The Military Revolution in Russia, 1550–1682

Michael C. Paul

Abstract

Much has been written about the Military Revolution, a series of changes in tactics and strategy, the scale of warfare, and the impact of warfare on society in the late sixteenth century and the first third of the seventeenth century. However, most of the discussion of the Military Revolution has centered on Western Europe. The Military Revolution in Eastern Europe and Russia is often poorly understood. From the mid-sixteenth to the late seventeenth century, the Russian armed forces underwent changes in tactics and organization that were truly revolutionary in their impact on Russian society and helped make Russia a significant power in Northern and Eastern Europe, laying the groundwork for the changes that Peter the Great was to bring about.

In a 1955 lecture at Queen’s University, Belfast, Michael Roberts introduced the concept of a Military Revolution that presumably had occurred in Europe from the mid-sixteenth to the mid-seventeenth century.1 While admitting that the history of warfare is replete with revolutions, such as the coming of the mounted warrior or the stirrup, Roberts argued that the Military Revolution of which he spoke fundamentally


Michael C. Paul earned his Ph.D. in Russian history in May 2003 at the University of Miami in Coral Gables, Florida, where he studied under the supervision of Janet Martin. His dissertation was a multifaceted look at the office of archbishop in the northwestern Russian city of Novgorod from the mid-twelfth to the late fifteenth centuries. His articles have appeared in Church History and International Social Science Review, and he has contributed entries to The Supplement to the Modern Encyclopedia of Russian and Soviet History (SMERSH), Ground Warfare: An International Encyclopedia, and Magill’s Guide to Military History.
altered the nature of warfare not only in Europe, but in the non-Western world as well, through European colonization efforts beginning in the sixteenth century.2 In his book *The Military Revolution: Military Innovation and the Rise of the West, 1500–1800*, Geoffrey Parker, following Roberts’s lead, not only touched on the impact of the Military Revolution in Western Europe, but also discussed how it spread to other parts of the world, including Russia.3 The Military Revolution described by Roberts and Parker was a series of changes in tactics and strategy (the replacement of the lance and pike by gunpowder weapons), the scale of warfare (tenfold increases in the sizes of some armies between 1500 and 1700), and the impact of warfare on society (greater tax burdens and increased costs and damages inflicted on noncombatants), which began in the United Provinces (the Netherlands) in the late sixteenth century and culminated in Sweden during the reign of Gustavus Adolphus in the first third of the seventeenth century.4 While many scholars have accepted this idea of a Military Revolution in the late sixteenth and early seventeenth centuries, Jeremy Black published a reassessment of Roberts’s thesis in 1991, arguing that truly revolutionary changes in army organization and size, and military tactics and strategy, as well as war’s impact on society, did not take place until the late seventeenth and first half of the eighteenth centuries, one hundred years after Roberts’s supposed Military Revolution.5

The military innovation that occurred in Russia after the reign of Tsar Peter I “the Great” (r. 1682–1725) and during the time of Black’s Military Revolution is more familiar to the nonexpert than are the changes that took place before his reign. However, Russian history from the mid-fifteenth to the mid-seventeenth century, particularly the mid-sixteenth to the mid-seventeenth (the period of the Western European Military Revolution discussed by Roberts and Parker) is often less well known. Yet this period saw changes in military tactics and organization in Russia that were truly revolutionary in their impact on Russian society. Furthermore, these changes helped make Russia a significant power in Northern and Eastern Europe and laid the groundwork for the changes that Peter was to bring about.

During the last thirty years, previously held notions that Russia was a backward, Asiatic, or medieval society until the reforms of Peter the Great have been largely abandoned for a much more complex and nuanced view. Richard Hellie, John Keep, Carol Belkin Stevens, and

2. Ibid., 195.
other scholars have convincingly demonstrated that over the two centuries before Peter, particularly the fifty years just prior to his reign, Russia made very substantial advances in its military capabilities. Indeed, pre-Petrine Russia underwent significant military changes that, in some respects, were similar to the Military Revolution that Roberts and Parker argued occurred in the West. The purpose of this article is not to resolve or even to address fully the debate as to whether tactical and organization changes from the mid-sixteenth to the mid-seventeenth century were more revolutionary than those of the following hundred years; rather, its purpose is to discuss the revolutionary changes in the organization and tactics of the Russian armed forces that took place from the mid-sixteenth to the late seventeenth century—just prior to Peter the Great’s reign—and to make them more accessible to scholars and students less familiar with this period of Russian history. These changes were revolutionary in comparison to those made in the late medieval period, but have been overshadowed by the changes made later by Peter, changes which were equally revolutionary in their own right.

While primary sources can shed light on how the Military Revolution developed in Russia, and why it occurred there later than the Revolution that Roberts saw in the West, the sources do not spell out that these changes added up to a “revolution” for two reasons. First, the concept of the early modern Military Revolution was not recognized until Roberts’s lecture in the mid-twentieth century, and this concept has been refuted by Black and other scholars. Second, during this time Russia did not produce any well-developed theories on the military or political sciences, as occurred in the West, since Russian society was still largely oral and did not keep documents in any meaningful numbers until the seventeenth century. The primary sources, however, do provide a description of the changes taking place in the military at this time, whether they were then understood as revolutionary or not. The Russian sources include documents found in the Tysiatskaia Kniga (The book of a thousand) and the


8. Tysiachnaia Kniga (Moscow: Izd-vo Akademii nauk SSSR, 1950). The book is so called because it discusses Ivan the Terrible’s “Chosen Thousand” brought to serve in the capital.
Novgorodskie pistsovie knigi (The Novgorodian land cadastres)⁹; the chronicles (the Polnoe Sobranie Russkikh Letopisei [The complete collection of Russian chronicles])¹⁰; and perhaps the most remarkable source, Grigorii Kotoshikhin’s O Rossiì v tsarstvovanii Alekseiia Mikhailovicha (On Russia in the reign of Alexis Mikhailovich),¹¹ a unique description of the Russian government and society written in Stockholm by a Russian diplomat who had fled the Tsar’s service in 1664 after spying for Sweden.¹² In addition, travel accounts by Western visitors to Russia during this time, particularly Giles Fletcher’s Of the Russe Commonwealth,¹³ Sigismund von Herberstein’s Description of Moscowa and Muscovy,¹⁴ and Heinrich von Staden’s The Land and Government of Muscovy,¹⁵ are useful in gauging the development of the Military Revolution in Russia during this period and offer a comparison between the military sciences of Western Europe and those of Russia. Anthony Jenkinson,¹⁶ Jerome Horsey,¹⁷ and Adam

---


¹⁰. Polnoe Sobranie Russkikh Letopisei, 40 volumes to date (Moscow, St. Petersburg, Leningrad: Arkheographicheskaia kommissiia, Vostochnaia Literatura, Nauka, 1846–1995) [hereafter PSRL].


¹². Kotoshikhin appears to have written the account based on questions posed by Swedish officials. The original manuscript is held by the University of Upsala, Sweden. On Kotoshikhin’s life and the circumstances surrounding his defection and writing of this work, see the introduction to Kotoshikhin, On Russia in the Reign of Alexis Mikhailovich, 4; A. I. Markevich, Grigorii Karpovich Kotoshikhin i ego sochnenie o Moskovskom gosudarstve v polovine XVII veka (Odessa: Tip. Shtaba Okruuga, 1895).


¹⁴. Sigismund von Herberstein, Description of Moscow and Muscovy, 1557, ed. Bertold Picard, trans. from the German by J. B. C. Grundy (London: Dent, 1969). The original Latin title was Rerum Moscoviticarum Commentarii.


Olearius also wrote helpful travel accounts. Also useful in this regard are selected diplomatic letters exchanged between England and Russia, as well as letters from Poland and other nations, regarding Anglo-Russian relations during the reign of Tsar Ivan IV “the Terrible” (r. 1533–84) and his son Tsar Feodor (r. 1584–98), published by George Tolstoy in The First Forty Years of Intercourse Between England and Russia, 1553–1593.

These sources may show how the Military Revolution unfolded in Russia, but they do not necessarily explain why Russia’s Military Revolution did not develop along the same lines as in Western Europe. Russia’s backwardness or deviation from the West in terms of military development may be explained by several variables: the great poverty of Russia, both absolutely and relative to the nations of Western Europe where the Military Revolution began; the poor soil and growing conditions in the Russian heartland, which left the agricultural sector incapable of feeding the large massed-infantry armies that developed during the Military Revolution; the lack of metals and other mineral resources needed to produce weapons for the Military Revolution; the nature of the enemies faced by Russia during this period; the relative simplicity of Russian society vis-à-vis that of the nations to the west; the natural disasters and political turmoil Russia faced during this period (particularly from the 1560s to 1613); and the poor tax structure, which kept Russia from modernizing as quickly as other nations. These factors delayed the Military Revolution in Russia and gave it a unique character when it finally did come.

**Russian Army in the Early Modern Period: 1462–1658**

The Russian army at the beginning of the fifteenth century was in many ways similar to the Kievan (ca. ninth century to 1240) and Appanage (1240–1480) armies that preceded it, but it bore an even greater similarity to the Mongol-Tatar armies that were its main adversaries during the thirteenth, fourteenth, and early fifteenth centuries. Mainly composed of the prince’s retinue, the Russian army of this time was made up of mounted archers, much like the armies of its nomadic enemies. This style of warfare was sufficient for facing Russia’s enemies up to the late fifteenth and early sixteenth centuries.

Not until the mid-fifteenth and early sixteenth centuries did truly significant changes in the organization and composition of the army and the adoption of new technology, particularly in weaponry, take place in

---


---
Russia. This marked a revolutionary transition from the military arts prevalent in the Middle Ages to those of the early modern and modern periods. During the reign of Grand Prince Ivan III “the Great” (r. 1462–1505) the military and political organization of Russia became increasingly centralized. The “right of departure” whereby a boyar (nobleman) could leave the service of one prince and join the retinue of another—a common practice throughout the Kievan and Appanage Periods—came to be seen as a treasonous act.20 Also during Ivan III’s reign, the middle service class arose to replace the princely retainers as the main component of the army. The middle service class was given land by the Grand Prince and held it on condition that its members provide military service, unlike the boyars who held land independent of their service to the Grand Prince. In the third quarter of the sixteenth century, the Military Service Chancellery (rasriady prikaz) was established in Moscow to oversee military affairs.21 In the course of the sixteenth and seventeenth centuries, other chancelleries (prikazy) were established to oversee the procurement of supplies; the manufacture of cannons, gunpowder, and weapons; the maintenance of middle servicemen; and the upkeep of fortresses.22 On the technical side, gunpowder made its way into Russia in the fourteenth century (apparently from Europe, but possibly directly from Asia via Central Asia or the Mongols),23 but it did not have a significant impact on warfare until the late fifteenth or early sixteenth century. At roughly the same time, organizational changes transformed the Russian army from “something more than a horde relying on superior numbers to win its military conflicts.”24 These technical and organizational changes in the Russian military heralded the Military Revolution in Russia.

