

Another Arrow That Changed History?

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King Henry V of England (1387–1422) The hero of Agincourt; the man who broke the French; the ideal knight - the epitome of piety and chivalry. He tends to be regarded as a medieval superman, applauded for his genius and dynamism, yet, his shortcomings overlooked. To Mortimer (2009):

"He was an extraordinary man, in that he demonstrated phenomenal organisational skills, focus, determination, resilience, leadership and – above all else – religious conviction; but...he was a deeply flawed individual. He lacked the simpler qualities of compassion, warmth, and the understanding of human frailty that one naturally looks for in all men – yeomen and paupers as well as kings..." (p1-2) .

Such aspects of Henry's personality have proved something of a conundrum for many historians and chroniclers of his life: his sudden transformation from a wild, brawling, drinking, womanising youth to a fervently pious King upon the death of his father Henry IV in 1413; his devout religious beliefs - a contrast to the atrocities he committed: the ordering of the slaughter of noble prisoners at Agincourt in 1415 which defied the chivalric law; his treatment of the inhabitants and defenders of towns he besieged and his persecution of the Lollard sect, (Barker 2005, 2009, Curry 2000, 2005, Dockray 2007, McGlynn, 2008, Mortimer 2009).

According to legend, and to Shakespeare in his play "Henry V", (written in 1599), Henry, the wild prince who enjoyed taverns and carousing turned into a pious overnight. As a youth, the anonymous "Vita et Gesta Henrici Quinti" (Hearne 1727) describes him as:

"Passing the bounds of modesty he was the fervent soldier of venus as well as mars; youthlike he was fired by her torches, in the midst of his brave deeds as a soldier, he also found leisure for the excesses of untamed youth" (p.21, Dockray 2007).

However, upon ascending the throne as King Henry V on April 9th 1413 following the death of his father Henry IV:

"...[He] suddenly changed into a new man and henceforth devoted himself single-mindedly to live as virtuously as maintaining Holy Church, destroying heretics, keeping justice and defending his realm and subjects" (Anonymous English Chronicler in Dockray 2007, p. 96)

“[He] reformed and amended his life and manners...all his acts were suddenly changed into gravity and discretion” (Tito Livio in the "Vita Henrici Quinti" in Dockray 2007, p.96)

“...as soon as he was made King he was changed suddenly into another man, zealous for honesty, modesty and gravity, there being no sort of virtue that he was not anxious to display” (Thomas Walshingham, in Dockray 2007, p.23) “...as soon as he was made King he was changed suddenly into another man, zealous for honesty, modesty and gravity, there being no sort of virtue that he was not anxious to display” (Thomas Walshingham, in Dockray 2007, p.23)

This was, and has been, interpreted as Henry having a religious conversion (Seward 1987).

A number of his personal characteristics and behaviours have been seen as admirable in the past and today: his piety; his passion for justice; his bravery and courage; his skills as an administrator and manager who recognised talent and rewarded loyalty; his honesty; his decisiveness in planning and effectiveness in delivering policy. As a military commander he has been admired for: his gift of command: planning and masterminding of strategies and sieges; diplomatic negotiations; maintaining firm control over deployment of manpower; enforcement of discipline and the redistribution of conquered territories, (Barker 2005, 2009; Curry 2000, 2005; Dockray 2007 ; Mortimer 2009; Seward 1987).

In contrast, he is also described as: severe; cold; humourless; aloof; domineering; ruthless; bad tempered vindictive and inhumane. He was intolerant of dissent and prepared to punish, even remove those whose loyalty he suspected. Men feared his anger and avoided questioning the wisdom of his judgements or the rightness of his decisions - when his honour was impugned he could suddenly become very angry (Dockray 2007; Mortimer 2009; Seward 1987):

“[Henry was] much feared and dreaded by his princes, knights and captains and by people of every degree because all those who disobeyed his orders or infringed his edicts he would put to death without mercy.” (Waurin: Hardy 1868, p.429)

Many of his behaviours have been viewed as excessive. His religious behaviour was extreme, even for the time (Mortimer 2009). He constantly went on pilgrimage to the shrines of saints, heard several masses a day, (refusing to be interrupted while at prayer). The Gesta states:

“[Henry was] devoted to the hearing of divine praises and to his own private prayers that, once he had begun them there was not anyone, even from amongst his nobles and magnates, who was able, by conversation however brief, at anytime to interrupt them. There cannot,

therefore, be denied by the Prince of princes to a prince also, in the judgement of all men, is of such goodness and obedience, whatever he may justly ask of them."

