

PAST

THE NEWSLETTER OF THE PREHISTORIC SOCIETY



The Tregiffian project: analysis of an entrance grave

The Tregiffian project is the analysis and dating of the archive from unpublished excavations at an entrance grave at Tregiffian in Penwith, Cornwall. The project involves analysis and publication of the very significant findings from the site and aims to establish a thorough chronological basis for the use of the entrance grave for burial, as well as analysing the burials and ceramics from the site and detailed photogrammetry of the stones. The work is being funded by a British Academy/Leverhulme small research grant.

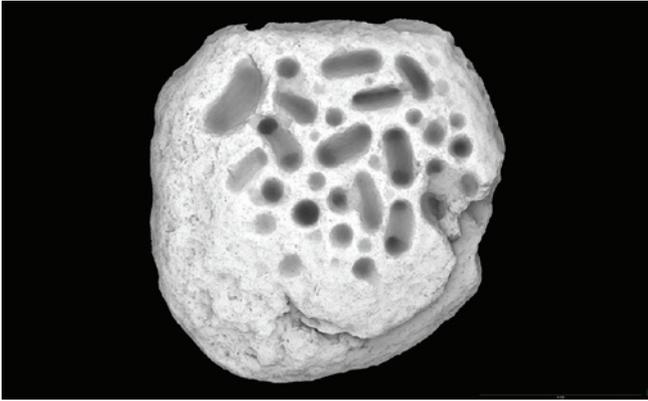
Entrance graves, of which approximately 12 are known in west Cornwall, are now thought to broadly date to the second millennium cal BC. Chronologically and morphologically they are related to late megalithic tombs found in the Isles of Scilly and Ireland and other parts of the Atlantic Façade, including the Irish Tramore group, wedge tombs and the Bargrennan tombs of western Scotland.



Tregiffian during excavation showing chamber area and kerb in the foreground and the extent of the mound to east

Where records exist, entrance graves generally contain quantities of cremated bone in their chambers. Tregiffian is no exception to this, although the number of surviving deposits inside it is remarkable. The precise chronology for entrance graves, however, has been hard to determine because only one other example in Cornwall, at Bosiliack, was excavated to modern standards and is associated with radiocarbon determinations which fall in the latter part of the Early Bronze Age. The remaining examples in Penwith have been disturbed with no record or were excavated in the late 19th century and therefore have neither been scientifically dated nor had a modern standard of analysis of the human remains present. This means that we know little of the timescale or range or length of burial practices associated with these sites. Even the excavated site at Bosiliack may not be typical as it was a small example with evidence for only one cremation burial being deposited inside it.

The excavations at Tregiffian were undertaken by Dorothy Dudley in 1967–8 and subsequently by Arthur ApSimon in 1972–3. These seasons of excavation revealed that, unlike all other megalithic tombs of this form, Tregiffian had a complex history which included the deposition of cremated human remains in the chamber and within three pits, one of which contained a ceramic vessel and another sherds, and alterations of the kerb which may have been intended to block further access to the site. Uniquely for a Cornish entrance grave, the excavations also revealed evidence for the incorporation of rock art on several stones within the monument. Three cup-marked stones were built into its structure and eventual blocking. The entrance was flanked by a highly decorated cup-marked stone, a second (possibly reused standing stone) was used as a capstone and the third was set in the apparent blocking material. A fourth decorated stone was found in disturbed material on the east of the site.



Depth-shaded render of photogrammetry data, showing the rock art. Note grooves and cup-marks and the marking of the ends of some grooves by cup-marks (Image: Thomas Goskar)

ApSimon was asked by the then Department of Environment to take both his and Dudley's excavations to publication but was never able to publish the site. After his death in 2019 the archive was deposited with English Heritage who have who made it available to the project team to analyse and publish. The archive is exceptionally rich for an entrance grave. It includes a large number of colour slides, plans and notes and an artefactual assemblage which includes flints

and pottery and, most significantly for the dating of the site, several deposits of cremated human bone.

