

## Journal of the Society of Army Historical research-publication date 2002

`A combersome tying weapon in a throng of men`

### The decline of the longbow in

#### Elizabethan England

`By far the most important [military] development in Elizabeth`s reign was the victory of fire-arms over the older missile weapon, the long-bow`<sup>1</sup>. So begins Cruickshank`s book *Elizabeth`s Army*. Lindsay Boynton declares that the `old English longbow was an unconscionable time a-dying`<sup>2</sup>, and both historians appeared to favour euthanasia. Although the bow had proved a serviceable weapon in the last French campaign of Henry VIII (1544-6), a useful weapon at the battle of Pinkie in 1547,<sup>3</sup> and a popular one amongst the untrained men of Elizabeth`s reign, yet in 1595 the Privy Council, with royal authority, condemned the last remaining bows to the historical bonfire. The replacement of the bow by the caliver and musket has long been seen in a simple mechanically deterministic light. A technically inferior weapon was thus ostensibly replaced with a superior one, yet in many respects the “fiery weapon” was inferior to the bow. This essay will try to explain how and why this took place. The answer lies in a close analysis of Tudor tactics and equipment in the context of what has been described as a “military revolution”.

The replacement of the longbow in Europe was not a contentious issue. Only the English and Welsh were wedded to the longbow as their primary weapon of war<sup>4</sup>. Although the French and Scottish encouraged archery, and many English mercenaries served overseas, the bow was not central to the continental military tradition. The crossbow, which had been, was readily discarded for the hand-gun. The rapid replacement of the crossbow by the handgun as a military weapon between 1500-1530 can be explained in terms of their similarities rather than their differences. It is noticeable that, for example, the Gascons and the Genoese, who were renowned crossbowmen<sup>5</sup>, took up the hand-gun *en masse*, discarding their `traditional weapon` with alacrity.

In the pre-firearms and pike period the English infantry were equipped with bows and bills<sup>6</sup>, while the men-at-arms, equipped with full plate armour, were armed with a variety of weapons. The archers were placed in the front line, sometimes positioned on the flanks or interspersed between blocks of footsoldiers. They would form a block many ranks deep able to launch a concentrated barrage. The awesome effectiveness of the `arrow storm` was such that according to the Monk of

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<sup>1</sup> C G Cruickshank, *Elizabeth`s Army* (Oxford, 1966) p. 102

<sup>2</sup> L Boynton, *The Elizabethan Militia* (London, 1967) p. 65

<sup>3</sup> It remained a popular weapon in the North of England and Scotland long after it had lost its place to the firearm elsewhere. Its last recorded use in Scotland was in 1685 in the clan battle between the Macdonalds of Keppoch and the Mackintoshes of Moy. I am indebted to HD Soar for this information.

<sup>4</sup> The development of regional expertise with a weapon was quite well developed. The North Welsh were known as spearmen, the South Welsh as archers. In Europe, the Gascons were famed as crossbowmen, the Swiss as pikemen.

<sup>5</sup> Perhaps most famous for their abysmal performance at Crecy 1346, which concluded with their being ridden down by their French employers.

<sup>6</sup> A generic term given to a `polearm` of approximately 6 feet in length, with a iron tip that could be designed to cut, thrust or catch an opponent.

Malmesbury `After the third or fourth, or at the very most the sixth, draw of the bows, men knew which side would win.<sup>7</sup>

The military history of England in the reign of Henry VIII and his successors is undistinguished. The military inactivity of Henry VII after Stoke (1487)<sup>8</sup> was followed by a flurry of futile excursions under his son. Henry VIII was a magnificent archer and friend to archery, but his campaigns were devoted to expensive and wasteful sieges in which the longbow could only play a small and unheroic part. Domestically, the bow was a popular weapon against the Scots and both for and against rebels<sup>9</sup>, but abroad there were few opportunities for it to show its mettle. Even so it was not until the middle of the century that the predominance of the bow began to be challenged. Despite the enthusiasm Henry VIII also had for artillery and firearms, only seven per cent of British troops were equipped with the arquebus by 1544, as compared to almost a third of the armies of France and Spain.

Between 1546 and 1585 England was effectively excluded from any significant participation in continental conflicts which were fought with handgun, pike and artillery. That is not to say that the English had no men experienced in the art of war. Englishmen served in small numbers throughout the European continent where they experienced European tactics and weapons.

In England there was apparently little popular demand for military treatises. This lack was felt by the translator of Luis Gutierrez de la Vega's military manual, who wrote that he hoped that the book `may be an inducement to better knowledge and further understanding, whereby in our time our servitours by good observance and imitation, may obtain the lyke perfection that all forreine Nations doe generally embrace<sup>10</sup>. Only six books of a military nature were published before 1562. In the latter portion of the century a market for military texts developed, brought about by the compulsory training of troops after 1572 and by the increasing threat and then reality of war after the mid 1570s. The new European textbooks and their English equivalents<sup>11</sup> were printed and their tactics, orders and ranks adopted wholesale. In 1587 one thousand veteran soldiers, experienced in continental warfare, were brought back from Holland to help the trained bands prepare for the expected invasion. Since the longbow was regarded by European theorists as a foreign weapon of little pedigree, and since in their own experience firearms replaced crossbows, it is hardly surprising that the longbow found disfavour with English theorists who modeled their work on that of their continental counterparts.

The organisation of English units can itself explain the redundancy and then the extinction of the archer. The band or company was the smallest self-contained unit. It would be `imbattled` with other bands to form a regiment or combined with many to form a full battle. The size of bands or companies varied from 100 to 300.

Footsoldiers consisted of two sorts, "shot", a term that included archers as well as arquebusiers, and those who used polearms. The ratio of shot to pike in a

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<sup>7</sup> Quoted in Boardman. *The Medieval Soldier in the Wars of the Roses* (Sutton Publishing, 1998) P169 from William of Malmesbury, *De Gestis Regum Anglorum*, W Stubbs, ed., vol.2, p.291

<sup>8</sup> A victory that could in part be attributed to the longbow, against ill-armoured Irish and `modern` German mercenaries.