Organizational Reforms

The rise of the middle service class can be traced to the late fifteenth century. This class arose through the reduction of the power of the Appanage princes and the creation of the service estate (pomest’e) sys-

23. Hellie, Enserfment and Military Change, 152.
24. Ibid., 32.
tem in the third quarter of the fifteenth century, particularly in 1487–89 when Grand Prince Ivan III exiled Novgorodian nobles to other parts of Russia and transferred their Novgorod estates to Muscovite middle-servicemen. Gustave Alef has pointed out that even where Appanage princes remained, Ivan III made it clear that the Appanage forces owed primary allegiance to him as Grand Prince of Moscow, not to their immediate lord, and that they were to be used wherever the Grand Prince saw fit.

The upper service class in the mid-sixteenth century comprised some two thousand people, almost all of whom lived in Moscow. The uppermost level of this class sat on the “Boyar Council” which, under Ivan III and his son Grand Prince Vasilii III (r. 1505–33) comprised around a dozen people but expanded to some fifty people during Ivan IV’s reign. The lower-upper service class served at the grand princely (or, after 1547, tsarist) court as cupbearers, equerries, chamberlains, or kennelers. They came from old princely families in former Appanages such as Tver’, Yaroslavl, and Smolensk, or even from the old Lithuanian royal house of Gedymin, or else from the old boyar lines that had come to Moscow in the early fourteenth century. Some had even arrived with Prince Daniil (r. 1261–1303), who established the Muscovite branch of


26. Alef, “Muscovite Military Reform in the Second Half of the Fifteenth Century,” 84–85. Appanage principalities remained in existence in Muscovy into the sixteenth century. They were often given to brothers or cousins of the Grand Prince, or to younger sons. However, they no longer had any real independent power base, and the Grand Prince or Tsar could reassign an Appanage prince to other lands, as Ivan the Terrible did to his cousin Vladimir Staritskii. Vladimir was arrested along with his mother in 1563 and was later executed, while his mother was forced to enter a convent. See A. A. Zimin and A. L. Khoroshkevich, Rossiia vremeni Ivana Groznogo [Russia in the time of Ivan the Terrible] (Moscow: Izdatel’stvo Nauka, 1982), 100; Sergei Platonov, Ican the Terrible, ed. and trans. Joseph L. Wieczinski (Gulf Breeze, Fla.: Academic International Press, 1974), 113.

27. Hellie, Enserfment and Military Change, 22.


29. Hellie, Enserfment and Military Change, 22.
the Riurikid dynasty in the early 1260s and began Moscow’s long rise to preeminence.\textsuperscript{30}

The members of the middle service class, in contrast, were given service estates (\textit{pomest’ia}) in the countryside for their upkeep. Such an assignment was considered beneath the dignity of the members of the upper service class, who saw relegation to the provinces as punishment or a political dead end. The service estate was “an estate held on conditional tenure in return for performance of military duty.” The system was similar to the Kazan Tatar \textit{soyughal} system, though whether the Russians borrowed it directly from the Tatars is not known.\textsuperscript{31} Failure by the holder of a service estate (a middle serviceman, or \textit{pomeshchik}) to carry out his duties could result in fines, imprisonment, confiscation of property, or execution, but such punishments were rarely carried out. In most cases when a middle serviceman failed to serve, the land was “ascribed” to a younger brother, cousin, nephew, or other relative. The Grand Prince or Tsar usually took control of the land again only when a middle serviceman died without heir and the land escheated back to the state.\textsuperscript{32}

In the century from 1550 to 1650, the middle service class comprised some twenty-five thousand horsemen. They “constituted the major military force of the consolidated Muscovite state until the completion of the gunpowder revolution in the second half of the seventeenth century.”\textsuperscript{33} They were armed like their predecessors in the Kievan and Appanage periods, with spears, swords, and bows and arrows. They wore armor similar to that of their Kievan and Appanage predecessors, but the less wealthy servitors might have worn a cloth cap with a metal nosepiece, a densely quilted coat of hemp or flax tow with a high color and no sleeves, sometimes with bands of iron sewn inside, or even a \textit{kiuak}—a leather or cloth tunic with metal strips sewn on.\textsuperscript{34} Sigismund

\textsuperscript{30} Kollmann, \textit{Kinship and Politics}, ch. 1, “The Formative Fourteenth Century.”

\textsuperscript{31} Keep, \textit{Soldiers of the Tsar}, 14.

\textsuperscript{32} Ibid., 34, 45. In some cases, however, the estates of those who failed to show up for muster (the \textit{netchiki}) were confiscated.

\textsuperscript{33} Hellie, \textit{Enserfment and Military Change}, 24. For a contemporary discussion of the composition of the upper, middle, and lower service classes and pay scales in the Russian army, see Fletcher, \textit{Of the Russe Commonwealth}, 54–57.

von Herberstein, who traveled to Russia as ambassador from the Holy Roman Emperor in the first half of the sixteenth century, described the Russian cavalry as follows:

Their horses are small, usually geldings, close-haired, unshod and with a simple bit. They ride with short stirrups, as though they wanted to lift their knees above the saddle. Saddles are also small and made so that the rider can turn right round to either side to allow of shooting with the bow. They cannot stand the shock of a lance. They use spurs little, but lash commonly; [the lash] hangs from the little finger of the right hand. When the bow or sabre is grasped—the proportion of riders with sabres is small—they drop the lash and it hangs from the finger.35

There were also patrimonial estates, known as votchiny (singular, votchina).36 Middle servicemen are known to have also held patrimonial estates, which, until 1552, did not require service to the Tsar for their maintenance. However, in that year, Ivan IV issued the Decree on Service (Ulozhenie o sluzhe), stating that all upper and middle servicemen owed service to the Tsar, and that holders of patrimonial estates as well as service estates could suffer confiscation of lands or other penalties for failure to appear when summoned.37 Everyone, regardless of what type of estate he held, owed service based on how much land he held. Landowners had to equip one horseman for battle for every one hundred populated chetverti located in a three-field system of three hundred chetverti, or roughly four hundred acres.38

The middle service class, however, remained a vestige of the medieval past, since the servitor, while given a small cash payment, was compensated mainly in land (for which he owed service), with some grain being supplied for his and his horses’ sustenance.39 The servitor was paid very little out of the central treasury, and payments actually made were often only part of the “entitlement” (oklad) he was supposed

35. Herberstein, Description of Moscow, 76.
36. For an explanation of the difference between pomest’e and votchina estates, see Kotoshikhin, On Russia in the Reign of Alexis Mikhailovich, 180–82.
37. Hellie, Enserfment and Military Change, 38.
38. Ibid. A chetvert, or quarter, was approximately 1.35 acres, though sometimes as much as 4.1 acres. The system of measuring land was not very precise, as it was based on “good land” as determined by officials sent from Moscow. A chetvert was also a unit of weight equal to 182 pounds. Keep, Soldiers of the Tsar, 43, 91; Soloviev, A History of Russia, 12:vii.
39. The Russian pomest’e system is in fact quite similar to the feudal system set up in England by William the Conqueror some five hundred years earlier. There a landowner had to equip one mounted knight for every five hides of land held. The Cartae Baronorum of 1166 gives an overview of this system under Henry II. Charles Oman, The History of the Art of War in the Middle Ages, vol. 1, A.D. 378–1278 (New York: Burt Franklin, 1969), 360–71.
to have received. Such entitlements were often viewed by a government that had “a long-standing aversion to pay troops” as “desirable norms or targets . . . or else as limits that should not be exceeded, rather than as definite commitments by the authorities.” Herberstein noted that “whoever he [Vasilii III] employs at his court, in war or upon a diplomatic mission, must bear the cost himself save for deti boiarškii, or poor noblemen.”

Sir Jerome Horsey, who traveled in Russia from 1575 to 1591, first as an agent of the Russia Company (a company of English traders in Muscovy chartered by the Crown) and later as an English envoy to Tsar Feodor Ivanovich, noted similarly that Ivan the Terrible:

spent now his time in pacifying his discontented nobles and people; kept two armies afoot and yet but small charge, for his princes and nobles went most upon their own charge, and gentlemen and common synnoboarskes [poor noblemen] had certain portions of land, corn, and money allowed them yearly, and this issued out of certain revenues put apart for that purpose, and escheats, robberies, and customs, pensions, duly paid them whether they go to war or not, without diminution of any of his crown revenues or great standing treasure.

Horsey went on to describe the “two armies.” The first consisted of Tatars, “which [Ivan the Terrible] employed against the king and princes of Poland and Swethia [Sweden] by whom he now was environed, for the country of Liolande [Livonia].” The other “consisting commonly of 100 thousand horse, most of his own natural subjects, saving some few Pollacks [Poles], Swethians [Swedes], Duch [Dutch], and Scots, employed against his great enemy the Crim Tartar [Crimean Tatars], which commonly does not last above three months, May, June, and July every year.” Horsey did not mention how the foreign troops were paid.

Russian scholars have determined that in the early 1500s, income from a service estate of 300 chetverti would have been roughly five to eight rubles annually and ten to twenty rubles a century later, while in the late 1500s, the cost of equipping a rider was five to seven and one-half rubles, and the expense for a horse and rider on campaign was an

41. Keep, Soldiers of the Tsar, 42.
42. Herberstein, Description of Moscow, 47. Herberstein also noted that “Those who have an agreed salary of twelve guilder . . . must set off with their horses upon an errand at any time at their own expense.” Deti boyarski were a rank of middle servicemen. The term literally means “children of boyars,” although they were not actually related to the boyar class at all by this time.
44. Ibid.
additional seven rubles. While armor and weaponry did not have to be bought or manufactured anew each year, the middle servicemen of the early part of the century still had little left over, especially considering that many of them often held less than 300 chetverti of land.45 Of the 1,078 members of Ivan IV’s “Chosen Thousand,” brought to serve him in and around Moscow, 614 held (or were entitled to) only 300 chetverti, while an additional 396 were entitled to between 300 and 450 chetverti. The lands given to the “chosen” or “thousanders,” around Moscow were not by themselves sufficient to provide anything but a bare minimum for the “thousanders,” who had to rely on income from lands held outside of the immediate vicinity of Moscow for their support.46 The government was often not very generous in its distribution of land to its servitors.

