

Richard the Lionheart 'had mummified heart'

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Richard the Lionheart's tomb at the Fontevraud Abbey in the French town of Saumur, on August 21, 2009. Forensic scientists say they have delved into the embalmed heart of Richard the Lionheart, finding chemical evidence that the remains of England's Crusader king were handled with holy reverence.

Forensic scientists on Thursday announced they had delved into the embalmed heart of Richard the Lionheart, finding chemical evidence that the remains of England's Crusader king were handled with holy reverence.

Reduced to dust by eight centuries, the [heart](#) of the legendary warrior was analysed by modern lab technology.

It indicates that the organ was treated with the veneration reserved for a Christian relic, said Philippe Charlier of the Raymond Poincare University Hospital in Garches, near Paris.

"We found things that we didn't expect," said Charlier, one of the world's top historical pathologists.

Mediaeval embalmers used mercury and tar-like creosote to preserve the heart, then applied frankincense, myrtle, daisy and mint to it so that it would smell sweet, his team found.

The organ was then wrapped in linen and sealed for eternity inside a lead box.

"The frankincense is something we have never seen until now. It is a substance whose use comes directly from divine inspiration," he said in an interview with AFP.

"It was one of the three gifts brought by the Wise Men at Jesus's birth, and it was used by Joseph of Arimathea to help preserve Jesus's body at his death. So using it is a direct reference to Christ."

The probe, reported in the journal *Scientific Reports*, sheds light on the contemporary status of a king that across Western Europe became the emblem of gallantry.

Through today's prism, though, many historians say the Lionheart was a neglectful king and war mongerer who slaughtered thousands of hostages in his battle to wrest Jerusalem from Saladin.

King Richard I died in 1199 at 41 while fighting the French in Chalus, central France, where he was shot in the left shoulder by a crossbow arrow, reputedly fired by a boy.

He died 12 days later, presumably from [septicaemia](#) or gangrene, although some folk tales suggest the arrow was deliberately poisoned.

In line with tradition, his body was "partitioned."

Historical documents say most of his body was buried at Fontevraud Abbey in the western Loire Valley, close to the remains of his mother and father.

His entrails were buried in Chalus, in what historians say may have been intended insult to the French.

But the heart—an organ then believed to be the site of the soul—was buried in the cathedral at Rouen in Normandy, then an English possession.

On July 31 1838, Rouen historian Achille Deville made an astonishing discovery.

During an excavation of the cathedral, a lead box about the size of a large book tumbled into the crypt.

The box was engraved with a funerary inscription—"HIC IACET COR RICARDI REGIS ANGLORUM" (Here lies the heart of Richard, king of the English)—and inside lay a brownish-white dust.

Charlier's team was permitted to take two grammes (0.07 ounces) from the 80 grammes inside.

They analysed the precious sample visually, using an electron microscope, before scanning it for chemical compounds with gas chromatography.

The team were not authorised to test for DNA, which would have required a far bigger sample. In any case, the result would have been fuzzy given the presence of lead, which degrades DNA, said Charlier. Carbon-dating was also ruled out because of creosote.

There was no clearly identifiable tissue, but there was an antibody reaction to myoglobin, a tell-tale protein found in human muscle, which implies the heart. Several bacteria and fungi species were spotted, but none confirming how Richard died.

The scrutiny revealed a tiny scrap of linen and ancient pollen from poplar, oak and pine that probably came from airborne contamination before the box was sealed.

Twelfth-century embalmers were usually cooks and butchers, who were used to cutting meat and removing offal and had access to herbs, spices and other aromatic substances, said Charlier.

But—contrary to a popular image of the Middle Ages as being barbarous—the individual or individuals who worked on Richard's heart "were extremely skilled," combining complex metals, including liquid mercury, with vegetal residues.

If the heart was reduced to dust, this was probably because water crept into the box over time, he said.

The heart may have been carefully preserved for reasons of dogma, said the study, which drew on expertise from historians.

According to calculations by a 13th-century English bishop, "Richard the Lionheart spent 33 years in Purgatory as expiation for his sins, and ascended to Heaven only in March 1232," it said.

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