<sup>9</sup> In 1549 the longbow was used against Kett's rebels by the citizens of Hull and by the rebels in a successful engagement with mercenary pikemen and arquebusiers.

<sup>10</sup> G Parker, *The Military Revolution: Military Innovation and the Rise of the West* (CUP 1996) p. 113

<sup>11</sup> Two of the most popular were Thomas Styward, *The Pathwaie to Martiall Discipline* (London, 1581) and Robert Barret, *The Theorike and Practike of Moderne Warres* (London, 1598).

formation was dependent on county and commander's preference, combined with pragmatism. In 1588 the total return for the 79,798 Trained Bandsmen that John Tincey<sup>12</sup> has analysed produced the following percentages: calivers 36%, muskets 6%, bows 18%, pikes 26 % and bills 14%. The Lansdown MSS that has been attributed to Lord Burghley suggests that for every 50 shot there should be thirty pike and twenty bill. It is interesting to that the term `shot` here refers to both bow and gun (if not in fact primarily the bow), as the document continues `And when the archers, shoot not strongly...nor that there is good Calivers or harquebusses to make up the number, then the division may be fourty shot, fourty pikes and twenty bills.`<sup>13</sup> The ratios of each type varied but clearly the fiery weapon was preferred to the bow and pike to bill. In London the Trained bands eschewed the bow<sup>14</sup>, while in Lincolnshire and Cornwall it still equipped almost a third of their forces<sup>15</sup>.

There were a multitude of different formations for a band or battle, there are references to a half moon<sup>16</sup>, worm, and formations in the shape of a D, G or S<sup>17</sup>. The most common appear to have been four variations on the square. The true square of equal sides was preferred by Barnabe Rich<sup>18</sup> for its simplicity, ease of manoeuvre, and all round capability in offence and defence. The broad square had a ratio of 2:1 front to flank and the base square 3:1. In addition between the true square and the broad was the bastard square with a ratio of 1.1 or 1.2:1. Detailed calculations were published for numerically challenged captains faced with the complex mathematics of arranging their bands, battalions and battles. As in the Middle Ages an army consisted of three battles or guards, a vanguard, main and rearguards.

The main weapons of the army were pike, bill or halberd, caliver and musket. To understand how the formations worked and the place of the archer within it is necessary to analyse the capability of each of these weapons. Pikemen always formed the outer carapace of the block of bills and pikes. They were the core of any formation, for as Barnabe Rich asserted `the very strength and bullwarke in the field, is the stand of pykes, which being impald and trouped with shot orderly, are defensible against both against horse and shot`<sup>19</sup>. The great reach of their weapons (up to eighteen feet rather than the six to eight feet of the bill) enabled them to keep cavalry and infantry a `safe` distance away. Rich, in line with current thinking, asserted that `the stronger your pikes are together in number, the battaile is accounted to be the most forceable, but the shot to be devided into manie troupes, are the better to maintaine fight, and the apter for service`<sup>20</sup>.

The bill, or `brown bill` as it was known, and halberd still had their uses, but not as front-line weapons, as the `ranks of Billmen in order of Battle are always

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<sup>12</sup> J Tincey and R Hook, *The Armada Campaign* (1996) p. 47

<sup>13</sup> Lansdown MSS 56 f 50

<sup>14</sup> The Captain of `Price Arthur's Knights` an archery society founded around 1578 was Thomas Smith, Captain of the Bishopsgate and Broadstreet wards of the London East Regiment. The rather fanciful names of the societies and their officers, for example `Black Train`, `The Black Prince of Portugal`, `Sir Lancelot`, would suggest an infatuation with a mythical past rather than a martial future. I am indebted to HD Soar for providing this information.

<sup>15</sup> Tincey and Hook, *The Armada Campaign* p. 49

<sup>16</sup> This appears to have been the organisation of files of musketeers in `spokes` arranged in a semi-circle, in all but the most experienced hands it appears to be a recipe for mutual annihilation!

<sup>17</sup> Formations designed to provide mutual defence for shot and pike.

<sup>18</sup> Military theorist and author of *A Path Way to Military Practise*.

<sup>19</sup> B Rich, *A Pathway to Military practise* (London 1587)

<sup>20</sup> Rich, *A Pathway to Military practise*

enviored and compassed about with pikemen.<sup>21</sup> The purpose of the billmen was to `serve specially for execution if the Enemy in Battle be overthrown`...and `there must be reserved a few armed billmen or armed halberds to guard the ranks wherein the ensignes and drums etc., are placed in the order of battle.`<sup>22</sup>

From contemporary illustrations it is clear that the calivers formed a protective curtain to the pike formation, which in turn protected them from cavalry. Sir John Smythe recommended that `two or three rankes of them being placed almost close to the front of a squadron of piques, and likewise upon the flanches and backe... , are of good effect to give their volees at a squadron of launces...they must performe altogether on their right knees from under the piques, which must guard them against the charge of the Launces.`<sup>23</sup> John Smythe recommended that the calivermen should accompany an advancing pike block in `sleeves, wings, and troupes, upon the flanck and corners of the squadron.`<sup>24</sup>

The musket was very heavy (weighing from 7-9 kgs), cumbersome (1.7-1.9m in length), slow to load, terrifying to fire, with a fearsome reputation to friend and foe alike<sup>25</sup>. It fired a ball weighing from 50-70g, two or three times heavier than that fired from an arquebus, the recoil was ferocious and the results on firer and observer impressive. Their role would be to form a screen, acting rather like anti-tank rifles in the face of the oncoming armoured onslaught. Despite their apparent ferocity La Noue stated `musketry without pikes is like arms and legs without a body`<sup>26</sup>. Musketeers were a very recent innovation in English armies and still few in number. They formed a protective screen one rank in depth in front of the troop, or in single rank sleeves projecting ahead of the troop<sup>27</sup>.