Initial results from the current project have included study of the cremated bone by Clare Randall. This has identified a total of 553 highly fragmented pieces of bone, which include an adult in the chamber and a juvenile in the pit with sherds. Ten samples of bone have been radiocarbon dated and the determinations all fall in the period between c.1850 and 1500 cal BC. The ongoing analyses of the contents of the entrance grave are significant as they provide the first evidence for multiple burial and a range of radiocarbon determinations. The next stage will be to model these dates.

In addition to the analysis of the contents of the entrance grave, a detailed photogrammetric record of the rock art has been made by Thomas Goskar. Analyses of the 3D data are revealing more detail of the rock art than has been seen before, including the large entrance flanking stone, which has both circular cup-marks and deeper longer grooves. Interestingly, there is evidence for time depth, with the ends of some of the grooves appearing to have been (re)defined by cup-marks.

Andy M Jones (andy.jones@cau.org.uk), Cornwall Archaeological Unit and Henrietta Quinnell, University of Exeter

Re-dating of a notable Early Neolithic pit at Rookery Hill, Bishopstone, East Sussex

Excavations on Rookery Hill, Bishopstone, East Sussex, were conducted between 1967 and 1975 by Brighton and Hove Archeology Society, directed by Martin Bell. A complex multi-period site was investigated, with evidence dating from the Early Neolithic to Anglo-Saxon periods. Rookery Hill is a south-facing spur of chalk Downland overlooking Newhaven harbour and the River Ouse estuary. Early Neolithic evidence included pits, gullies and tree-bowls. Assemblages of struck flint, potsherds and stone objects were recovered from many features. Environmental samples showed that in the Neolithic the immediate area was wooded, followed by partial clearance, some grassland then scrub development.

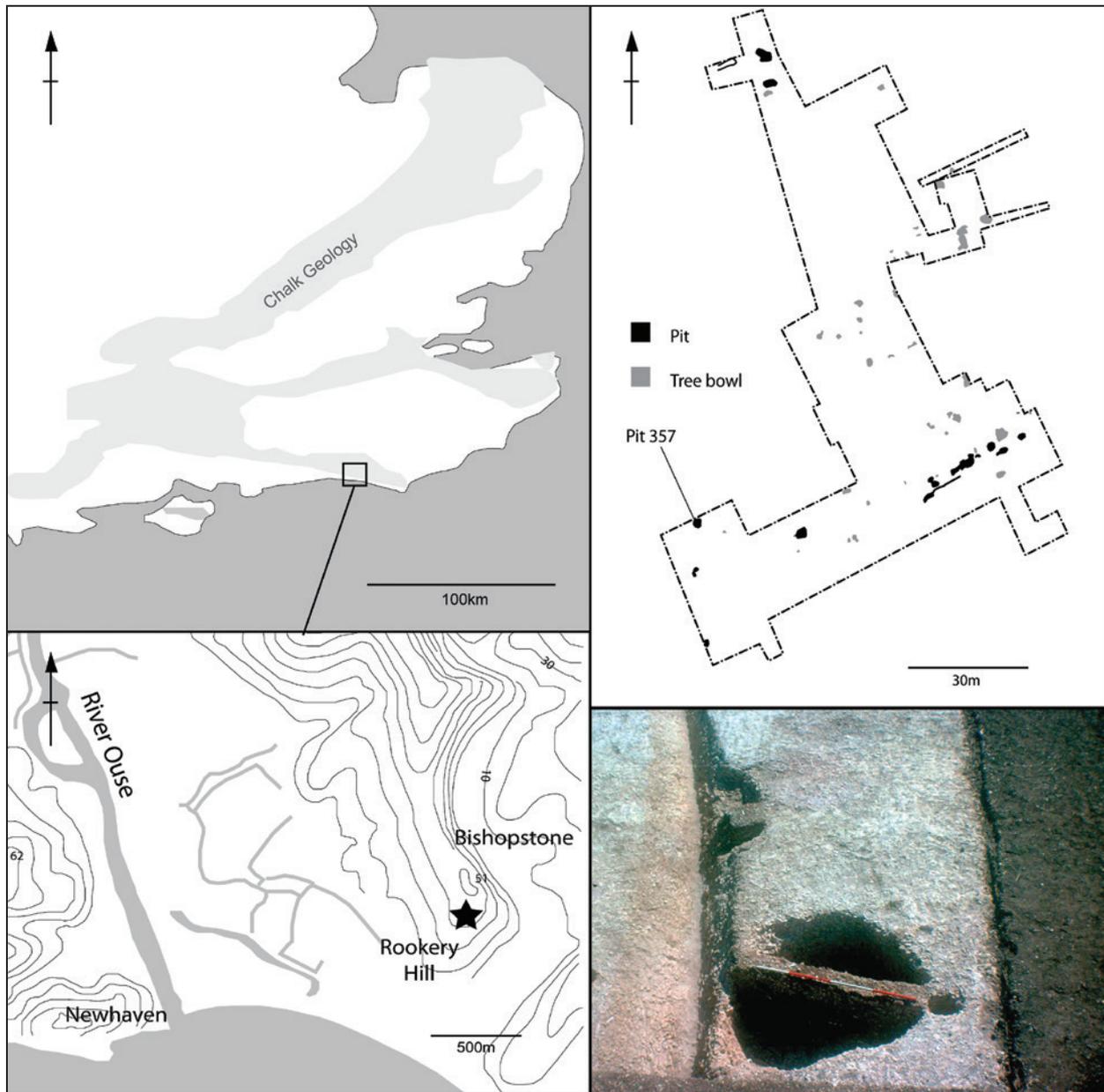
In 2021 two new radiocarbon dates, OxA-40630 (4773±21 BP) and OxA-40631 (4842±21 BP) were obtained from the most artefactual rich feature, Pit 357. The dates were funded by a NERC/AHRC award (NF/2019/2/8) for the authors PhD project undertaken at the University of Southampton, titled *The Early Neolithic flint mines of Sussex and their wider environs*. The dating, 3645–3525 cal BC (95% probability, combined date), adds to the chronology of Early Neolithic activity in southern England.

