

Institution: Durham University
Unit of Assessment: 17A Geography, Environmental Studies and Archaeology
Title of case study: (1) Let the dead teach the living. The applications of palaeopathological research to industry, heritage and education
<p>1. Summary of the impact</p> <p>Archaeology at Durham, in response to international tensions over the curation and repatriation of human remains, is transforming the ways in which we care for and analyse archaeological skeletal material. We are also changing public perceptions, making human health in the past relevant to present populations. We demonstrate here how the research of Charlotte Roberts is indicative of this impact, presenting evidence of the reach and significance of her research across the UK, Europe and the USA in terms of:</p> <ul style="list-style-type: none"> • Establishing best practice in commercial archaeology; • Changing codes of practice and guidelines on the research and care of human remains; • Shaping museum policy relating to the ethics, care and display of human remains, and; • Enhancing educational experience and influencing public perceptions.
<p>2. Underpinning research</p> <p>During 13 years at Durham University, Charlotte Roberts has drawn on the strength and research excellence of our bioarchaeology community to set the agenda for our understanding of health and disease in ancient populations. Via 11 research grants, 77 publications including 7 books, she has created a fundamental change in how the commercial archaeology and museum sectors research and understand ancient health and disease, and how they care for and display human skeletal remains. Core to the impact returned here are 2 milestone publications. These draw on the critical mass of Roberts' research since 2000, and set the agenda for current and future research:</p> <ul style="list-style-type: none"> • Health and disease in Britain: from prehistory to the present day (2003) [Ref 1] draws on the comprehensive study of data collected from over 35,000 skeletons and 200 archaeological sites, spanning prehistory to 1850 AD, to establish and document a decline in human health over time in tandem with increasing social complexity. The key areas include dental disease and dietary change; urban living and health; and the arrival of leprosy, tuberculosis and syphilis in Britain. A significant quantity of unpublished data are brought into the public domain and extensive comparative skeletal data are made available. The book sets out recommendations for future research; standards for data recording and presenting future data; and calls for the creation of a nationwide database of curated human remains. • The Archaeology of Disease, 3rd edition, (2005) [Ref 2], provides an up-to-the moment appraisal of the origin and history of disease in global populations. Roberts and Manchester define how to diagnose, record and interpret disease and trace the global skeletal and historical evidence for diseases that affect bones and teeth. The origins, development and decline of diseases like tuberculosis and leprosy are charted from ancient to modern times showing how the use of historical and archaeological contextual data is vital to the identification and study of disease in ancient and modern populations. <p>These publications highlight the importance of the long-term perspective for understanding human health and provide unparalleled resources for comparative disease frequency for Britain and the western world. They enhance awareness of inadequacies in recording methods, and advocate guidelines for new stringent practices for the documentation of human remains. Drawing materially on these, Roberts has developed four additional publications designed specifically for the commercial and museum sectors.</p>

Impact case study (REF3b)

- Roberts C.A. 2009. *Human remains in archaeology: a handbook*. York: Council for British Archaeology.
- Roberts C.A., Connell, B. 2004. Palaeopathology. In M. Brickley and J. McKinley (eds), *Guidelines to the standards for recording human remains*. 34–39. Institute of Field Archaeologists Paper 7. BABAO and IFA.
- Roberts C.A., Mays, S. 2011. Study and restudy of curated skeletal collections in bioarchaeology: a perspective on the UK and its implications for future curation of human remains. *International Journal of Osteoarchaeology* 21: 626–30.
- Roberts C.A. 2013. Archaeological human remains and laboratories: attaining acceptable standards for curating skeletal remains for teaching and research. In M Giesen, V Park (eds), *Curating human remains. Caring for the dead in the United Kingdom*. 123–34. Woodbridge, Boydell Press.

These 'pathway' publications have influenced best practice among contract archaeologists and museum curators in the UK and beyond, and through her extensive advocacy and wider engagement Roberts has made this research relevant to both education and public audiences.

Key Researcher: Charlotte Roberts, Reader then Professor of Archaeology at Durham 2000-present.

