

From Archers to Arquebusiers: The Replacement of the Longbow by Firearms in the English Army

Throughout a large part of the later Middle Ages, the longbow played a significant role in English military and civilian life. Archery was practiced in most towns and villages by the majority of the English populace; on several occasions, archery practice was even mandated by royal decree. This constant practice meant that, in times of war, the English army was always able to draw upon a large reserve of highly skilled archers equipped with longbows. In the late medieval period, longbowmen became an increasingly important element of English armies, and played significant roles in many important English victories such as those at Crécy and Agincourt. By the end of the Middle Ages, English archers had established the longbow as the premier missile weapon in Europe, with capabilities clearly superior to those of both the standard bow and the crossbow. However, during the end of the Middle Ages and the beginning of the early modern period, the first firearms were introduced onto the battlefields of Europe. These weapons were generally crude and unreliable, in some cases even presenting a danger to their own users. Despite this, by the seventeenth century early firearms – specifically the arquebus and the musket – had replaced the longbow as the primary missile weapons of the English army. This paper investigates the reasons behind the longbow's decline and ultimate replacement. It examines the relative tactical capabilities of the longbow and early firearms, the differences in the training and practice required to effectively fire both weapons, and the quality and expense of early modern longbows. Ultimately, this paper concludes that the longbow was not replaced by firearms due to the latter's tactical capabilities; rather, the longbow was eventually supplanted largely because of the significant difficulties involved in training and supporting English longbowmen.

Although the longbow was ultimately replaced by firearms during the early modern period, this phenomenon was almost certainly not caused by the superior capabilities of firearms: in fact, throughout the early modern period, the longbow was the better weapon in many regards. In terms of both its maximum and effective range, as well as rate of fire that it could maintain, the longbow was clearly superior to the weapons which replaced it. Though partially dependent upon the strength and skill of the archer, the longbow's maximum range was approximately 400 yards.¹ More important, however, was the distance at which a longbowman might expect to effectively hit a target, and Donald Featherstone estimates that the longbow's effective range was approximately 200-240 yards.² In contrast, early firearms were not nearly as effective. Although the arquebus possessed a maximum range of somewhere between 200-300 yards, Tom Wintringham suggests that it could only fire accurately at a range of about twenty yards.³ However, Sir John Smythe, writing about arquebusiers in 1590, suggested that the arquebus had an even shorter effective range: “they [arquebusiers] must take heede that they doo not giue their volee ... till they [the enemy] come within eight, tenne, or twelue paces.”⁴ In short, the longbow's range far outstripped that of early modern firearms. The longbow's rate of fire was also superior to that of early

¹ Bert S. Hall, Weapons and Warfare in Renaissance Europe: Gunpowder, Technology, and Tactics (Baltimore: The John Hopkins University Press, 1997), 19.

² Donald Featherstone, The Bowmen of England: The Story of the English Longbow (Clarkson N. Potter, Inc.: New York, 1967), 60.

³ Tom Wintringham and J. N. Blashford-Snell, Weapons and Tactics (Baltimore: Penguin Books Ltd, 1973), 105.

⁴ Sir John Smythe, Certain Discourses (London: Richard Johnes, 1590), 17.

firearms. Bert S. Hall estimates that English longbowmen would likely have been able to loose as many as ten arrows a minute.⁵ When compared to an early musket, Thomas Esper notes that the longbow was able to maintain a rate of fire roughly five times greater.⁶ Longbowmen could also maintain this rate of fire for longer than arquebusiers or musketeers. At the Battle of Crécy in 1346, English longbowmen fired an average of about ninety arrows each.⁷ However, Sir John Smythe recorded that early firearms could only fire seven or eight shots at once before they became too hot to use safely.⁸ In short, the longbow significantly outperformed early modern firearms in terms of both range and rate of fire.

Longbowmen were also less vulnerable on the battlefield than soldiers armed with either arquebuses or muskets. Due partly to their high rate of fire, longbowmen were nearly able to defend themselves in battle. Tom Wintringham writes that “[d]efence by longbow could almost be defence by fire alone.”⁹ However, the much slower rate of fire of early firearms meant that the soldiers carrying them were constantly in need of protection by shock troops, usually pikemen.¹⁰ This need was so great that, when firearms were introduced onto the battlefield, “the proportion between men armed with projectile weapons and men armed with these shock weapons altered. The firearms were at first few; the pikes were many.”¹¹ Bert S. Hall reaches a similar conclusion, writing that “the longbow ... required some form of protection for the archer ... firearms demanded even sounder protection.”¹² Thus, the longbow's capabilities meant that English archers were less in need of battlefield protection than their counterparts carrying firearms.