Pit 357 was roughly circular in plan with vertical sides and a flat base, measuring 2.5 m in diameter and 0.85 m in depth. Distinct backfilling episodes had occurred, beginning with a fill of silty grey chalk with charcoal inclusions which had

been compressed by trampling. Little weathering of the pit had occurred before a 0.5 m thick layer of chalk rubble was backfilled over the silty chalk. Artefacts were recovered throughout the fills of Pit 357, although the majority were located in the middle deposits, including struck flints (c.1000 pieces), pottery sherds (153 fragments), a fragment of saddle quern and animal bone (14 fragments). The struck flint included serrated flakes (43 pieces), two leaf-shaped arrowheads, nine end-scrapers of varying sizes, a broken blade segment from a knife or sickle, four re-touched flakes and a small complete bi-facial axe. The pottery assemblage is typical of the Early Neolithic Plain Bowl and Decorated Bowl ceramic traditions and included sherds from a minimum of 32 vessels, mostly closed or straight-sided bowls with simple rims, but a lugged vessel and three decorated vessels were also present, including a carinated form bowl.

Unusually, for an Early Neolithic feature a substantial number of marine molluscs were recovered from Pit 357 (c.2500 pieces), predominately mussel (*Mytilus edulis* L.), but also smaller quantities of oyster (*Ostrea edulis* L.), pullet carpet shell (*Venerupis pullastra*) and common limpet (*Patella vulgate*), including one that had been purposefully perforated, possibly as an ornament.

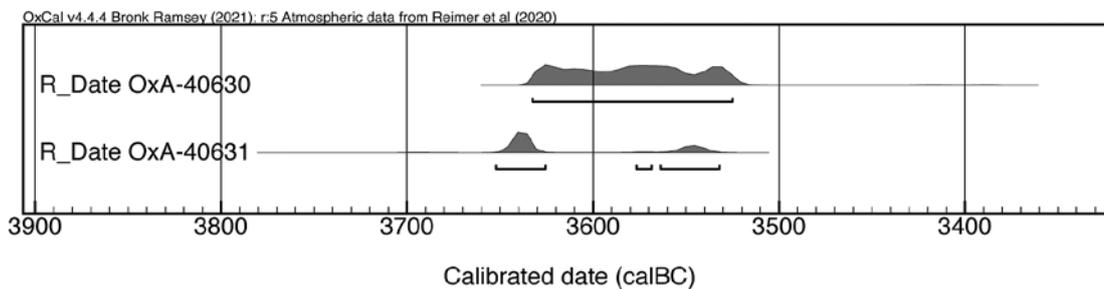
Several factors contributed to the decision to re-date Pit 357. Firstly, a single radiocarbon date (HAR-1662, 4460±70