3. References to the research

[Ref 1] Roberts C.A., Cox, M. 2003. *Health and disease in Britain: from prehistory to the present day*. Stroud: Sutton Publishing. <http://dro.dur.ac.uk/3875/>

- RAE 2008 submission. '...the authors have produced the definitive account of palaeopathology in Britain...' Miller, E. (California State University, USA), Review, *International Journal of Osteoarchaeology*, 15: 386–8.

[Ref 2] Roberts C.A., Manchester, K. 2005. *The Archaeology of Disease*. 3rd edition. Gloucester: Sutton Publishing and Ithaca: Cornell University Press. <http://dro.dur.ac.uk/6005/>

- '...highly recommended to all who are interested in the history of disease and their scientific investigation. The clear, precise and elaborate description and interpretation of palaeopathological observation the world over...provide excellent insight into life and death hundreds to thousands of years ago.' Nerlich, A. (Ludwig-Maximilians-Universität, München, Germany), Review, *Journal of the American Medical Association*, 296: 1408–9.

4. Details of the impact

The reach of Roberts' research is extensive, effecting change in policy and commercial and museum practice across two continents. Via a vigorous and wide ranging programme of engagement, Roberts has also made her research relevant to education and impacted on public consciousness.

Commercial impact in archaeology and forensics

Direct influence can be identified in the drawing up of professional standards in commercial archaeology and forensic laboratories in the UK and the USA. A survey of developer-funded reports produced by 5 major UK contracting units revealed that since 2008 Roberts's research and pathway publications were cited 1186 times in 82 reports, both in explicit reference to recording standards and in the identification and interpretation of skeletal evidence (Source 1). This usage attests firstly to the rigorous adherence by units to the gold standard recording systems developed and made available through Roberts' research and pathway publications, ensuring that their

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reported data are readily comparable to skeletal data worldwide. Secondly, Roberts' published research is shown to be unparalleled as a resource for any specialist seeking comparative data in the diagnosis of disease and health issues in ancient or modern skeletal samples: Wessex Archaeology make 'regular' use of her research, identifying her books as 'an excellent starting point and a very useful broad base for various types of comparative data' (So2). Beyond commercial archaeology, her publications provide 'significant and substantial guidelines and reference material' for the unique, worldwide work of the Forensic Science Academy, Hawaii, responsible for finding, recovering and identifying America's missing service members from all past wars: helping to establish 'a differential diagnosis of skeletal remains, [and] better understand the history of disease,...biological profile (age at death, ancestry, sex, trauma, and more) of skeletal remains' (So3).

Changing national codes of practice and guidelines

Consultancy and advocacy by Roberts have led to wholesale improvement in UK standards and ethics for the recording, handling and sampling of human skeletal remains. Working with the British Association for Biological Anthropology and Osteoarchaeology in 2010 as a key team member, Roberts helped set new professional Codes of Practice and Ethics which cite and draw upon her research and pathway publications (eg. So4: Tables 2, 4, 5). As a consultant on the production of *Science and the Dead* (guidelines for the destructive sampling of archaeological human remains for scientific analysis produced by the Advisory Panel on the Archaeology of Burials in England and English Heritage, published February 2013), she used this research to underpin recommendations for the taking of bone samples for other scientific purposes as well as for aDNA analysis, important feedback that saw direct take-up in the finished guidelines (So5: sections 3, 4, 5, 6 & 7).

Creating the gold standard for curatorial policy in museums.

Roberts' work has also impacted on curatorial practice. Pennsylvania Museum of Archaeology and Anthropology attracts around 170,000 visitors a year, some 30,000 of them children. Human remains feature throughout the galleries, are core to long term displays on human evolution and Egyptian mummies, and underpin temporary exhibitions such as *Making and Unmaking Race* (2013) which uses Penn collections in a critical interrogation of whether there is any such thing as 'race' <http://www.penn.museum/current-changing-exhibits.html>. Roberts' research is cited as vital to the current work at Penn, as 'a model for policies specifically associated with access to bioarchaeological collections by students and professional researchers'. 'Her mixed methodology, including DNA, isotopic, histologic and chemical residue analysis, informs [their] scientific testing committee on the efficacy of the research agenda of many dozens of visitors to our collections' (So6), and her analyses of paleopathology and traumatic damage to the peoples of the past is used as a comparative base for the Penn collections in lectures and public programs (So6).