The formations adopted for the army assembled at Tilbury preparing to meet the Armada in August 1588 conformed to the accepted theory of the time. The Earl of Leicester and the chief officers of the army, many of whom had seen service in the Netherlands, consisted of three battles `Vaward`<sup>28</sup>, *battle* and *Reward*,<sup>29</sup> with wings, sleeves, squares & troupes, according to their best skill<sup>30</sup>. In many respects the deployment of the army was more to impress `the *Queene*, her Councel, and Nobilitie` who visited the camp, but it does represent the `ideal`. The formation is dominated by the tactical thinking of the time and are organised on a relatively easy arithmetical basis, with the main formation 20 men deep.

At its heart is a core of pikemen, with some billmen, (probably in the centre of the pike block). The Calivers form two massive blocks on the flanks and four smaller

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<sup>21</sup> A mixture of pikes and bills was disliked because of the `unseemely shew` they made, although such practice appeared common in the 1540s as is apparent when studying the Cowdray House engravings. Barret, *The Theorike and Practike* p. 47

<sup>22</sup> Harleian 168 f110 November 1587

<sup>23</sup> J Smythe, *Certain Discourses, written by Sir John Smythe, Knight: Concerning the formes and effects of divers sorts of weapons* (London 1590)

<sup>24</sup> Smythe, *Certain Discourses*

<sup>25</sup> The true musket is seen by Hall as an evolutionary dead end, too heavy to be sustained by the poor overloaded soldier, he considers them `a false innovation`.

<sup>26</sup> B S Hall, *Weapons and Warfare in Renaissance Europe* (John Hopkins University Press 1997) p. 199

<sup>27</sup> The existence of what are patently forlorn files (thirty six to a file) in the Tilbury battles, would suggest that the tactic of shooting by `introduction` was already in use by 1588.

<sup>28</sup> Italicised in text.

<sup>29</sup> A confusion conflation and diminution of the medieval terms for the organisation of an army, van, main and rear for position and ward, guard and battle for the formation.

<sup>30</sup> Smythe, *Certain Discourses*

blocks on each quarter. The musketeers form a single line in front of the main formation and provide two forlorn hopes designed to screen the formation and break up the attack. The muskets as the most powerful weapon are given the clearest fields of fire, while the calivers are designed to provide the bulk of barrage fire either to protect the pike block or to shoot in an attack. The archers were disposed of as two long thin columns sandwiched between pikes and calivers, and to the very rear of the pike block. The commanders at Tilbury approached the problem of the archers `with many terrible othes and cursings and bannings of Archers and their Bowes, partlie for the hatred they bare that weapon<sup>31</sup>, but chiefly (as I think and as it after appeared) because they knew not where to place them;` and therefore positioned them in such a way that they could not see the enemy to shoot at him, and if they did they would have had to shoot over, or rather through a forest of pikes<sup>32</sup>. These dispositions were as Smythe reported due to `the small skill of our ...men of warre at Tilbury [who] did (as it were) locke up all the archers, depriving them of all <sup>33</sup>use and effect of their arrowes`.

Archers were formed into `sleeves` alongside the pike blocks or formed a rear rank to the battle. Unable to see their target and having to shoot over or “through” the pikes, it is very difficult to see how they could be of use in such positions. The requirement that the archers had for varying quantities of space was especially tiresome. The bow was, `a combersome tying weapon in a throng of men`, as they `requireth such elbow rome, and are so troublesome<sup>34</sup>. Sir John Smythe, who knew the capability of archery, preferred to organise archers in `hearses, that is broad in frunt, and narrow in flanck`, with a width of twenty to thirty five archers and a maximum depth of seven to eight. These could then be placed at the front and flanks, and given a clear field of fire. Styward was rather more creative, advertising that in the second book of *The Pathwaie* he would show `how to bring Bowes to a great perfection of service`. He placed them behind a block of calivers, but equipped them with light arrows capable of ranges from 240-280 yards. They would complement the shooting of the calivers `to the blemishing and very great anoie of the enimie<sup>35</sup>. The major problem with the longbow appeared to be the failure to successfully integrate it into a tactical unit where the firearm predominated as the preferred projectile weapon.

The characteristics of the bow and the firearm deserve some comparison as they were hotly debated by contemporaries and historians. The period we are considering takes place during what has been described by Professor Michael Roberts as a `military revolution`. In his 1956 Lecture he suggested that `on the battlefield firearms represented a big step backward<sup>36</sup>... `by a curious paradox, the coming of the hand-gun brought a steep decline in firepower: the superiority of the longbow in speed, accuracy and mobility were so marked that even in the late seventeenth

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<sup>31</sup> Bows that were sent by the Council to Tilbury were ignominiously discarded by the commanders.

<sup>32</sup> Smythe, *Certain Discourses*

The firearm was seen as the main weapon of war, which led to the bow becoming neglected in training, for as the Council stated in 1577 archery was neglected by `people imagining it to be of no use for service as they see the caliver so much embraced`. Quoted from P. Valentine Harris, `The Decline of the Longbow` *Journal of the Society of Archer Antiquaries* (London 1976) Volume 19.

<sup>33</sup> Smythe, *Certain Discourses*

<sup>34</sup> R Barret, *The Theorike and Practike* p. 48

<sup>35</sup> Styward, *The Pathwaie to Martial Discipline*. P. 97

<sup>36</sup> G Parker, *The military Revolution* p. 7

century military writers were pleading for its reintroduction<sup>37</sup>. David Eltis, in his recent reappraisal of the Roberts thesis, argues that the introduction of the firearm actually increased the firepower of an army. This was probably true if the arquebus replaced the crossbow, but in comparison to the bow it was woefully inadequate. The time taken to reload a musket or caliver was such that the enemy would move from extreme practical<sup>38</sup> range to hand to hand fighting in two but more probably one round, and the slow rate of fire would determine the numbers of musketeers in a file necessary to maintain sustained fire against their opponents. Before the reforms of Gustavus Adolphus it was generally considered necessary to have ten ranks of musketeers to ensure continuous fire. Sir John Smythe, a friend of the bow asserted that `Archers are able to discharge fore or five arrowes apeece, before the Harquebuziers shall be readie to discharge one bullet. ` This would suggest a reloading rate for the Harquebus of thirty seconds, a rate of fire rarely achieved in practice when using contemporary weapons. Humfrey Barwick`s extraordinary explanation of how a musketeer can exceed the rate of shooting of an archer, by double, triple and finally sextuple loading of his piece would indicate the desperation of his case and the superiority of the bow. Barwick claimed to achieve a rate of fire of forty shots per hour from a firearm, a lamentably slow rate of fire compared to the bow. A competent archer with a bow to match his physique can sustain a rate of shooting of ten arrows a minute for some time<sup>39</sup>. The key to the longbow was the ability to generate a high rate of fire for the short period when an attack was being made. Its role was therefore directly comparable to that of the rifle whose rapid rattle so impressed observers of the British Expeditionary Force in 1914. The bow can also be shot and arrows nocked while on the move, an impossibility for the fiery weapon, and a characteristic that would suit it in a skirmishing role<sup>40</sup>.

