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978-0-521-84682-0 - The Asian Military Revolution: From Gunpowder to the Bomb

Peter A. Lorge

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Introduction

There seems little doubt that the composition of gunpowder has been known in the East from times of dimmest antiquity. The Chinese and Hindus contemporary with Moses are thought to have known of even the more recondite properties of the compound . . .

Gunpowder has been known in India and China far beyond all periods of investigation; and if this account be considered true, it is very possible that Alexander the Great did absolutely meet with fire-weapons in India . . .¹

Early modern warfare was invented in China during the twelfth and thirteenth centuries. It was during those two centuries of brutal warfare between the Chinese Song dynasty, the Jurchen Jin dynasty, and the rising power of the Mongols that guns, grenades, rockets, and other incendiary weapons fueled by gunpowder became regular and widespread tools of war.² These weapons were used extensively in siege and naval warfare by vast armies and navies, and gradually moved on to the open battlefield. Chinese soldiers were recruited, trained, and armed by the government, and organized into regularly ordered military units supplied by a bureaucratic logistics system, as indeed they had been for more than a thousand years. These troops were even housed in barracks and provided with regular medical care. The major sieges of the time revolved around cities with relatively low, thick walls, almost impenetrable to missiles, with circumferences measured in miles. True guns developed in this environment, and subsequently spread to the rest of Asia and the world.

¹ W. W. Greener, *The Gun and its Development*, Guilford, CT: Lyons Press, 2002 (reprint of the 9th edn published 1910; 1st edn 1881), 13.

² Joseph Needham slipped in including the eleventh century in his “real proving-grounds” for the wide military use of gunpowder, since war with the Jurchen did not begin until after 1125. See Joseph Needham, *Science and Civilization in China*, Vol. V, part 7: *Military Technology: The Gunpowder Epic*, Cambridge: Cambridge University Press, 1986, 16. My point here is more specific to the invention of early modern warfare as a whole, rather than simply gunpowder’s regular use in warfare. The latter began in at least the eleventh century.

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The French king Charles VIII led the first “modern” European army, invading Italy in 1494 with a force of infantry, cavalry, and gunpowder artillery, all paid from his treasury, thus ending the medieval warfare of the knights. Between this early period and the Revolutionary wars of Napoleonic France that ushered in national armies, Europeans adopted the articulated army units of Classical Rome, developed centralized state bureaucracies to supply those armies, and fortified major cities with low, thick walls able to withstand cannon. In Europe, at least, the association of modernity with guns is clear, though the precise relationship is still the subject of debate.³ In China, as Geoffrey Parker noted, all of these elements, minus guns, existed before the Qin dynasty (221–206 BCE), and for him constituted a military revolution.⁴

Gunpowder played an important role in Asian history. This simple fact has usually been downplayed in Western scholarship on Asia, if not entirely denied, because the modern perspective on Asian history is that, before the arrival of Europeans, Asian military practice as a whole, and military technology in particular, was primitive and backward. European military superiority in the nineteenth century, at least with respect to technology, training, and tactics, led to an assumption that Asians had fallen behind because they were culturally non-military and racially inferior. Although the explicit racial argument has disappeared from recent Western scholarship, the cultural argument remains.

The cultural explanation of Asian technological inferiority is as pernicious as the racial explanation, since it denies Asia a military and political history before the arrival of the West. Technology is often portrayed as an objective measure of development, and its advancement as something that can be examined outside of politics. But the history of technology, particularly military technology, has been deeply inflected by nationalist sentiment. Early modern European superiority convinced many observers that Asian rulers had neglected military technology. Historians like Joseph Needham, who had done so much to establish China’s primacy

³ Michael Howard, *War in European History*, Oxford: Oxford University Press, 1976, 19–20, and Gunther E. Rothenburg, “Maurice of Nassau, Gustavus Adolphus, Raimondo Montecuccoli, and the ‘Military Revolution’ of the Seventeenth Century,” in Peter Paret (ed.), *Makers of Modern Strategy*, Princeton: Princeton University Press, 1986, 32–63.

