

# Technological Determinisms of Victory at the Battle of Agincourt<sup>1</sup>

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## ABSTRACT

*This article takes issue with the deterministic conclusions of a recent study by three scientists who investigated the effects of wearing armour on soldier exhaustion during the battle of Agincourt. Armour is not the usual military technology given credit for determining victory and defeat at the battle of Agincourt. That has been longbow archery. Too often in retelling the story of Agincourt the technology has determined the outcome. As I show in this article, while armour and the longbow play a role in the battle narratives of the original sources, they do not determine victory and defeat.*

In July 2011, while doing research in the Royal Armouries library in Leeds, I was approached by Andy Deane, who has been a Royal Armouries interpreter for many years. In suitably dry tones, he asked whether I had heard that the French had lost at Agincourt because they were exhausted by the weight of their own armour. He then proceeded to tell me that he and several other Royal Armouries interpreters had been the subjects of a series of physical tests carried out at the University of Leeds by Graham N. Askew (University of Leeds), Federico Formenti (University of Oxford) and Alberto E. Minetti (University of Milan) to determine the effects on medieval soldiers of wearing armour.

These interpreters had all worn and performed in armour frequently for several years for patrons of and visitors to the Royal Armouries.<sup>2</sup> As such they were good candidates for Askew, Formenti and Minetti's investigations. Despite being unable to precisely reproduce all the conditions of the 15<sup>th</sup> century – it was not, for example, possible to exactly replicate the types of nutrition or the frequency of horseback

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<sup>1</sup> Versions of this article were presented at 'The Hundred Years' War: A Century of Conflict Re-evaluated', sponsored by the Royal Armouries and held at the Tower of London on 29 September 2012, and at the Fiftieth International Congress on Medieval Studies, Kalamazoo Michigan, 16 May 2015.

<sup>2</sup> Extremely experienced, Deane had been an interpreter for more than twenty years while some of his colleagues had also been members of the professional tournament circuit.

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travel – the physicality of the re-enactors was the closest that could be achieved in a modern setting. Deane did not dispute the way these experiments were conducted. Nor did he take issue with the immediate findings of these experiments. However, he was not convinced by the interpretations that the scientists had developed from them. In particular he took issue with the suggestion that the fatigue of the French cavalry wearing armour had ‘contributed’ to the French defeat at Agincourt.

Like Deane, I do not take issue with the findings of the team of biological and physiological researchers, who published their work, *Limitations Imposed by Wearing Armour on Medieval Soldiers Locomotor Performance*, in the *Proceedings of the Royal Society B* in 2011.<sup>3</sup> Their human subjects were four men – described as ‘height 175 +/- 4 cm, mass 79 +/- 10 kg, age 36 +/- 4 years’ – who wore armours which were provided by the Royal Armouries from their collection of replica armours. These replica armours were accurate in weight and height to original armours found in the Royal Armouries collection.: an English armour dating to 1470-80; a Milanese dating to the mid- to late-fifteenth century; and a German Gothic armour dating to the late fifteenth century. The replica armours, including historically accurate arming doublets, weighed an average 35 +/- 5 kg and had all previously been worn by the interpreters.

Tests were performed on respiratory frequency, tidal volume, CO<sub>2</sub> production and O<sub>2</sub> consumption – Deane assured me that the tests performed on him and the others simulated armour usage as accurately as possible. The results of the tests were scientifically charted and present in full by three researchers in their article. They need not be repeated here. What they showed is not surprising, however: medieval soldiers became tired when they wore armour for an extended amount of time, whether they were walking or running.

The article should have stopped there. Askew, Formenti and Minetti’s tests of the Royal Armouries interpreters conclusively showed that there was a correlation between wearing armour and exhaustion. But that was not where the article ends; and it is with the final paragraph, from which I quote liberally, that Deane, the other interpreters and I take issue:

The significant energetic cost of moving in armour is likely to have had a profound limitation on soldiers’ performance, and may have contributed to the outcome of certain battles. For example, during the Battle of Agincourt

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<sup>3</sup> N. Askew, Federico Formenti and Alberto E. Minetti, ‘Limitations Imposed by Wearing Armour on Medieval Soldiers’ Locomotor Performance’, *Proceedings of the Royal Society of B: Biological Sciences* (2011), pp.1-6.