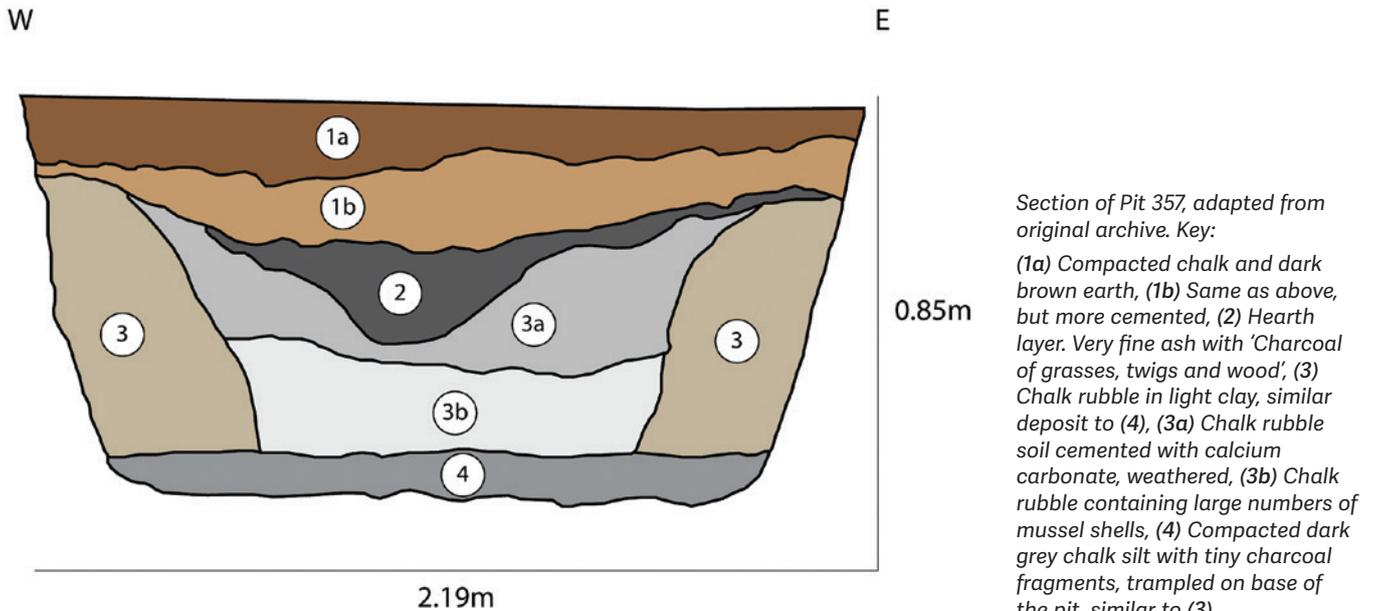
Location of Rookery Hill, Bishopstone, East Sussex, with plan of Early Neolithic features, Rookery Hill (adapted from Bell 1977, Fig 3) and photograph of Pit 357 (Brenda Westley)

BP) obtained from a charcoal sample in the late 1970s gave a middle Neolithic date for Pit 357, 3360–2920 cal BC (95% probability). This date was at odds with the artefactual assemblage, which is characteristic of the earlier centuries of the Neolithic. Secondly, the bi-facial axe was subjected to atomic absorption spectrometry analysis by the British Museum Research Laboratory in 1983, which indicated a geological source in the Worthing area, possibly the Cissbury

flint mines. It was hoped that new dates would refine the chronology of Early Neolithic pottery traditions in Sussex, as another pit dated for this project, Pit X on New Barn Down, was associated with Carinated Bowl pottery and flint mining. As Pit X dated to 3970–3790 cal BC (95% probability), within the accepted chronology for Carinated Bowl, it was reasoned that Pit 357 would be similar in date due to an association with Plain Bowl and Decorated Bowl ceramic traditions.