In spite of the innovation of creating a service basis for land ownership, the middle servicemen were neither a standing army nor infantrymen, the basis of armies in the wake of the Military Revolution. They were cavalrmen who appeared only once a year for inspection (suffering penalties if their weapons, horses, or other equipment were not considered up to muster), and when summoned for a campaign or other military duties.47 Furthermore, their weaponry comprised bows and arrows, swords, and spears, and not gunpowder weapons. This class came into being at a time when the West was abandoning feudalism and adopting infantry-based armies. At roughly the same time that the service estate system was being established, however, the first steps were being taken which would lead to a modern infantry-based army in Russia, steps which came within a scant generation after the establishment of the middle service class. The adoption of infantry armed with gun-


47. Servitors on the southern steppe-borders were required to appear for patrols south of the chertca lines. The patrols were divided into eight squadrons, the first riding out on 1 April, followed by the second on 15 April, the third on 1 May, and so on, until the first again rode out on 1 August, the second again on 15 August. These patrols continued until the last left on 15 November, returning 1 December, though later patrols could be sent if “the Great Snow” had not yet fallen. See Soloviev, A History of Russia, 12: 22–27. Keep states that these patrols, usually comprising Cossacks and numbering seventy to one hundred men, served three-month rotations on the southern frontier. Keep, Soldiers of the Tsar, 34.
powder weapons was a significant innovation in the almost exclusively cavalry army that had been prevalent since the early medieval period.

The first corps of infantry to use firearms in Russia was the *pishchal’niki*, appearing in the early 1500s. The *pishchal’,* for which they were named, was originally, in fact, a small caliber cannon (30 to 40 mm) used in fortresses; the *pishchal’niki* were thus originally artillerymen and remained tied to fortress defense throughout their history. Later, however, the *pishchal’* evolved into a shoulder arm, like the Western European harquebus. 48 Hellie dated their appearance to 1508, and their greater use of firearms is considered a response to the Muscovite defeat at the hands of the Livonians in 1501 at the battle of Siritsa River, near Pskov, a defeat seen as the result of a lack of firearms. 49 One thousand *pishchal’niki* were outfitted at treasury expense and participated in the final annexation of Pskov in 1510, as well as the conquest of Smolensk in 1512, but were disbanded after each campaign. They were revived in 1545 when two thousand *pishchal’niki* (one thousand on horseback) were levied by the towns and outfitted at treasury expense. 50

Since the *pishchal’niki* were disbanded after each campaign, and the middle servicemen returned to their estates, Russia remained without a standing army. Arguably, the *strel’tsy*, often translated as musketeers, but more accurately harquebusiers, were the first standing units in the Russian army. The exact date of their formation is open to debate, though most scholars agree it was in the last years of Ivan IV’s minority or the first years of his majority, between 1545 and 1550. The *strel’tsy* were first used in combat at the siege of Kazan’ in 1552. 51 Three thousand men were chosen from the *pishchal’niki* and formed into six units

48. The harquebus first appeared in Germany and made its way into Switzerland and Italy in the 1300s. It first surfaced in Russia at the Stand on the Ugra in 1480, when, according to tradition, Moscow threw off the Mongol Yoke. Hellie, *Enserfment and Military Change*, 160. The *pishchal’,* as it developed as a harquebus, was an early matchlock of 0.22 caliber weighing 8–10 kg., enough to require a stand for firing. It had a range of two hundred to three hundred meters. Thomas Esper, “Military Self-Sufficiency and Weapons Technology in Muscovite Russia,” *Slavic Review* 28 (June 1969): 192; Hellie, *Enserfment and Military Change*, 153. On the early *pishchal’* cannon, as well as the *nariada*, a late fourteenth-century cannon, see Razin, *Istoriia voennogo iskusstva*, 2:310–11. These weapons were metal tubes set and bracketed into a grooved, wheelless piece of wood.


51. Chernov, “Obrazovanie strelets’kogo voiska [The formation of Strel’tsy troops],” *Istoricheskie zapiski* [Historical notes] 38 (1951): 282–84. Chernov cites Marx, who, using several sources, claimed the *strel’tsy* were founded in 1545; sources would also seem to show the formation of the *strel’tsy* in the last years of Ivan’s minority. Cf. *PSRL* 20:57, 297; Sergei Soloviev, *Istoriia Rossii s drevneishikh vremen*
to serve in Moscow. They became not so much a military unit as a military caste, as they were housed with their families in the Vorob’evo Settlement, now the Lenin Hills (previously the Sparrow Hills where Moscow State University now stands).52 They were allowed to farm and trade during peacetime to supplement their income of four rubles annually, and their sons were raised to be strel’tsy as well.53 They were, more often than not, used as a police force, and special detachments guarded foreign dignitaries, particularly later in the seventeenth century. Two hundred mounted strel’tsy (stremiannye strel’tsy), or “gunners at the stirrup,” served as guards to the Tsar, though they became something of a Praetorian element in the late seventeenth century.54 Kotoshikhin and Olearius wrote that the strel’tsy were also used to fight fires, since by this time they were a constabulary force rather than a true military force.55

[History of Russia from ancient times] (Moscow: Izd-vo sotsialno-ekonomicheskoi literatury, 1965), 2:57. Hellie dated the strel’tsy from 1550 (Enserfment and Military Change, 161), as did Keep (Soldiers of the Tsar, 60). The Chronicle of the Beginning of the Reign of Ican Vasil’evich noted that as Ivan IV advanced on Kazan’, “the streltsy and cossacks advanced with him in front of the regiment” and that the hetmen of the cossacks and commanders of the streltsy accompanied the tsar. PSRL 29:95. That chronicle, as well as the Aleksandr Nevsky Chronicle, noted that “Strel’tsy with pishchali” took part in the siege of Kazan’. PSRL 29:98; see also 195, 197.

52. Olearius calls this section of town Streletskaia sloboda [the Strel’tsy suburb]. It lay to the south of the Moscow River and was, in Olearius’s day, “surrounded by a barrier of timbers and wooden fortifications.” Olearius, The Travels of Olearius in Seventeenth Century Russia, 116.

53. Kotoshikhin noted that “among the musketeers . . . . there are many rich trading men and artisans of various kinds.” Kotoshikhin, On Russia in the Reign of Alexis Mikhailovich, 172. On their sons being raised to be strel’tsy, see 243. On their incomes, see 172–73.

54. Esper, “Military Self-Sufficiency and Weapons Technology in Muscovite Russia,” 193; Keep, Soldiers of the Tsar, 61–68. Their pay was reduced to two to three rubles and six quarters of grain per year by 1647–48; mounted strel’tsy received five rubles, the additional pay meant for the upkeep of their mounts. Keep, Soldiers of the Tsar, 65. Giles Fletcher mentions two thousand stremiannye strel’tsy. Fletcher, Of the Russe Commonwealth, 56. Horsey noted that when English Ambassador Sir James Bowes was received by the Tsar in 1583, there were “a thousand gunners clad in red, yellow and blue garments, set in rank by the captains on horseback, with bright pieces, harquebuses in their hands, from the ambassador’s door to the Emperor’s palace.” In addition, the ambassador was escorted by three hundred “gentlemen on horseback richly furnished,” though the ambassador was displeased that the prince accompanying him had a better horse than he was given. Horsey, “The Travels of Sir Jerome Horsey,” 197. Cf. Kotoshikhin, On Russia in the Reign of Alexis Mikhailovich, 171–74.

55. Kotoshikhin, On Russia in the Reign of Alexis Mikhailovich, 174; Olearius, The Travels of Olearius in Seventeenth Century Russia, 112. Kotoshikhin noted that they used “axes and buckets and copper fire-pumps, and fire hooks with which to tear down the wooden houses.” Olearius, however, claims that they never used water.
The strel’tsy, however, were employed differently from musketeers in Western Europe. In addition to their auxiliary duties as guards, firemen, and policemen, their function in battle differed from that of their Western counterparts. They were seldom sent into pitched battle, instead being used against fixed positions or fortifications. Often protected by cavalry, they fired upon the enemy from wooden platforms, from behind moats or fascines, or from within mobile wooden fortifications (guliai gorod—literally “moving city” or “moving fort”) some three meters wide and erected specifically for their use. He wrote that “they never intentionally engaged in hand-to-hand combat, the storming of a fortress, or street fighting . . . [instead] the major function of the strel’tsy was to deliver massed firepower.” He added that the strel’tsy probably fired in volley, (which he called “caracole fashion”): the first row fired and stepped to the rear to reload while the second row stepped forward to fire. In addition to their handguns, they were armed with sabers and occasionally lances, as well as with large battle-axes, which they used as stands for their handguns.

In the second quarter of the seventeenth century, the strel’tsy were supplemented by new units “based on foreign formation.” At first, foreign mercenaries were brought in to fight for Moscow. Most of the for-

56. On the employment of the strel’tsy and their static deployment on wooden platforms, see Razin, Istoriia voennogo iskusstva, 2:332–33; Hellie, Enserfment and Military Change, 162; Hamel, in Early Travels in Russia and Persia, 2:360–61, appendix 1. The platforms were used for public reviews, but apparently also were used in combat. The gulai gorod is discussed in Razin, Istoriia voennogo iskusstva, 2:337; Fletcher also discusses the gulai gorod, calling them “walking castles.” Fletcher, Of the Russe Commonwealth, 60–61; Christopher Duffy, Siege Warfare: The Fortress in the Early Modern World, 1494–1660 (London and Henley: Routledge and Kegan Paul, 1979), 171–72; Hellie, Enserfment and Military Change, 164–65. For illustrations and diagrams of them, see Razin, Istoriia voennogo iskusstva, 2:334, 336–37; Duffy, Siege Warfare, 172.
57. Hellie, Enserfment and Military Change, 162.
58. Roberts and Hellie defined the caracole differently. A caracole, in Roberts’s usage, was when “a squadron of heavy cavalry . . . would ride to within thirty paces of the enemy . . . turn right, and simultaneously discharge their left-hand pistols. The maneuver was then repeated by wheeling about and firing the right-hand pistol.” Michael Roberts, Gustavus Adolphus: A History of Sweden, 1611–32 (London: Longman, Green, and Co., 1958), 2:179. What Hellie called a caracole, Roberts referred to as the countermarch or volley. See Roberts, Gustavus Adolphus, 2:174; Parker, The Military Revolution, 18–19.
59. Hellie, Enserfment and Military Change, 161; Fletcher, Of the Russe Commonwealth, 58.
60. The strel’tsy, though the main unit to be equipped with firearms, were not the only ones so armed prior to this time. At the siege of Kazan’, “strel’tsy and boyars’ men” were armed with firearms and took part in the siege, firing on the defenders of Kazan’ who fired cannons at the Muscovite army. PSRL 29:99.
eigners in the sixteenth century had served in units comprised exclusively of foreign soldiers, but by the seventeenth century, after the desertion of foreign mercenaries led to several defeats, foreigners served mainly as commanders over middle servicemen who held no service land. In 1630, two thousand deti boyarskie were invited to Moscow for training as infantry soldiers, but the middle servicemen felt insulted to serve under foreigners, and no more than sixty of them registered. In September of the same year, Patriarch Filaret, frustrated by the failure to recruit middle servicemen, allowed Tatars, Cossacks, and other “free people” to join the new formation infantry. Filaret’s role in raising recruits was due not as much to his ecclesiastical office as to his position as the father of Tsar Mikhail Romanov (r. 1613–45) and the power behind the throne until his death in 1633. He had been forced to take monastic vows during the Time of Troubles and had been chosen Patriarch. (Forced tonsure was a way to remove a person from political power.)