⁴ Geoffrey Parker, *The Military Revolution: Military Innovation and the Rise of the West, 1500–1800*, 2nd edn, Cambridge: Cambridge University Press, 1996, 7.



Map 1 Asia

in inventing gunpowder and cannon, felt they had to explain why a people who had been so precocious in technology fell so far behind. They argued that Asian regimes, with the possible exception of Japan, either did not value technology or were less militarily oriented than Europeans. This book will demonstrate that all major Asian regimes valued military

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technology and none was quantifiably less oriented to military affairs than were the Europeans.

The Military Revolution debate

One of the most productive scholarly debates within the field of military history is the “Military Revolution debate.” The reactions to this ongoing discussion are sufficiently varied that it would be hazardous and unfair to describe any sort of general consensus held by the majority of scholars. Some scholars certainly feel that the question has been resolved one way or the other, but it is possible (and instructive) to adumbrate the arguments and counterarguments without taking sides. Fundamentally, the importance of the thesis and the ensuing debate rests on the connection between changes in warfare and changes in government and society, and upon whether the introduction of a particular technology produces only a specific response to it.

Michael Roberts first proposed the idea that there was a Military Revolution in Europe between 1560 and 1660 in a 1956 article, “The Military Revolution, 1560–1660.”⁵ Maurice of Nassau and Gustavus Adolphus shifted their shot-armed infantry to linear formations and required their cavalry to charge the enemy aggressively. These changes led ultimately to the early modern nation-state through the bureaucratic and structural needs of the army. A centralized bureaucracy was required to provide the standing army, now extensively trained and disciplined, with uniforms and weapons. The strategy that grew out of these tactical changes and the trajectory of the Thirty Years War dramatically increased the size of the army.

With the increased army size came much heavier demands on the populace in terms of men, material, and money. The apparatus of the state developed to deliver these goods to the army, along the way creating techniques of management and new institutions within the government. All of this enhanced the power of the state itself. Roberts’ thesis provided a direct connection between the military, and the political and social changes that led to the modern state, thus making military history relevant to historians in other subdisciplines.

⁵ Michael Roberts, “The Military Revolution, 1560–1660,” originally delivered as his 1955 inaugural lecture at Queen’s University Belfast. Initial publication as a pamphlet *The Military Revolution, 1560–1660* (Belfast: Marjorie Bajd, 1956), then reprinted with revisions in Roberts’ *Essays in Swedish History* (1967).

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Geoffrey Parker adopted and expanded Roberts' thesis, both chronologically and technically, by taking the period 1530–1710 as the time of revolutionary change.⁶ For Parker, the introduction of the *trace italienne* (Italian plan) fortifications made battles irrelevant and sieges long and difficult.⁷ The *trace italienne* fortification was built with low and thick walls to protect it against cannon, and angled bastions to provide defending cannon overlapping fields of fire to prevent enemy troops from approaching. These new fortifications were also larger, requiring more money and troops to create and maintain, and forced besieging forces to grow as well. Where Roberts' revolution emphasized changes in drill and tactics, Parker emphasized the changes caused by technology. Gunpowder and cannons revolutionized warfare in Europe and, because of the economic, political, and social demands of that revolution, changed the European states themselves.

Parker's thesis has been attacked on a number of grounds, only two of which concern us here.⁸ Some scholars have argued that political factors rather than technological ones were the cause of changes in warfare. This is a critical chicken-and-egg problem, and one that this study directly engages. In Asia, at least, it was political conditions that made the use of guns possible. The second objection relates to the necessary effects of the new technology. Did the technological changes necessitate growth in army size, change in government operations, and so on, or did changes in other areas cause those changes without particular respect to the technology? Certainly in Asia, technology was not a driver of change, but an indicator. These two problems obviously overlap. The first, however, concerns the political and social influence on warfare, and whether governments and societies fashion modes of warfare in response to real or perceived threats and cultural inclinations, or whether modes of warfare are determined by technology, with governments and society forced to accommodate them. The second problem is more technical, and confronts the issue of whether a specific technology requires a specific response. John Lynn, for example, demonstrated that *trace italienne*

⁶ Geoffrey Parker, *The Military Revolution: Military Innovation and the Rise of the West, 1500–1800*, 2nd edn, Cambridge: Cambridge University Press, 1996.

