Institution: University of Sheffield

Unit of Assessment: 17A - Geography, Environmental Studies and Archaeology: Archaeology

Title of case study: Stonehenge and its landscape; changing perceptions, informing the next generation and benefitting the local economy.

1. Summary of the impact

The Stonehenge Riverside Project was carried out between 2003 and 2010, to determine the purpose of Stonehenge by investigating both the monument and the surrounding landscape. The project's reach and importance have been considerable, from training and inspiring the next generation of professional archaeologists to stimulating people worldwide with new knowledge about Stonehenge, providing artistic inspiration and changing perceptions and beliefs about the use of the site, leading to significant economic, cultural and technological benefits.

2. Underpinning research

The *Stonehenge Riverside Project* was directed by Prof. Mike Parker Pearson (University of Sheffield 1990 to 2012) an expert in British Prehistory, alongside Dr Umberto Albarella (Sheffield since 2004) a leading expert in zooarchaeology, and brought together a host of academic and other institutions in one of the world's largest field archaeological research projects of the 21st century. Work was initially AHRC funded from 2006 to 2010, with follow on AHRC funding for the *Feeding Stonehenge* project (2010-13) which looked at the supply, production and consumption of material as well as foodstuffs in the wider Stonehenge area [R1]. The team of co-directors were Professor Colin Richards and Professor Julian Thomas of Manchester University (prehistoric societies), Dr Josh Pollard of Bristol/Southampton University (monuments), Dr Kate Welham of Bournemouth University (geophysical survey) and Professor Chris Tilley of UCL (prehistoric landscapes). The project was funded by grants to Parker Pearson and Albarella from the AHRC, NERC, National Geographic, Google, The Society of Antiquaries and Royal Archaeological Institute; the combined project funding totalling £1.33m (>96% AHRC (peer review) funded). The project attracted staff and students from other universities in the UK and across the EU, and its discoveries were followed by millions worldwide.

The project's working hypothesis - that Stonehenge and Durrington Walls were juxtaposed as places of the living and the dead – was supported by research instigated and led by Sheffield researchers and by our many discoveries made during the course of four field seasons. Extensive post-excavation analyses and C14 dating was mostly conducted by a team at Sheffield: Ben Chan (lithics analysis), Sarah Viner (zooarchaeological analysis), Mandy Jay (isotopic analysis), Christie Willis (analysis of cremated human remains) [R4], all under the direction of Parker Pearson as PI, project visionary and media spokesman.

Durrington Walls was a large enclosure, with the remains of many houses, previously unknown on the site. The discovery of just three human bones among the 80,000 animal bones found at Durrington shows that the activities that took place there were the complete opposite of what was happening at Stonehenge, which was used as a cemetery. In 2008 the team excavated 60 cremation burials from within Stonehenge; these date to the two main periods of its use (3000-2400 BC) [R5].

The project also established why Stonehenge is where it is. Prehistoric people adapted pre-existing natural features into the 'avenue' leading from Stonehenge's entrance; these were three parallel chalk ridges aligned by geological accident on the midsummer sunrise-midwinter sunset axis. This seems to have formed the blueprint for solstitial alignments not only at Stonehenge but at four of the timber circles at Durrington Walls and Woodhenge [R2&3].

As predicted by the working hypothesis the project discovered a second 'avenue' at Durrington Walls. The Durrington avenue linked the timber monument known as the Southern Circle to the River Avon. The Durrington Walls avenue's midsummer sunset orientation provides a counterpoint to the Stonehenge avenue's midsummer sunrise axis whilst the Southern Circle's view towards midwinter sunrise contrasts with Stonehenge's midwinter sunset axis.

Analysis of the faunal assemblage from Durrington Walls points to seasonal culling indicative of midwinter (predominantly) and summertime gatherings, suggesting that Stonehenge and its associated timber monuments were not primitive astronomical observatories but monumentalised

key moments of the year when people gathered here and celebrated [R6].

