⁹ The Cossacks then harvested the grain fields and established an even more formidable defense. Further, the Cossacks fortified Albazin under the guidance of Afanase Baiton, an experienced Prussian engineer whose design would prove critical in the next encounter with the Manchus.²³⁰

Hearing the news of Cossack recidivism, Kangxi reacted swiftly with a second expedition. Besieging Albazin for the second time was no easy task: not only had the Manchus mobilized a significantly smaller force than in 1685, but the Russian resistance was also more formidable. On May 27, 1686, the Qing army, led by Sabsu and Langtan, commenced attack on Albazin with an army of 2,000

²²³ Hummel 1943, 442-43, 621-22, 630-31.

²²⁴ Hsu 1964, 690.

²²⁵ Also see Hsu 1964, 690.

²²⁶ Ravenstein 1861, 47.

²²⁷ Ravenstein 1861, 46-51.

²²⁸ Golder 1914, 59-60.

²²⁹ Golder 1914, 61-63.

²³⁰ Golder 1914, 59-60. Also see Hsu 1964, 690.

men and forty cannon.²³¹ However, the Russian defenders resisted admirably, thanks to Baiton's new fortifications: the forbidding walls of Albazin resembled those of a *trace italienne*, mounted with guns and reinforced with protruding polygonal bulwarks that enhanced crossfire. Nonetheless, the Albazin Cossacks slowly withered away as the Manchus still held the advantage in numbers and firepower, not to mention the outbreak of diseases and the death of Tolbuzin. By the time the Qing lifted their siege in mid-1687, the Albazin Cossacks had persevered for over a year and their forces had been reduced from approximately 1,000 to only 66.²³²

Guns and germs played crucial roles but what finally lifted the siege was diplomacy. Earlier in 1686, the Russian czar had sent an envoy to Kangxi to request the cessation of the siege and to state his wish for peace talks. Kangxi welcomed this and showed magnanimity towards the Cossacks. He ordered Sabsu to lift the siege and to share provisions and doctors with the Albazin Cossacks. On July 23, 1689, the final agreement was reached with the conclusion of the Treaty of Nerchinsk.²³³ Recognizing the Stanovoi Mountains and the Argun River as the border, the Russians ceded the Amur region and agreed to demolish Albazin, while the Chinese conceded the trans-Baikal region and allowed Russians to trade in Beijing.

Both parties achieved their ends. The Russians received lucrative trade opportunities, and the Chinese resolved their anxiety about a possible Russo-Zunghar alliance and put an end to decades of Cossack disturbances in the frontiers. Encounters on the Amur culminated in amiability and diplomacy. After the peace treaty of 1689, the Russians traded freely in Beijing and the Qing incorporated Cossacks captured during the siege of Albazin into their army as part of the Manchu Bordered Yellow Banner. Kangxi even allowed the Russians to build an Orthodox church of St. Nicholas in Beijing, which the Chinese called the "Temple of the Rakshasas" (羅刹廟).

The conflicts on the Amur lasted for about half a century from Poyarkov's expedition in 1643 to the signing of the Treaty of Nerchinsk in 1689. The numerous battles generated destruction and bloodshed but ironically also brought the belligerents closer together, whether through resentment, revenge, friendship, curiosity, or diplomatic gestures of magnanimity. The brutality of Cossack raiding engendered much resentment among inhabitants of the frontier region: Juchers and Nanais took revenge on the Cossacks by butch-

²³¹ Golder 1914, 61-63.

²³² Hsu 1964, 691. Also see Golder 1914, 61-63.

²³³ Wassermann 1953.

ering their corpses after the battle of 1658. But in the multi-ethnic Qing army, unprecedented friendships were forged among people of ethnicities as varied as Manchu, Han Chinese, Jucher, Daur, Nanai, and Korean as they shared military camps and fought against a common enemy. This trans-ethnic interaction engendered curiosity and consequently increased awareness amongst the participants: Korean General Sin Yu wrote not only about battles but also about the personalities of allied generals such as Sarhuda and the culture and eating habits of the Amurians. His stories apprised the inquisitive King Hyojong of the geography of the Amur and the military capabilities of its inhabitants. In this way, transcultural encounters reached a new threshold at the Amur frontiers.