(1415), heavily armoured French knights advanced towards the English men-at-arms across terrain made extremely muddy from recent ploughing, overnight rain and an earlier French cavalry charge. Exhaustion of the French knights is cited as a contributing factor to their demise at the hands of the more lightly armoured English archers.<sup>4</sup>

The 'cited' authority is Juliet Barker, whose book on Agincourt was published in 2005, although no page number is given.<sup>5</sup> Following their statement on Agincourt, the scientists suggest that a similar thing happened at Crécy, before ending with a bit of a step back from their more decisive determinations of what had caused French defeat in those two battles, 'together with numbers and condition of soldiers, equipment availability, battle strategy and terrain, the high energetic cost of movement in armour could have contributed to the outcome of Medieval battles'. Naturally, those other factors made little difference to the popular English media reporting the work of these scientists. *The Guardian's* article, for example, carried the title 'Heavy Armour would Have Exhausted the French at Agincourt, say Scientists,' with the subtitle, 'Tests Involving Volunteers Running on a Treadmill in Medieval Armour Suggest the French were Too Knackered to Fight'.<sup>6</sup>

The obvious problem with these conclusions is that even the closest armour in date, the mid- to late-fifteenth century Italian armour, used for their tests was significantly different than that worn at Agincourt. That this was a misunderstanding of the scientists in the Royal Armouries experiments is not to condemn them alone. It is an error that is found in many publications, including that of the cited Barker, who writes frequently about both the French and English men-at-arms wearing 'a full suit of armour,' at one point suggesting that John Mowbray, Earl Marshal of the English army, were 'encased from head to foot in plate of armour, with even his face hidden behind the visor of his helmet,' so much in fact that he was 'unrecognizable among his peers.' Her evidence, however, is only to his purchase of an intricately made surcoat that identified him with his heraldry. Mail armour was worn, she writes, but it provided only a 'second line of defence under plate armour, particularly at vulnerable points, such as under the arms and at the joint, which were often exposed when moving.'<sup>7</sup> Contrarily, it was in fact these joints, at least the elbows and knees, which received some of the first plate armour simply because they were the most vulnerable.

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<sup>4</sup> Askew, Formenti and Minetti, pp. 3-5.

<sup>5</sup> Juliet Barker, *Agincourt: The King, The Campaign, The Battle* (London: Little, Brown, 2005). The absent page numbers are pp. 134-35.

<sup>6</sup> *The Guardian*, 20 July 2011.

<sup>7</sup> Barker, pp. 134-35.

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But this begs the question: what was the armour worn at Agincourt?

The early fifteenth century was once thought to be a time of transition between mail armour, which had proven its effectiveness against all types of weapons since Ancient Roman times, and full suits of plate armour, which begin to be worn around the middle of the fifteenth century. Plates added to vulnerable parts of the body – the knees, the elbows and the neck – throughout the fourteenth century, had been joined by a breastplate, shoulder, arm and leg armours by the end of the century. How much plate was being worn at Agincourt, and by how many, could only be guessed at, with the general conclusion that mail was still the primary armour worn by both the French and English in the battle.<sup>8</sup>

This is not to say that wearing mail armour with plates over it was less protective or less fatiguing than those armours tested by the scientists. Mail may not have been as heavy as plate armour, but it was still heavier than not wearing armour at all. And it was very protective – by the time of Agincourt it had been around for nearly a millennium. By 1066, according to dated artistic portrayals, mail armour had covered the head and descended down the arms and legs, and by 1150 it had covered the hands and feet, with Great Helms covering the head by 1200. By 1350 plates had begun to be placed on the elbows, knees and torso.<sup>9</sup> At any of those times the weight would have been enough to exhaust anyone fighting or exercising in it for very long, although maybe not as quickly as full plate armour would have done.

However, as a result of work by Dr Thom Richardson, the former Deputy Master of the Royal Armouries until his retirement this year, it is now possible to challenge the date ranges associated with some of these claims. By studying unpublished accounts of the acquisition of armour by the Tower of London in the later Middle Ages, Richardson identified ‘a dramatic change’ in armour worn across Europe in the middle of the fourteenth century: ‘The accounts of the Tower armoury ... in the study of plate armour show that the idea of a ‘complete armour’ existed by the late 1360s, half a century earlier than conventionally accepted’.<sup>10</sup>

In particular, an account of John Spencer for 1413 and 1418 elucidates what was worn at Agincourt, at least by English knights. Among his list of what had been acquired by the Tower during that period, which included armours for specific parts

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<sup>8</sup> See, for example, Claude Blair, *European Armour: circa 1066 to circa 1700* (London: B.T. Batsford, 1958), pp. 52-58 & pp. 62-66.