Plot of new radiocarbon dates from Pit 357



Section of Pit 357, adapted from original archive. Key:
 (1a) Compacted chalk and dark brown earth, (1b) Same as above, but more cemented, (2) Hearth layer. Very fine ash with 'Charcoal of grasses, twigs and wood', (3) Chalk rubble in light clay, similar deposit to (4), (3a) Chalk rubble soil cemented with calcium carbonate, weathered, (3b) Chalk rubble containing large numbers of mussel shells, (4) Compacted dark grey chalk silt with tiny charcoal fragments, trampled on base of the pit, similar to (3)

Pit 357

The new dates from Pit 357 were obtained on two samples of animal bone (*Bos sp.* and *Ovis sp.*) recovered from the lower deposits in the feature. A re-cut and hearth placed in the top of the pit was not dated, although this also appeared to be Early Neolithic. The dates obtained are compatible with the chronology of Early Neolithic pottery traditions, specifically the transition from Plain Bowl to Decorated Bowls. They are also comparable with dates recently obtained from the Cissbury flint mines, which indicate extraction activity between 3700–3600 cal BC, supporting the probable source of the axe.

Within the chronology of the Early Neolithic, Pit 357 dates to an important period when the construction of causewayed enclosures was underway, three of which are recorded within 15 km of Bishopstone, including Whitehawk located to the west, Offham to the northwest and Coombe Hill to its east. It was noted in the Bishopstone report by Martin Bell that

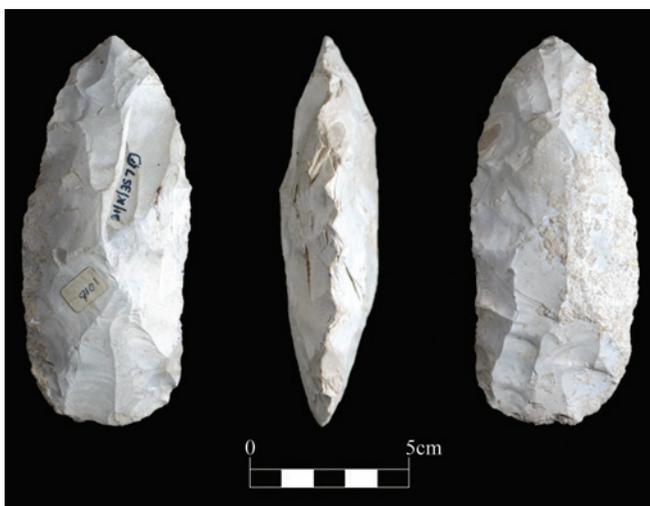
the Neolithic features lay on the periphery of a circle of 115 m diameter. That hint of a proto-enclosure was taken up by Peter Drewett who noted some similarity between the placed deposits in the Bishopstone pits and those in causewayed enclosures. It has further been suggested that this Early Neolithic site may have lain on a trackway which is attested by an early Bronze Age barrow alignment and later enclosure boundaries. The connection between Pit 357 and the neighbouring causewayed enclosures is further evidenced by the similarity of artefacts being deposited, which included lightly decorated bowls, serrated blades, arrowheads, quern stone fragments and animal bone. Although these assemblages are domestic in character, the difference between deposition settings, one monumental and the other a pit associated with a settlement is significant.

Lastly, Pit 357 remains notable due to the presence of a large quantity of mussel shell possibly associated with a feast, questioning the notion that marine resources were entirely abandoned in the Neolithic. This is also called into question by the occurrence of shellfish at Whitehawk and the continuance of shell middens at Prestatyn, Wales, of a similar date.

