'It's not like CSI': The science of the search for Richard III

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DNA testing, environmental sampling and radiocarbon dating are some of the tests being undertaken to determine whether the skeleton found in Leicester was once Richard III - and there are also plans to do a facial reconstruction.

Lead archaeologist Richard Buckley, of the University of Leicester's Archaeological Services, has explained the schedule for the scientific processes the skeleton is being subjected to.

The complexity and rigorousness of the tests – along with the need to find specialist facilities for some crucial stages – mean that the results of the skeleton's identity will not come overnight.

After the remains were exhumed, soil samples were taken from the grave and from around the skeleton which may provide information about the burial practice and its environment together with information related to health and diet of the person.

The skeleton has been given a computed-tomography (CT) scan which will allow scientists to build up a 3-D digital image of the individual.

From here, they hope to reconstruct the individual's face, in a similar way to the images created of King Tutankhamun following CT scans of the 3,000-year-old mummy.

Samples of dental calculus - mineralised dental plaque, which sometimes

builds up around teeth - will be taken from the skeleton to help the scientists find out more about the person's diet, health and living conditions.

Further samples have been taken from the teeth and a long bone so that ancient DNA can be extracted and compared with that of Michael Ibsen, believed to be a descendant of Richard III's sister, Anne of York via the female line.

But extracting the DNA from these samples is not straightforward, as even the act of breathing on 500-year-old remains can cause the sample to be contaminated with modern DNA.

While the testing of modern DNA from Michael Ibsen is being carried out at Leicester, the extraction of DNA from the skeleton is taking place in partnership with "ancient DNA" testing facilities which will allow the sample to be tested safely, without risk of contamination.

A separate genealogical study is being undertaken to verify Michael Ibsen's connection to the Plantagenets and researchers also hope to identify a second line of descent.

The skeleton is also being radiocarbon dated by two separate labs, which should indicate - to within 80 years - the date the individual died.

The skeleton has now been cleaned, and is currently being examined in detail in an attempt to ascertain the individual's age, build and the nature of its spinal condition.

Particular attention will be paid to the trauma to the skeleton which may have been incurred in battle – including the injury to the skull. Specialists in medieval battles and weaponry are advising the team on the kinds of instruments that may have caused the damage.

Forensic pathologists at the University's East Midlands Forensic Pathology Unit are also working with the team and are involved in helping to determine the cause of death.

Richard Buckley said: "We are looking at many different lines of enquiry, the evidence from which all add up to give us more assurance about the identity of the individual. As well as the DNA testing, we have to take in all of the other pieces of evidence which tell us about the person's lifestyle – including his health and where he grew up.

"There are many specialists involved in the process, and so we have to coordinate all of the tests so the analysis is done in a specific order.

"The ancient DNA testing in particular takes time and we need to work in partnership with specialist facilities. It is not like in CSI, where DNA testing can be done almost immediately, anywhere – we are reliant on the specialist process and facilities to successfully extract ancient DNA."

The University of Leicester, in association with Leicester City Council and the Richard III Society, is leading the Search for Richard III.

The University has made it clear that it is not saying it has found Richard III – rather that the skeleton has characteristics that warrant extensive further detailed examination and that the search has moved from an archaeological to a laboratory phase.

The University has added that the outcomes of its investigations are expected early next year - and that possible outcomes are:

- The scientific research suggests it is Richard III
- The scientific research suggests it is not Richard III
- The scientific research is inconclusive and therefore conclusions

may be drawn from the evidence available.

The Search for Richard III is also the subject of a Channel 4 documentary being made by Darlow Smithson.

More information: Search for King Richard III press portal: http://www2.le.ac.uk/offices/press/media-centre/richard-iii

Provided by University of Leicester