<sup>9</sup> On the history of mail see Kelly DeVries and Robert D. Smith, *Medieval Military Technology*, 2<sup>nd</sup> ed. (Toronto: University of Toronto Press, 2012), pp. 53-75.

<sup>10</sup> Thom Richardson, ‘Armour in England, 1325-99’ *Journal of Medieval History* 37 (2011), pp. 304-320, with the quotes appearing on pages 304 and 320.

of the body – sabatons (for the feet), poleyns (for the knees), greaves (for the shins), cuisses (for the thighs), chausses (for the legs), paunces (for the lower torso), vambraces (for the upper arms), pauldrons (for the shoulders), rerebraces (for the elbows and upper arms), gauntlets (for the hands), and various types of helmets (for the head) – were ‘twenty pairs of complete armour’ and ‘23 new armours of steel.’ That these specific armours were plate, and the latter full suits of plate armour seems correctly interpreted, as they are separate from armours specified to be mail: ‘five mail shirts ... three pairs of mail chausses ... three mail sleeves, three ‘peticoats’ of mail’. Spencer also mentions the names of two of the king’s armourers, Martin Pull and John Hill, who were responsible for the ‘repair and modification of various pieces of armour of plate and mail at various times’.<sup>11</sup> So it is very likely that some on both sides of the Agincourt battlefield wore full suits of plate armour. However, bearing in mind that at most 43 suits of armour were provided by the royal armoury to the English men-at-arms, it would appear that the numbers of those wearing full plate armour would have been quite low. How close the suits identified by Richardson were to the extant armours of the later fifteenth century cannot be determined, nor how fatiguing they might have been to soldiers on horseback.

Armour is not the usual military technology given credit for determining victory and defeat at the battle of Agincourt. That has been longbow archery. The fame received by the longbows at Agincourt is well earned and obvious – it has certainly been trumpeted as such by modern historians, as evidenced by Jim Bradbury’s *The Medieval Archer*, published in 1985, and Matthew Strickland’s and Robert Hardy’s *The Great Warbow: From Hastings to the Mary Rose*, which appeared in 2005. Both devoted entire chapters to the battle of Agincourt.<sup>12</sup> Their explanation: at Agincourt English longbowmen decisively defeated French knights whose armour they easily penetrated with their arrows, killing thousands.

This they have asserted with support primarily from some English sources of the battle that ascribe victory to the weapon. Further proof emerges from an examination of those longbows on the *Mary Rose* – from which Robert Hardy took his draw-weight estimations of several hundred pounds of pull<sup>13</sup> – and by the modern

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<sup>11</sup> Thom Richardson, ‘Armour in Henry V’s Great Wardrobe’ *Arms and Armour* 12 (2015), pp. 22-28. An English translation of Spencer’s account (from which the above quotes were taken) is on pp. 22-23, with a Latin transcription of the document provided in footnote 3 (pp. 27-28). In the original source the number 20 is written out and 23 is in numerals; hence I have kept the same format.

<sup>12</sup> Jim Bradbury, *The Medieval Archer* (New York: St. Martin’s Press, 1985), pp. 116-138, and Matthew Strickland and Robert Hardy, *The Great Warbow: From Hastings to the Mary Rose* (Stroud: Sutton Publishing, 2005), pp.318-338.

<sup>13</sup> After examining the *Mary Rose* bows, and even trying to string one (which destroyed the bow), Hardy (in *Longbow: A Social and Military History*, 3<sup>rd</sup> ed. [London: Bois d’Arc Press, 1993], among other places) claimed draw-weights of up to 400 lb, although his average is generally between 180 and 250 lb These

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testing of longbow ballistic force, for example at the United Kingdom Defence Academy in 2005.<sup>14</sup> However, reliance on archaeology and ‘experimental archaeology’ to prove the importance of the military technology at the battle of Agincourt has caused a shift of attention away from the original sources. The result has been a ‘we’ve proven the determinism of the technology’ mentality that has meant the reinterpretation, and sometimes dismissal, of sources that do not agree with those modern validations of the longbow and armour. Surely the original sources must have recognized the deterministic effects of the English longbow. And surely they must have remarked on the fatigue felt by the French cavalry because of their heavy suits of armour.