Whilst the maximum range of a musket against an unarmoured target might have been 600 yards, as Sir Humfrey Barwick averred, Sir John Smythe recommended an engagement range against cavalry of `eight, tenne or twelve paces...and in that sort they may work verie good effect<sup>41</sup>. Such a short range was not unusual. In the English Civil war Thelwell`s Royalists opened fire at a pike`s length<sup>42</sup> at the second battle of Newbury, while at Cheriton, the Royalist musketeers extended their range to two<sup>43</sup>. Maximum range should not be confused with effective range, which is a combination of accuracy and hitting power.

The accuracy of contemporary firearms was execrable. With ill-bored barrels, uncertain ignition, ill-fitting balls, poor powder, and careless loading it is surprising that even the one round in five hundred that was fired would hit its target, as suggested by one authority<sup>44</sup>. Sir Henry Radecliff in his inspection of the hundred

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<sup>37</sup> G Parker, *The Military Revolution* p. 7

<sup>38</sup> Perhaps 100-200 yards at most

<sup>39</sup> Experimental observation of myself and others. Simon Stanley achieves a rate of eight arrows a minute for his very heavy war bows of up to 180lbs (conversation with the archer) .

<sup>40</sup> A role it performed with a mixed formation of archers and matchlockmen in sixteenth century Japanese armies.

<sup>41</sup> Smythe. *Certain Discourses*

<sup>42</sup> François La Noue in his contemporary military textbook considered the optimum range of the reiter`s pistol to be only three paces (five metres), or just outside the reach of a pike. Hall, *Weapons and Warfare* p.195

<sup>43</sup> Stuart Peachey, *Infantry Combat*, (Stuart press 1992)

<sup>44</sup> Moritz Thierbach quoted by Hall (p.138-9) concluded from his research in 1886 on C18th musketry, that `One could assume on average that only one bullet in 500 struck home. ...Piobert went so far as to

strong Portsmouth garrison in 1571, found their preparedness and marksmanship poor. He reported that they `were ...untrained and unredi, for amonghtes three and twenty which were alowed serviceable, not fyve of them shott within fyve foot of a marke being sett within four score yards of them`. Perhaps the most unimpressive example of Elizabethan marksmanship was the failure of ten or twelve of the Ostend garrison to hit a man at six yards distance. This was specially reprehensible as their target was their own commanding officer Sir John Conway during the 1588 mutiny<sup>45</sup>. Even allowing for the likely use of the harquebus to engage bodies of men, rather than the body of a single man, it would encourage all but the most confident to hold his fire until it was impossible to miss. The recent detailed research by Bert Hill would support the contention that the firearm was inherently inaccurate, and that its role was primarily as a barrage weapon<sup>46</sup>. The continued employment of the longbow by some counties, such as Sussex<sup>47</sup> would seem to indicate an appreciation of its advantages.

Hostility to the bow was founded on three basic criticisms. Firstly, it was argued that arrows however numerous could not penetrate armour and would serve only against horse and unarmoured men, secondly that arrow fire was less psychologically effective than gunfire and thirdly that there were now too few "strong shooting" archers. The first criticism is firstly countered by the argument that there were still archers whose arrows had the ability to massacre cavalry and unarmoured men who formed perhaps perhaps the majority of the men in any force<sup>48</sup>. This seems to have eluded contemporaries so that as Barnabe Rich recorded, `men of judgement and dailie experience, findes them [archers] to be to so little purpose, that we see they never call for them`<sup>49</sup>.

David Eltis asserts that `The weakness of the crossbow and even more of the longbow lay in their inability to perforate plate armour` but he does not help his case by citing a bow with a draw weight of fifty pounds<sup>50</sup>, perhaps a third of the correct figure. His criticism of the Roberts thesis is that the introduction of the handgun on a large scale actually increased rather than diminishing firepower. This might be true of continental armies where it replaced the crossbow, but in England the bow was clearly able to produce a greater volume and accuracy of fire. David Eltis also claims a much greater armour piercing capability for firearms `The arquebus and later the musket-changed all that. Able to penetrate even the best plate armour they dramatically increased the firepower of the infantryman`.<sup>51</sup>

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claim that only one bullet in 10,000 hit its target. Berenhorst thought that being hit by a pistol shot was something that could only happen through sheer bad luck.

<sup>45</sup> Cruickshank, *Elizabeth`s Army* (Oxford 1966) p.169

<sup>46</sup> See *Weapons and Warfare*, an excellent study of the introduction, technical capabilities and employment of early firearms.

<sup>47</sup> In 1588 Sussex continued to deploy archers in its "trained" companies of foot, although it was not short of calivers or muskets.

<sup>48</sup> Arquebusiers went unarmoured as did many pikemen, even those equipped with corslets soon discarded all but the cuirass and morion, leaving their face, arms, legs and groin unprotected. The passion for armour evinced by some experts was only equalled by the enthusiasm of soldiers for discarding any dead weight which they did not deem absolutely essential to survival. My own experience with jack and plate armour, is that except in the most temperate conditions prolonged wear is almost insupportable. The weight and cumbersome nature of armour is a constant discouragement to its use.

<sup>49</sup> Rich, *A Pathway to Military practise*

<sup>50</sup> A reasonably fit sixteen year old boy can draw such a bow.