The spark from guns and gunpowder, of course, was the catalyst that ignited a rapid challenge-response chain reaction amongst the belligerents. The efficiency of European firearms provided the Russians a clear edge against the nomadic tribesmen of Siberia and enabled the Muscovites to expand eastward with remarkable alacrity. When the Cossacks presented a formidable challenge at the Amur frontiers, the Manchus failed to respond adequately, largely because they had the best of their artillery occupied at another battlefield in the south. Hence, the Big Heads, supported by a Korean Musketry Revolution, stood up to the challenge during the Northern Expeditions of 1654 and 1658. They brought back Russian gunpowder and flintlocks to Chosŏn, completing the response. In the latter half of the seventeenth century, the Qing, under the reign of Kangxi, also reacted powerfully with refined gunnery. Pitted against the forbidding walls of Fort Albazin, Kangxi's gunners prevailed and met the challenge with an even more forceful response. Thus, the military revolution of the early modern era was a polycentric, Eurasian-wide arms race that violently awakened the world to the looming age of gunpowder weapons.

Appendix: Tables

Table 1: Size of Regional Armies in Chosŏn, 1600-1778

Year	Size of the Sog'o Army
1600	95,226
Before 1626	75,000
1628	~100,000
1633	90,070
1640	101,914
1641	110,000
1681 (August)	200,000
1681 (December)	200,000
1698	200,000
1702	188,800
1711	200,000
1778 (June)	210,000
1778 (September)	190,000

Source: Kim 2001, 127.

Table 2: Size of Central Armies in Chosŏn, 1590-1704

	Military Training Agency	Royal Division	Defense Command	Total (10-year intervals)
1590				0
1593	500			
1594	1,000			
1595	1,146			
1597	1,100			
1598	2,000			
1599				
1600				2,000
1601	2,650			
1603	2,000			

Table 2 (cont.)

	Military Training Agency	Royal Division	Defense Command	Total (10-year intervals)
1610				2,000
1616	4,000			
1620				4,000
1623		260		
1624		1000	4,205	
1625	4000			
1627				
1630				17,000
1631	4000			
1635		6170		
1636	4400		12700	
1639		6194		
1640				23,294
1643		10,000		
1649	5,440			
1650				27,440
1652		21,000	11,009	
1657	5,650			
1658	6,350			
1660				38,359
1662	7,000			
1663				
1668				
1670				39,009
1672	5,000			
1674			20,000	
1680				46,000
1682	5,000			
1690				46,000
1702	6314			
1704	5000	17875	16,500	39,375

Source: See respective tables of individual armies below for citations.

Table 3: Size of the Military Training Agency, 1593-1704

Year	Number of Men
1593	1,000
1598	2,000
1616	4,000
1649	5,440
1657	5,650
1658	6,350
1662	7,000
1672	5,000
1682	5,000
1702	6,314
1704	5,000

Source: Kim 2003, 105.

Table 4: Size of the Royal Division, 1623-1704

Year	Number of Men	Source
1623	260	<i>Injo sillok</i> , 4,1624/1/12 (Chǒngmyo)
1624	1,000	<i>Hyǒnjong kaesu sillok</i> , 10, 1663/11/14 (Muin) Also see <i>Injo sillok</i> , 4, 1624/2/8 (Imjin)
1635	6,170	<i>Injo sillok</i> , 31, 1635/10/18 (Ŭlmi)
1639	6,194	<i>Injo sillok</i> , 39, 1639/7/21 (Pyǒngja)
1643	10,000	<i>Hyǒnjong kaesu sillok</i> , 10, 1663/11/14 (Muin)
1652	21,000	<i>Hyǒnjong kaesu sillok</i> , 10, 1663/11/14 (Muin)
1704	17,875	<i>Sukchong sillok</i> , 40, 1704/12/28 (Kabo)

Table 5: Size of the Defense Command, 1624-1704

Year	Number of Men	Source
1624	4,205	<i>Injo sillok</i> , 7, 1624/11/9 (Kimi)
1636	12,700	<i>Injo sillok</i> , 32, 1636/7/15 (Chǒngsa)
1652	11,009	<i>Hyǒnjong kaesu sillok</i> , 10, 1663/11/14 (Muin)
1674	20,000	<i>Hyǒnjong kaesu sillok</i> , 10, 1663/11/14 (Muin)
1704	16,500	<i>Sukchong sillok</i> , 40, 1704/12/28 (Kabo)

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