Over the course of the 1630s, 1640s, and 1650s, however, the government in Moscow found that reliance on the middle servicemen, strel’tsy, foreign mercenaries, and Cossack and Tatar recruits was insufficient to face the threats from Poland-Lithuania and the Swedes. Therefore, in 1658, the government introduced conscription, which mainly affected the peasantry, due to their disproportionate representation among the population. Annual recruitment of one infantry soldier for every twenty-five households (sometimes one for every three adult males) began in November 1658. In the Novgorod region, one infantry soldier was required for every ten households. Villages with fewer than ten households paid 1 ruble per household in lieu of providing a soldier. The first annual call-up yielded eighteen thousand men and 10,300 rubles. These levies continued annually until 1663, so that over the course of the Thirteen Years’ War with Poland (1654–67) over one

61. At the Battle of Klushino (1610), despite a six-to-one superiority, the Russians were defeated by the Poles when their Swedish mercenaries (who also outnumbered the Poles) went over to the enemy. Hellie, Enserfment and Military Change, 169. Roberts attributed the defeat to a difference in tactics. The Poles, who continued to employ cavalry charges with the saber, attacked the Russian cavalry at the moment the latter had just completed a caracole and were reloading. Roberts, Gustavus Adolphus, 2:180. For descriptions of foreigners in the service of Ivan IV, including Tatars, Swedes, Poles, Dutch, and Scottish soldiers, see Horsey, “The Travels of Sir Jerome Horsey,” 181, 225.

62. Kotoshikhin wrote that foreign officers were used to train the cavalry (reitary) as well as the infantry regiments. Kotoshikhin, On Russia in the Reign of Alexis Mikhailovich, 242–43.

63. The rank-and-file soldiers in the new formations were paid five rubles annually. Hellie, Enserfment and Military Change, 171.
hundred thousand men were drafted into the army. Kotoshikhin wrote that conscription produced one horseman and one infantryman for every one hundred households during the early 1650s. If a second levy was required, another horseman was taken for every one hundred households, and one infantryman for every twenty.

But in many ways, the Russian army remained a vestige of the medieval world up to the reign of Peter I. The cavalry was still made up of middle servicemen who owed service in return for their estates. While strel'tsy officers were sometimes given land in addition to wages, most rank-and-file strel'tsy were simply given money and a grain ration, in addition to what they could earn on their own. They were expected to raise their sons to serve after them. To these were added foreign mercenaries, mainly hired in the second quarter of the seventeenth century and comprising the units "based on foreign formation." The implementation of conscription in the 1650s also honored the medieval status of the nobles since it was restricted to the peasantry, although by the mid-seventeenth century, the army was maintained by the central government, being outfitted with muskets and sometimes rapiers, axes, short pikes, hand grenades, and breastplates, and paid two kopeks a day. In times of economic shortfalls, noblemen were required to send servicemen to fight at their own (and not the Treasury's) expense. Even then, the majority of the levies were not kept on after hostilities, but were sent home. Hellie is right in maintaining that "the dead hand of the past" remained to restrict the system.

This being said, Russia was not the only army in which remnants of the Middle Ages survived into the seventeenth century. Thomas Esper noted that the English army used the longbow into the late sixteenth century. Sweden's cavalry under King Gustavus Adolphus was levied in

64. Hellie, Enserfment and Military Change, 194–95. Sometimes the number was increased to one soldier for every twenty households. Keep noted that universal conscription did not begin in Russia until 1874. Soldiers of the Tsar, 376.

65. Kotoshikhin, On Russia in the Reign of Alexis Mikhailovich, 245. He also noted that monetary payments were imposed on villages of fewer than one hundred households.


68. Hellie, Enserfment and Military Change, 196. Hellie has found that bread cost, on average, three kopeks a day during the seventeenth century; thus, a salary of two kopeks a day would have been insufficient for survival. However, grain allotments to the troops would have made it unnecessary to buy bread. Cash payments remained meager throughout the seventeenth century and insufficient to buy a basic basket of goods. Hellie, The Economy and Material Culture of Russia, 462–66, especially 466.

a fashion similar to Russia’s, but the determinant in how many troopers a landholder had to supply was the landholder’s hereditary income, not the amount of land he held. Likewise, Sweden’s system of conscription had taken shape only in the late sixteenth and early seventeenth centuries, and was based on one soldier for every rota (an administrative unit of ten conscriptable men). Lithuania did not establish a standing army until 1551, while Poland lacked one until 1562. Its army, remaining restrained by past practices, relied on the szlachta (gentry) to levy cavalry for the army into the eighteenth century.

Spain’s army, seen as one of the best in Europe during the Military Revolution, particularly its Army of Flanders, was made up largely of men who were subjects of the King of Spain, either as their king, as Duke of Milan, or as the lord of the Habsburg lands from which they were drawn. Roberts calls the Spanish army at this time a “mercenary army,” since it was not conscripted and neither its officers nor men owed service to the Crown for land or title. Parker, however, argues that the Crown desired to recruit men who held some loyalties to it, were not tied merely by payment for service, and were, therefore, not truly mercenaries. The Spanish Crown raised its troops in one of three ways. First, it commissioned a captain with a royal patent who recruited men from the various towns specified in his patent. The captain then presented his levies to a muster-master of the king who inspected the recruits, read the Articles of War to them, stated the penalties for misconduct, and formally enlisted them. Second, the Spanish Crown contracted out to foreign mercenaries who agreed, for a certain amount, to muster a certain number of troops within a given time. Third, it compelled men to serve, usually in lieu of a prison term. Spain and the Habsburg lands did not have conscription at this time.

Technical Innovations

On the technical side, the adoption of gunpowder in Russia was a significant modernization of the art of war, as it was in the rest of Europe. First appearing in Asia in the 1250s, firearms made their way into Europe in the thirteenth century. Gunpowder was first reported to have

71. Ibid., 207–8.
75. Ibid., 35–38.
76. Ibid., 38–40.
been imported into Western Europe in the thirteenth century and first used for explosive purposes (rather than as fireworks for entertainment) between 1270 and 1320. Its first recorded use in Russia was in 1382 when Khan Tokhtamysh attacked Moscow, but mobile cannons did not appear until the 1450s. An early chronicle account of gunpowder used in battle in Russia described the event by noting that “thunder was thrown” at the Russians. A later chronicler reported the use of mobile cannons in Galicia in 1450, but presumably did not fully understand their purpose, as he wrote with apparent relief that cannons, *tiufiaki* (singular, *tiufiak*) and *pishchali* were used against a city but “thank God no one was killed.”

The Russians were slow to adopt artillery and when they did, it was indecisive in battle until the second half of the fifteenth century, remaining “imposing rather than advanced.” The Russians first used artillery in the field at the Battle of Vorskla River (1399), in which the army of Lithuanian Grand Prince Vytautas (Vitold) was defeated, though not due to the artillery. More than a century later, according to Herberstein, the Russians still did not employ artillery to any large extent. “In battle,” he wrote, the Russians “never use artillery or infantry, their single tactic being to attack and flee in haste.” In his next sentence he contradicted himself, writing that Vasili III used fifteen thousand infantry


78. *PSRL* 15:25; Esper, “Military Self-Sufficiency and Weapons Technology in Muscovite Russia,” 188.

79. *PSRL* 8:122; Alef, “Muscovite Military Reforms in the Second Half of the Fifteenth Century,” 81. A *tiufiak* (from the Turkish word for “weapon”) was a type of cannon, said to have been used in Moscow when Khan Tokhtamysh besieged the city in 1382, though historian Anatolii Nikolaevich Kirpichnikov argues that it was actually a hand grenade. Esper, “Military Self-Sufficiency and Weapons Technology in Muscovite Russia,” 187. Hellie described the *tiufiak* as an antipersonnel weapon of the howitzer type firing buckshot; Hellie, *Enserfment and Military Change*, 153. For a discussion of the *pishchal*, *nariada*, and early cannons in Russia, see Razin, *Istoriia voennogo iskusstva*, 2:310–11, 343–50.

80. Hellie noted that of twenty-two battles in which artillery was used between 1425 and 1470, the outcomes of only four or five battles were influenced by cannons. Between 1470 and 1520, artillery had an influence in sixteen of twenty battles. Hellie, *Enserfment and Military Change*, 153–54.

and “a piece of field ordnance and a few infantry with his horsemen” against the Crimean and Kazan’ Tatars at a camp on the Oka River. The contradiction is perhaps best explained by the fact that this was a defensive response to an attack by the Tatars a year before. It was also the exception to the rule. Herberstein added that the single cannon had been used “only to show his [Vasilii III’s] power and to wipe away the disgrace of having hidden some days in a haystack—or else he feared that the Tatar would return.” Herberstein noted further that “at the time we were there, he [Vasilii] may have had fifteen hundred foot [soldiers], Lithuanian and other foreigners. He had cannonaded Smolensk, casting the pieces before the walls and breaking them up afterwards; he carried the remnants away.” Vasilii’s father, Ivan III, had used artillery against Fellin, in Livonia, and other Western fortresses, though it remained little-used in actual set-piece battles, and the Russians were often defeated due to an insufficient artillery park in comparison to their foes. The Livonians defeated the Russians at the Battle of Siritza (1501) and the Lithuanians beat them at the Battle of Orsha River (1514), in part due to their superior artillery.

Russia’s artillery had both foreign and domestic origins. According to Herberstein, in the sixteenth century cannons were cast by German and Italian gunsmiths: “the Muscovites learned nothing of their skill nor have they any notion of which piece to use for battle in the field and which for the attack or defense of walls.” Kotoshikhin noted more than a century after Herberstein that “the manufacture of this iron [for guns] is managed by men from foreign states while the workers are trading men and hired men from the towns.” The technology to cast bronze cannons was first brought to Russia by Aristotle Fioraventi in 1478, and cannons were first reportedly cast in Russia in 1485. Because bronze was very expensive, inferior iron cannons were also cast in the late fifteenth and early sixteenth centuries. Russia at this time had not yet discovered the copper or tin reserves of the Ural Mountains, so bronze for cannons (or the cannons themselves) had to be imported. In the seventeenth

82. Herberstein, Description of Moscow, 78; Hellie, Enserfment and Military Change, 155.
83. Herberstein, Description of Moscow, 78–79.
84. Ibid., 79.
85. Hellie, Enserfment and Military Change, 156.
86. Ibid., 79.
88. Esper, “Military Self-Sufficiency and Weapons Technology in Muscovite Russia,” 189. Herberstein wrote of an incident where a German gunsmith was ordered by a Russian “castellan” to take “an ancient piece of iron, like a mortar which had lain there for years” to use in the defense of Moscow against a Tatar raid. The gunsmith told the Russian that it would take more than three days to move the gun and even then, it would be ineffective. Herberstein, Description of Moscow, 79.
century, Olearius observed that cannons were cast in the shadow of the Moscow Kremlin: “Here . . . at a place on the Neglinnaia River that they call the Pogannyi prud, is a casting works where metal guns and large bells are made. Hans Falck, a very experienced master from Nuremburg, works here.”