(p.155, Taylor and Roskell 1975)

He founded monasteries for the most zealous orders: Celestines, Bridgettines and Carthusians (Dockray 2007; Seward 1987; Taylor and Roskell 1975). He has been described as "Messianic", (Dockray 2007; Mortimer 2009), believing he was divinely ordained as the servant of God, with full divine approval for his actions, (Dockray 2007). Thus, his every deed was moved by God: his will was God's will and his war against the French was God's war and the ensuing victories were God's victory. So fervent was his belief that he had been blessed by God he fought in the front line at Agincourt because God protected him (Mortimer 2009) As he stated:

"I am the scourge of God sent to punish the people of God for their sins" (Dockray 2007, p.222).

This may also explain the atrocities he committed. His persecution of the Lollards, who followed the teachings of John Wycliffe (Hudson 1988; Lutton 2006; Rex 2002), resulted from his intolerance of religious dissent (Dockray 2007). His slaughter of the prisoners at Agincourt (1415) and the savage reprisals against the inhabitants and defenders of Caen (1417), Rouen, (1418), Pontoise (1419), Rougement (1421) and Meaux (1422) were punishments authorised by God. Henry cited the "Law of Deuteronomy", as justification for his behaviour towards besieged towns in his own correspondence (Taylor and Roskell 1975):

"When you march up to attack a city, make its people an offer of peace.

If they accept and open their gates, all the people in it shall be subject to forced labour and shall work for you.

If they refuse to make peace and they engage you in battle, lay siege to that city.

When the lord your God delivers it into your hand, put to the sword all the men in it.

As for the women, the children, the livestock and everything else in the city, you may take these as plunder for yourselves. And you may use the plunder the LORD your God gives you from your enemies."

(Deuteronomy 20:10-14)

His acquired chasteness has also been linked to his religious fervour. His friends claimed he never took a mistress or slept with a woman after becoming King until he married Catherine of Valois in June 1420 and fathered only one child, Henry, (1421-1471), taking no mistresses or siring any illegitimate children, (Dockray 2007; Kingsford 1911; Mortimer 2009).

Mortimer (2009) attributes these contrasts and the enigmas of Henry's character to his upbringing; however, they may result from the injury he suffered at the Battle of Shrewsbury in 1403.

THE BATTLE OF SHREWSBURY (1403) AND THE WOUNDING OF PRINCE HENRY

On Saturday 21 July 1403 the armies of King Henry IV and the rebel Henry Percy met in battle just north of the town of Shrewsbury. The royal forces were victorious, (Priestley 1979), but during the battle Prince Henry was wounded in the face by an arrow while leading a cavalry charge. Despite the severity of the wound, he continued to fight on refusing to leave, demanding, according to one of his chroniclers, Tito Livio: "Lead me, thus wounded, to the front line so that I may, as a prince should, kindle our fighting men with deeds not words" (Dockray 2007 p.85).

Henry IV's surgeon, John Bradmore, treated the wound. He described it as:

"...smetyn in the face be syd the nose on the left syd with an arrow the wyche sayd arrow entryd overwharte and after the schafte was takyn owt and the hede ther of a bod styll in the hyndyr parte of a bone of the hede after the mesur of vj ynche" (p.129, Lang 2003)

Cole and Lang (2003) translate this as:

"...[the arrow] struck in the face with an arrow beside the nose on the left side, which arrow entered from the side, and the said arrow, after the arrow was extracted, remained in the back part of the bone of the head six inches deep." (Cole and Lang 2003, p.95).