Whilst theories of exotic origins for Stonehenge's design – invoking Bronze Age Mycenaean and ancient Egyptian inspiration – are still popular, the project has shown that Stonehenge's architecture derives from indigenous forms in use in Britain in preceding centuries.

Finally, down by the River Avon, at the end of the Stonehenge avenue at West Amesbury, a previously unknown henge was discovered. Its small circle contained about 25 bluestones that were removed around 2400 BC, perhaps to be taken to Stonehenge. Just when this stone circle was constructed is not certain but it was well before 2500 BC. The discovery of Bluestonehenge, together with new timber monuments upstream south of Woodhenge, has established the central importance of this stretch of the Avon.

We can now revise the working hypothesis to conclude that Stonehenge was built as a symbol of island-wide cosmological and geographical unity, with its stones representing ancestral connections to Britain's earliest Neolithic farming groups in Wales and southern England [R6].

3. References to the research

R1. Parker Pearson, M., Richards, C., Allen, M., Payne, A. and Welham, K. 2004. The Stonehenge Riverside project: research design and initial results. *Journal of Nordic Archaeological Science* 14: 45-60.

R2. Parker Pearson, M., Pollard, J., Richards, C., Thomas, J., Tilley, C., Welham, K. and Albarella, U. 2006. Materializing Stonehenge: the Stonehenge Riverside Project and new discoveries. *Journal of Material Culture* 11: 227-261. doi: 10.1177/1359183506063024

R3. Parker Pearson, M., Cleal, R., Marshall, P., Needham, S., Pollard, J., Richards, C, Ruggles, C., Sheridan, A., Thomas, J. Tilley, C., Welham, K., Chamberlain, A., Chenery, C., Evans, J., Knüsel, C., Linford N., Martin, L., Montgomery, J., Payne, A. and Richards. M. 2007. The age of Stonehenge. *Antiquity* 81: 617-39.

R4. Thomas, J., Marshall, P., Parker Pearson, M., Pollard, J., Richards, C., Tilley, C. and Welham, K. 2009. The date of the Stonehenge cursus. *Antiquity* 83: 40-53.

R5. Parker Pearson, M., Chamberlain, A., Jay, M., Marshall, P., Pollard, J., Richards, C., Thomas, J., Tilley, C. and Welham, K. 2009. Who was buried at Stonehenge? *Antiquity* 83: 23-39.

R6. Viner, S., Evans, J., Albarella, U. and Parker Pearson, M. 2010. Cattle mobility in prehistoric Britain: strontium isotope analysis of cattle teeth from Durrington Walls (Wiltshire, Britain). *Journal of Archaeological Science* 37: 2812-20. doi: 10.1016/j.jas.2010.06.017

Independent evidence of research quality

The project was highlighted for its research excellence in an editorial in *Antiquity* (Sept 2008), was voted 'Archaeological Research Project of the Year 2010' for Bluestonehenge, and Mike Parker Pearson was 'Archaeologist of the Year' for 2010 (voted by the readership of *Current Archaeology*). Parker Pearson was awarded the Samuel Kress Fellowship for 2012 by the Archaeological Institute of America for his work at Stonehenge. The project was awarded the Northern Antiquaries Society (Copenhagen) Prize (2008), and Andante Travel Prize (2008) which is designed to heighten public awareness of worthwhile and exciting projects.

Mike Parker Pearson was invited to speak on SRP in 2006-2010 at academic institutions in New York, Washington DC, Los Angeles, Berkeley, Stanford, Santa Fe, Granada, Seville, Tenerife, Kiel, Halle, Munich, Amsterdam, Seoul, Sydney, Leuven, Leiden, Stockholm, Dublin, Copenhagen, Gothenborg, Kalmar and Lund.

4. Details of the impact

The Stonehenge research project has had international impact, with 4 principal aspects: enhanced public understanding; economic benefit to the area and to the heritage industry through increased visitor numbers; contribution to cultural life and understanding; and education.