As a member of the *Human Remains Working Group* at the Natural History Museum (NHM), London, and a *Scientific Advisory Panel* member (both 2010), Roberts has contributed significantly to the museum's *Human Remains Policy*. The Natural History Museum holds in excess of 20,000 sets of human remains, over 1000 of which have been claimed for return by indigenous communities. The Human Remains Unit [HRU] at the NHM acknowledges Roberts' research as a driving force in shaping their position and approach: 'Roberts' stance on the importance of making research relevant to modern life or current populations has been important in informing and reinforcing the HRU stance that we need to give indigenous communities concrete examples of how research that includes human remains is relevant to modern peoples' (So7). Her key and pathway publications also inform the procedures used in the analysis of trauma and disease in the HRU data collection project (So7), and her work is 'invaluable' in the creation of a new digital archive, 'having a significant impact on our [the museums] understanding and interpretation of many of these specimens' (So7). The Centre for Human Bioarchaeology (CHB) at the Museum of London has additionally commented that all 6 of Roberts' publications have aided the Centre 'in its structure, rationale and quality of information when producing information for use in reports, site summaries on the CHB website and publications relating to the assemblages' (So8).

Education and Public Engagement.

Throughout her career Roberts has remained committed to a vigorous campaign of wider engagement including numerous public lectures, television broadcasts and work with artists. At the invitation of the Royal Anthropological Institute education committee, she recently contributed a section on human disease, based on her core publications, to the Reader for the new A-Level in Anthropology (2013) (So9). Working together with museums, Roberts has developed exhibitions that draw directly on her published work. *Plague, Poverty and Prayer* at the Barley Hall in York in 2009 highlighted leprosy and tuberculosis as endemic issues for medieval society, while *Skeleton Science* conceived together with Durham University Museums in 2012 used her core research in its themes and dedicated engagement activities. Over 4000 visitors saw this exhibition (5/2012 to 2/2013), many commenting positively on their experience: identifying how informative the activities and displays were for children and over 30 children specifically stated they had learned new things about the human body (So10).

5. Sources to corroborate the impact

[Source 1] Spreadsheet of citations of publications from 2008-July 2013 within published and unpublished developer-funded skeletal reports completed by commercial contract archaeology companies (Museum of London Archaeological Services (MoLA); York Osteoarchaeology; Wessex Archaeology; Oxford Archaeology; and AOC Archaeology Group). Collected between January 2012 and June 2013.

[Source 2] Testimonial letter. Senior Osteoarchaeologist at Wessex Archaeology, a commercial archaeology company in the UK. 18/7/13.

[Source 3] Testimonial letter. Director of the Forensic Science Academy, Joint Prisoner of War and Missing in Action Accounting Command, Pearl Harbour, Hawaii, USA. This unit leads the extensive task of identifying and repatriating US military lost or missing in action. 1/7/13.

[Source 4] British Association for Biological Anthropology and Osteoarchaeology Code of Ethics, revised 2010, <http://www.babao.org.uk/index/cms-filesystem-action/code%20of%20ethics.pdf>; and Practice, produced 2010, <http://www.babao.org.uk/index/cms-filesystem-action/code%20of%20practice.pdf>.

[Source 5] *Science and the Dead*, guidance document on destructive sampling produced by the Advisory Panel on the Archaeology of Burials in England and English Heritage. February 2013.

[Source 6] Testimonial email. Keeper of Physical Anthropology, University of Pennsylvania Museum of Archaeology and Anthropology, specifying the take-up and usage of Roberts' research in museum practice and interpretation. 18/4/13.

[Source 7] Testimonial letter. Head of the Human Remains Unit, Department of Earth Sciences, Natural History Museum, London. 9/11/12.

[Source 8] Testimonial letter. Curator of Human Osteology, Centre for Human Bioarchaeology, Museum of London. 10/5/13.

[Source 9] Reader (Volume 2) for A/AS Level in Anthropology. Roberts, C. 2013. 'The Archaeology of Disease' in Callan, H, Street, B and Underdown, S. (eds), *Introductory Readings in Anthropology*, pp. 194-99, Oxford: Berghahn. Published May 2013.

[Source 10] Evaluation Summary Report. *Skeleton Science*. Durham University Museums, UK. Produced June 2013.