Although the longbow was overall a better weapon than either the arquebus or the musket, early firearms did present certain advantages over their predecessor. Foremost among these was penetrating power, particularly when applied to armoured targets. Gervase Phillips argues that “[t]he superior performance of small arms in terms of armour penetration would seem to provide a compelling logic for their adoption in place of the bow.”¹³ However, longbows were able to pierce armour: Bert S. Hall suggests that, from a range of about 60-120 yards, the longbow's arrows retained enough force to penetrate leather, mail, and even some plate armour.¹⁴ In a recent article, Steven Gunn proposes that, although the longbow could penetrate armour in some cases, in this area firearms were nevertheless superior:

Guns' superiority lay in their penetration. Recent work has argued that while longbows were very effective against unarmoured men or even those wearing thin mild-steel plate armour, they stood little chance against the quenched high-carbon steel armour developed from the later fifteenth century. Here guns, with their vastly greater penetrative power, had a clear advantage.¹⁵

Yet although firearms were almost certainly better at penetrating armour than longbows, it must also be noted that at the same time firearms were being introduced into warfare in

⁵ Hall, Weapons and Warfare, 20.

⁶ Thomas Esper, “The Replacement of the Longbow by Firearms in the English Army,” Technology and Culture 6 (1965): 383.

⁷ Hall, Weapons and Warfare, 20.

⁸ Smythe, Discourses, 18.

⁹ Wintringham and Blashford-Snell, Weapons and Tactics, 103.

¹⁰ Ibid., 108.

¹¹ Ibid., 103.

¹² Hall, Weapons and Warfare, 111-112

¹³ Gervase Phillips, “Longbow and Hackbutt: Weapons Technology and Technology Transfer in Early Modern England,” Technology and Culture 40 (1999): 580.

¹⁴ Hall, Weapons and Warfare, 19.

¹⁵ Steven Gunn, “Archery Practice in Early Tudor England,” Past and Present 209 (2010): 74.

Europe, the use of armour in warfare was declining.¹⁶ In short, although the longbow did have the ability to penetrate armour under some conditions, firearms offered a greater ability to do so.

Firearms were, in some respects, also better suited to siege warfare than longbows. Donald Featherstone notes that longbowmen needed a significant amount of space around them in order to properly draw and fire their bows.¹⁷ Thus, it was sometimes difficult to use longbows while standing in entrenchments or behind parapets during a siege; in these situations, longbowmen often simply did not have enough space to be able to use their weapons properly.¹⁸ Steven Gunn and Gervase Phillips both note that, in the 1540's and 1550's, the English army was undertaking an increasing number of sieges, for which early firearms were in some respects better adapted than longbows.¹⁹ Phillips even concludes that “[w]ith increasing involvement in prolonged siege warfare between 1544 and 1550, the arquebus became increasingly commonplace among English soldiers.”²⁰ Thus, early firearms were still able to function in confined spaces where English archers simply did not have the room they required to properly draw their bows.

Ultimately, the longbow retained its tactical superiority over firearms throughout the early modern period. There were undoubtedly specific situations, most notably when engaging heavily armoured targets and operating during prolonged sieges, in which early firearms possessed certain advantages over their predecessor. However, in terms of basic tactical capabilities, longbows were unquestionably superior: they had a much longer range and faster rate of fire than early firearms. In addition, longbowmen were less vulnerable on the battlefield than soldiers armed with either the arquebus or the musket. Examining the relative capabilities of the longbow and firearms, Thomas Esper concludes that “the replacement of the longbow by firearms occurred at a time when the former was still a superior weapon.”²¹ Donald Featherstone even suggests that the longbow maintained this superiority at least until the time of the Battle of Waterloo in 1815.²² Thus, although the superior penetrating power of early firearms and their usefulness in siege warfare might have contributed to the partial decline of the longbow, the longbow's overall superiority means that it could not have been completely supplanted due to the tactical capabilities of the firearm. Therefore, the true causes of the longbow's replacement must be sought elsewhere.