Alas, surprising not, at least not universally, but more on ‘national’ lines: the English sources pay much more attention to the longbow, although none ascribe it as the sole determination of English victory, while the French pay more attention to the armour, although only two French sources (and one English source) note the fatigue of the men-at-arms at wearing their armour, and none cite it as the cause of victory or defeat. On the contrary, the French sources are very impressed by how protective the armour was against longbow arrows – although the horses fared substantially less well. For the original sources of the battle it was the muddy ground and the attacks by men-at-arms and archers in the English centre (the archers having discarded their bows for other weapons by this time) which brought the eventual defeat and high casualty rate among the French soldiers.

William Shakespeare repeated Raphael Holinshed’s quote from Henry V that he would ‘not wish a man more’<sup>15</sup> with the same definition that Holinshed had used:

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estimates declined in Hardy’s article on longbows in *Weapons of Warre: The Armaments of the Mary Rose*, ed. Alexzandra Hildred (Southampton: Mary Rose Trust, 2011), to 150-200 lbs (p. 591), although the team of analysts studying the bows found 23 had draw-weights from 65-90 lbs and 25 from 100-160 lbs (pp. 616-17). Only one had a draw-weight in Hardy’s estimate, and that at the low end of his most recent estimates (160 lbs).

<sup>14</sup> Paul Bourke and David Whetham, ‘A Report on the Findings of the Defence Academy Warbow Trials Part I Summer 2005’, *Arms and Armour* 4 (2007), pp. 53-75. In these tests longbow arrows proved very penetrative against plate armour. However, in an article in the same issue of that journal, I voiced my concerns about the authors’ methodology in those trials: Kelly DeVries, ‘Comments – A Report on the Findings of the Defence Academy Warbow Trials Part I Summer 2005’ *Arms and Armour* 4 (2007), pp. 75-81. In other tests, longbow arrows have proven less capable despite claims of success. One of the most interesting of these was by Mike Loades in his show *Weapons the Made Britain*, broadcast on Channel 4 in 2004, when he exalted the power of the longbow, despite the arrows shot penetrating plate armour placed directly on non-moving and uncovered wooden dummies only at a distance of 25 feet and only for 1/4 to 1/2 inch.

<sup>15</sup> William Shakespeare, *Henry V*, Act 4, Scene 3, and Raphael Holinshed, *Holinshed’s Chronicles of England, Scotland and Ireland*, in Anne Curry, *The Battle of Agincourt: Sources and Interpretations* (Woodbridge: The

'soldiers'. Thus both of these later publicists of the battle of Agincourt missed the original intention of the eyewitness English chaplain who wrote the *Gesta Henrici Quinti*, and who might actually have heard Henry utter such a line. In his account, Henry does not want any more 'archers'.<sup>16</sup>

How could Henry not have wished for more archers at Agincourt? Didn't he know the invincibility of his longbowmen? In fact, the English king had little choice. The march across Northern France had a devastating effect on his soldiers. As the *Gesta Henrici Quinti* testifies:

But because the dysentery, which had carried off more of our men, both nobles and others, than the sword, so afflicted and disabled many of the remainder that they could not journey on with him any further he caused them to be separated from those who were fit and well and gave them leave to return to England and those... numbered about 5000, so that of what left of the army, there remained no more than 900 lances and 5000 archers able to draw sword or set to fight.<sup>17</sup>

According to a number of sources, the larger percentage of those who returned to England before the battle were men-at-arms, not archers. Sources report that when dysentery – brought about because, according to Thomas of Walsingham, 'many had to eat hazelnuts and roast meats in place of bread... and forced by adverse fortune to drink water for the space of eighteen days'<sup>18</sup> – hit the English army, the archers simply pulled off their hose and kept marching while the men-at-arms were forced to withdraw. Indeed, the *Chronique de Ruisseauville*, written in a monastery near the battlefield during the 1420s-30s, and followed by Enguerrand de Monstrelet, Jean Waurin and Jean le Fèvre, all writing after 1444, remark that when the archers repositioned themselves on the battlefield 'their breeches [were] hanging down'.<sup>19</sup>

The problem presented Henry was that no English commander had ever had this

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Boydell Press, 2000), p. 254. NB: For consistency I have used Curry's book of translations for all the original sources, indicating where I differ with her translations.