<sup>51</sup> David Eltis, *The military Revolution* (I B Tauris 1998) p. 13

The long bodkin could penetrate mail at almost any distance but plate was another matter. In an appendix to the book *Longbow* by Robert Hardy, Peter Jones considers in some detail the penetrative qualities of a bodkin point against 1.5mm of mild-steel sheet. Penetration was achieved at up to 45°, partial penetration at 60° accompanied by fracturing of the tip, while the arrow ricocheted at 70° and above. It seems probable that plate could be penetrated at fifty yards<sup>52</sup>. In the French campaign of 1544 archers were used at very short distances only four or five pike lengths one assumes in order to hit the enemy in face or to penetrate the armour that was then in common use. To achieve such fire only the first rank could engage their opponents, a practice which would dramatically reduce the potential for massed fire<sup>53</sup>. At Flodden long range arrow shooting was clearly little more than an annoyance to well armoured men<sup>54</sup>, although devastating to the unarmoured highlanders. Penetration is all of course dependent on the thickness and hardness of the armour and the angle of strike of the arrow, its energy and the design of the head. In the South American continent the Tomoyo Indians fought the Spanish with bows and arrows made of slender reeds tipped with hardwood. Coats of mail were completely penetrated<sup>55</sup> at 300 feet, breastplates were penetrated, and in one case, a steel plate, an inch of heavy felt, a layer of cowhide, and nine inches of horse, was penetrated<sup>56</sup>. The Spanish had abandoned mail and plate in favour of coats of felt four inches thick, comparable, one assumes, to the medieval padded jacks.

Armour penetration by early modern firearms has been experimentally tested in Austria<sup>57</sup>. A musket fired at eight and a half metres at a breastplate manufactured in Augsburg in about 1570 made of cold-worked mild steel of 2.8-3.0mm., penetrated it and caused a serious wound. The inherent inefficiency of a spherical projectile meant that approximately half its kinetic energy was lost after 100 metres of flight, this would make the penetration of a 3.00mm breastplate at anything over 100 metres by a musket firing a twenty seven gramme ball an unlikely feat. Hill concluded that 'it was possible to purchase body armour that offered a reasonable degree of protection from most, if not all, gunshot wounds'<sup>58</sup>. Munition armour undoubtedly fell below this standard, but German steel was identified as being of outstanding quality<sup>59</sup>. Sir Henry Lee considered that 'the worlde ...is lykelye to use more [armour] hereafter than in tyme past.'<sup>60</sup> The introduction of the musket would however seem to suggest that there was general disquiet as to the penetrative capability of the arquebus. The simple conclusion would appear to be that neither bow nor firearm could assure

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<sup>52</sup> Although we await definitive test results these results have been achieved in recent trials.

<sup>53</sup> I am indebted to H D Soar for his remarks on this subject.

<sup>54</sup> Although James V was apparently wounded by an arrow through the jaw, he was mangled beyond description by bill and halberd.

<sup>55</sup> Heath. *The History of Archery* p. 201

<sup>56</sup> An almost identical occurrence is described by Giraldus Cambriensis by Welsh archers in the late C12th.

<sup>57</sup> Hall. *Weapons and Warfare* Chapter 5

<sup>58</sup> The proving of armour by firing ball directly at it was a common phenomenon, but as Cruickshank wrote, it weakened the area struck without providing a reliable guarantee that the armour was bullet-proof.

<sup>59</sup> The Marquis of Winchester ordered his officers not to buy English armour, but arranged for a contract with a Hamburg merchant. Boynton, *The Elizabethan Militia* p. 70

<sup>60</sup> Hall. *Weapons and Warfare* p. 147 The situation was quite the reverse with both foot and horse shedding armour rather than acquiring more. Sir Roger Williams a contemporary commentator noted that even bullet-proof armour was not worn, *ibid* p149.



penetration of contemporary armour at anything other than very short distances, certainly under 100 metres<sup>61</sup>.

The second argument was that an arrow storm was less intimidating to an enemy than concentrated gunfire. Experienced soldiers soon distinguish between what is and what is not dangerous to them, treating the former with great caution and the latter with some contempt. Sir John Smythe, drawing from his own experience, recorded that

*When horses and men that have been in three or foure skirmishes, do see that they receive no hurt neither by the fire, smoke, nor noise, and that in manie thousands of Harquebuzes and mosquet shot, there are not twentie en slaine nor hurt; they grow after to to be farre lesse in doubt of those weapons of fire, than of Piques, Halbards, Launces & swords<sup>62</sup>.*

He continues ‘Howbeit the volles of Archers arrowes flying together in the ayre as thick as haile, do not only terrifie and amaze in most terrible sort the eares, eyes and harts of both horses and men’. The visual impact of arrows being both shot and received is an impressive one. On the few occasions that I have had to stand and receive a ‘benign’ arrow shower<sup>63</sup> it became obvious that it was impossible to avoid arrows. It is safe to assume that the majority of arrows would miss<sup>64</sup>, like the majority of caliver balls, but their visibility made them appear more threatening. The physical and psychological impact of an arrow storm must have been considerable. John Keegan argues strongly that the arrow storm at Agincourt created the conditions under which the French men at arms were driven into an inchoate mass and then slaughtered.

The third major criticism by contemporaries was that archery had much decayed and the range of the archers had dropped below the twelve score yards expected from them<sup>65</sup>. What was prized above accuracy was ‘shooting strongly’ and the ability to ‘draw a good length’. The Herefordshire archers were required to be ‘suche as are both Lustye in body, and able to abyde the wether and can Shoote a good Strong Shoot for heretofore we have allowed manye Simple and weake<sup>66</sup>. Ascham was clear that strong shooting rather than accurate shooting was essential for war, and that ‘if men should go into the fields, and learn to shoot mighty strong shots, and never care for any mark at all, they should do much better<sup>67</sup>. It has been suggested that an increasingly poor diet, syphilis and general ill-health left Englishmen pale and weak, unable to draw a war bow.

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<sup>61</sup> Bert Hall considers that the musket ball would unhorse an opponent at 100 metres, but not necessarily penetrate his armour (Hall. *Weapons and Warfare* p. 177).

<sup>62</sup> Smythe. *Certain Discourses*....