⁷ I use the italicized Italian term "*trace italienne*" rather than the simple translation "Italian plan" throughout to be consistent with scholarly convention. In Italy this kind of fortification was called "*alla moderna*" or "modern" plan. Some scholars now use the term "artillery fortress" both to indicate that it was a phenomenon whose development was not restricted to Italy and to emphasize the reliance upon artillery for the defense of the structures.

⁸ These responses have been published in Clifford Rogers (ed.), *The Military Revolution Debate: Readings on the Military Transformation of Early Modern Europe*, Boulder: Westview Press, 1995.

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fortifications did not require the vast increases in army size that Parker claimed they did.⁹

In contrast to early modern Europe, at least as Roberts and Parker have described it, there were a variety of responses to guns in Asia. This was true both before and after Europeans reached Asia. In some cases guns were paired effectively with cavalry, as the Mughals did, and in others they enhanced the infantry to the point of nearly rendering the cavalry obsolete, as in Japan. European historians have often, though not unanimously, assumed that European modern warfare was the one true path, a system that developed logically and inevitably from the nature of the advancing technology of guns. Since Europeans by their own definition were the most rational and logical of people, their mode of warfare was also the most rational and logical. Those who did not adopt it after seeing it were being deliberately irrational, or lacked the ability to advance their polity to the point where it could follow it. Yet European warfare in Asia was often highly unprofitable, involving vast expenditures to build and maintain *trace italienne* fortifications and colonial administrations that only profited a small number of merchants (while immiserating native populations and undermining local cultures). European imperialism as a whole was only rational for the narrow group of elites who were able to use the resources of their states to profit themselves economically and politically. Competition for glory among European nations led to political and ideological traditions that supported unprofitable military adventures around the world. Warfare in Asia did not materially benefit most Europeans, however, and may well have actually hurt them in the form of higher taxes, and resources diverted from domestic uses to foreign adventures.

Clifford Rogers has suggested that: "Henceforth it would be clear that the consequences of military innovation in early modern Europe belonged at least as much to World as to European History."¹⁰ Rogers did not, presumably, intend to imply by this statement that it was only European developments in guns and their use in warfare that created a truly transformative revolution in world history. It is only that his frame of reference looks forward from early modern Europe for the roots of the modern world. Pulling the narrative framework back a little chronologically, it would be equally accurate to say that henceforth it would be clear

⁹ John Lynn, "The *Trace Italienne* and the Growth of Armies: The French Case," in Rogers, *The Military Revolution Debate*, 169–99. But see Parker's response to Lynn in Parker, *The Military Revolution*, 169–71.

¹⁰ Clifford Rogers, "The Military Revolution in History and Historiography," in Rogers, *The Military Revolution Debate*, 5.

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that the consequences of military innovation in twelfth- and thirteenth-century China belonged as much to World as Chinese History. Without the Chinese revolution in warfare there could not have been a European revolution, no matter how it was constituted.

Western perspectives and the reality of gunpowder in Asia

The perspective of modern Western history and historians obfuscates a clear view of the Asian past. The current global dominance of Western technological, social, and economic systems has created a heuristic end point for the underlying Hegelian narrative of Western triumphalism, a point extensively discussed by Jeremy Black in *Rethinking Military History*.¹¹ Consequently, the modern bias in contemporary Western scholarship (which has spread to the rest of the world as well) insists upon focusing all attention on the formation of the modern world and “modernity.” By directing attention to a time period rather than to a region, Western scholars can place the West at the center of any discussion, and subordinate backward Asia to Western history, without explicitly condemning Asian cultures and polities or arguing for a narrowly Eurocentric view of the world. Nevertheless, modern history is effectively a racist pursuit that not only elevates white Westerners above all others, but also actively denigrates Asian history.

