Chapter 5

(Note by editor: **This is the text before any editing**.)

Conclusion

"History is complicated." This phrase has been used so often among historians and students of history that it can often elicit an eye roll. People restate this idiom so often because of the truth behind the words. Any argument trying to simplify the Hundred Years War, or any other, to a simple statement of fact ignores so many facets of history as to hinder understand of complex subjects. There were a myriad of factors involved in the Hundred Years War, from the politics, to the strategy, and down to the tactical level. Modern historians, either looking to revise a perceived inaccuracy or to sensationalize the story they mean to tell, have made the fault of simplifying history with the efficacy of the English longbow as used on the battlefields of France.

For the effectiveness of the arrows of the English against French armored men-at-arms, DeVries pointed out that while many of the English sources praise the longbow, some French sources dismiss it.[1] Just because some French sources do not support the English sources does not mean that the historians should discount either. England had cause to self-congratulate and find a reason for their victories just as the French had reason to dismiss the bow as a weapon as it did not fit in with the ideals of chivalry and nobility. Historians would do well to take both views as counterbalances, allowing room for an effective weapon, but not a war winner, on its own. The sources reviewed in chapter one of this work support the idea that the warbow was a weapon

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[1] Kelly DeVries, "Technological Determinism of Victory at the Battle of Agincourt," *British Journal for Military History* Vol. 2, no. 1 (November 2015), accessed May 15, 2019, https://pdfs.semanticscholar.org/e127/54a734813ffe20817475a2acf0e69748e799.pdf.

that shifted battlefield tactics towards fighting from the defensive, where the archers and English men-at-arms could support each other to great effect.

While English sources support the view of a longbow that was effective against the armored man-at-arms, sources also support the effectiveness of armor in warding off damage. Tactics were built around the capability of armored men-at-arms, be they dismounted or charging atop a warhorse. Armor also adapted to those strategies, with the most vulnerable areas of the body becoming the first parts armored in plate. Plate armor offered as much of a technological innovation as did the longbow, and the two entered an arms race with bowyers attempting to overcome plate armor that was ever more refined to resist not just arrows, but all damage a knight might encounter in battle. It was the development of hardenable steel plate in particular that marked the end of longbow dominance on the field, but enough people did not adopt or could afford this technology during the scope of this study to drive the longbow to obsolescence.

If the English sources contended that the warbow was effective, it became necessary to test the weapon to see what kind of force it could generate to be able to puncture armor. Calculating the joules of energy in a specifically weighted arrow at a certain speed was easy enough. The first question that needed to be answered to use this data to effect was how fast the bow could cast an arrow. This was dependent on its pull weight, which was the force needed to hold the string at a set draw length. Draw weights caused arguments between historians who could not agree on just how much weight the typical longbow had. Before the recovery of the longbow staves of the *Mary Rose*, historians assumed draw weights to be close to those of the target longbows still in use recreationally. The *Mary Rose* bows have been calculated to have a much greater draw weight and reconstructions of these bows with modern yew suggested that these higher draw weights were accurate. While some estimates put warbows at a higher draw weight, good bows were expected to have a pull of between about 120 and 140 lbs. Bows with draw weights in this range cast arrows meant for war with similar force, with heavier arrows making up for the loss of speed with the increased impact of weight. An arrow struck with approximately ninety joules of force at close range with some arrows being recorded to strike with as much as 100 joules or more. The energy, along with arrowheads that were hardened and shaped to maximize penetration of armor, provided a deadly threat to the man-at-arms not armored in the best materials.

Just as the bow provided mystery to its strength due to a lack of artifacts, so too has the resiliency of armor been questioned. Williams has led the way in understanding the metallurgy of medieval Europe and how protective those armors were. His testing of artifacts found the approximate durability of iron plate and medieval mild and hardened steels and how they compared to the equivalent modern mild steels of the same thickness. He also meticulously measured what early armors were available to find out how thick plate armor could be. Though numbers vary wildly over time, in the fourteenth and fifteenth century, the thickest part of the armor was the helmet and the cuirass, both of which would have measured between one and a half and two millimeters thick at the thickest and other parts of the body had plates that were thinner, sometimes less than one millimeter thick. Just as the thickness was important, the material had much to do with the armor's characteristics. The three major materials used in the early fifteenth century, as mentioned above, were iron, mild steel, and hardenable steel. Each of those materials had greater defensive abilities than the one before it. Rogers estimated that only a small percentage of the men-at-arms of Agincourt owned hardened steel armor and a majority of those wearing plate still relied on iron for protection. Testing conducted on both modern mild steel and a modern iron that shared many characteristics with its medieval counterpart. In the tests conducted by Williams, he found that the curvature of armor had an influence on the strength of the armor and that when testing against flat sheets, shooting at the sheet from a thirty-degree angle replicated the effect of the curve. These tests, when compared to those of the power of the bow, suggested that iron armor was very vulnerable to arrows unless it was two millimeters thick or greater. Either type of steel was resistant to arrows with mild steel providing reasonable protection at range and hardened steel being almost impervious to all but the most direct hits or strikes to the thinnest areas.

Williams gave other armors a resistance value as that were adopted by most scholars currently researching this field. Williams tested padded armor, *cuir-bouilli*, and mail. He estimated that padding under armor added about fifty joules to the resistance of armor against a lance, but arrows remained untested. Testing that Williams conducted against mail hinted at the reason a lance tip cannot substitute for an arrow. Mail resisted forces greater than 200 joules from a lance but failed with only 120 joules from an arrow.