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T rex breath and Queen Elizabeth's car: scientists creating 'time machine for the nose'



The scentscapes will feature in London Intersections, an exhibition celebrating the 200th anniversary of UCL. Photograph: Smellscape

Researchers are recreating ancient odours for museumgoers as interest in the archaeology of smell grows

From the interior of Queen Elizabeth II's car to the scent of ancient Egyptian funerary practices, museumgoers are getting a whiff of the past like never before.

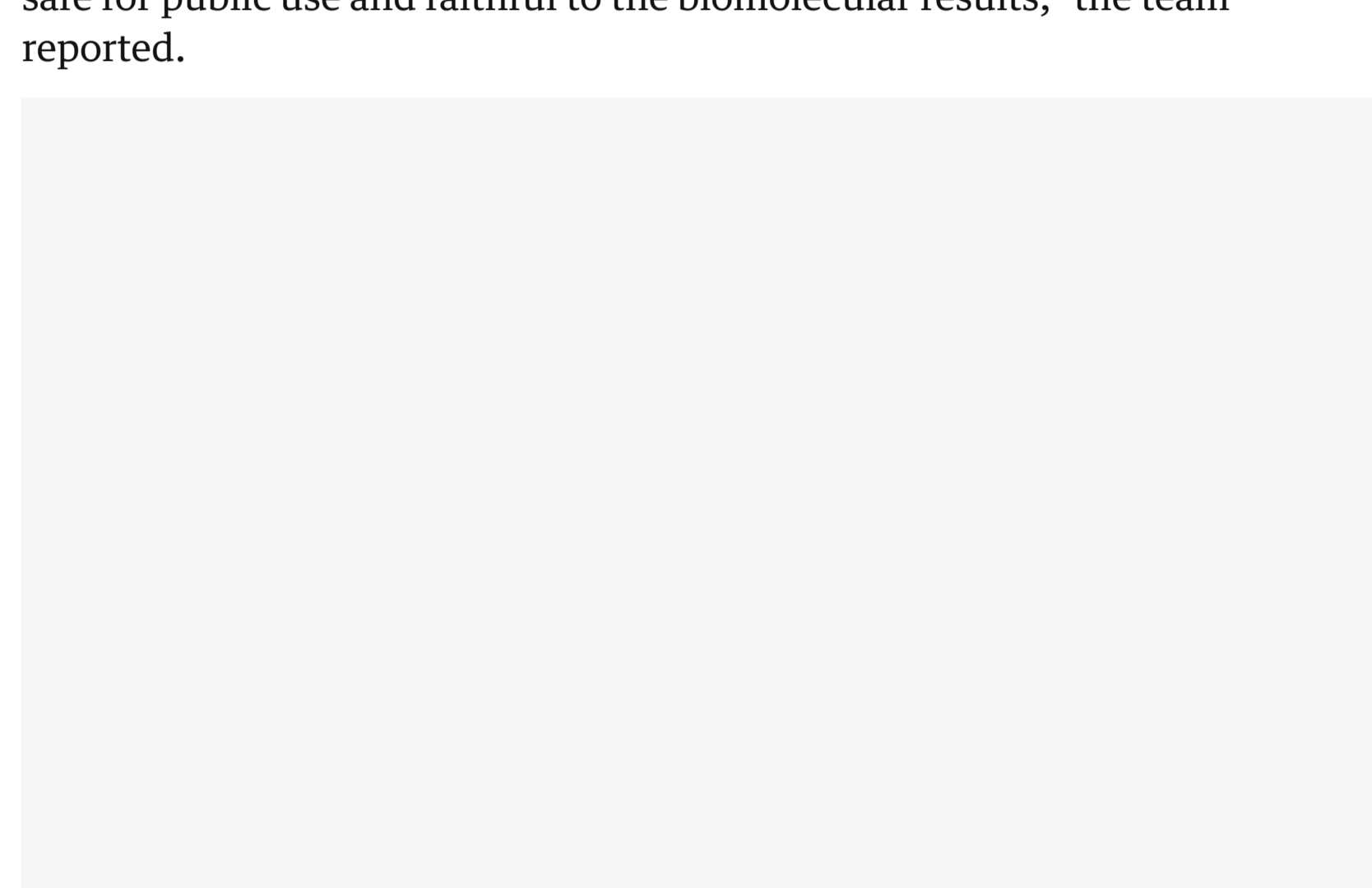
Experts say the approach is more than a pungent stunt: it's part of a broader effort to try to reconstruct the sensory worlds of the past, with collaborations involving historians, scientists, heritage experts and perfumers.

"Over the past decade or so there's been a growing interest in the 'archaeology of the senses', including the archaeology of smell," said Dr Barbara Huber, an archaeochemist at the Max Planck Institute of Geanthropology in Germany. "Researchers began asking not just what objects looked like but what past environments felt, sounded and smelled like."