As late as the 1660s, Kotoshikhin noted that iron cannons were cast in Tula, south of Moscow, although “that iron is forged crudely, not so soft as Swedish iron,” adding that “when the Tsar needs Swedish iron for any purpose, such iron is bought from trading men.” He went on to write that “for the manufacture of cannon, copper is brought from Archangél and from Sweden, while other cannon are contracted to be made by men from Holand and Lübeck and Hamburg and are brought to the town of Archangél.”

Powder mills were established throughout Russia by both foreign and Russian masters.

According to Giles Fletcher and others, the quality of Russian arms remained below that of the West, but Russia made up for the deficiency in quality by collecting a great quantity of artillery over the course of the sixteenth and seventeenth centuries. Fletcher, English Ambassador to Russia, stated in his 1588 embassy to the court of Ivan IV the Terrible that the Russians used field pieces “as occasion doth require,” but noted that:

of pieces for the field they carry no great store, when they war against the Tatar: but when they deal with the Polonian [i.e., the Poles] (of whose forces they make more account), they go better furnished with all kind of munitions and other necessary provisions. It is thought that no Prince of Christendom hath better store of munitions than the Russe [Russian] Emperor. And it may partly appear by the Artillery house at Moscow, where are of all stores of great ordnance, all brass pieces, very fair to an exceeding great number.

Ivan IV had introduced regimental artillery into the army in 1552, when each regiment was given two to four light (six- to eight-pound) cannons

90. Kotoshikhin, On Russia in the Reign of Alexis Mikhailovich, 198. Tula bog iron is in fact, very soft, softer than Swedish iron; that is why Swedish iron was favored over Tula iron for casting cannons.
91. Ibid., 200.
92. Ibid.
93. Esper, “Military Self-Sufficiency and Weapons Technology in Muscovite Russia,” 196, 200. Esper noted, however, that Russian cannons said to have been of poor quality had to have been of some value since they were sold abroad in the mid-seventeenth century. As indicated elsewhere, other Westerners held Russian ordnance in high regard, though Kotoshikhin also noted that the iron used in cannons was of an inferior quality. (See footnote 90.)
94. Fletcher, Of the Russe Commonwealth, 61.
of 95–106 mm and a range of five hundred meters. On the campaign against Kazan’, Ivan employed 150 medium and heavy cannons, in addition to an unknown number of light cannons. A 1577 letter attributed to one Dr. Hamel, who acted as Anthony Jenkins’s interpreter in Russia, noted that every December, Ivan the Terrible had

all his ordinance that is in the city of Moscow carried out into the fields. . . . and there have it planted and beat upon two houses of wood filled within with earth . . . to the end [that] the Emperor may see what his gunners can do. They have fair ordinance of brass of all sorts, bases, falcons, minions, sakers, culverings, cannons double and royal, basilisks, long and large. They have six great pieces whose shot is a yard in height, which shot a man may easily discern as they flee. They have also a great many mortar pieces or potguns, out of which pieces they shoot wild fire.

The Austrian ambassador, Hans Kobenzl von Prossseg, claimed that by 1576, Ivan had more than 2,000 artillery pieces. It is not clear how many of these pieces were actually used in battle, as Heinrich von Staden, a German in the service of Ivan IV, noted that in Moscow the Kremlin contained a number of pieces of Livonian artillery “that the Grand Prince seized in Fellin when he captured the Master [of the Livonian Order] Wilhelm Furstenberg. They stood there uncovered, just for show.” At the coronation of Ivan the Terrible’s son Feodor, Jerome Horsey noted that 170 cannons were fired in salute, “great pieces of brass of all sorts, as fair as any can be made.” Three hundred cannons were used in the war against Sweden during the reign of Feodor Ivanovich. By 1600, Muscovy is said to have had 3,500 cannons, and by the late 1600s, from 4,000 to 5,000 pieces. However, in the 1660s Kotoshikhin wrote that there were only “about six hundred artillerymen (pushkari) and harquebusiers (zatinshchiki) and masters of various kinds in Moscow, in addition to the provinces,”

95. Hellie, *Enserfment and Military Change,* 156. A special artillery branch did not then exist and would not be introduced into Russia until the reign of Peter the Great.
99. Horsey, “The Travels of Sir Jerome Horsey,” 274. In addition, twenty thousand harquebusiers fired a two-volley salute, and Feodor was accompanied by fifty thousand horsemen.
100. Hellie, *Enserfment and Military Change,* 157, 185; Esper noted that in 1678, Russia had 3,575 artillery pieces and campaigned with 400 to 500 pieces. Esper, “Military Self-Sufficiency and Weapons Technology in Muscovite Russia,” 201.
101. Kotoshikhin, *On Russia in the Reign of Alexis Mikhailovich,* 200. Pushkari are defined as artillerists who manned field cannons; Zatinshchiki manned smaller cannons fixed to fortress walls (p. 557). In other cases where the term *harquebusier* is used, particularly in Western travel accounts, it is not clear whether a cannon or a handgun is meant, i.e., whether a *zatinshchik* or *strel’ets* employed the weapon.
too few to man the 4,000 or 5,000 cannons in Russia’s arsenals. He later wrote that the Tsar’s Regiment had some 200 artillery “pieces of various kinds,” while the other regiments, including the strel’tsy regiments, had 50 to 80 pieces each. 102 Fortresses and fortified monasteries were likewise equipped with cannons as needed. 103 While it was true, as Hellie noted, that by the second half of the sixteenth century “Russian military successes . . . can be attributed in large part to the skillful use of artillery,” it must be added that many of the pieces in stock were older pieces; an inventory of the arsenal at Smolensk in the mid-seventeenth century listed artillery pieces from the reign of Ivan III, two hundred years earlier. Such large numbers of cannons were apparently quite obsolete by 1700, when almost the entire (modern) artillery park was lost at Narva. 105

In response to advances in artillery, Russian fortresses were built or rebuilt to incorporate artillery as well as to withstand artillery attacks by besiegers. During the fifteenth, sixteenth, and seventeenth centuries, the Russians worked with Italian and other Western architects and military engineers to modernize their medieval wooden palisades (resembling nineteenth-century forts in the American West) and stone fortresses, particularly on the Western frontier. In the course of the 1500s and 1600s, the Russians came to adopt layouts that were geometrical rather than built to follow the terrain. However, the Russians never became fully “Western” in their fortification methods. They never adopted the trace italienne to any large degree, but rather used the “reinforced castle” style of fortification popular in Germany but considered elsewhere in the West to be less modern than the Italian style. 107 Furthermore, as late as the mid-seventeenth century, most fortresses in Russia remained

103. Ibid., 238.
wooden palisades resting atop earthworks. In the 1660s Grigorii Koto-
shikhin counted only about twenty stone fortresses in Russia. 108

The Moscow Kremlin, as it now stands, is a product of rebuilding
under Ivan III in the late fifteenth century. While triangular in shape, it
was not geometrical, but rather followed the course of the Moscow and
Neglinnaia Rivers, though the latter river was filled in during the late
eighteenth or early nineteenth century. 109 A moat was dug in 1508 along
the northeastern wall, where Lenin's mausoleum and the tombs of the
Soviet leadership and heroes now stand. The fortress grew from the
twelfth century, when a wooden stockade or palisade (tyn) occupied
what is now only the southwestern corner of the current site, where the
Grand Palace of the Kremlin now stands. (The town of Moscow occupied
another third of the present site, to the northeast of the wooden
fortress.) By the early fourteenth century, Grand Prince Ivan I “Kalita”
(“Moneybags”) (r. 1328–41) had built oak walls encompassing about five-
sixths of the present site. Grand Prince Dmitrii “Donskoi” (1359–89),
who defeated the Tatars on the Don in 1380, built limestone walls, essen-
tially on the site of the current walls, in the late fourteenth century, and
Grand Prince Ivan III rebuilt them in brick in 1485–95. During his visit
to Moscow, Adam Olearius observed that “the castle [i.e., the Kremlin]
is surrounded by triple stone walls and a deep moat, and is defended with
fine weapons and soldiers.” 110

Other fortifications in Moscow and throughout Russia closely resem-
bled the Kremlin in that they, too, followed the “reinforced castle” pat-
tern of construction. In the mid-sixteenth century, the Kitai-Gorod north
and east of the Moscow Kremlin (so named for the baskets filled with
earth that had previously been used for making embankments), was for-
tified along the same lines as the Kremlin (remnants of the wall can still
be seen near Lubianka Square). The Kamennyi gorod (Stone City), or
Belyi Gorod (White City), section of Moscow was fortified in stone only
in 1595 under Tsar Feodor, Ivan the Terrible’s son, and took its name

Benesch counted only fourteen stone-and-brick fortresses, while Lappo-Danilevskii
counted nineteen. W. Benesch, “The Use of Wood as a Building Material in Pre-
Modern Russia: Its Extent and Potential Cultural Implications,” *Cahiers d’histoire
mondiale* 8, 1 (1964): 160–67; A. S. Lappo-Danilevskii, *Organizatsiia priamogo
oblosheniia v Moskoeskom gosudarstve so vremen smuty do epokhi preobrazo-
vaniiia* (The organization of direct taxation in the Muscovite state from the time of
troubles to the era of reforms) (St. Petersburg: I. N. Skorokhoda, 1890).

109. The Aleksandriniskii Park and several of the older buildings of Moscow Uni-
versity now stand over the Neglinnaia River. For a discussion of the Kremlin, see

from the white stone used in its walls. The fortresses at Tula and Ivan-
gorod resembled the Kremlin in the structure of their towers and walls, but were geometrical fortresses, though again, without the ravelins and bastions popular in the Western trace italienne or Vauban’s star fortresses. The fortifications at the Troitskii Monastery northeast of Moscow and at Smolensk (the largest building project in sixteenth-cen-
tury Europe) were irregular and again, were in the “reinforced castle style” favored by the Germans. They were joined by only a few exam-
plies of bastions built in Russia. In 1638, a bastion fortress was built along the Osetr River as part of the chertva line, a defensive line of wooden and earthen walls stretching along the southern border in Ukraine and pro-
tecting Russia from raids by the Crimean Tatars. In 1703, Peter I began building the fortress of Peter and Paul in what is today St. Peters-
burg, where all but one of the later Emperors and Empresses of Russia are buried. He used a bastion system, most likely modeled on the fortresses of the Netherlands where he had spent time learning to build ships. This, however, is outside the time frame of this paper. A handful of others can be found, but the Italian style was never widespread in Russia.