<sup>63</sup> At the annual re-enactment of the Battle of Tewkesbury up to 200 archers in formation shoot at each other, it is an impressive sight from both sides!

<sup>64</sup> A simple but contentious calculation would be for Agincourt. With 5,000 archers and perhaps 10,000 French casualties the likely ratio of arrows to ‘kills’ was probably over 100:1. This assertion is bound to be contradicted and I look forward to the correspondence, but I don’t believe in Robin Hood archery!

<sup>65</sup> In 1521 prizes for “strong shooting” began at XX score yards and extended to XXiiiJ. The greatest distance shot by a modern archer from his 165lb. Bow with a “livery” arrow was 394 yards.

<sup>66</sup> Quoted from P. Valentine Harris *The Decline of the Longbow* (JSAA)

<sup>67</sup> R Ascham. *Toxophilus* (Simon Archery Foundation 1985) p82

There is, however, little evidence to suggest that there were few archers to choose from. As late as 1583 a two day contest at Hodgson`s Field<sup>68</sup> attracted 3,000 Londoners<sup>69</sup>, while in 1588 there were still at least 20,000 archers in the trained bands<sup>70</sup>. In 1457, when archery was still at its height, the total number calculated in the array was 20,000 in all. The figures, though large, are small by comparison to the total numbers of archers that would have been available, if, as expected by statute, every adult male practised with the bow<sup>71</sup>.

The Mary Rose which sank in 1545 contained bows which had a draw weight calculated as being from 100-172 lbs.<sup>72</sup> and the remains of their archers seem to suggest men of exceptional power and skill. The argument that the English had become a weak and sickly crew unable to draw a bow also lacks conviction or evidence. The Mary Rose archers were no weaklings as their skeletons attest<sup>73</sup>, and compare with those of the Towton archers of 1461, who have recently been uncovered. William Harrison, in his *Survey of England*, oft quoted for its denigration of archers, asserts that `Such as are bred in this island are men for the most part of a good complexion, tall of stature, strong in body, white of colour, and thereto of great boldness and courage in the wars.<sup>74</sup> Although the last years of Elizabeth`s reign was one of hardship for the poor, their misery cannot compare to the trauma of industrialisation and urbanisation which produced the pathetic physical specimens that so shocked the authorities recruiting for the Boer and First World Wars. The other argument that the debilitating effects of any campaign would make the already apparently weak archer weaker is hardly borne out by the extraordinary performance of the dysentery riddled archers at Agincourt. Besides, anyone who has had the misfortune to carry and use a caliver or musket would also assert that it was no job for the weakling.

Robert Barret in his *Dialogue between a Captain and a Gentleman* had the Captain wishing `were there such bowmen as were in the old time<sup>75</sup>. Sir Thomas Elyout in *The Governour* (1531) wrote `O what cause of reproche shall the decaye of archers be to us now livynge?`, and blamed those who failed to enforce the existing legislation. Ascham, and the stout defender of the longbow, John Smythe, concurred with the opinion that archery was in decline. In his monumental study of late Elizabethan England William Harrison expressed a disdain for current archery while evoking memories of a glorious past

*In times past the cheefe force of England consisted in their long bowes. But now we have in manner generallie given over that kind of artillerie, and for long bowes in deed doo practise to shoot compass for our pastime:... Certes the Frenchmen and Rutters deriding our new archerie in respect of their corslets... turne*

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<sup>68</sup> Heath. *The History of Archery* p 175 At the surprisingly short range of 148 yards, the danger zone extended to twenty feet either side of the mark, which gives some indication of the degree of accuracy, or rather inaccuracy, that was expected..

<sup>69</sup> In the 1457 Array London had to provide only 1,137 archers.

<sup>70</sup> The impressive army assembled at Tilbury in August 1588 mustered 1,347 archers, this compared to 4,744 calivermen and only 307 musketeers. They could have played an important part in the army, but for their inappropriate positioning.

<sup>71</sup> Surrey was expected to provide only 175 archers and Bristol 91.

<sup>72</sup> R Hardy, *Longbow A Social and Military History* (Patrick Stephens Ltd 1995) pp. 215-221

<sup>73</sup> Hardy, *Longbow* pp. 217-221 The evidence of the Towton excavations was similar, with archers readily identifiable by skeletal deformation.

<sup>74</sup> W Harrison, *The Description of England* (London 1994) pp. 444-5

<sup>75</sup> Hardy, *The Longbow* p.141

*up their tails and crie; Shoote English, and all because our strong shooting is decayed and laid in bed. But if some of our Englishmen now lived that served King Edward the Third in his warres with France, the breech of such a varlet should have been nailed to his bum with one arrow, and another fethered in his bowels, before he should have turned about to see who shot the first.*<sup>76</sup>

Similar sentiments concerning the decline of archery had been expressed by the King: 'Whereas the people of our realm, nobles as well as commons, usually practised in their games the act of archery... now the act is almost totally neglected and the people amuse themselves with dishonest games so that the Kingdom, in short, becomes truly destitute of archers'<sup>77</sup>. But in this case the king was Edward III in 1363, seven years after Poitiers and with Agincourt a generation away. In 1472, when the longbow was still dominating the English battlefields, an Act of Parliament complained of a shortage of bowstaves with the consequence that 'archery was greatly discontinued and almost lost'<sup>78</sup>.

It could be argued that the process of enclosure led to a decline in the numbers of stalwart yeoman, fit and able to serve with bow and sword. The process of medieval enclosure was almost completed by 1485, and it did not involve a simple transition from arable to pasture<sup>79</sup>. Wolsey, Cromwell and Sir Thomas More all saw enclosure as an evil that seriously dislocated society for the benefit of a few, but there is little to suggest that their analysis, even if commonly shared, was correct. The country was predominantly agricultural, but even in London (the only sizeable city in the realm) archery was very popular. There is little evidence to suggest that the yeoman of England were either fewer in number or had forsaken the bow. It is more likely that the long years of peace had made any training in arms less important. It is possible that changes in recreation brought about by the events of the Reformation with particular reference to Sunday<sup>80</sup> might have interfered with the normal practice of archery.