Although it was a very simple weapon, the longbow was also unquestionably a tremendously powerful one. Longbows measured roughly two metres in length, and were usually made of either elm or yew, which were both extremely stiff varieties of wood.²³ The arrows which these longbows propelled were larger than those of almost any other bow.²⁴ However, this immense power came at a significant cost: drawing and firing a longbow was physically very strenuous. Modern historians have calculated that fully drawing a longbow required a force of about 40-50 newtons.²⁵ Bert S. Hall characterizes the physical demands placed upon English archers by the longbow as “extreme.”²⁶ Unsurprisingly, a significant amount of training was necessary in order to use such a powerful weapon effectively. Thomas Esper writes that “years of regular practice were necessary for the development of

¹⁶ Wintringham and Blashford-Snell, Weapons and Tactics, 103.

¹⁷ Featherstone, Bowmen, 186.

¹⁸ Phillips, “Longbow and Hackbutt,” 587.

¹⁹ Gunn, “Archery Practice,” 76.

Phillips, “Longbow and Hackbutt,” 587.

²⁰ Phillips, “Longbow and Hackbutt,” 587.

²¹ Esper, “Replacement of the Longbow,” 393

²² Featherstone, Bowmen, 185.

²³ Hall, Weapons and Warfare, 19.

²⁴ Ibid.

²⁵ Ibid.

²⁶ Hall, Weapons and Warfare, 20.

good bowmen.”²⁷ Without such training, the longbow would have been nearly useless as a weapon.²⁸ Both contemporaries of the longbow and modern historians are in agreement that this training would have been almost a lifelong endeavour. Roger Ascham, one of the foremost proponents of the longbow in early modern England, noted that archery could not be done properly as an adult, unless it had first been learned as a child.²⁹ Gervase Phillips agrees with Ascham's assessment, writing that “[e]ffective use of the bow depended on regular practice, beginning in childhood and maintained into manhood.”³⁰ Thus, the skill and effectiveness of English longbowmen depended heavily upon the training which they received, both during their childhood and as an adult.

In late medieval England, such archery training and practice was commonplace across virtually the whole of the country. This constant practice of archery was so crucial to the maintenance of an effective reserve of longbowmen that it was legally required on two occasions, by Edward III in 1365 and by Elizabeth in 1591.³¹ However, in the early modern period, archery practice in England was in a state of decline. Ascham admitted in his *Toxophilus* of 1545 that, although men kept longbows as required by law, they did not actually practice with them.³² While discussing the role of archery practice in England, Steven Gunn writes that “by the [sixteenth] century's end there had clearly been decline.”³³ In order to illustrate his point, Gunn uses records from musters of longbowmen in the sixteenth century. According to these documents, in 1522 about one in three longbowmen who attended the muster were classified as “competent.”³⁴ However, by 1557, the percentage of competent archers had shrunk to only one man in four.³⁵ Other scholars have also noted that there was a significant decline in the practice of archery in sixteenth-century England. Thomas Esper writes that longbowmen “as a whole were more poorly trained in the sixteenth century, and especially at the end of it, than they were in preceding centuries; consequently the efficiency of an army of bowmen was reduced.”³⁶ Thus, archery training and practice were both declining in England during the sixteenth century, resulting in the creation of less capable archers.

This decline in the practice of archery in England contributed in no small part to the decline and ultimate replacement of the longbow in the English army, and its replacement by early firearms. The longbow's immense power served to make it the preeminent missile weapon in Europe by the end of the medieval period, but it also contributed significantly to its ultimate downfall. Bert S. Hall writes that “the extreme demands longbow archery placed on its practitioners help to explain why, despite its success on the battlefield ... it was bound to decline and wither away even in the land of its birth.”³⁷ As many scholars have noted, longbowmen needed to begin training at a young age and continue practising regularly in their adult life in order to use effectively what was unquestionably a highly demanding weapon. As archery practice decline in England, so did the longbowman's physical ability to use his weapon to its full potential. Illustrating this point, Thomas Esper writes that in the late sixteenth century Sir Roger Williams, an English army officer who fought extensively in Europe, observed “that, of five thousand archers, only one thousand could shoot with sufficient force to be effective.”³⁸ In contrast to the physical demands placed upon archers by

²⁷ Esper, “Replacement of the Longbow,” 391.

²⁸ Featherstone, *Bowmen*, 61.

²⁹ Gunn, “Archery Practice,” 61.

³⁰ Phillips, “Longbow and Hackbutt,” 584.

³¹ Esper, “Replacement of the Longbow,” 392.

