The King in the Car Park: The Discovery and Identification of Richard III

Transcript

Date: Tuesday, 3 November 2015 - 6:00PM
Location: Museum of London
Let us start by saying what this talk is about and what it is not. Richard III is possibly one of the most famous and controversial of English kings, yet this talk is not intended to fan the flames of any controversy surrounding his reign. It will not comment on his character nor refer to how he came by the throne. Rather it will focus exclusively on the discovery of skeletal remains in Leicester in 2012 and their subsequent investigation leading to their identification as those of Richard III.

It is set to make clear that what I report in this talk today is the result of a wide collaborative effort. Many experts from a range of discipline were involved and this talk draws together their work. In this regard reference must be made to colleagues at the University of Leicester: Dr Richard Buckley, Matthew Morris, Dr Jo Appleby, Prof Sarah Hainsworth, and Dr Turi King, with whom I worked most closely on the genetic aspects of the project. Others from outside of Leicester also made major contributions (see publications for details) but, with reference to this talk, thanks are due to Bob Woosnam-Savage of the Royal Armouries, Leeds, who provided expertise on the weapons which may have killed Richard. Special acknowledgement is due to Philippa Langley, without whom none of this would have happened, for it was she who chased and lobbied the City Council to grant permission for the dig to go ahead and persuaded Richard Buckley of the University of Leicester Archaeological Service that it was worth undertaking.

Throughout the identification process, we essentially treated it much like a forensic missing person case. The remains or a body are found. What scientific (and historical) evidence can be used to identify the remains. So let us outline what we know about the circumstances surrounding Richard's death. Richard III was in Nottingham when he learned of Henry Tudor's landing in Milford Haven. He chose Leicester as the rallying point for the Royal army, arriving himself on 20 August 1485. He would have ridden into Leicester from the north, passing through the North Gate and riding along what was then the High Street (today Highcross Street) and spending the night at the Blue Boar Inn (then the White Board Inn, later renamed). The next morning he rode out of Leicester across Bow Bridge - where legend has it he struck his spur against a stone on the bridge as he left and it was prophesised that his head would strike the same stone on the way back towards Market Bosworth, twelve miles to the east of Leicester. The next day on 22 August, he was killed in battle against Henry Tudor, Henry VII.

Following the battle, according to contemporary accounts Richard's body was stripped naked, thrown over the back of a horse, and brought back to Leicester, where his corpse was taken through the town to the Newarke and displayed in the Church of the Annunciation of the Blessed Virgin Mary. This establishment was effectively a Lancastrian mausoleum and therefore added insult to injury. Two or maybe three days later it was taken from the church and speedily buried in the choir of Franciscan friary church known as Greyfriars.

So far so good but 32 years later the friary was sold off and demolished under the Dissolution of the Monasteries. With the exact site of Richard's grave was lost for over 500 years. We know that the friary was bought by Robert Herrick, a former mayor of Leicester, who built a mansion and gardens on the site and that within his garden he erected a memorial pillar to Richard, since this is recorded in the diary of Christopher Wren, father of the architect. It is important to note that approximately 125 years after Bosworth a rumour arose that Richard's remains had been disinterred during the dissolution and thrown into the river Soar, maybe Ironically by Bow bridge, yet Herrick, a local man, clearly believed that Richard was still buried beneath his garden a year after the story was first published.

While the precise location of Richard's burial was lost with the destruction of the Greyfriars, historical records and the subsequent analysis have long indicated the approximate location of the friary and its likely situation in relation to the modern urban landscape of Leicester. In his 1610 map of Leicestershire John Speed includes a small insert of the city of Leicester and a depiction of the Battle of Bosworth. He describes the friary as being ruined and Richard's tomb as obscured by weeds. In his History of England, published the following year, Speed records, over 70 years after it was supposed to have happened, the story about Richard's body being dug up following the dissolution thrown off Bow Bridge into the river Soar. However this is not the only thing that Speed got wrong. He totally misallocated the Greyfriars, confusing its location with that of Blackfriars.

In addition to Richard being 32 at the time of his death and him being buried in the choir of the Greyfriars, what else do we know about him? Presumably he died of battle injuries. Leaving to one side Shakespeare's much later portrayal of him, contemporary accounts mention him to be of slender build, 'small of stature', and having 'unequal shoulders, the right higher than the left'.

