A selection of ceramic vessels and terracotta oil lamps recovered from a 7m-deep well in the eastern portico of the Hellenistic agora *of Paphos, the ancient capital of Cyprus (featured in this month's Project Gallery). The material forms a homogeneous, closed deposit dating to the late second century or first half of the first century BC. © Robert Słaboński, Paphos Agora Project.*

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'Staged' excavation of a later Neolithic henge and Early Bronze Age barrow at Barleycroft Farm/Over, Cambridgeshire, UK, in late Spring 2015 (featured in this month's Project Gallery). © Dave Webb, Cambridge Archaeological Unit, University of Cambridge.

EDITORIAL

The summer of 2015 marks the seventieth anniversary of one of the tragic turning points in recent human history: the detonation of the two atomic bombs at Hiroshima and Nagasaki on 6 and 9 August 1945. Those events were soon followed by the Cold War and the build-up of nuclear arsenals capable of obliterating the world population several times over.

Cold War bunkers, missile silos and test sites all form part of 'atomic age archaeology'. In September 2014, George Johnson writing for *National Geographic* drew up a list of '8 places that showcase atomic age archaeology for tourists'. They include locations directly connected with the invention of this devastating new weapon: Ellis Avenue at the University of Chicago and Los Alamos in New Mexico where the research was carried out, and the Trinity Site south of Los Alamos where the first atomic bomb was exploded. They also include the harrowing memorials of Hiroshima and Nagasaki, and Bikini Atoll in the Marshall Islands where islanders were ruthlessly displaced to make way for underwater tests in the 1940s and 1950s. Failed attempts to clean up the nuclear fallout and allow the islanders to return have left it "a destination for divers, who can explore the sunken wreckage and lament the Bikinians' fate".[1]

The physical legacy of the Cold War has become a specialist focus for some archaeologists. With the fall of the Berlin Wall in 1989, many military sites went out of use and began to decay. This prompted a first wave of fieldwork, to record what became a rapidly deteriorating archaeological record. The Berlin Wall itself was a subject of archaeological enquiry (see *Antiquity* 67: 709–33).[2] Meanwhile, here in the UK, English Heritage commissioned a survey of the surviving remains of buildings and bunkers. Although structures designed to withstand nuclear attack were (not surprisingly) in no imminent danger, the survey concluded that many of the more ephemeral features would soon disappear (*Antiquity* 76: 664–66).[3]

In the USA, the historic districts of Frenchman Flat and Apple-2, part of the Nevada test site, furnish a material legacy of many atmospheric and underground nuclear tests. Here, Colleen Beck of the Desert Research Institute has carried out a long-running project cataloguing and recording the remains of the various structures built specially to test the effects of a nuclear blast on different kinds of materials. Over 650 buildings, structures and objects associated with nuclear testing have been recorded, along with some exploring

[1] Johnson, G. 2014. 8 places that showcase atomic age archaeology for tourists. *National Geographic*. 17 September 2014.
[2] Baker, F. 1993. The Berlin Wall: production, preservation and consumption of a 20th-century monument. *Antiquity* 67: 709–33.
[3] James, N. 2002. The Cold War. *Antiquity* 76: 664–66.

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the use of nuclear technology for peaceful purposes. The entire landscape is a remarkable testimony to the post-war condition.[4]

Apple II house at the Nevada Test Site (photograph: John Schofield).

For archaeology, as we know, one unexpected outcome of the nuclear bomb was the development of radiometric dating techniques. O.G.S. Crawford, founder and first editor of *Antiquity*, began his editorial notes for September 1949 with a striking announcement:

> *A discovery has been made in America which may be of the greatest use to archaeologists. It consists of a method of dating dead pieces of formerly living substances (such as wood and bone) by means of their radiocarbon content.*[5]

Less encouragingly, he continued: "The details are highly technical and beyond the comprehension of those who are not specialists". The technique he was describing was (of course) radiocarbon dating, a cornerstone of modern archaeology.

Crawford summarised the results of Libby's initial results, dating wooden objects from ancient Egypt. Subsequently, the method underwent a series of refinements, notably tree-ring calibration in the 1960s, and then the introduction of the AMS technique in the 1980s, which enabled much smaller samples to be dated. More recently still, there has been a further 'revolution', with the introduction of Bayesian statistical analysis allowing radiometric dating results to be combined directly with archaeological information. As Buck and colleagues wrote in *Antiquity* almost 25 years ago, Bayesian statistics have "wide

[4] Beck, C.M. 2014. Nevada test site, in Smith, C. (ed.) *Encyclopedia of global archaeology*: 5247–52. New York: Springer.