Perhaps the strangest manifestation of the Eurocentric approach to the history of military technology is not the focus on the past few centuries, but the attempt to discern fundamental cultural roots in the distant past that have resulted in the perceived current Western dominance of the world.¹² This essentialism attempts to contrast ancient Greek logic and philosophy with the less rationally minded philosophies of the non-West. Modern science and technology, in this view, is a simple jump from ancient Greece to early modern Europe. Although historians of technology do not

¹¹ Jeremy Black, *Rethinking Military History*, London and New York: Routledge, 2004.

¹² Victor Davis Hanson is perhaps the most prominent current purveyor of this view, particularly with respect to Western warfare. Victor Davis Hanson, *The Western Way of War*, New York: Knopf, 1989, and many subsequent books. Hanson’s views have been so thoroughly rejected that Stephen Morillo criticized John Lynn for spending too much time in his book explaining why they were wrong. See Stephen Morillo, ‘Review of Kenneth Chase, *Firearms: A Global History to 1700* and John Lynn, *Battle: A History of Combat and Culture*,’ *Journal of World History*, 15/4 (Dec. 2004), 525. David Landes has voiced a similar position with respect to economic history in his *The Wealth and Poverty of Nations: Why Some are So Rich and Some So Poor*, New York: W. W. Norton and Company, 1998. As with Hanson, critics have pointed out that Landes’ descriptions of cultures and states outside of Europe and America are simply incorrect.

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use this sort of simplistic approach to technological history, it is often present, implicitly or explicitly, in many popular histories that rely upon an earlier generation of scholarship.¹³ Of course, this does not explain why gunpowder, guns, and rockets were invented in China, not the West.

The history of gunpowder spans pre-modern and modern history, and shifts focus from Asia as originator to receiver. Yet gunpowder's Asian history does not fit comfortably into any European schema of historical progression, and, consequently, the Asian side of the gunpowder story has been severely truncated or cloaked in the minutiae of purely technical history. The impression one is frequently given is that Chinese Daoists stumbled upon gunpowder while, ironically, searching for elixirs of immortality; not understanding the obvious uses of such a mixture, they used it only for fireworks.¹⁴ It was only when gunpowder reached Europe that the potential of gunpowder to transform warfare was realized. Europeans then developed modern warfare and colonized Asia with its fruits. The pre-existing use of guns and gunpowder weapons before Europeans arrived, and the eager and smooth adoption of European guns into various Asian armies, is usually incorporated into the narrative of Asian backwardness. Although there were guns in Asia before Europeans, they were not very good.

A number of nationalisms are based upon the European narrative of gunpowder's history and the concomitant military relationship between the West and Asia. Technology has become the West's main prop to its claims of inherent superiority over the non-West, and the reason why the non-West should adopt Western culture. If advanced technology is particular to Western culture, then it is only by Westernizing that the non-West can obtain it. This argument collapses if Western technology can be adopted in isolation from the broader culture, or if other cultures can generate significant technology independently. Since gunpowder, guns, and rockets (not to mention the compass, paper, and movable type, among others) were invented outside of the West, Western culture is

¹³ See for example Ian V. Hogg, *The Story of the Gun*, New York: St. Martin's Press, 1996, 12, where he asserts that the Chinese experimented with "various pyrotechnic compositions . . . but so far as we can ascertain, they never applied any of these compositions to the propelling of something out of a tube." He goes on to attribute the first mention of gunpowder to Roger Bacon, "a Franciscan friar, scientist and philosopher," in 1242. Notice that Hogg assiduously avoids using the term "gunpowder" with respect to the Chinese. Hogg's book accompanied a television show on the subject. Given that J. R. Partington's book on gunpowder, including information on the Chinese use of it, was published in 1960, and Needham's volume on the subject first appeared in 1986, Hogg's ignorance is impressive.

¹⁴ See Landes, *The Wealth and Poverty of Nations*, 52–3, for a similarly ignorant assertion that the Chinese were more interested in incendiary devices than explosives.