Russia’s technical advances in warfare were usually made by West-
ern experts imported into Russia for their expertise, often with Western weaponry. In 1547, Hans Schlitte was commissioned by the Tsar (he himself claimed to be Ivan IV’s ambassador) to recruit Western special-
ists. The following year, he received permission from Holy Roman Emperor Charles V to take the specialists to Russia, provided they did not pass on to Turkey, Tartary, or any non-Christian land. Most of the 123 specialists assembled at Lübeck were arrested and dispersed after the city received a request from the city of Revel (Tallinn) to detain them. One who attempted to continue on to Russia was apprehended two miles from the Russian border and executed. In November 1567,

111. PSRL 14:37. A map of Moscow published by Adam Olearius in the mid-sev-
enteenth century showed bastions along the southern wall of the city (left side of map). See Anthony Cross, Russia Through Western Eyes, 1517–1825 (London: Elek Books, 1971), 92–93; Olearius, The Travels of Olearius in Seventeenth Century Russia, plates between 150 and 151. For a description of Moscow’s fortifications, see 112–16.


113. Nikitin, Materialy i issledovaniia po arkhelogiia SSSR, no. 44, pp. 164–70.

114. This importation of weapons and experts caused consternation among Western Europeans, especially in the Hanseatic cities, Poland, and Livonia. See Esper, “A Sixteenth Century Anti-Russian Arms Embargo,” Jahrbücher für Geschichte Osteuropas [Yearbook for East European history] 15 (June 1967): 180–96; George Tolstoy, England and Russia, 29–33. On the importation (and export) of weapons, see also Esper, “Military Self-Sufficiency and Weapons Technol-
gy in Muscovite Russia,” 200–203. Also note Herberstein’s remarks above regarding German and Italian gunsmiths. Herberstein, Description of Moscow, 79.

Anthony Jenkins, Queen Elizabeth’s ambassador to Ivan IV, presented a request from the Tsar to Elizabeth to “license masters to come unto him which can help make ships, and sail them. Further that the Q[ueen] ma[je]st[y would suffer him to have out of England all kind of Artillery and things necessary for war.”\footnote{116. Tolstoy, *England and Russia*, 38–40.} Several Western specialists arrived, and some even set up arms factories in Russia, though they usually were required to train native Russians in the manufacture of arms.\footnote{117. On foreign-owned and built armament shops in Russia, particularly the Dutch venture founded at Tula in the 1630s, see Esper, “Military Self-Sufficiency and Weapons Technology in Muscovite Russia,” 199–200, 202–3.} Native cannon masters were known to be at work during the reign of Ivan III; the most famous of the Russian founders, Andrei Chokhov, cast the *Tsar-Pushka*, the largest cannon ever made, with a caliber of 89 cm, a barrel of 5 m, and a weight of forty tons. The cannon, built “to frighten the Tatars,” was cast in 1585–86 and meant to fire crushed stone, but was never used. It is now on display in the Kremlin, next to large cannonballs that are mere decorations.\footnote{118. Hellie, *Enserfment and Military Change*, 156–57.}

One of the best examples of a foreign expert brought into Russia for his military (and other) expertise is the Italian architect and military engineer Rudolfio Fioraventi degli Alberti, better known as Aristotle Fioraventi. He is perhaps most famous as the architect of the Cathedral of the Dormition in the Moscow Kremlin where the Grand Princes, Tsars, and Emperors were crowned. As for his military contribution to Russia, he is said to have brought cast bronze cannons to Muscovy in 1475, as mentioned above.\footnote{119. Ibid., 154.} While in Russian service, he also built a pontoon bridge across the Volkhov River for the transport of mobile cannons during the campaign against Novgorod (1478), but the Pskovians, who had been ordered by the Grand Prince to bring artillery, never arrived. In 1482, Fioraventi designed artillery for the campaign against Kazan’, and three years later he was said to have directed the use of matchlocks and artillery against Tver’.\footnote{120. Alef, “Muscovite Military Reforms in the Second Half of the Fifteenth Century,” 79.} In 1481, mobile cannons from Moscow and Pskov were used against the city of Fellin in Livonia, the only time cannons facilitated direct assault on a fortress during Ivan III’s reign.\footnote{121. Ibid., 80–81.} It is not certain if Fioraventi participated in the campaign. Fellow Italians, particularly Pietro Antonio Solario and Aelevisio de Milano, helped rebuild the Kremlin walls in brick during the latter part of the reign of
Ivan III. They and other Italian architects took part in the rebuilding of other major fortifications at this time as well.\textsuperscript{122}

Tactically, the Russian army during the Muscovite period comprised five regiments: the Advanced Regiment (vanguard), the Left Wing, the Right Wing, the Main Regiment, and the Guard or Rear Regiment (rear-guard). The Reconnaissance Regiment (first mentioned in 1524) occasionally joined the other five, as did the Tsar’s Regiment when the Tsar was in attendance. In the course of the sixteenth century, these were joined by a Transport and an Artillery Regiment.\textsuperscript{123} Into the seventeenth century, the regiments were comprised mainly of horsemen who fired volleys of arrows and then closed with sabers. Kotoshikhin noted that the Tsar’s Regiment numbered some thirty thousand men and that each of the other regiments contained between seven and twenty thousand.\textsuperscript{124}

Russia did not develop tactics as fully as the West did until the seventeenth century, since initially Western tactics were utilized in Russia only by the “New Formation Units” led and manned by Westerners. In the course of the seventeenth century, especially during and after the reign of Peter I, Russia fully adopted Western tactics. But Russia came to have an academy, or higher military training, for its officers only in the eighteenth century, almost a century after many nations of Western Europe had begun to establish some form of higher training for officers and military specialists. Peter the Great founded a Navigation School in 1701 and an Artillery School in 1714. Engineering schools were established in Russia in 1712 and 1719; and the Military College was created only in 1719. In comparison, higher military education in Western Europe began on 9 January 1600 with the creation of a chair of surveying and fortification at Leiden University by Maurice of Nassau and Simon Stevin.\textsuperscript{125} Seventeen years later Maurice’s cousin John founded the first military academy from which students could receive “the first systematic military education of modern times” at Siegen. King Christ-

\textsuperscript{122} The Kremlin is said to closely resemble the Sforza Castle in Milan, which is not surprising since both Solario and de Milano came from that city. Duffy, \textit{Siege Warfare}, 170. Novgorod’s Kremlin (or Detinets) was rebuilt in 1484–90. The fortifications at Pskov, Ladoga, Ostrov, Kopor’e, and Iam were all rebuilt by the end of the fifteenth century along similar lines. Hellie, \textit{Enserfment and Military Change}, 157.


\textsuperscript{124} Kotoshikhin, \textit{On Russia in the Reign of Alexis Mikhailovich}, 250.

\textsuperscript{125} Duffy, \textit{Siege Warfare}, 81.
ian IV of Denmark established a similar academy at Sorø, the Marquis de Louvois founded a short-lived cadet school in France around this time, and the Baron de Chaos created a military academy in Austria in 1648. However, the fact that higher military training institutes were not established in Russia during this period does not mean that Russia lagged behind the West. Indeed, other Western European nations did not establish academic training for their officers until the eighteenth century. British officers bought their commissions in the eighteenth century, and no formal training for British officers was required or even provided until the Royal Military Academy was established in 1741.

Russia adopted some Western siege techniques as early as the famous assault on Kazan’ in 1552, but the siege remained a “curious amalgam of medieval and Renaissance practice,” and the Russians did not systematize their siegecraft until the reign of Peter the Great. Christopher Duffy wrote that “the impression of modernity was somewhat spoilt” at Kazan’ by the forty-foot siege tower built by Ivan Vyrod-khov and used against the southeastern wall near the Arskie gates. While stocked with ten large and fifty smaller guns, the tower still harked back to the siege machines of the Middle Ages. The town was invested on 23 August and completely cut off. By 26 September, the Dutch mining engineers had reached the edge of the ditch and laid charges at the base of the walls near the Nóqáisk and Arskie gates. The city was finally taken when these charges (i.e., forty-eight barrels of gunpowder) were exploded at three o’clock in the morning on 2 October 1552. The Russians then began a general cannonade of the city and stormed it at six points.

The Military Revolution: The Causes of Russia’s Delay

While it cannot be denied that Russia participated in the Military Revolution prior to the reign of Peter the Great, it must be admitted that Russia’s revolutionary military changes occurred later than those in the West, and that when Russia did make significant reforms, they were


128. PSRL 29:96, 192.

129. Razin, *Istoriia voennogo iskusstva*, 2:365; PSRL 29:97, 192. The chronicle mentions four gates that were stormed: the Arskie, Tsarevie, Talykovye, and the Tiumenskie.

often quite distinct from those adopted in Western Europe.\textsuperscript{131} (A prime example of this is the lack of fortresses of the Dutch or Italian style in Russia until the eighteenth century, and even then only a few instances can be found.) The cause of this delay has traditionally been seen as backward thinking on the part of the Russians: their inability to grasp the value of modernization, the famous Slavic stubbornness, or Russia's status as “a barbaric Asiatic power.”\textsuperscript{132} Likewise, the lack of Russian industry and the inability of Russian masters to produce modern weapons have been cited as causes of Russia's slow development. The monographs by Hellie and Keep and the studies by Esper and other scholars thoroughly dispel the myth of innate Russian backwardness. While scholars of Russian military modernization in the early modern period admit that Russia was slow to develop, sometimes due to the inability to grasp new innovations or due to conservative tendencies, especially among the upper and middle servicemen who wished to maintain their positions, they have pointed out several important variables that better explain Russia's delay in taking part in the Military Revolution.

One of the first reasons Russia did not adopt the innovations of the Military Revolution sooner is that it did not need to do so in order to face the state's main military threats, which remained the Tatars even into the late sixteenth century. The chertvea line, which effectively neutralized the Tatar threat, was not completed until 1654.\textsuperscript{133} Prior to that time, Russians adopted tactics like those of their enemies in order to meet the Tatar menace.\textsuperscript{134} John Keep concluded: “in many respects the pre-

\textsuperscript{131} Richard Hellie has pointed out that Russia used linear tactics at the Battle of Dobrinichie in 1605, “only five years after they had been ‘invented’ by Maurice of Orange to maximize fire power.” He also noted that the pishchal'niki used linear tactics when employing the gulai gorod. This being said, the Military Revolution in Russia was not completed until the early eighteenth century, later than the case in the west of Europe, assuming a Military Revolution in the mid-sixteenth century. Hellie, “Warfare, Changing Military Technology, and the Evolution of Muscovite Society,” 84; Hellie, \textit{Enserfment and Military Change}, 165.

\textsuperscript{132} Esper, “A Sixteenth Century Anti-Russian Arms Embargo,” 180. Esper refutes these claims.