[5] Crawford, O.G.S. 1949. Editorial. *Antiquity* 91: 113.

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applicability to radiocarbon determinations from sites where good information exists about the relationship between the events being dated" (Buck *et al. Antiquity* 65: 819).[6]

Bayesian analysis has been applied with great success to a growing variety of prehistoric subjects, including British Neolithic long barrows, Çatalhöyük, Hawaiian temples and Great Zimbabwe, many of them featured in *Antiquity*. In the current issue, Nenad Tasić and colleagues report the results of a further application of this technique to the impressive prehistoric tell-settlement of Vinča-Belo Brdo in Serbia, on the banks of the River Danube. Vinča was one of the sites that helped fix the prehistoric chronology of Europe for Gordon Childe in *The Danube in prehistory* and *The dawn of European civilization*, almost a century ago. Its 10m-high stratigraphy of successive occupation layers made it key to unravelling the prehistoric sequence of south-east and Central Europe in the decades before absolute dating methods were available. That deep stratigraphy also makes it an ideal subject today for the application of Bayesian chronological modelling.

Tell sites are a common feature of south-west Asia, but in Europe they are largely confined to the Balkans and the south-east; they do not spread far into Central Europe. Where they do occur, however, they all too easily steal centre stage through their size and prominence. A ploughed-out settlement buried in a field can hardly compete for visual impact with a 10m-high settlement mound. But for all their visibility, it would be entirely wrong to conclude that every Neolithic denizen of south-east Europe lived on a tell—many people did not, and, furthermore, the tell settlements themselves did not last beyond the end of the Late Neolithic. What caused them to be abandoned? The new dating programme reveals that at Vinča-Belo Brdo the end was associated with dramatic conflagrations. Within a space of only 25 years, perhaps even less, houses on top of the tell were twice burned to the ground. The precise chronology now available is vital to understanding the sequence of events, but it does not in itself show us how these fires were caused. Aggression is at least one possibility. Did the Vinča community collapse in a maelstrom of violence and insecurity? Or were these merely accidents, kitchen fires, fanned by the wind to consume entire neighbourhoods? At all events, nobody returned to rebuild.

Given the huge potential of AMS radiocarbon dating, applicable to smaller and smaller samples at lower and lower costs, coupled with clever statistical modelling, it is a sobering thought that all may not continue to be well, at least not as far as samples of relatively recent age are concerned. Yet such is the warning sounded by Heather Graven of Imperial College London. Writing recently in the *Proceedings of the National Academy of Sciences*, she points out that the massive increase in fossil CO_2 emissions over the past century is ageing the atmosphere artificially. CO_2 released by fossil fuels has lost virtually all of its ^{14}C. It constitutes an increasingly large proportion of the earth's atmospheric CO_2, which is absorbed by living things. As levels of fossil fuel CO_2 continue to rise, those living things will begin to have ^{14}C signatures equivalent to archaeological samples of up to 2000 years old. As Graven concludes, "For archaeological or other items that are found without sufficient context to rule out a modern origin, radiocarbon dating will give ambiguous results".[7] That

[6] Buck, C.E., J.B. Kenworthy, C.D. Littonal & A.F.M. Smith. 1991. Combining archaeological and radiocarbon information: a Bayesian approach to calibration. *Antiquity* 65: 819.

[7] Graven, H.D. 2015. Impact of fossil fuel emissions on atmospheric radiocarbon and various applications of radiocarbon over this century. *Proceedings of the National Academy of Sciences USA* 112: 9542–45.

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might not matter for many archaeological samples, but it could have a profound impact on forensics, for example. What if one were unable to distinguish between a recently deceased murder victim and an individual who perished several centuries ago?

Mummies at home?

Fossil fuel emissions may complicate the future of the recent past, but for bodies long dead they should not pose a problem. Those bodies, however, come with their own attendant complexities. The skeleton we excavate is the product of both taphonomic transformations and cultural manipulation. It is, indeed, very much an artefact, but one whose post-mortem trajectory may be very difficult to reconstruct from the remains as they stand. Consider, for example, the account of one burial custom in Western Australia, described by a colonial official just over a century ago:

> *At Princess Charlotte Bay, although every effort is made to prevent a fatal termination to sickness or accident within the precincts of a camp, by removing the moribund patient to a distance, there appears to be no compunction about bringing the corpse back immediately after death, and temporarily burying it well within the camping ground. [. . .] After some three or four days, when the friends and relatives who have been sent for are gathered round, the body is exhumed, and packed up in a piece of bark, the ends of which overlap like a tongue, while the sides are sewn across in single boot-lace style. In this fashion the corpse is carried about from camp to camp for a long period, many months maybe, indeed until such time as the deceased tells his brother, uncle, etc., who it was that doomed or put him to death* (Roth 1907: 371).[8]

A little later, the same writer tells us of the Torilla or Pine Mountain. Here the custom was to bury the body of an adult male in a shallow grave half a mile from the camp; after decomposition, the bones were disinterred and deposited in a triangular aperture cut in a hollow tree.