So, armed with this information, the dig started. Given the events which have followed, it is perhaps all too easy to retrospectively think that finding Richard would be a foregone conclusion. At the start of the dig the aims in
Let us move onto the now famous Car Park. Thomas Robert's 1741 map of Leicester is the first accurate map of the town. On it is clearly marked an area of land called Grey Friars. This can be compared with modern OS maps of the City. Re-orientating and overlaying the two, one can see the current open spaces which appear to have been largely undeveloped since the friary's dissolution. These constitute only 17% of the friary precinct in total. Taking into account limitations on time and resources, these meant that only some 1% of the friary precinct could be excavated.

Given this, deciding where to place the trenches was critical. To add to this process a ground penetrating radar survey was undertaken of all three open spaces in the hope that this would identify the walls of the friary. However it failed, identifying only anomalous spreads of rubble (which could be modern) and modern service lines. As least the latter was useful in so much as it pointed to where to avoid digging through a sewer or telephone line.

Since the target was a set of medieval religious buildings, one would expect them to be orientated along an east/west axis, thus trenches one and two were laid out running approximately north-south in the hope that they would cut across perpendicular any major walls. In trench two evidence was found of a long north/south corridor which could be on the western or eastern side of the cloister garth leading up to an east/west orientated building. Trench one indicated that this building had benches built along its walls indicating that it was likely to be the friary's chapter house. This was an important discovery since it meant that the church most probably lay off the cloister, either to the north or the south of the chapter house. Given that one piece of documentary evidence refers to the church being accessed from the street today known as St Martin's and that in the 18th century human remains were found when the cellars for the houses to the north of the site were being dug, it was decided to place a third trench in the playground of what was a school to the north-east of trench one.

This new trench almost immediately started to offer up some interesting finds, including what first appeared to be in-situ medieval floor tiles but what is more probably one of Robert Herrick's garden paths recycling rescued floor tiles. More importantly there was evidence of large robbed walls, one of which appeared to have been buttressed. This was almost certainly the church. Given this, it was decided to widen the trench. This revealed a small group of disarticulated bone, all seemingly from one person, most likely a woman, and also other finds which cast further light on the interior of the church. In particular a low L-shaped stone wall was uncovered with different areas of floor tiling. At the top the tile impressions are parallel with the walls; at the bottom they are diamond patterned, suggesting two different spaces in the eastern half of the church -- the choir with its choir stalls, and the presbytery. Other graves, including one in a stone coffin, were found, together with lots of decorated floor tiles, a medieval silver halfpenny of Edward IV and a number of brass letters most likely from tomb inscriptions. It appears, when the church was demolished in 1538, all the tombs were broken up and their material recycled. Anything of value was salvaged, including metal which would have been melted down and reused. However, the destruction was only at floor level and no attempts were made to desecrate the underlying graves.

Projecting the southern choir stall west from trench three across trench one meant that the grave (skeleton one) which was found in trench one on the very first day of the dig was potentially located at the west end of the choir against the southern choir stall and therefore was now of major interest. The reason why it was not excavated at the time was because, at the time it was found, one didn't know where it was in relation to anything else: the layout of the friary was unknown at that stage so realistically it could almost have been anywhere: in the church, outside in a cemetery, in the chapter house, etc. Once it was realised that this skeleton was in the right part of the church to make it worth examining closer, the trench around the grave was widened and the skeleton excavated by Dr Jo Appleby, an osteologist in the University of Leicester's School of Archaeology and Ancient History – dressed in full CSI kit to prevent potential contamination of the DNA.

This revealed a skeleton in good condition except for the feet which are missing, almost certainly caused by post-mortem damage from later disturbance. Two things became almost immediately evident: first there is a marked curvature of the spine, second the skull had multiple injuries, consistent with a violent death. This skeleton was becoming distinctly interesting. The burial itself was also unusual. The skeleton is laid awkwardly on the north side of the grave, with its torso twisted slightly to the north and its head propped up against one end. This suggests that the grave is too short, and maybe done with haste, unusual for a high status grave in the choir. The chronicler Polydore Vergil noted that Richard was buried without pomp or solemn funeral and this grave reflects this. The position of the hands is also interesting. They are placed precariously, right over left, over the right hip. This again is unusual and may suggest they were tied together. There is no evidence of a coffin, shroud, clothes or any other personal ornaments.

It should be noted that the skeleton is lucky to have survived at all. Modern disturbance over the legs came to within 90mm of the knees. The modern disturbance also explains why no floors were found in trench 1 since if one projects the floor level across from trench three across, it is higher than the modern disturbance.
Once the skeleton was taken to the lab, cleaned up and scanned, more could be determined. It was male, in his late 20s to late 30s and had an unusually gracile or feminine build – all in keeping with what we know about Richard. Interestingly there is no evidence of the Shakespearian withered arm – both arms are of the same size and were used normally during life. The skeleton indicates that the person suffered from idiopathic adolescent onset scoliosis – perhaps onset around the time of puberty. Although it is not known what might have caused this, it was not through trauma (which would have left identifiable markers on the vertebrae). Without the spinal abnormality, the person would have stood roughly 5ft 8in (1.72m) high.