Strickland and Hardy (2005) as:

"...[the arrow] entered at an angle (ex traverso), and after the arrow shaft was extracted, the head of the aforesaid arrow remained in the furthest part of the bone of the skull for the depth of six inches.(p.284)

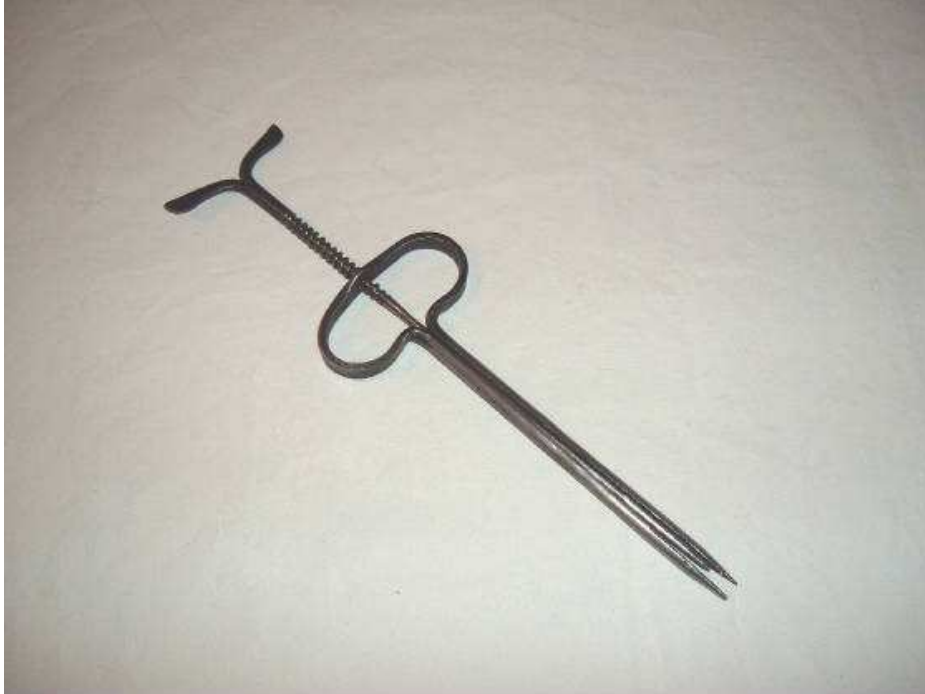
To Cole and Lang (2003) the arrow was embedded in the interior bone of the skulls posterior.

Pollard and Oliver (2002) describe the arrow as being "lodged in a bone behind the nose" (p.45), although this differs from Bradmore's description.

The arrowhead was left imbedded in the skull and Bradmore invented a set of tongs to remove the arrowhead, (recreated by Hector Cole: Cole and Lang 2003) (Figure 1).

According to Cole and Lang (2003):

***“...it is just possible for an arrow to enter beside the nose and lodge at the back of the head without causing immediate death or lasting disability, but the margin of error either way is extremely small, and the Prince was clearly very fortunate indeed to survive the wound.”
(Cole and Lang 2003 p.96)***



***John Bradmore's Arrow Extractor recreated by Hector Cole,
(Picture by Jo Homfray)***

THE WOUND:

The injury Henry received would be classed today as a “penetrating head trauma caused by a missile”. This is a wound in which a projectile breaches the skull but does not exit it, (an injury in which the projectile passes entirely through the head, leaving both entrance and exit wounds, is described as “perforating”), (Vinas and Pilitsis 2006). Patients with penetrating wounds have a greater survival rate than those with perforating wounds, (Aarabi 1999).

In a missile wound, the amount of damage to the brain depends on numerous factors including:

- (1) The kinetic energy imparted***
 - (2) The trajectory of the missile and bone fragments through the brain***
 - (3) Intracranial pressure changes at the moment of impact***
 - (4) Secondary mechanisms of injury, (infection caused by the penetrating missile or shards of bone)***
- (Vinas and Pilitsis 2009)***

Injury is related to:

- (1) The direct crush injury produced by the missile***
- (2) The cavitation produced by the centrifugal effects of the missile on organ tissue***
- (3) The shock waves produced***

(Vinas and Pilitsis 2009)