<sup>16</sup> *Gesta Henrici Quinti*, in Curry, p. 33. Strangely, Tito Livio Frulovisi, writing c. 1438, has 'knights' the type of soldiers that Henry would not have another of (*Vita Henrici Quinti*, in Curry, p. 60).

<sup>17</sup> *Gesta Henrici Quinti*, in Curry 27. The total numbers of English soldiers at Agincourt are in dispute, with Anne Curry suggesting against earlier accounts that, according to the muster rolls, the *Gesta's* numbers are too low (*Agincourt: A New History* [Stroud: Tempus, 2005]), although that there were many more archers than men-at-arms is not disputed.

<sup>18</sup> Thomas Walsingham, *St. Alban's Chronicle*, in Curry, p. 50.

<sup>19</sup> *Chronique de Ruisseauville*, in Curry, p. 125; and Enguerrand Monstrelet, Jean Waurin and Jean le Fèvre, in Curry, p. 154. (Curry puts these three chroniclers together as their accounts of the battle differ only slightly, thus concluding that they were all using the same source.)

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ratio of archers to men-at-arms; in fact, no commander had even come close. At Falkirk in 1298, at Halidon Hill in 1333, at Crécy in 1346, at Poitiers in 1356, and in numerous smaller engagements, archers had either numbered less than men-at-arms or were at a one-to-one ratio.<sup>20</sup> English commanders generally placed their units of archers as wings to their units of men-at-arms. These archers were used to funnel attacking enemies onto the strength and experience of the men-at-arms, preventing any flanking manoeuvres. Not a huge number had been necessary as these had proven effective in numerous battles, where the damage to horses and men caused the charge to become disrupted and confused.<sup>21</sup> Such a formation can be seen also at Agincourt in Tito Livio Frulovisi's assertion that Henry V 'drew up three *acies* and two *alas*, according to the custom of the English'.<sup>22</sup> *Acies* has been translated in a number of ways by medieval military historians, as 'lines,' 'battles/batailles,' or 'units,' but *alas* only as 'wings'.

However, the *Gesta Henrici Quinti* reports how Henry was forced to alter that traditional line 'when he positioned "wedges" of archers in between each of his three *acies*' – resulting in placing archers both as wings and in two units within the line.<sup>23</sup> Writing in 1418 Thomas Elmham, the earliest non-eye-witness source of the battle, says the same: 'Among them [the three *acies*] he intermingled troops of archers'.<sup>24</sup>

The archers also placed stakes in front of themselves, stakes they had actually made before their crossing of the Somme River a few days before. These stakes were initially pounded into the ground, but would be pulled up and moved when Henry moved the army closer to the French. The stakes were then replaced in the ground. Some sources indicate that these stakes were placed only in front of the archers formed along the wings, perhaps as Henry felt that these were the soldiers who would be attacked first in an effort to remove them from the battlefield, or at least to disrupt their ability to shoot their arrows into the charging French cavalry.<sup>25</sup> The units of archers placed among the men-at-arms would not need that protection. If so, Henry proved a tactical prophet, as this was precisely the initial manoeuvre made by the French commanders. 'And then, when the enemy were nearly ready to attack, the French cavalry posted on their flanks made charges against those of our archers

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<sup>20</sup> See Michael Prestwich's numbers for these conflicts. M. Prestwich, *Armies and Warfare in the Middle Ages: The English Experience* (New Haven: Yale University Press, 1996), pp. 115-119.

<sup>21</sup> This is a central thesis of my *Infantry Warfare in the Early Fourteenth Century: Discipline, Tactics, and Technology* (Woodbridge: The Boydell Press, 1996).

<sup>22</sup> Tito Livio Frulovisi, in Curry, p. 56.

<sup>23</sup> *Gesta Henrici quinti*, in Curry, p. 34. I have changed the word translated as 'battle' to its original Latin *acies* for consistency.

<sup>24</sup> Thomas Elmham, *Liber Metricus de Henrico Quinto*, in Curry, p. 40.