This is slightly above average height for a medieval man. However, he would have been short in comparison to his brother (Edward IV) who was reputed to have been 6ft 2in tall. The curvature of the spine would also have also probably have reduced his apparent height and may have lifted his right shoulder higher than his left, as Richard was described by John Rous.

The skull revealed a number of wounds. On the front of the face there is a small rectangular wound to the right cheek and cut marks on the jaw. These are superficial, possibly caused by a dagger or similar piercing weapon. The jaw cuts may be consistent with slicing through the leather straps which would have held a helmet on. However, it is noticeable that there are fewer wounds to the face and on this body than others of the period, such as the dead from the battle of Towton in 1461.

To the top of the skull is a non-penetrating wound probably made by a rondel dagger. Whilst this could potentially have caused internal (and external) bleeding, it would not have been enough to have killed the individual immediately. The same is true of three other shallow injuries to the dome of the skull, all inflicted by a sharp bladed weapon, removing part of the scalp and cutting into the bone. But there are two blows either of which could have been fatal, both to the lower back of the skull. The larger of the two was caused by a slicing action from a heavy bladed weapon such as a halberd. This would have exposed the brains at the back of the head. It is also consistent with the description of Richard's death in the Moliner Chronicles of 1490. The other wound, to the lower left side lines up with a correlating mark on the inner surface of the skull was caused by a bladed instrument (possibly a sword or a bill of a halberd) and would have pierced through the brain.

There is also another wound consistent with a weapon being thrust through the right buttock in an upward movement. This would have been difficult to inflict during battle, especially if the individual was protected by armour, and could potentially have been inflicted post-mortem, as an act of humiliation.

So far all the features of the skeleton are consistent with being that of Richard III. But what about the date?

Radiocarbon dating was carried out by two labs independently at the universities of Glasgow and Oxford. Both analysed samples of rib bone and their results were broadly the same. The results came back with a 95% probable date of 1430-1450 cal AD. Too early for someone who died in 1485! However, carbon in the body is derived from the atmosphere and is gained through our diet. If our diet contains large quantities of sea food, which gain different ratios of carbon isotopes from sea water rather than the atmosphere, the results can be up to several hundred years too old and it becomes necessary to ‘correct’ the radiocarbon age. Correcting for this gives a 95% probable date of 1455-1640 cal AD. This can be narrowed down further because we know there are no more burials in the church after 1538, giving us 95% probability that the person died 1450-1540 cal AD.

Analyses of the carbon and nitrogen isotopes suggest this person had a high protein diet with a strong marine component. These are dietary indicators that we would expect to find in a high status diet (someone who can afford to eat a lot of expensive meat).

So far, so good, but all eyes were on the DNA analysis in order to ‘confirm’ the identity of the skeleton which this far showed all the correct signs of being Richard III. Extracting ancient DNA from a skeleton, assuming you can sequence it, may tell you many things but it will not in isolation allow you to identify the individual in question. For this you need another DNA sample to compare it against. Once the skeleton had been discovered the project team was inundated by emails from ‘relatives’ of Richard offering their DNA (and in some cases body parts!), but not just any old relative will do. The vast majority of our DNA is a complete patchwork of that of our ancestors and it becomes impossible to know which bit has come from which ancestor. However, there are two pieces of our DNA which have a very simple pattern of inheritance: these are the Y chromosome and mitochondrial DNA. The Y chromosome has on it the gene for maleness so it can only be passed down through the male line, from father to son, and so forth. In this sense it is important to realise that illegitimacy does not matter: all males inherit the Y chromosome of their father regardless of whether the conception is within or without wedlock.

We all have mitochondrial DNA and this comes from the egg and is inherited from our mothers, however, only daughters can pass it on. Given that mitochondrial DNA is in the egg, in each of our cells, we have hundreds to thousands of copies of our mitochondrial DNA, yet a man will only have one copy of his Y chromosome in each of his cells. This is important for ancient DNA work since it means that (especially if the remains are degraded as in the case of the Greyfrairs skeleton) one is far more likely to be able to sequence mitochondrial DNA in comparison to Y chromosome. All the modern DNA work on this project was carried out by Dr Turi King at the University of Leicester, while the ancient DNA analysis was undertaken by Turi King at a dedicated ancient DNA facility at the University of York and independently verified at the Université Paul Sabatier in Toulouse.