Due to Bradmore's account we know that Henry was struck in the face some where beside the nose on the left side, the arrow entering from the side with the arrowhead remaining in the posterior interior of the skull at a depth of six inches (Cole and Lang 2003; Lang 2003; Strickland and Hardy 2005). Unfortunately, there are number of unknown variables:

- The rate the arrow was travelling at when it struck Henry.**
- The trajectory of the arrow when it struck, (did it come from the left or right side?).To McKinnell et al (2007) the precise meaning of the description of the arrow entering sideways, ("Overwharte") is unclear.**
- The exact location where the arrow penetrated Henry's face.**
- The trajectory of the arrow through the skull.**
- The exact location where the arrowhead was imbedded in the skull's interior.**
- The length of time before the arrowhead was removed, (Henry was transported to Kenilworth Castle after the battle, yet how long it was before the arrow was removed is unknown and Bradmore was not the first physician to attempt to remove the arrow, Lang 2003).**

A variety of arrowheads were in use during this period, (Jessop 1996), but Bradmore refers to the arrow as a "bod" (p.129, Lang 2003) or bodkin. This was an arrow head used to penetrate armour and maille, (Strickland and Hardy 2005). The remains of bodkin arrowheads have been found at the site of the battle (Pollard and Oliver 2002).

The rate the arrow was travelling at when it struck Henry is unknown. Stretton (2006) found when shot from a yew war-bow with a draw weight of 144 pounds (65.3 kg), an arrow with a bodkin head weighing 86 grams (1,324 grains), travelling at 47.9 m (157 ft) per second has a kinetic energy of 99 joules. The draw weight is defined as the amount of force, expressed as a weight, which needs to be applied to the string in order to bend the strung bow to its full extent. The formula for calculating kinetic energy:

$$\mathbf{1/2mv^2 = \frac{Mass\ (kg)\ x\ Velocity^2}{2}}$$

A fragment or missile striking a vital area with a kinetic energy of 80 joules or more is considered a fatal blow, (Health and Safety Executive 2002).

An arrowhead travelling at this rate is capable of penetrating armour 1.6mm thick to a depth of 7.62cm (3 in), (Stretton 2006). Should the target be moving towards the archer, as in the case of a mounted knight, then the bodkin can penetrate a further 2.54 -5.08 cm (1-2 in), (Stretton 2006). However, the cavitation and shock wave damage would be far less than those caused by bullets, (Davies and Harbinson 2002,

Hain 1989). The injuries inflicted by medieval arrow wounds have been documented (Fiorato et al 2000; Karger et al 2001; Thordeman 2001).

It is not recorded whether Henry lost consciousness. It appears he did not as he was able to continue fighting, (Dockray 2007). This may indicate that the penetrating arrow had ricocheted and its speed and kinetic energy had substantially decreased. There is also no record of any impairment immediately or after treatment.

He was also fortunate in the medical care he received. The arrow head was left in place, patients in whom the penetrating object is left in place have a significantly lower mortality than those in whom the objects are inserted and then removed (26% versus 11% respectively), (Vinas and Pilitsis 2009). The wound was also treated with honey. Research has shown that honey has antibacterial properties and promotes tissue healing and blood vessel formation, (Dunford et al 2000ab; Dunford 2005; Simon et al 2009).

However, despite Cole and Lang's (2003) assertion that Henry was fortunate to have escaped without lasting disability, Henry may not have escaped entirely unscathed, as his later behaviours are indicative of temporal lobe impairment.

PERSONALITY CHANGES AS RESULT OF LEFT TEMPORAL LOBE DAMAGE

The temporal lobes are areas of the cerebral cortex, located on both the left and right hemispheres of the brain,.