<sup>25</sup> *Gesta Henrici Quinti*, in Curry, p. 34; Thomas Elmham, in Curry, p. 44; *The Brut*, in Curry, p. 95; and *Mémoires de Pierre de Fenin*, in Curry, p. 118.



who were on both sides of our army,' reports the *Gesta Henrici Quinti*.<sup>26</sup> Jean Juvenal des Ursins, writing his French account in the 1430s or 1440s, states similarly: 'It was ordered that there would be cavalry to charge the English archers in order to disrupt them with arrow shot'.<sup>27</sup> The *Histoire de Charles VI*, by the Religieux de Saint-Denis, the French source most contemporary to the battle, becomes very emotional in describing the beginning of the battle:

...the illustrious dukes and counts of France, having invoked the assistance of heaven and made the sign of the cross, said adieu to each other and kissed each other affectionately; then they advanced against the enemy at the head of their men-at-arms, with a bold countenance, crying loudly "Mountjoye, Mountjoye!" O blindness and lack of foresight of moral men! They scarcely realized that their presumptuous joy would soon be succeeded by grief and sadness.<sup>28</sup>

The English archers loosed their arrows. An English chronicle, identified by Anne Curry as the Pseudo-Elmham's *Vita et Gesta Henrici Quinti*, written c. 1446-49, adds this cinematic imagery: 'The warlike bands of archers, with their strong and numerous volleys, darkened the air, sheddin as a cloud laden with a shower, an intolerable multitude of piercing arrows'.<sup>29</sup> The Religieux de Saint-Denis likens it to a 'hailstorm'.<sup>30</sup>

The effect on the French was significant as Waurin and Le Fèvre recount:

When [the French] approached their trumpets and clarions gave great noise. The French began to bow their heads, especially as they had no pavises, because of the archery shot. The English shot so vigorously that there were none who dared approach them, and the French did not uncover themselves or look up.<sup>31</sup>

Monstrelet notes that this was 'so that the arrow shot would not penetrate the visors of their helmets'.<sup>32</sup>

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<sup>26</sup> *Gesta Henrici Quinti*, in Curry, p. 34.

<sup>27</sup> Jean Juvenal des Ursins, *Histoire de Charles VI, roy de France*, in Curry, p. 134. Here and throughout this article I have changed Curry's translation of 'fire' to describe archers discharging bows to the more accurate and accepted 'shot'.

<sup>28</sup> Religieux de Saint-Denis, *Histoire de Charles VI*, in Curry, p. 107.

<sup>29</sup> Pseudo Elmham, *Vita et Gesta Henrici Quinti*, in Curry, p. 72.

<sup>30</sup> Religieux de Saint-Denis, in Curry, p. 107.

<sup>31</sup> Waurin and Le Fèvre, in Curry, p. 158. I have corrected Curry's translation of shields to pavises.

<sup>32</sup> Monstrelet, in Curry, p. 160.

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The French sources, understandably, are more descriptive in referring to the armour worn by their soldiers. Waurin and Le Fèvre report that the French men-at-arms were 'armed with long coats of armour (*cottes de acier longue*) stretching below their knees and very heavy. Below these they had leg armour (*harnois de jambes*) and above these white armour (*blans harnois*)'.<sup>33</sup> It is difficult from these terms to know exactly what this armour was, as *cottes* and *harnois* are words used for both mail and plate during the Middle Ages, although it would seem that *acier* and *blans* are meant to identify plate; what they seem not to be referring to is an entire 'suit of plate armour' but one made with the torso armour separate from the leg and knee armours.

Waurin and Le Fèvre add that this armour 'weighed down' the French troops, 'so heavy were their armour (*armés*) that as the ground was so soft they could scarcely lift their weapons (*bastons*)'.<sup>34</sup> In this latter description they match the 1420s-30s chronicle of the Religieux de Saint-Denis that the French were 'already exhausted by a long march and were suffering under the weight of their armour,'<sup>35</sup> the early 1430s *Chronique anonyme du règne de Charles VI* that the French were heavily armoured and the ground very soft,<sup>36</sup> and the 1430s-40s Jean Juvenal des Ursins that the French sank into the ground to the thickness of the legs so that they could scarcely move their legs or pull them from the ground.<sup>37</sup> In fact, the French had recognized that this might happen before and during the battle and, according to Waurin and Le Fèvre, the men-at-arms had stripped off so much armour and set it aside before the battle that when the English came upon it after the battle it more than met their needs, the extra sold off as booty.<sup>38</sup>