If there was a decline in archery it was probably less in the total number of archers but in the absence of an elite who could use the exceptionally powerful bows of over 150lbs<sup>81</sup>. Many of the archers who accompanied the English Kings to France in the Hundred Years war were professional warriors<sup>82</sup> trained to the bow from their youth, and these perhaps were fewer as the result of the collapse of the system of indentured retaining which had begun in the reign of Henry VII. The 'liveried' archer was no more by Elizabeth's reign. The new order required the 'The strongest and best persons were to be pikes. The strongest and squarest fellows will be fit to Carry

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<sup>76</sup> The minimum range for all adults was laid down by statute at 220 yards.

<sup>77</sup> English Historical Documents, IV p1182

<sup>78</sup> A Boardman, *The Medieval Soldier in the Wars of the Roses* (Sutton Publishing. 1998) p. 146

<sup>79</sup> There also seems to be some animosity towards shepherds on the grounds that only ploughmen had enough power to draw a bow!

<sup>80</sup> The day which with other holidays was established for practice by Richard II in 1388.

<sup>81</sup> A 165 pound draw weight yew bow with a "Westminster" arrow can reach nearly 400 yards. Conversation with Simon Stanley.

<sup>82</sup> The 1365 prohibition against archers leaving the Kingdom without a royal licence would suggest that 'real' archers constituted a minority. All men were required to practice archery, but not all men would have come under that prohibition. In J Bradbury, *The Medieval Archer* (The Boydell Press 1988) pp. 170-9, he establishes that the term 'yeoman archer' referring to someone of some wealth and status clearly had some basis in fact.

Muskets<sup>83</sup>. 'The tallest men, and the elder sort are fitted for other weapons'<sup>84</sup>, (one assumes the bow and bill,) while the young and fit were allotted to pike and shot.

The recruitment and training of the Elizabethan armies can also explain the decline in the use of archery. Whilst the expeditions raised by late medieval kings mostly consisted of what were effectively professional soldiers raised by indenture, in Elizabeth's reign, *'when service happeneth we disburthen the prisons of theeves, wee robbe the tavernes and Alehouses of Tossottes, and Ruffines, We scoure bothe Towne and Countrie of Rogges and vagabons'*. Falstaff, in Shakespeare's Henry IV, Part 1, illustrates most persuasively the attitude of an Elizabethan Captain to his company, when he declares of his pathetic force that 'my whole charge consists now of slaves as ragged as Lazarus, discharged unjust serving-men, revolted tapsters and ostlers trade-fallen,' and that despite their unprepossessing appearance 'they'll fill a grave as well as better than they'.

Those who could avoid foreign service did so with only a few gentlemen volunteers choosing to serve on their own terms. The great majority of soldiers were conscripts<sup>85</sup>, sometimes drawn from the able and honest but more likely the reverse, and after a period of campaigning it would be difficult to distinguish between them. Sir John Smythe in his devastating criticism of the conduct of the expeditions to the Netherlands asserted that

*by suffering their soldiers for lack of pay in those wars to go robbing and spoyling the countries people their friends. ..[evil government] hath brought many of them from good to evil, and made most of those that have returned to England impudent rogues and theeves, that were true men before they went over*<sup>86</sup>.

With this low calibre of recruit the longbow as a weapon was not an option, requiring as it did constant practice and commitment. The pike was a cheap<sup>87</sup> and simple weapon to master<sup>88</sup>, while the firearm would require as little as a full morning's training. Bert Hall writes compellingly of the 'proletarianization' of soldiers. The medieval soldier was chosen for his skill with a weapons that had taken years to master. This skill was the product of early and assiduous training, for as Bishop Latimer famously explained

*In my time, my poore father was as diligent to teach me to shoote, as to learn any other thyng; and so I think other menne dyd thyr children. He taught me howe to drawe, how to lay my bodye in my Bowe, and not to drawe wyth strength of armes, as other nacions do, but wyth strength of bodye. I had my Bowes bought me according to my age and strength, as I encreased in them; so my bowes were made bigger and bigger; for men shall never shute well, excepte they be brought up in it*<sup>89</sup>.

The Elizabethan soldier was unskilled in arms before joining and his training was relatively simple. A good soldier was one who survived the rigours of a campaign without desertion rather than one who possessed any great skill at arms. The

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<sup>83</sup> Harleian 3324 f55

<sup>84</sup> Foljambre F81 Sept. 1585

<sup>85</sup> Cruickshank, *Elizabeth's Army* Chapter II Recruitment and p. 107 Hall. *The Military Revolution*

<sup>86</sup> Smythe, *Certain Discourses*

<sup>87</sup> The cost of a pike bought from the Queen's Pikemaker was 3s 8d, Norwich bought black and white corslets for £2.7s each. Powder was sold to the Council for 7d a pound. Cruickshank, *Elizabeth's Army* ch. VI.

<sup>88</sup> The essentials of pike drill took about fifteen minutes to master in my case, and I am a slow learner.

<sup>89</sup> Quoted from A E Hodgkin *The Archer's Craft* (Llanerch publishers 1995) p. 54

practice of holding short musters, dating from 1572-3, for issuing and inspecting equipment and training, also encouraged these weapons as they suited a conscript army. The history of Elizabethan campaigns abroad is a testimony to the incompetence and venality of the officers and the poverty and indifferent quality of the men.

The copious legislation<sup>90</sup> passed to support archery has surprisingly been seen as evidence of a serious decline. Boynton has however convincingly made the case<sup>91</sup> that the late Tudor legislation in favour of archery and hostile to gambling and other sports was a means by which the authorities strove to eradicate vice by encouraging virtue. The support of Queen and Council was also an attempt to maintain the importance of the bow until troops could be properly equipped with modern weapons. The 1577 legislation must be understood in this light as the `people imagining it [archery] to be of no use for service as they see the caliver so much embraced` were still encouraged to practice what was perceived as an obsolescent art. As late as 1587 the Council declared that shooting was `a thing greatly to be regarde and favored to the musteringe and trayninge of souldiers`<sup>92</sup>. Even then there were still more than enough good archers to hand.