Impairment affecting temporal areas tends to leave intellectual functions intact while causing alterations in personality (Blumer and Benson 1975). Left temporal lobe damage produces a number of effects:

- **Altered sexual behaviour: Increase or decrease in libido (Blumer, 1975; Blumer and Walker, 1975; Geschwind ,1975, 1979; Kolb & Wishaw, 1990)**
- **Extreme, heightened sense of religiosity with augmented sense of personal destiny (Bear and Fedio, 1977; Blumer, 1975; Geschwind 1975, 1979)**
- **Extreme morality and ethical concerns: Bear and Fedio, 1977; Blumer, 1975; Geschwind 1975, 1979)**
- **Paranoia and aggressive rages (Blumer and Benson 1975; Geschwind ,1975, 1979; Kolb & Wishaw, 1990)**
- **Sudden Mood Changes (Bear and Fedio, 1977; Blumer, 1975; Geschwind 1975, 1979)**
- **Deepened Emotional Response: (Bear and Fedio, 1977; Geschwind 1975, 1979)**
- **Humourlessness (Bear and Fedio, 1977; Blumer, 1975)**
- **Seizures and strange reveries (Blumer and Benson 1975)**

All of these are prominent in Henry's character and behaviour: the disinterest in sex; the extreme religious and messianic beliefs and

behaviours; the deeply held moral and ethical beliefs; the cold, severe humourlessness; the feared aggressive and violent rages which would swiftly appear. It may explain his change from a "...fervent soldier of venus" (p.21, Dockray 2007) into "... another man, zealous for honesty, modesty and gravity" (Thomas Walsingham in Dockray 2007, p.23). However, it is unlikely such a transformation occurred as soon as he was crowned as believed by his chroniclers.

The observable impairments may have commenced several years earlier. In 1408, an Oxford academic, Richard Ullerston, noted Henry's desire for spiritual study and knowledge of the scriptures, (Dockray 2007). By 1409, there were problems developing between Henry and his father, King Henry IV, as Prince Henry launched an attempted coup and in 1412 when Prince Henry had to be restrained from seizing his father's throne by force, (Dockray 2007; Mortimer 2007; Seward, 1987).

While there appeared to be no immediate impairment after being wounded, it is possible that an abscess on the left temporal lobe may have caused such impairment.

Patients who survive penetrating head injuries are at risk of experiencing multiple complications, including infections and abscesses from bone or missile fragments imbedded in the brain, (Vinas and Pilitsis 2006). Brain abscess can occur after a long period of silent infection,(Hagan 1971; Peneck and Burchiel, 1986).. Hida et al (1978) reported a case of delayed brain abscess following a penetrating gunshot injury 38 years after the injury; Pencek and Burchiel (1986), 15 years after an injury; Lee and Kim (2000) 47 years after and Aulino et al (2005) 16 years later. Thus it is feasible that Henry could also have experienced similar damage either from a fragment from the arrow or fragment of bone.

This also may indicate a possible trajectory through the skull: not coming in contact with the brain, but passing close to the left temporal lobe from the entry point in the left half of the face.

There are obvious problems in formulating a hypothesis concerning the personality and behaviour of a major historical figure. In this instance, not only is there a lack of archaeological evidence but there is also a deficit of contemporary accounts regarding Henry's life.

The only contemporary accounts of Henry's life which survive are the anonymous "Gesta Henrici Quinti" (c.1416) (Taylor and Roskell 1975), Thomas of Elmham's "Liber Meticus de Henrico Quinto" ("Memorials of Henry V") (Cole 1858) and Thomas Walsingham's "Ypodigma Neustriae"(Riley 1876). Later works copied them and modern historians place their own interpretations upon them. Further, such original works can be regarded as being propaganda as can later works, which created a medieval superman much removed from reality: "...the ideal Englishman: plucky and persevering, austere and audacious, cool-headed, stiff-lipped and effortlessly superior: simply the greatest man, ever to rule England" (Fernandez-Armesto 2009).

For example, stories of Henry's wild, misspent youth and his dramatic conversion at his coronation into a sober and righteous King were written long after his reign was over and have become accepted as historical because of Shakespeare, (Barker 2005). Dockray (2007) concludes that there is no evidence of wild behaviour, or at least for a sudden change when he was crowned, although to Curry (2005) "The stories of a misspent youth have never been proven, but neither have they been disproved" (p.30).

The aim of this article has been an attempt to forward a possible explanation for the puzzles surrounding Henry's character and behaviour, albeit based on the limited information possessed. However, while such information is limited and the conclusion controversial, is it merely coincidence that many of his behaviours match the characteristics that are symptomatic of injuries to the left temporal lobe?

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