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clearly not a precondition for technological advancement. Europeans refined Chinese technology, and began fully to exploit the possibilities of that technology when their armies began to resemble Chinese armies in the sixteenth century. That is not to say that they somehow became “sinified,” in the sense of actively copying Chinese practice, only that the technology came into its own when European warfare began to function like Chinese warfare.

Just as technology has served as an unreliable tool to prove Western cultural superiority, so too has the idea that many Asian polities were only able to form into states in response to Western colonialism. Once again, this idea is sustainable only when focusing on the modern world. Victor Lieberman makes a point of starting his discussion of the development of Southeast Asia in 800 in order to demonstrate that political development and state formation were well under way before the arrival of Europeans.¹⁵ In Lieberman’s extremely compelling formulation, the political consolidation of several Southeast Asian states developed in parallel with Western states, without any clear connections between them. What is important here is that a European presence was not necessary for state formation. Europeans believed that it was their arrival that created modern Southeast Asia since they had little knowledge or understanding of the pre-existing political trends.

Southeast Asia is something of a special case in Western historiography, since it lacks the politically asserted core cultural and political traditions of China, Japan, Korea, and South Asia (though see the discussion below for these terms). Yet if even the least consolidated Asian polities were gaining coherence and organization before the arrival of Europeans, then it is clear why Asians as a whole were so resistant to Western culture. It is also clear, then, that better guns were one of the few attractive things that Europeans brought to Asia. Guns were in widespread use in Asia and had already transformed Asian warfare before the arrival of Europeans. The use of guns in warfare was a marker of the level of political and military organization in Asia. Guns could not have been integrated into warfare without a certain degree of organization. The more organized polities were better able to avail themselves of the power of guns. When Europeans arrived with superior guns, it was the political state of Asian polities that determined their ability to absorb and deploy them.

This is not, however, a history of the decline of Asia from world leader to world follower in military technology. Nor is this a technological

¹⁵ Victor Lieberman, *Strange Parallels: Southeast Asia in Global Context, c.800–1830*, Cambridge: Cambridge University Press, 2003.

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history of the invention and diffusion of gunpowder and gunpowder weapons in Asia. The general outlines of that history are already known (and will be briefly recounted throughout the narrative), leaving the larger question of what effect that technology had still unanswered. It is not enough to locate and date the earliest appearance of a particular technology within a particular polity, or even simply to ascertain where and when that technology was invented, and if possible by whom. These are important pieces of information without which any subsequent discussion is impossible, but they do not explain how that technology was understood and used. What is critical to the discussion in this book is the impact gunpowder weapons, particularly guns, had on Asia.

Asia was a different place after the introduction of gunpowder, though the changes varied from place to place, and were mostly confined to the battlefield. There was no one “Asian” mode of warfare, nor a single response to gunpowder. Guns were incorporated into battle in ways consistent with the pre-existing culture. In and of itself, this varied response from different societies to the advent of not only early gunpowder and gunpowder weapons, but also later, more advanced weapons, disproves the notion that the introduction of firearms necessitated a particular military, political, or social reaction. Indeed, the easy adoption of guns by some societies was an indicator that the requisite military, political, or social environment already existed. Guns did not cause institutional change, or at least not irreversible institutional change. In Japan, for example, the shifting social makeup of soldiers at the end of the sixteenth century away from the samurai class was reversed in the early seventeenth century.

The political and social effects of new groups armed with guns entering into a particular political arena have often been mistakenly attributed to the gun itself. While guns gave these groups, for example the Mughals in the early sixteenth century, an advantage over their opponents, the resulting change outside the military environment was a result of the victorious groups’ political program, not the guns. Well-armed and organized groups always had an advantage over their less well-armed or organized opponents even before the advent of guns. Guns were not an absolute advantage, though even early guns were effective, but a relative one whose effects depended on numbers, ammunition supply, and tactics. It was the system behind the guns that made them effective or not. Guns grew out of particular cultures and interacted with cultures in many different ways.

Defining Asia

The term “Asia” means different places to different people, so it is important clearly to define the scope of this book. In this section I will try briefly,