The argument that the bow was less serviceable in inclement weather than the firearm also does not bear close scrutiny. Yew bows do not like cold weather and need to be warmed before use to avoid breakage, but this is easily accomplished<sup>93</sup>. The strings are beeswaxed and come to little harm in rain. The bow is carried unstrung unless ready for use, since stringing puts a strain on the bow, and a bow in tension is more likely to be damaged, and stringing only takes a few seconds. Glue<sup>94</sup> is only used on the horn nocks of the bow, if it isn't self nocked, and on the fletchings of the arrows. Crecy was preceded by a downpour, and Towton was fought in a miserable mixture of snow and sleet. In neither case was the bow limited by the conditions. Wind and rain can adversely effect the flight of the arrow, and as at Towton (1461) archers can be deceived as to the range and effectiveness of their shooting. Accuracy, though impaired, is of less importance when considering the size of the potential target that would be engaged at maximum range. I have shot my bow in conditions which made the ignition of a firearm by my fellows an improbable if not impossible event<sup>95</sup>.

The lower cost of bows and arrows compared to firearms has always been cited in their favour, but I fear that is a fallacy. Yew bows were increasingly difficult

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1542 Rules for regular shooting practice laid down for all males 16-60

1558 Orders for keeping bows by all adult males repeated

1566 Price of bows controlled

1569 Archers forbidden to use firearms

1571 Extension of import duties paid in bow staves.

1577 Encouragement of archery by the Council in the face of the introduction of firearms.

<sup>91</sup> L Boynton, *Elizabethan Militia* pp. 65-69

<sup>92</sup> L Boynton, *Elizabethan Militia* p. 68

<sup>93</sup> John Smythe recommended a mixture of wax, rosen and tallow to protect the wood of the bow.

<sup>94</sup> Manufactured from bluebell bulbs, slow to cure but rock-hard when so.

<sup>95</sup> I remember an especially wet day at Norham and an especially cold and windy day at Hardwick Old Hall, my compatriots with their fiery weapons were much discomforted. The fletchings are subject to damp, but can be readily revived by steaming.

to procure and their cost reflected it<sup>96</sup>. A good bow of foreign yew cost 6s 8d, a bow of second quality 3s 4d<sup>97</sup> and each archer would require several for a campaign<sup>98</sup>. The cost of arrows was defrayed by the authorities unlike that of gunpowder which until the late 1590s was paid for out of the wages of the soldier. The total cost of two or three bows, spare strings and three or four sheaves of arrows could not have been less than 20-30shillings<sup>99</sup>. All these items were subject to wear and decay, and could not be expected to survive prolonged storage or practice. The caliver cost from 12-30shillings: four stolen in 1573 from a church in Essex together with powder flasks and touch-boxes<sup>100</sup> were valued at 13s4d each. In addition firearms could, if properly cared for<sup>101</sup>, be stored for an indefinite period for later use, and used regularly for practice without being harmed<sup>102</sup>. There was therefore little if any saving to be made maintaining the bow in stead of introducing firearms. In economic and administrative terms firearms were highly cost-effective.

Bow and arrows were, in the minds of the authorities seen as the weapons of the poor man. They were the weapons required by the statutory rates of 1558 from the poorest, those who could, were expected to find armour and firearms. The archer and his bow lacked the status of the fiery weapons. The prevalence of sieges over major field engagements did not provide an opportunity for the longbow to shine<sup>103</sup>. Englishmen were now trained in the continental tradition and fought continental armies, and there was no place for the bow in `modern` tactics.

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<sup>96</sup> Cruickshank, *Elizabeth's Army* p. 104. In the previous century the cost of imported bow staves rose from £2-£12 per hundred. In 1566 best foreign yew bows were priced at 6s 8d, and English at 2s. English yew rarely produces bows of the first quality, the trees grow too quickly.

<sup>97</sup> Cruickshank, *Elizabeth's Army* p. 104

<sup>98</sup> A bow is a consumable item (or at least mine are) with a limited useful and storage life.

<sup>99</sup> It is difficult to establish exact prices, but a sheaf of arrows for between one and two shillings, a little over the average price paid during the Wars of the Roses is not unreasonable. In addition many strings would be required for each bow.

<sup>100</sup> Containers of fine powder for priming the pan. Coarser powder was used as a propellant.

<sup>101</sup> One caliver had been stored in the Tower after the Boulogne campaign (1545) and was not discovered to be still loaded until 1584 when it was being refurbished (achieved at an average cost of four shillings. The armourer unable to unload the weapon conventionally placed the dismounted breech in a fire and rested the muzzle against his thigh, the consequences were dire! I am always heartened by historical accounts of monumental stupidity; this is from William Clowes, *A profitable and necessarie Booke of observations for all those that are burned with gun-powder, &c. and also for the curing of wounds made with musket and caliver shot, and other weapons of warre* (London 1596)

<sup>102</sup> In an armoury in Ireland in 1578 after only two years storage all the arquebuses were found to be unserviceable, many of the calivers and muskets were badly rusted, most of the bows broke when drawn and strings and arrows had been badly affected by damp. Essex in correspondence with the Council argued that privately held weapons were more likely to be maintained properly; Cruickshank, *Elizabeth's Army* p. 111

<sup>103</sup> At the siege of Leith in 1560 only a single casualty was caused by an arrow wound. As a weapon for besieging and defence the crossbow was far superior both in terms of accuracy, economy and ease of use. I have shot my longbow at and through arrowloops and crenallations, in neither case were the results very satisfactory (not all attributable to my lack of skill).

The hand-chosen archers that had served Henry V in France for high wages and rich pickings had been replaced by a motley collection of pressed men granted a cursory training in the handling of cheap and simple weapons. The bow's rustic simplicity and ancient reputation were a disadvantage in an age that professed an enthusiasm for the latest weapons and tactics. This led to an attitude bordering on contempt for a weapon that could still have won victories in the field. The "up-to-date" tacticians of the 1580s, heirs to the triumphs of Agincourt and Poitiers, discarded the archer for many reasons, but primarily "because they knew not where to place them".

(Word count including footnotes 8,967)