Such behaviours are going to be hard to recognise from archaeological remains, but careful observation and innovative analysis can sometimes reveal that burial practices in the past—even the prehistoric past—were just as complex. Witness the story revealed by Thomas Booth and co-authors (pp. 1155–73). It was a considerable surprise to learn a few years ago that two Bronze Age skeletons excavated beneath Late Bronze Age roundhouses on South Uist, a small island off the west coast of Scotland, had been mummified (*Antiquity* 2005: 529–46).[9] Further surprise was occasioned by the discovery that these were not complete bodies but composites, in which parts of several different individuals were combined together. The Merina of Madagascar practise unusual (and to our minds rather gruesome) customs in which the fully or partially decomposed remains of dead kinsfolk are rewrapped and recombined during occasional *famadihana* ceremonies (Bloch 1971).[10] It is possible that some prehistoric

[8] Roth, W.E. 1907. North Queensland ethnography. Bulletin 9. Burial ceremonies and disposal of the dead. *Records of the Australian Museum* 6: 365–403.

[9] Parker Pearson, M., A. Chamberlain, O. Craig, P. Marshall, J. Mulville, H. Smith, C. Chenery, M. Collins, G. Cook, G. Craig, J. Evans, J. Hiller, J. Montgomery, J.-L. Schwenninger, G. Taylor & T. Wess. 2005. Evidence for mummification in Bronze Age Britain. *Antiquity* 79: 529–46.

[10] Bloch, M. 1971. *Placing the dead: tombs, ancestral villages, and kinship organization in Madagascar*. London: Seminar Press.

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communities of north-west Europe did something similar. But mummifying the dead gives it a whole new dimension.

Could it have been accidental? Did Scottish island communities burying bodies in peat bogs discover to their surprise that the anaerobic burial environment preserved them? Maybe so, but Booth *et al.*'s analysis of Bronze Age skeletons from Britain reveals that almost half of them displayed Oxford Histological Index scores typical of mummification, including burials from lowland southern England, a long way from the Bronze Age peatlands of the north and west. Hence this was no accident. Some bodies may have been mummified by submerging them in wetlands, others preserved by smoking. All that survives today are the skeletons—the preservative effects were far from permanent. There is certainly nothing to match the well-known mummified corpses from Egypt or Peru. But they appear to form a distinct tradition, one that was current for most of the British Bronze Age. This should make us think more carefully about the bones we encounter in excavations. Did these communities keep their mummified ancestors in special shrines? It is an evocative image, far removed from our modern Western preoccupation with keeping death at a distance.

Peer review—an ongoing debate

There has been renewed discussion recently about the efficacy of the peer-reviewing process that is used by most academic journals. The *Times Higher Education* ran an article in August recounting notable cases where it had not worked well, presenting a range of views from authors and reviewers across a variety of disciplines.[11] There are evidently some who dislike or mistrust it, just as there are many others who support it. But long gone are the days when an editor would decide whether to accept a paper for publication merely on the basis of his or her own opinion. Seeking specialist advice is essential if editorial decisions are to be appropriately informed—not only because many of the papers a journal receives for consideration fall far outside one individual's area of expertise, but also to maintain a sense of perspective and impartiality.

We are acutely aware that reviewer comments can sometimes be robust, but we seek to ensure that they are fair and constructive, and I hope we mostly achieve that. Nobody of course likes to receive disappointing news, and pressure on space as well as academic evaluation means inevitably that we are unable to accept all the papers that we receive. Our hope nonetheless is that the peer review comments—whether papers are accepted or declined—can be viewed as a positive feature, both in informing and explaining our decisions to authors and in helping them strengthen and improve what they have written. We are therefore extremely grateful to all of our peer reviewers, who perform an essential service—not only for the *Antiquity* editorial team, but also for all our authors and readers.

Chris Scarre
Durham, 1 October 2015

[11] Times Higher Education. The worst piece of peer review I've ever received, 6 August 2015. Available at: https://www.timeshighereducation.co.uk/features/the-worst-piece-of-peer-review-ive-ever-received (accessed 27 August 2015).

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