Richard III left no descendants. His only legitimate son, Edward, died in 1484 and none of the known illegitimate offspring are recorded as having children of their own. As such, no descendants of Richard III survive to the
For the mitochondrial line, this passes from Richard to his mother, Cecily Neville, to his sister, Anne of York and then down the maternal line to Joy Ibsen and her children. Much of this line was published as separate parts of Ruvigney’s *Plantagenet Roll* in 1907 and also featured in various tables in Foster’s earlier work on Yorkshire county families. Indeed, in a later separate volume, Ruvigney published a single tree showing the Ibsen line from Anne of York all the way to Barbara Gough (died 1826) including her marriage to Isaac Spooner (‘Table showing the descent of George Brooks Percy Lillington’ and ‘Table showing the descent of Major Hugh De Crespigny Huntsman’). Crisp also included a version of the tree in his *Visitation of England and Wales*. However, subsequently, and most significantly for this project, John Ashdown-Hill traced the lineage further down to Joy Ibsen, and her children Michael, Jeff and Leslie. This work was initially carried out in order to find a comparator for research into the remains of Margaret of York (brother of Richard III, known as Margaret of Burgundy by marriage, who died in Mechlin, Belgium), and was found not to match the skeletal remains then under investigation. The sequencing of two small sections of Joy Ibsen’s mitochondrial DNA control region was carried out a number of years ago and the results published in a non-scientific journal without peer review. Therefore, taking all of this into consideration, together with the availability of current samples and recent technological advances allowing for much higher resolution typing, it was decided to start the genetic analysis for the current project from scratch using DNA kindly provided by Joy Ibsen’s son (she died in 2008), Michael Ibsen, who was known to the project prior to the dig.

Since the provenance of the exhaustive work of Ruvigney on the Plantagenet lineage is often vague and the subsequent work of Ashdown-Hill extending the lineage of Barbara Spooner down to Joy Ibsen provides no supporting documentary evidence, it was important to validate the Ibsen line independently. This was seen as central to the planned work since, should there be a mismatch between the skeleton’s DNA and that of Michael Ibsen, this could be due to the fact that the published Ibsen lineage was in error. Equally, and for similar reasons, from the start of the project, we felt that it was important to try and establish a second lineage in addition to the Ibsen line, so that any subsequent results could be triangulated. As a result, alongside the research to verify and document Michael Ibsen’s lineage (with the important assistance of David Annal, Hugh Bierbrier and Bob Matthews) the lineage of a second female-line relative of Richard III, Wendy Duldig, was traced and documented. Michael Ibsen is Richard III’s nephew, 16 times removed, and Wendy Duldig is Richard III’s niece, 18 times removed; Wendy is Michael’s 14th cousin, twice removed.

Turning to the Y chromosome, using *Burkes Peerage* as a starting point, since this is generally accepted as the ‘authoritative’ guide to the lineage of peers of the realm, the project traced unbroken male line to Richard III – up through the Dukes of Beaufort, the Marquises and Earls of Worcester, the Dukes of Somerset, to John of Gaunt and Edward III, and then back down through Edmund, Duke of York (John of Gaunt’s brother) to Richard. The project was able to identify, locate and contact five distant relatives, descended from the 5th Duke of Beaufort (1744–1803), who agreed to take part in the study, providing an albeit distant (between 24 and 26 generations) set of patrilinear relatives.

It is important to note two events in this lineage where sons were born illegitimate. The first of these is John Beaufort (1373-1410), 1st Earl of Somerset, the eldest of four illegitimate children of John of Gaunt and his mistress, Katherine Swynford. Katherine (nee de Roet) married Hugh Ottes Swynford, a knight in the service of John of Gaunt (thought to have died in 1372), and was governess to John of Gaunt’s daughters before becoming his mistress. Katherine and John of Gaunt later married, Katherine becoming his third wife. The second of these is Charles Somerset (c. 1460-1526), 1st Earl of Worcester, who was the illegitimate child of Henry Beaufort, 3rd Duke of Somerset and Joan Hill.[1]

DNA breaks down over time and how quickly this happens is very dependent on the burial conditions. However, ancient DNA has been successfully retrieved.

Analysis of the complete mitochondrial DNA sequence from skeleton one showed a perfect match with the mitochondrial DNA sequence from Michael Ibsen and a single substitution when compared with that from Wendy Duldig. This small mutation is only to be expected given the number of generations between the two individuals. However, the Y chromosome haplotype from the skeleton does not match that of male-line relatives of Richard III.