So, according to some contemporary French sources, the armour worn by their troops, whatever it might be, was heavy, and this weight hampered them (and their horses) in moving across the soft ground. But, as to how protective this armour was against the English longbow arrows, all are in agreement, as in the words of Juvenal des Ursins: 'The French were scarcely harmed by the arrow shot of the English because they were so well armed'.<sup>39</sup> Waurin and Le Fèvre imply the same in insisting that 'once taken [the French] had their helmets removed by their captors' and that only then could these prisoners be executed, 'their heads and faces cut'.<sup>40</sup> There is

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<sup>33</sup> Waurin and le Fèvre, in Curry, p. 160.

<sup>34</sup> Waurin and Le Fèvre, in Curry, p. 161.

<sup>35</sup> Religieux de Saint-Denis, in Curry, p. 107.

<sup>36</sup> *Chronique anonyme du règne de Charles VI*, in Curry, p. 115.

<sup>37</sup> Juvenal des Ursins, in Curry, pp. 130-31.

<sup>38</sup> Waurin and Le Fèvre, in Curry, p. 165.

<sup>39</sup> Juvenal des Ursins, in Curry, pp. 130-131.

<sup>40</sup> Waurin and Le Fèvre, p. 163.

also the strange story from Waurin and Le Fèvre about Antoine, the Duke of Brabant, who arrived after the battle had begun and was so anxious to enter it that 'he took one of the banners from his trumpeters, made a hole in the middle of it, and used it as his coat armour'. Eventually he dismounted – likely being pulled from his horse – and was killed 'immediately'.<sup>41</sup> Still, this banner must have provided sufficient armour, insists the Brabantese chronicler, Edmund de Dwynter, writing in the 1440s, as the duke only suffered cuts on his face and neck.<sup>42</sup>

English sources of the battle are much less interested in what the French were wearing, with only four making any comment on the French armour. Of these Thomas Elmham is alone in noting that the French soldiers were 'worn out under the weight of their armour' by the time they reached the English lines. He does this in the context of both the longbow arrows 'carry[ing]and penetrat[ing] the armour' and 'some of our king's trustworthy men' pressing down on the enemy with axes.<sup>43</sup> The other sources divide that technological context. The *Gesta Henrici Quinti* refers to the English arrows piercing the sides and visors of the French helmets,<sup>44</sup> and Thomas Walsingham, in his *St. Alban's Chronicle*, c. 1420-22, writes: 'Then the cloud of arrows flew... from all directions, and iron sounded on iron, while volleys of arrows struck helmets, plates and cuirasses. Many of the French fell, pierced with arrows, here fifty, here sixty'.<sup>45</sup> Finally, the Pseudo-Elmham refers to the joints of the French 'strong armour' violently broken by the first attack of the English men-at-arms and archers (presumably those in between the English *acies*) using 'lances, axes, and swords'.<sup>46</sup> Tito Livio Frulovisi does not mention the French armour, but does agree on the damage caused by the English archers, insisting it is what caused French defeat: 'The order of the English would have been thrown into disorder by the French knights if the great part of the latter had not been killed or wounded with arrows and had been forced to retreat in terror'.<sup>47</sup>

French sources are not, however, of the same opinion as the English on the effect of the longbows. The Religieux de Saint-Denis notes especially the tightly packed and confused French cavalry who not only quickly lost the impetus of their charge on the soft ground but also lost their freedom of movement. These were then met by the English archers whom Henry had placed amid his men-at-arms. They had discarded their bows and were swinging 'great lead covered mallets from which one single

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<sup>41</sup> Waurin and Le Fèvre, in Curry, p. 162.

<sup>42</sup> Edmond de Dwynter, *Chronique des ducs de Brabant*, in Curry, p. 174.

<sup>43</sup> Thomas Elmham, in Curry, p. 47.

<sup>44</sup> *Gesta Henrici Quinti*, in Curry, p. 36.

<sup>45</sup> Thomas Walsingham, in Curry, p. 52.