Enhanced public knowledge through popular media outputs and public engagement activity

The project was a flagship for the AHRC and the findings have been the basis of worldwide media coverage. It has reached an audience of millions worldwide, through TV documentaries, radio programmes, headline news, international lecture tours and non-specialist publications, to which Parker Pearson, Albarella, Viner, Chan, and Willis have contributed. The research findings have been the subject of a number of documentaries. On Channel 4, the Time Team special *Secrets of*

Stonehenge (first broadcast 1 June 2009) reached 2.27m viewers (and is also available in video format), while *Secrets of the Stonehenge Skeletons*, first broadcast 1 June 2009, reached 2.05 million viewers [S1]. This represented a 6.9% share of the viewing audience at that time, compared to Channel 4's average of 5%. The programme is now available on 4oD, Channel 4's interactive on-demand service. Internationally, the National Geographic documentary *Stonehenge Decoded,* first broadcast in May 2008, reached 6.3m viewers in the USA alone, while also being broadcast on the network's UK channel. It is now available for purchase on DVD or free to view on National Geographic's website. The documentary was nominated for a 2009 Emmy award. The PBS documentary series NOVA is the highest rated science series on US television and the most watched documentary series on public television. Their special *Secrets of Stonehenge*, was first broadcast on 16 November 2010 and is now available for download on iTunes and YouTube, for which it currently has 49,000 views [S2]. In addition to the initial viewing figures, each programme has been repeated a number of times on their host channels, while also being available through on-demand services. They have also been shown to many millions more in Britain, North America, Europe and other English- and Spanish-speaking countries. In addition, German, Russian, Japanese and other American film crews have made documentaries about the project. The widespread dissemination through the media has increased public awareness of the project results, changing the general public's perception of the nature and use of Stonehenge and of society in the British Bronze Age, indicated by the responses of reviewers to these documentaries such as '*by the end you genuinely felt like you had increased your own knowledge*', and '*A truly fantastic programme showing how far our ancestors travelled at a time when we thought they only moved a few miles from where they were born*' [S3].

It was the front-cover story for *National Geographic Magazine* in June 2008 (circulation 9 million and published in 36 languages) [S4], and has appeared in the National Trust's magazine (National Trust membership is 4 million). These magazines aim to disseminate science and research findings in a readable and well-illustrated format to educate and inform a world-wide public.

The discoveries of the Durrington Walls settlement in 2006/7, the Stonehenge findings of 2008 (in 430 international publications), and of Bluestonehenge in 2009 received heavy news coverage. These included the LA Times (circulation 572K, ranked 5 in US), Washington Post (circulation 512, ranked 8 in US) and Boston Globe (circulation 360K) amongst the many other newspapers across the world who carried it as front-page news and/or ran large feature articles [S5].

The director and staff have given hundreds of lectures to packed audiences of local societies, museum groups, tour guide groups and the general public in Britain, the US, Sweden, Denmark, the Netherlands, Spain, Tenerife (Institute of Astronomy), Croatia, South Korea and Australia. For instance lectures on Stonehenge by Parker-Pearson in 2008, 2009 and 2010 and the 'Stonehenge debate' at Salisbury Guildhall were attended by 200, 197,196 and 79 attendees respectively.

Economic Benefits for local tourism

Increased public interest in the site has led to economic benefits for tourism in the Salisbury area, and particularly for Salisbury & Stonehenge Guided Tours [S6]. Visitor numbers on the tour have increased year on year from ~300 in 2008 to ~800 for year ending April 2013, resulting in a 265% rise in turnover (from £20k to ~£53k) over the same period. Visitors taking the 5-hour tour frequently travel by train from London and stay overnight in Salisbury to enjoy the town's facilities, providing national and local economic benefits. Comments include - '[The guide] made Stonehenge and its surrounding landscape come alive with his passion, his in-depth knowledge of the monument, related sites and the area and his "hot off the press" insights gleaned from his involvement with the on-going "Riverside Project"' and 'Simply put, there is no better way to visit Stonehenge than with PS'. (Trip Advisor 328/330 reviews excellent).