Four of the modern relatives were found to match (Y-haplogroup R1b-U152), STR haplotypes being consistent with them comprising a single patrilinear group. Yet one individual was found to belong to a different haplogroup (I-M170) and therefore could not be a patrilinear relative of the other four within the time span considered, indicating that a false-paternity event had not occurred within the last four generations. Having subsequently discussed this with the individual in question it became clear where this break had occurred.

Thus, the putative modern patrilinear relatives of Richard III are not genetically related to skeleton one through the male line over the time period considered. However, this is not surprising, given an estimated average false-paternity rate of 2%. The false-paternity event could have happened in any of the 19 generations separating Richard III and the 5th Duke of Beaufort, on either branch of the genealogy descending from Edward III. One can speculate that a false-paternity event (or events) at some point(s) in this genealogy could be of key historical significance, particularly if it occurred in the five generations between John of Gaunt (1340–1399) and Richard III.
A false-paternity between Edward III (1312–1377) and John would mean that John's son, Henry IV (1367–1413), and Henry's direct descendants (Henry V and Henry VI) would have had no legitimate claim to the crown. This would also hold true, indirectly, for the entire Tudor dynasty (Henry VII, Henry VIII, Edward VI, Mary I and Elizabeth I) since their claim to the crown also rested, in part, on their descent from John of Gaunt. The claim of the Tudor dynasty would also be brought into question if the false paternity occurred between John of Gaunt and his son, John Beaufort, Earl of Somerset. If the false paternity occurred in either of the three generations between Edward III and Richard, Duke of York, the father of Edward IV and Richard III, then neither of their claims to the crown would have been legitimate.

As has been detailed already, historical accounts record Richard III as having one shoulder higher than the other; sustaining battle injuries and being killed at the Battle of Bosworth and as being brought back to Leicester and subsequently buried in the choir of the church of the Grey Friars. However, despite there being no record of any of the above being attributed to any of Richard's relatives, could there be any chance that the burial is actually that of a female-line relative of Richard III who also suffered a spinal abnormality, who died at the Battle of Bosworth and who would therefore also show evidence of battle injuries and carry the same mitochondrial DNA type? In order to attempt to answer this question, the inheritance of Richard's mitochondrial DNA was traced for seven generations, from his maternal great-great-grandmother down and out through his network of cousins, identifying any males who would have been alive at the time of Bosworth and who might be candidates for the skeleton in the site of the Grey Friars. It is not possible to trace the line further back than this, as the identity of his maternal great-great-grandmother is unknown. Tracing this web of relatives descended from Sir Payne Roet and his wife over seven generations identified 144 individuals who would have shared the same mitochondrial DNA as Richard III, of whom 82 were male, excluding Richard himself. Of these males, 81 could not be the Grey Friars skeleton as they either are known to have died pre or post Bosworth, or were clearly either too old or too young at the time of Bosworth. This leaves just one candidate male: Robert Eure, born around 1450 (Richard was born in 1452), whose death is unknown. However, there is no record of this Eure family having fought at Bosworth, and being a Knight of the Order of St John of Jerusalem (Knights Hospitaller), he is likely to have spent time in the Mediterranean, especially Rhodes and could even have died there. In addition, there are four females who could in theory have passed on the mitochondrial DNA to a future generation but for whom no clear details are known. However, importantly, no record of any marriage for any of these women is recorded, so it is reasonable to assume that they did not have children.

The DNA data forms just a single strand of the evidence for the identification of any putative remains of Richard III. This evidence needs to be taken alongside all other evidence: genealogical, archaeological, osteological and radiocarbon dating evidence. Pulling all these strands together (radiocarbon data, estimated age at death, sex, presence of scoliosis, presence of perimortem wounds, genetic mitochondrial and Y chromosome data) using an integrative Bayesian analysis results in a conservative overall likelihood ratio of 6.7 million. Thus we can state beyond reasonable doubt that the skeleton found at Greyfriars is the remains of King Richard III.

Select bibliography


Bilson, C. J. Medieval Leicester Edgar Backus (1920).

Note that John Beaufort, 3rd Earl of Somerset, grandson of John of Gaunt, was created Duke of Somerset (1st Duke) in 1443. This technically expired with his death in 1444. His younger brother, Edmund, was later created Duke of Somerset in 1448. As this was a separate creation he was also technically the 1st Duke of this creation, however, many sources refer to him as the 2nd Duke. Subsequently his son Henry inherited the title under the same creation, thus technically he was the 2nd Duke under the second creation, yet is often referred to as the 3rd Duke.