<sup>46</sup> Pseudo-Elmham, in Curry, p. 72.

<sup>47</sup> Tito Livio Frulovisi, in Curry, p. 61.

## TECHNOLOGICAL DETERMINISMS AT AGINCOURT

blow on the head could kill a man or knock him senseless to the ground'.<sup>48</sup> Not weighed down by heavy armour, these archers moved much more easily than men-at-arms.

Other French narratives explain that English arrows did not so much damage the French soldiers as they did their horses. The *Chronique de Ruisseauville*, for example, reports that the French cavalry charging the archers 'turned back, because of the arrowshot which their horses could no longer endure'.<sup>49</sup> Monstelet, Waurin and Le Fèvre agree:

Because of the strength of the arrowshot and their fear of it, most [of those charging at the wings of archers] doubled back into the French vanguard, causing great disarray and breaking the line in many places, making them fall back onto the ground which had been newly sown. Their horses had been so troubled by the arrowshot of the English archers that they could not hold nor control them. As a result the vanguard fell into disorder and countless numbers of men-at-arms began to fall. Those on horseback were so afraid of death that they put themselves into flight away from the enemy. Because of the example they set many of the French left the field in flight.<sup>50</sup>

Jean Juvenal des Ursins goes so far in his account of the battle to accuse the English archers of purposely aiming at the horses:

the archers... began to aim against the cavalry and their horses with great fervour. When the horses felt themselves pierced by arrows, they could no longer be controlled by their riders in the advance. The horses turned and it seems that those who were mounted could no longer be controlled by the riders in the advance. The horses turned and it seems that those who were mounted on them fled, or so is the opinion and belief of some, and they were blamed for this.

This, insists the French chronicler, was what defeated the French, adding to this the quote mentioned above, 'the French were scarcely harmed by the arrow shot of the English because they were so well armed'.<sup>51</sup>

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<sup>48</sup> Religieux de Saint-Denis, in Curry, p. 107. See also Pierre Fenin, in Curry, p. 118.

<sup>49</sup> *Chronique de Ruisseauville*, in Curry, p. 125.

<sup>50</sup> Monstelet, Waurin and Le Fèvre, in Curry, p. 161. The English longbowmen made a similar attack of the horses at the battle of Crécy in 1346, with the same results. See Michael Livingston and Kelly DeVries, *The Battle of Crécy: A Casebook* (Liverpool: Liverpool University Press, 2015), forthcoming.

<sup>51</sup> Juvenal des Ursins, pp. 130-131.

Of course, the influence of military technology on the outcomes of battles should never be questioned. Nor should it be overestimated. There is always a man shooting that arrow and a man in that armour, and there are always men commanding them. It is always they alone who determine victory and defeat; it is they alone who gain the glory or pay the price. Concerning Agincourt, it is the Pseudo-Elmham, an Englishman, who says this best:

O deadly war, dreadful slaughter, moral disaster, hunger for death, insatiable thirst for blood, insane attack, impetuous frenzy, violent insanity, cruel conflict, merciless vengeance, immense clash of lances, prating of arrows, clashing of axes, brandishing of swords, breaking of arms, infliction of wounds, letting of blood, bringing on of death, hacking up of bodies, killing of nobles! The air thunders with dreadful clashes, clouds rain missiles, the earth absorbs blood, the surface of the earth is covered with the corpses of the dead, this man changes, that one falls, that one attacks, that one dies, this one recovers, that one vomits forth his soul in blood, the killer is enraged, the dead crashes in grief; the living desires to surrender, the charge of the victors does not allow the time for withdrawal, cruelty reigns, piety exults, the brave and the strong are crashed, and mountains of corpses are piled up, a vast multitude is yielded up to death, princes and magnates are led off as captives.<sup>52</sup>

My analysis is not intended to discourage archaeological or experimental archaeological research in medieval military history. On the contrary, the more that can be added to our understanding of why and how wars were fought the better. However, it must be understood that this type of research complements rather than supplants analyses of original sources by historians. Proving scientifically that longbow arrows could penetrate armour, and that armour weighed down those who wore it, is important, but no one should jump to technologically deterministic conclusions about conflicts which alter or deny the story given by eyewitness and contemporary sources, as at the battle of Agincourt.

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<sup>52</sup> Pseudo-Elmham, in Curry, pp. 72-73.