\textsuperscript{133} Though Staden noted defensive fortifications along the Oka River: “For more than fifty miles along this Oka River the banks were fortified so: two four-foot palisades were set up with a two-foot space between them. The earth dug from behind the rear palisade was thrown between the two and the space was thus filled. The palisades were constructed by the princes and the boyars according to the extent of their estates. The harquebusiers therefore could lie behind the two palisades or entrenchments and shoot the Tatars as they swam across the river.” Staden, \textit{The Land and Government of Muscovy}, 53. Such defenses were similar to the chertvea lines in intent and, to some extent, in construction.

\textsuperscript{134} Hellie, \textit{Enserfment and Military Change}, 21; Alef, “Muscovite Military Reform in the Second Half of the Fifteenth Century,” 106; Esper, “Military Self-Sufficiency and Weapons Technology in Muscovite Russia,” 192. Keep pointed out that the
Petrine armed forces were reasonably well-adapted to the relatively limited tasks they faced."\textsuperscript{135} Large masses of slow-moving infantry were not suited to fighting on the steppe frontier. Gunpowder weapons had not been perfected to the extent that they could be effectively fired from horseback. Cannons were totally useless against the fast-moving Tatar cavalry.

Only in the course of the sixteenth century did Russia’s major enemies (Poland-Lithuania, the Livonian Germans, and Sweden) come to possess significant numbers of infantry with gunpowder weapons and large artillery parks. In order to face these enemies successfully, it became essential for Russia to take part in the Military Revolution, particularly in 1558 when Ivan IV launched his war against Livonia to seize the ports along the Baltic.

Several scholars have pointed out that Russia was slow to modernize because it suffered serious socio-economic and political upheaval at precisely the same time as the Military Revolution was occurring in the West, and was thus unable to modernize its military until the second quarter of the seventeenth century.\textsuperscript{136} Although similar crises hit nations in northern Europe at this time, Marshall Poe found that Russian society was “profoundly primitive” in comparison to the nations of Western Europe, and therefore could not withstand the crises as well as those countries. In addition, the simplicity of Russian society (e.g., a relatively small population, a relatively simple government structure, and a relatively undeveloped infrastructure) made it impossible for Russia to adopt the same changes in the same way, or at the same time.\textsuperscript{137} The much

\textsuperscript{135} Keep, \textit{Soldiers of the Tsar}, 15.

\textsuperscript{136} Several scholars have noted similar crises (epidemics, famines, etc.) elsewhere in Europe during the seventeenth century. See Geoffrey Parker and Lesley M. Smith, eds., \textit{The General Crisis of the Seventeenth Century} (London: Routledge and Kegan Paul, 1978). Peter Clark limited the crisis to the late sixteenth century: Peter Clark, \textit{The European Crisis of the 1590s} (London: George Allen and Unwin, 1985). At some point between 1594 and 1603, starvation caused by famine hit England, Scotland, France, Ireland, Norway, Sweden, Prussia, Livonia, Poland-Lithuania, and Russia. Chester Dunning, “Does Jack Goldstone’s Model of Early Modern State Crises Apply to Russia?” \textit{Comparative Studies in Society and History} 39 (July 1997): 582. See also 574–80 on the General Crisis. It is not clear what impact the General Crisis had in the West, or would have had on similar changes in Russia, although Russia’s crises, including the interregnum between the Riurikid and Romanov Dynasties, were arguable more severe and may thus have put off the Military Revolution there.

\textsuperscript{137} Marshall Poe, “The Consequences of the Military Revolution in Muscovy: A Comparative Perspective,” \textit{Comparative Studies in Society and History} 38 (October 1996): 613, 617. Hellie, Kaiser, and others have also commented on the simplicity of Russian society compared to Western European society at this time. Hellie, “Warfare,
smaller size and density of the Russian population in comparison to the nations of Western Europe were also important impediments to Russia’s ability to modernize. Russia had perhaps five to nine million people and a population density of six people per square kilometer, compared to eight people per square kilometer in Poland, thirty-nine people per square kilometer in France and the Rhineland, fifty-two people per square kilometer in Belgium and Westphalia, and fifty-five people per square kilometer in Lombardy. The Russians were also much poorer than the more numerous peoples of Poland-Lithuania, the German lands, and other nations to the west. These disparities in population and wealth left Russia with a smaller tax base and a smaller pool of military recruits. Low population densities also made the supply of armies much more difficult. In the nineteenth century, Russia’s army commissary, Egor Frantsevich Kankrin, determined that an army could supply itself in a region with a population density of at least thirty-five people per square kilometer without having to rely on an expensive and intricate system of supply (food) magazines and transport columns. Russia’s lower population density, therefore, would have required it to spend more on logistics for a comparable number of troops than would the Dutch or French armies, the Imperial armies on the Rhine, or the Spanish armies of Flanders and Italy.

In addition to simple demographics, Russia suffered serious epidemics in the 1550s, particularly in the eastern borderlands and perhaps some of the central districts as well. In 1552, some 279,594 people...

---


138. Egor Frantsevich Kankrin, Über die Militärökonomie im Frieden und Krieg, und ihr Wechselverhältnis zu den Operationen [On the military economy in war and peace and its changing conditions in operations] (St. Petersburg: n.p., 1823), cited in G. Perjé’s, “Army Provisioning, Logistics, and Strategy in the Second Half of the 17th Century,” Acta Historica Academiae Hungaricae [Historic acts of the Hungarian academy] 16 (1970): 4–5. While most of Kankrin’s figures are from 1700, and Austria’s and the Rhineland’s figures are from 1754 and 1768 respectively, they serve as a rough guide to the difference in population density between Russia and Western Europe around this time.


were said to have died in the western districts of Staraia Rusa and Novgorod alone, though this figure seems much too high and too precise to be at all reliable. Another 25,000 died in the district of Pskov, according to the land cadastres of the time. In 1556–58, crop failures led to famines and rising bread prices. The Livonian War, which began in 1558, deepened the economic depression. Bad harvests and epidemics continued in the northwest throughout the 1560s and 1570s. Epidemics and famine struck Moscow in 1570–71, when “a man would kill another for a piece of bread,” according to Heinrich von Staden, a German mercenary. He added that unmarked mass graves in the city were said to hold “200, 300, 400, or 500 in one heap.”

Political turmoil added to the misery of epidemic and famine: in early 1565, for reasons that may never be understood, Ivan the Terrible launched what is known as the Oprichnina, dividing the Russian state between the Oprichnina (named for the portion of an inheritance given to the widow), which was to be his personal land administered by his oprichniki (singular, oprichnik; a sort of secret police often compared to Stalin’s NKVD), and the Zemshchina, which made up the rest of the Russian state and was still ruled by Ivan as tsar. The oprichniki made up a bizarre corps who wore black and allegedly rode around with severed dogs’ heads (i.e., hounds that rooted out evil) and brooms (with which to sweep away evil), torturing and killing, while at the same time following some monastic rituals. They laid waste various parts of the Oprichnina over the course of the seven years of its existence, killing thousands, including members of important boyar clans. The oprichniki likewise destroyed many towns and villages, particularly Novgorod (1570), where at least four thousand people were killed, but also the towns of Tver, Torzhok, and others before Ivan disbanded the Oprichnina as abruptly as he had formed it. The oprichniki also confiscated boyar land, exiling to other districts those boyars who were not executed and thereby disrupting the economy. Many who survived the terror fled north of the Volga River or south to the steppes of the Ukraine (where they often joined the Cossacks), leaving the fields in the central Russian districts unplowed or the grain unharvested, the military levies unmet, and the taxes unpaid. Further crop failures ensued since large areas of the country had almost no one left to plant or harvest the crops. This led to more famines, more flight, and a deeper economic crisis. Russia’s agricultural

141. Novgorodskie Pistsovie knigi, 6:581; Istoricheskiy arkhiv (Moscow: ANSSSR, 1951), 7:221; Kolycheva, Agrarnii stroi Rossii, 172; Kaiser and Marker, Reinterpreting Russian History, 166.

sector lay devastated throughout the 1570s and 1580s. Since Russia’s middle servicemen depended on agriculture to provide their sustenance, many were unable to report when called up (to fight in the Livonian War at this point). Many of them also fled. Those who were caught were beaten and sent to the army.

In May 1571, a Crimean Tatar raid on Moscow destroyed large parts of the capital. Staden noted that “The city, the palace [Kremlin], the Oprichnina court, and the suburbs burned down completely in six hours. It was a great disaster, because no one could escape.” The stone churches in which people sought refuge collapsed from the force of the fire and killed those within. The powder magazine in the Kremlin exploded, and those hiding in the cellar were asphyxiated. Muscovites attempting to escape the devastating fire set by the Tatars are said to have jumped into the river, where many drowned. The Tatar raid also devastated Tula, Serpukhov, Kashira, Riazan, and parts of the Ruzsk district. On the lands of the Vysotskii Monastery in Serpukhov, only 18 percent of the households remained inhabited in 1572. Seventy percent of the houses (more than three hundred) had been burned down, and 12 percent stood empty. Eighty-nine percent of arable land was left fallow, and 3,412 chetverti were grown over. In the 1590s, only 12 percent of the lands in Vasil’itsev remained under cultivation. Even in many districts around Moscow, some 60 percent of arable land lay fallow into the 1580s, some due to Tatar raids, but mostly on account of epidemics, poor harvests, and the internal turmoil brought about by the Oprichnina and other aspects of Ivan IV’s reign.

143. Zimin and Khoroshkevich, Rossiia vremen Ievana Groznogo, 104–33; Platonov, Ican the Terrible, 96–114; Ruslan Skrynikov, Oprichnina Terror (Leningrad: ANSSR, 1969); Ruslan Skrynikov, Rossiia posle oprichniny [Russia after the Oprichnina] (Leningrad: ANSSR, 1975); Aleksandr Zimin, Oprichnina Ivan Groznogo [The Oprichnina of Ivan the Terrible] (Mosecow: Nauka, 1964); Kolycheva, Agrarnii stroi Rossii; Blum, Lord and Peasant in Russia, 152–67. Iurii Got’e argued that the economic crisis of the last decades of the sixteenth century was not resolved until the 1610s or 1620s. Kolycheva, Agrarnii stroi Rossii, 171.

144. By 1577, only 9.6 percent of arable land was in use in the Bezhetskii Verkh district, according to some surveys, and the average abandonment of service estates had reached 98.2 percent in the Moscow District. Kolycheva, Agrarnii stroi Rossii, 182; Kaiser and Marker, Reinterpreting Russian History, 170.

145. Staden, The Land and Government of Muscovy, 47.

146. Ibid., 47; Horsey, “The Travels of Sir Jerome Horsey,” 164–66. Horsey claimed the Crimean Khan (whom he calls the “Sithian Emperor”) entered Russia with “200 thousand soldiers, all horsemen.”