Cultural impact and contribution to national cultural life

The project has provided new information on Stonehenge (chronology, landscape context, narrative, house reconstructions, population, meaning and cultural significance etc.), both for updating guide books and for the complete re-design of the visitor centre (Parker Pearson was consultant for the exhibition centre) opening in 2013. At present the site attracts over 1 million people p.a. and so the new-look centre is designed to accommodate and inform such a large international audience. A new booklet, arranged by Jennifer Moore at Sheffield, was sponsored by

the increase in visitor numbers from Salisbury & Stonehenge Guided Tours [S6].

In 2008 and 2009, Art+Archaeology – a group of seven international artists – responded to the archaeological excavations of the Stonehenge Riverside Project [S7]. The Director (an archaeologist) and co-director (artist in residence at the project 2007 and 2008) presented exhibitions at the Whitworth Art Gallery, Manchester (May-December 2008 with 34,900 visitors) and subsequently at the Oliver Holt Gallery, Sherborne (Sept-Oct 2009). Another exhibition 'Touchstone: an encounter between art and archaeology' at Salisbury Museum (2010) had 3,800 visitors. The Stonehenge Spectacular event for National Archaeology Week in 2008, also at Salisbury Museum, was attended by 670 visitors [S8]. A photographer also recorded the excavation and, partly on the strength of this, was subsequently appointed Leverhulme artist in residence at the University of Sheffield.

Education - enhancing children's knowledge of Stonehenge

The research has generated interest within different educational media across different sectors of the community from children's books and magazines to general interest archaeology. It has regularly featured in issues of the popular magazines *British Archaeology* and *Current Archaeology* (each with circulation over 17,000) [S9] as well as the American children's magazine *Dig* (current circulation 12,000). The research also led to a children's *National Geographic* book *If Stones Could Speak*, aimed at 10-14 year-olds across the English-speaking world which won the Orbis Pictus Honor for Outstanding Nonfiction for Children Award 2011, and sold nearly 15,000 copies (to May 2013) [S10]. The readership and range of these different publications aimed at a younger audience suggests the message relating to the role of Stonehenge, its peoples and its place in the landscape will become embedded in their understanding of prehistory.

Educational impact – Skills training for the next generation

The project has enhanced skills training. Approximately 1,000 students from different disciplines (including archaeology) and nationalities, as well as local volunteers were trained in archaeological techniques at Stonehenge during the project's lifetime. The students have come from universities throughout Britain, Ireland and across Europe, from Sweden to Portugal. Many are now professional contract archaeologists, returning in subsequent seasons to work as supervisory staff. Local volunteers have become skilled, passionate and well-trained archaeologists. Approximately 6,600 interested visitors (about 38% of them from overseas) were shown around the project's excavations by our outreach team populated by local volunteers in 2008.

The project also led to the development of new technologies. Additional funding from Google to Parker Pearson has enabled development of a new concept 'Google Under the Earth' using SRP's results as a pilot study. This was launched in 2011, and allows Google Earth users to travel through the Stonehenge landscape, looking under the surface at the results of our excavations and geophysical surveys.

5. Sources to corroborate the impact

S1. www.barb.co.uk for corroboration of Time Team, Channel 4 viewing figures.

S2. The PBS website (http://tinyurl.com/28e68ym) corroborates Sheffield's contribution to the documentary (via transcript).

S3. Express and Star website (http://tinyurl.com/p3pojem).

S4. National Geographic website (http://tinyurl.com/p6v2k88).

S5. e.g. Washington post (http://tinyurl.com/oues83p 26/05/2008), NY Times (http://tinyurl.com/or3z8so 30/05/2008), Boston.com (http://tinyurl.com/pj3v32h 09/03/2013), LA Times (http://tinyurl.com/y9r7uv7 06/10/2009)

S6. The Salisbury & Stonehenge Tours manager can corroborate the increased interest in tours of the site following public engagement activity about the project.

S7. Art+ Archaeology website http://tinyurl.com/oogbd39 confirms the organisation's artistic response to the project findings.

S8. Salisbury Museum can corroborate exhibitions/lectures/debate numbers.

S9. Corroboration contact for *Current Archaeology* readership available.

S10. National Geographic book sales corroboration contact available.