



Heritage Science: Neglected but Necessary in Planning for the Future

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The opening ceremony of the London 2012 Olympic Games was a showcase of British heritage, viewed by over 900 million people worldwide [1]. The conservation, interpretation and management of the cultural assets on display are the domain of heritage science, a little known and long-neglected field straddling the realms of science and art.

The cultural and educational importance of heritage assets is widely acknowledged and appreciated, but the economic benefits of investment in heritage science are less obvious. Tourism is the UK's fifth largest industry, and 57% of survey respondents stated that history and culture strongly influenced their choice of a holiday destination (2009 Nation Brands Index) [2]. Heritage tourism alone contributed £7.4bn in gross domestic product (GDP) and supported 195,000 full time equivalent jobs in 2010 [2]. "All businesses need to invest in order to be sustainable. Heritage tourism requires heritage science capacity in order to maintain the UK's cultural assets and develop new forms of access and engagement with time", was the conclusion of Prof. May Cassar of University College London, at the October 2013 conference on the Science and Heritage Programme in London [3].

Rather than being a luxury the country cannot afford during times of government cutbacks, investment in heritage and heritage science can generate short-term returns in the form of tourism revenue, as well as preserving heritage assets for the future. As roughly six million (25% of) buildings in the UK were constructed before 1919, heritage science research into understanding and managing the aging and decay of building materials could directly impact the £5bn a year conservation and restoration industry [4]. Currently, less than 0.1% of this investment is in heritage science [4]. This positive relationship was summarised by the Minister for Tourism and Heritage, John Penrose MP, who stated that "heritage and economic growth are complementary and assist each other, rather than being, as in some people's minds, alternatives", whilst defending a 2006 House of Lords report that called for greater investment and development of the heritage sector [2].

While increasing public access to heritage assets is a priority, this results in additional wear and tear, degradation and disfigurement of what are often fragile and sensitive materials. Research on techniques for protecting these assets can help ensure they will survive for future generations to appreciate. Many of these techniques originate from a broad array of physical, biological and chemical science disciplines. Climatologists are working to understand the impacts of climate change and pollution on historic buildings, monuments and pre-historic structures such as cave paintings and Stonehenge.

In addition, understanding and mitigating the impacts of fluctuating humidity, temperature and mould in museums on the degradation of works of art and delicate materials such as paper and silk is essential to their continued public display. Advances in conservation and historical analysis of artefacts and paintings have been made using techniques such as optical coherence tomography, which uses lasers to enable three-dimensional imaging of sub-surface structures. The diversity of fields and techniques within heritage science can be a source for creativity and cross-disciplinary collaboration. However, it is also one of the sector's greatest weaknesses.

The previous high esteem in which the British heritage science sector was regarded, largely due to the development of science-based conservation at the National Gallery and the British Museum in the mid-twentieth century, is under threat due to fragmentation of the field. Lack of a common vision, communication and collaboration between institutions and researchers, as well as dwindling influence with funding bodies and policy-makers, has contributed to a decline in funding allocated to heritage science projects. Perhaps most notably, funding from the European Commission Framework Programmes for Research for heritage-related research fell from £28m in 1999-2002 to just £7m in 2002-2006 [5].

Significant portions of researchers in heritage science were trained in a physical, chemical or biological science, and either conduct heritage science research part of the time, or their research has applications in heritage science but has a primarily technical focus. The gap between research and application of techniques could be improved by increased cooperation and collaboration within the heritage science research community, and by training scientists who specialise specifically in heritage science. The UK has lagged behind other European nations such as Italy, France and Germany in developing heritage science graduate degree programs, with the first Masters in Heritage Science programmes in the UK established only in 2010.

Furthermore, increased investment in graduate training at the Master's and PhD level since the 2006 House of Lords report has not been followed by a significant increase in the number of research positions available following graduation. This, combined with the diminishing number of senior positions in heritage science, results in many young researchers choosing to change career paths due to poor career prospects. These are further limited by the lack of research prestige surrounding the field of heritage science, as judged by the conventional standards applied to science in general. Particularly in museum environments, publication is not a priority, and what is published is often in museum reports and low

profile journals. The founding of a new flagship journal *Heritage Science* in 2013 is a positive step towards raising the profile of publications in this field and improving communication and collaboration between scientists.

Increasing the prestige and influence of heritage science is crucial in ensuring funding for research. Conservation and heritage science are often among the first areas to see cutbacks when budgets are slashed, according to Neil MacGregor, Director of the British Museum; “For anybody having to manage a museum or a gallery budget research is obviously one of the areas you can most easily cut back on because the impact is not immediately visible. I think there is a real danger to research in our institutions” [5].

The 2006 House of Lords report may signify a turning point in the trajectory of heritage science as a field. Since then, a UK-wide strategy for heritage science has been developed, to demonstrate the public benefit of heritage science and increase public engagement and support. Priorities include strengthening partnerships within the sector to increase collaboration, translating research findings into practical improvements, improving preservation and understanding, building future capacity and sharing of limited resources. The launch of the Science and Heritage Programme in 2007 has helped fund almost 50 projects involving 200 researchers, but additional efforts are needed to sustain the progress of these projects and to continue to provide career opportunities for researchers [6].

There is still much to be done by researchers, administrators, policy-makers and funding bodies to improve investment and capacity building in heritage science. A future without the cultural, educational and economic benefits of the heritage that helped make this country what it is today is difficult to imagine. Prioritizing and investing in heritage science is a commitment to preserving the UK of the past for its citizens of the future.

References

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About the Author

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