Huber worked on the creation of small cards infused with a perfume based on ingredients identified in residues of ancient Egyptian mummification balms, which formed part of a project called Scent of the Afterlife.

She described it as a "time machine for the nose". It has an aroma rich and warming with honey-like notes and a hint of earthy spices – but not entirely pleasant. In order to create the scents, Huber and colleagues carried out a chemical analysis of the residues of balms within ancient Egyptian canopic jars, dating back to 1450BC, to identify a complex mix of aromatic ingredients.

Among these were beeswax, resins from trees of the pine family, and a substance called coumarin, a crystalline chemical compound with a vanilla-like scent. The researchers then worked with a perfumer to recreate the aroma. "Since the materials identified in the chemical analysis of the original balm dated to antiquity, modern olfactory equivalents had to be identified that were both safe for public use and faithful to the biomolecular results," the team reported.



An animatronic figure of a Viking at the Jorvik Viking Centre in York. Photograph: Ian Dagnall/Alamy

Liam Findlay of AromaPrime, which created Jorvik's smellscape, said the company used odours in different ways depending on what a museum was trying to communicate. For example, at Jorvik there are specific scents dotted around, such as the smell of fishing and leather works.

"If you walked through that Viking village back then, you wouldn't have necessarily smelled all these individual things very specifically, but it's about making sure that the visitors take that in because they've got like five seconds," he said.

The team have also created scents that aimed for accuracy, such as the breath of a T rex. "I was informed by fossil evidence, and palaeontologists had their input," Findlay said.

Dr Cecilia Bembibre, of University College London's Institute for Sustainable Heritage, said investigating smells could bring benefits for researchers, expanding interpretations and helping them "explore how materials were experienced, how environments were shaped by odour and how cultural practices developed in response to them".

Huber is about to start work on a new project which will involve reconstructing scents from different parts of the Roman empire, while from 26 March, Bembibre and colleagues will be presenting two smells as part of London Intersections, an exhibition that marks UCL's bicentenary, at the UCL Bartlett Faculty of the Built Environment. Visitors will be able to get a whiff of St Paul's Cathedral library and the inside of the late Queen Elizabeth's Rover car from golden funnels attached to glass flasks.

The scent of St Paul's was created by perfumer Sarah McCartney, Bembibre said, adding this artistic interpretation, first made in 2018, evokes worn leather, tobacco, chocolatey vanilla and smooth wood.

The aroma has now been used in various settings, including in a recent exhibition about ancient Egypt in Denmark, and in different formats, including perfumed cards and fixed "scent stations". In the latter case, scent cartridges were placed inside two modern ceramic vessels and visitors were invited to lift the lid and take a sniff.

Huber added that the perfumed cards had even been sent to schoolchildren studying the ancient civilisation, while the scent is to feature in another exhibition, in Canada, from June.

Huber said a smell could help visitors experience the past. "It can make abstract history tangible," she said. "It also reminds us that the past was not sterile or silent, it was sensory, embodied and often intense."

It is not the first time museumgoers have encountered unusual odours: a 2016 Rolling Stones exhibition included the smell of the band's digs, while the Jorvik Viking Centre offers visitors a ride through Viking-age York complete with a memorable smellscape created in the 1980s.

But the approach is evolving. "Jorvik was pioneering and bold but it was primarily experiential, for fun or to 'shock' visitors," Huber said. "Today we can ground scent displays in chemical analysis, archival research and interdisciplinary collaboration. Smell in museums has shifted from theatrical atmosphere to research-based storytelling."

The Scent of the Afterlife perfume has been used as an educational tool to "explore the ingredients, where they came from and what they reveal about trade connections in ancient Egypt", she said.

Queen Elizabeth II driving a Rover across muddy turf in Windsor Great Park in 1963. Photograph: PA/Alamy

The second is a more scientific reconstruction: the interior scent of the late queen's Rover P5B, first created in 2023 was developed "through historical research, chemical analysis of the air from this particular vehicle, and interviews with classic car collectors", Bembibre said.

She previously was part of a research team working with art historians and perfumers to reconstruct the scent of a pomander, a fragrant accessory used to ward off illness. That smell, she said, was based "on a 16th-century 'Book of Secrets' recipe, combining ambergris, musk, civet, rose, clove, nutmeg, cinnamon and sandalwood".

Bembibre said it would be exciting to have a museum of smells, noting that among other projects she was working on the UK "smell inventory" – an initiative that is asking members of the public to share odours they would like to preserve for posterity.

"Our interpretation of heritage is largely vision-centric, but when people use their noses as tools for understanding, they often challenge how we think about the past and uncover aspects of heritage that might otherwise be lost," Bembibre said.

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Scent of the Afterlife cards. Photograph: Copyright SC Ehrlich, C Calvert, CE Looßen, U Dubbel, S Terp Laursen and B Huber

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