³² *Ibid.*, 391.

³³ Gunn, “Archery Practice,” 68.

³⁴ *Ibid.*, 66.

³⁵ *Ibid.*

³⁶ Esper, “Replacement of the Longbow,” 390.

³⁷ Hall, *Weapons and Warfare*, 20.

³⁸ Esper, “Replacement of the Longbow,” 385.

the longbow, however, early firearms were comparatively easy to load and fire. Crucially, they did not require anywhere near the same amount of training as did the longbow. Bert S. Hall writes that,

One could learn to use a crossbow, as one could learn to use later firearms, in a matter of weeks or at most months; and the rather low level of proficiency that was required could be kept up with a minimum of practice. Archers, at least those good enough to be useful for military purposes, have to train from childhood, and they frequently perform near the limits of human capabilities.³⁹

In the end, the strenuous demands of drawing and firing a longbow contributed significantly to its decline in English army service, particularly once early firearms – which did not place anywhere near the same physical demands upon their operators – were introduced onto the battlefield.

Though the declining ability of English archers played a significant role in the longbow's decline and ultimate replacement, the longbow itself may have played a role in its own demise. During the early modern period, longbows were made mainly of yew, which had to be imported from Spain.⁴⁰ However, supply problems and commercial interests meant that the prices of high-quality bows increased to the point where it became difficult for ordinary subjects to purchase well-made bows of yew.⁴¹ Steven Gunn suggests that, particularly in the sixteenth century, “many of those who bought them opted for cheap and inferior items.”⁴² The result of the increasing expense of bows, according to Gunn, was that “the quality of archery suffered.”⁴³ Gervase Phillips also notes that the issues involved in supplying high-quality yew in the sixteenth century almost certainly made the increasing use of firearms an attractive option.⁴⁴ Thus, a decline in the quality of longbows themselves during the sixteenth century, caused by problems with the supply and importation of quality yew, also likely played a role in the longbow's replacement by firearms in the English army.

Ultimately, multiple factors had varying degrees of influence upon the longbow's replacement by firearms in the early modern English army. By and large, tactical considerations did not cause the longbow's replacement. In fact, in almost all respects the longbow was superior to firearms throughout the early modern period. In terms of its range and rate of fire, the longbow was clearly a far more effective weapon than either the arquebus or the musket. Longbowmen were also less vulnerable on the battlefield than their counterparts armed with firearms, and consequently required less protection by soldiers armed with shock weapons. However, firearms did possess two small advantages over the longbow: the bullets which they fired possessed a much greater ability to penetrate high-quality armour than a longbow's arrows, and less space was required by soldiers to fire a musket or arquebus than to properly draw and fire a longbow. Though these abilities could have given early firearms an advantage over the longbow in certain situations, the longbow still remained the superior weapon in most circumstances. Thus, the firearm's advantages – and particularly its better penetrating power – could have played a role in the longbow's partial decline. Despite this, as the longbow was a better overall weapon than the firearm, it could not have been completely replaced due to the latter's tactical capabilities on the battlefield. However, it is likely that the problems experienced in the early modern period with supplying sufficient quantities of high-quality yew for longbows did have an effect upon the longbow's ultimate replacement by firearms: the high price of yew meant that many English commoners bought inexpensive and thus inferior products, leading to an ultimate decline in the quality of archery. By far the most significant factor in the longbow's decline

³⁹ Hall, *Weapons and Warfare*, 20.

⁴⁰ Hall, *Weapons and Warfare*, 19.

⁴¹ Phillips, “Longbow and Hackbutt,” 590.

⁴² Gunn, “Archery Practice,” 71.

⁴³ *Ibid.*

⁴⁴ Phillips, “Longbow and Hackbutt,” 593.

and ultimate replacement, however, was the massive physical demand which it placed upon the archer. The sheer physical strength required to properly draw a longbow meant that archers had to train regularly from childhood in order to maintain their effectiveness. Once the practice of archery in England started to decline in the early modern period, and particularly in the sixteenth century, archers were largely not able to receive the training needed to enable them to deal with the longbow's physical demands, and were therefore not able to retain their effectiveness on the battlefield. Ultimately, it was not tactical considerations which contributed to the longbow's decline: rather, it was largely the difficulty of training archers so as to give them the strength necessary to draw a longbow, when combined with the decline of this training in England, that led to the eventual and inevitable replacement of the longbow by firearms in the English army.