Even prior to these political and social upheavals, the Grand Princes of Moscow, though wealthier than the other Russian princes, did not have sufficient funds to pay for a standing, professional army. Though a vast land, little of Russia was suitable for service estates. The country had not yet discovered the deposits of gold, silver, iron, bronze, tin, or other important resources to be found in the Ural Mountains and elsewhere, resources needed to build or finance the Military Revolution; thus, the government had to import quantities of expensive brass and tin for bronze cannons, or else to rely on iron cannons of inferior quality. As a result, except for well-paid foreign mercenaries, the government’s payments to its soldiers were almost always in arrears. Furthermore, while many Western observers marveled at the wealth and ostentation of the Russian court, society as a whole was not fabulously wealthy or able to support a Military Revolution on par with the changes that occurred in Western Europe. Adam Olearius noted the small size of Russian coins: “The Tsar coins his own money of pure silver, and sometimes of gold, in four cities of the realm: Moscow, Novgorod, Tver, and Pskov. The coins are as small as Danish sechslings, smaller than the German pfennig, some of them are round and some oblong.” While Olearius was describing the den’ga, or half-kopek, one of the smallest denominations of Muscovite currency at the time (there was also a polushka, or quarter-kopek), the small size of the coin may indicate the scarcity of silver available for coinage in Russia at the time, as would later devaluations of the silver currency with copper.

150. Hellie argued that Muscovy’s prikazy system was efficient enough in the mid- and late sixteenth century, so that “when the crucial instrument of war—money—was needed, the Muscovites often had enough.” This statement may have been true for the sixteenth century, but it became less so as the military became more complex and larger in the next century. Hellie, “Warfare, Changing Military Technology, and the Evolution of Muscovite Society,” 81.


152. Olearius, The Travels of Olearius in Seventeenth Century Russia, 177–78. Gold coins were struck only for special occasions, such as great military victories. Kotoshikhin also noted the small size of the silver coins. Kotoshikhin, On Russia in the Reign of Alexis Mikhailovich, 185.

153. Kotoshikhin also told of an incident where Alexei Mikhailovich had his seal imposed over the original seal of Lübeck thalers confiscated during the Russo-Swedish War (1656). Kotoshikhin, On Russia in the Reign of Alexis Mikhailovich, 187. In 1654, the government began melting down foreign coins worth sixty-four kopeks and recasting them into one-ruble coins (one hundred kopeks). Kotoshikhin, On Russia in the Reign of Alexis Mikhailovich, 476–77; I. G. Spasskii, “Denezhnoe...
Following these economic and agricultural declines under Ivan, the fifteen-year reign of his son Feodor was basically a time to recover. After Feodor, Boris Godunov’s reign (r. 1598–1605) was short-lived, and his hold on power while Tsar was precarious, since he did not have the prestige of being from a seven-hundred-year-old dynasty and thus lacked the support of the boyars. Russia also faced a famine in 1601–3, which may have claimed one-third of the population. In addition, during the last year of Boris’s reign, Russia suffered invasion by a Polish army headed by the First False Dmitrii. Even before Godunov’s death, Russia had entered the period of disorder known as The Time of Troubles, in which a series of pretenders sought the throne and Russia suffered foreign invasion and internal turmoil. The False Dmitrii reigned briefly but was overthrown in 1606, though other False Dmitriiis surfaced. In addition, Cossack armies roamed the southern regions spreading disorder, while the Swedes and Poles attacked and occupied large parts of Central and Western Russia. The Poles occupied Moscow itself in 1611. An armed movement began in Nizhnii Novgorod that gained support, drove out the Poles, and restored order. An Assembly of the Land (Zemskii Sobor) elected Mikhail Romanov Tsar in 1613, and the next several years were spent rebuilding and establishing the authority of the new dynasty. Thus almost the whole period from the middle of Ivan’s reign (1565) to the middle of Mikhail’s (ca. 1620) was unstable. Russia’s epidemics, crop failures, and military, economic, social, and political setbacks sapped the government and the people of their energy and turned the government’s focus away from modernizing and reorganizing the khoziastvo russkogo gosudarstva v seredine XVII v. i reforma 1654–1663 gg.,” Arkheograficheskii ezhegodnik za 1959 god (“The monetary economy of the Russian state in the middle of the seventeenth century and the reforms of 1654–1663,” Archaeographic Yearbook for 1959) (Moscow: Nauka, 1960), 103–56, especially 124–41; Hellie, The Economic and Material Culture of Russia, 162–65.

154. The affects of Ivan’s reign were felt throughout his son’s reign. For example, Feodor’s Official Code of 1597 identified the fire of 1571 as the main reason for the absence of slave records, which apparently been burned in the conflagration. Kolycheva, Agrarnii stroi Rossii, 172; Kaiser and Marker, Reinterpreting Russian History, 169.


156. Sergei Platonov, The Time of Troubles, trans. John Alexander (Lawrence: University Press of Kansas, 1970); Kotoshikhin, On Russia in the Reign of Alexis Mikhailovich, 32–34. The early period of the Romanov dynasty was not entirely stable and not without its pretenders, however. Timofei Ankidinov claimed to be either the son or grandson (at different times) of Vasilii Shuiskii, who had reigned briefly as tsar during the Troubles (r. 1606–10) before being forced to take monastic orders. Ankidinov was finally executed in Moscow in 1653, during the reign of Aleksei Mikhailovich. Paul Dukes, The Making of Russian Absolutism, 1613–1801 (New York and London: Longman, 1992), 25, 28.
army. Russia instead concentrated on simple survival. During and even after the reign of Mikhail Romanov, the Muscovite government simply was not able to come up with the economic resources to pay for a Military Revolution on a scale similar to that occurring in the West. Russia’s economic base was unproductive, and its tax system was overly complex in comparison to Western states, which were then also undergoing a commercial revolution (a revolution Russia did not experience at this time). The Muscovite government tried various ways to raise revenues, introducing a salt tax in 1646 that proved so unpopular that it had to be abolished the following year.157 The Russian tax system in the seventeenth century, if it could be called a system, comprised, by Hellie’s count, some 280 separate taxes, including, for a brief time at the end of the century, a tax on crossing bridges.158 Such a large number of unwieldy taxes would seem to indicate that the government was desperate to find revenues anywhere it could.

In addition to taxes paid in cash, several taxes were paid in kind, especially grain taxes collected to pay for troops in the Ukraine. However, crop yields at that time were too low to create surpluses sufficient for the general population as well as to support a large armed force. Yields in Russia and the Ukraine in the 1600s were on a ratio of between 1:2 and 1:5, with an average yield of 1:3 (three seeds harvested for every one sown). In comparison, England had yields at this time of between 1:6 and 1:9.159 Such poor yields, even in good times, meant little surplus and spelled disaster in hard times. Poor yields in the late 1620s and early 1630s led to an increase of grain prices.160 Prices decreased in the 1640s, but in the 1650s and 1660s, the prices for rye, oats, barley, and other grains peaked in the markets in Velikii Ustiug, Moscow, and elsewhere in Russia.161 Rye alone reached a price of fifty-two rubles per chetvert (chet’).162 In spite of this inflation, Muscovy continued to export grain to Sweden, shipments it had made for twenty years. This policy led to riots in Novgorod and Pskov.163 Because of the poor yields in the mid-seventeenth century, or because of the fear of poor yields that led to hoarding,
the Muscovite government received only 70 percent of required grain allowances for rank-and-file troops in 1663. Grain arrears were, in fact, a chronic problem throughout the seventeenth century.

Furthermore, the government in Moscow could not afford to store or ship the grain to its own troops stationed in the south. Therefore it left the maintenance and security of the granaries up to the towns of the Ukraine and also required the taxpayers to deliver their grain payments to the granaries in their own carts and at their own expense. Entitlements to officers in the Ukraine in 1683 were not paid in full, since to do so would have consumed over half of southern grain payments that year. Officers and rank-and-file troops were seldom paid in full, or on time, either in kind or in money. In fact, only 10 percent of campaign forces were paid on time in the seventeenth century.

Rank-and-file troops were paid only while in the field. In 1654, they should have been paid 725,000 rubles, which the government accomplished by debasing the silver ruble with copper. While troops were paid with the copper ruble, payments to the government had to be paid in the old silver ruble. Inflation ensued, leading to the “Copper Riots” in Moscow in 1662. The government yielded to the rioters’ demands by returning to the silver ruble, but redeemed the copper rubles below face value. Carol Stevens found that Muscovy was unable to pay for its armies in the seventeenth century without relying on emergency grain shipments and the debasement of its currency. She concluded that

Muscovite provisioning in the seventeenth century was incomplete and inadequate for feeding a large and growing army. The inability of the state to extract sufficient amounts of food for the population and the competing demands of its meager resources, helped to make the seventeenth century army a “semi-standing, semi-regular force.”

Conclusions

In the fifteenth, sixteenth, and seventeenth centuries, roughly at the same time as Roberts’s Military Revolution in the West, Russia underwent similar—though not identical—changes to those occurring in West-

165. Ibid., 74, note 92, 194.
166. Ibid.; Blum, *Lord and Peasant in Russia*, 164. Kotoshikhin wrote that it was redeemed at a rate of ten silver den’ji for each copper ruble. Kotoshikhin, *On Russia in the Reign of Alexis Mikhailovich*, 197.
ern Europe: adopting gunpowder weapons; adapting its military organization as it shifted its focus away from the horsemen of the steppe to the more Western infantry-based armies of Poland-Lithuania, the Livonian Germans, and Sweden; and rebuilding its fortresses both to utilize and withstand artillery. Several variables dictated that the Military Revolution in Russia would differ significantly from and come later than the Military Revolution in the West. Until the seventeenth century Russia’s enemies had cavalry-based armies and could only be fought by cavalry, not by infantrymen armed with gunpowder weapons. Russia’s population was very poor, particularly in relation to the nations of Western Europe that began the Military Revolution. Thus Russia could not pay for the Military Revolution, at least not on the level seen elsewhere in Europe. Russia’s social and political structure also made it either impossible or unnecessary for Russia to closely follow the West. Russia also suffered serious political, economic, and social upheavals in the late sixteenth and early seventeenth centuries. All these hardships made it difficult for the Muscovite government to procure resources to pay for, equip, and feed the larger and more complex armies that arose out of the Military Revolution. In spite of these hardships, the success of Russia’s endeavor to take part in the Military Revolution can be seen not only in the fact that Russia was never conquered or carved up by Western powers in the way Africa and Southeast Asia later were, but also in the fact that Russia was able to expand to take up one-sixth of the world’s land-mass. Taras Hunczak, borrowing a remark from Russian historian Vasilii Kliuchevskii, illustrated the unparalleled expansion of the Russian empire when he wrote that “Russia controlled an area of 15,000 square miles in 1462 and 8,600,000 square miles in 1914, thus expanding ‘at a rate of fifty square miles a day for four hundred years.’”169 Much of this expansion, no doubt, was due to Russia’s adoption of revolutionary changes in military tactics and organization in the century or so leading up to the reign of Peter the Great.