Acknowledgements

I would like to thank the Natural Environment Research Council and Arts and Humanities Research Council for funding the radiocarbon dates. Thanks are extended to Dan Robertson (Royal Pavilion & Museums Trust) of Brighton Museum and Art Gallery for access to the material. Finally, thanks are also extended to Professor Joshua Pollard for his support and to Professor Martin Bell for his comments.

Jon Bączkowski (baczkowski@umk.pl), Institute of Archaeology, Department of Environmental Archaeology & Human Paleoecology, Nicolaus Copernicus University, Torun, Poland



Bi-facial axe from Pit 357 (photo: J Bączkowski)

Test excavations at the early prehistoric site of Wogan Cavern (Pembroke, Wales)

Test excavations conducted in summer 2021 marked the beginning of a programme of fieldwork at Wogan Cavern (Pembroke, Wales). Supported by the Prehistoric Society, the Natural History Museum, and the British Cave Research Association, with Scheduled Monument Consent from Cadw, the first phase of fieldwork tested for intact deposits and prehistoric archaeological remains and assessed the scientific potential of the cave following antiquarian exploration in the mid/late 19th and early 20th centuries. The summer 2021 excavations identified intact deposits of apparent early Holocene and Pleistocene age and recovered archaeological and palaeontological material attributable to the Mesolithic and (possibly) Palaeolithic periods.

Wogan Cavern (also known as Wogan Cave or simply The Wogan) is an imposing cave that lies beneath the Great Hall of Pembroke Castle. A usable and useful space, the cave has seen multiple phases of historic activity. A walled entrance and gate was constructed during the early 13th century, with a spiral staircase used to access the cave from within the castle. There are also some records of antiquarian archaeological investigation, although frustratingly little is known about the nature and extent of this. Documentary archives and collections held at the nearby Tenby Museum indicate multiple periods of exploration, and possibly structured excavation(s), during which small collections of artefacts were found within or near the cave (Roman coins, Romano-British pottery, and 33 flint artefacts including one of Mesolithic type). Despite the uncertainties surrounding the extent of previous work and its impact on any remaining

extant sediments, the archaeological potential of the cave is clearly high. The sheer size of Wogan Cavern (measuring c.18 m wide and c.22 m deep, with a wide and high north-facing entrance letting in an abundance of natural light), and its close proximity to several known caves with documented prehistoric (including Palaeolithic) archaeology (e.g., Priory Farm Cave, Hoyle's Mouth) mean that it is likely to have witnessed multiple episodes of prehistoric activity. Any remaining deposits may therefore retain potentially important archaeological and/or palaeontological material.

The 2021 fieldwork season comprised a small-scale test excavation, carried out by a team of five over a two-week period in late June and July. Excavation was mainly limited to three 1 x 1 m squares within three planned trenches spread across the rear half of the cave. Given the abundance of material recovered none of these 1 x 1 m squares was fully excavated, but we have already established that important archaeological deposits are present. Post-excavation analysis of the recovered material, including radiocarbon dating, is on-going, but it is already possible to draw some conclusions.

The majority of archaeological and palaeontological material recovered in 2021 came from excavation close to the cave's eastern wall. Cleaning of the thin surface tread revealed an intact calcium carbonate flowstone deposit, which forms the floor in this area of the cave, and which overlies a coherent sequence of undisturbed deposits. Immediately underlying the flowstone floor were red-brown and orange-red cave earth deposits, which contained a rich archaeological layer. From



Pembroke Castle. Wogan Cavern lies beneath the Great Hall (credit: Pembroke Castle)



Left: Excavations in progress at Wogan Cavern, Pembroke (credit: R. Dinnis). Right: Excavation of the early Holocene archaeological horizon in the eastern part of Wogan Cavern, Pembroke (credit: R. Dinnis)

the 1 x 1 m excavated square, more than 300 worked stone pieces and debitage were recovered (including diagnostic Mesolithic tool types) as well as a notable quantity of burnt bone. Together these indicate significant early Holocene activity in this area of the cave. The underlying sediments are a dense limestone scree containing a red-brown clay, which is provisionally interpreted as (Late) Pleistocene in age. These lower deposits were largely sterile but contained some fragmentary bone and possible archaeological material (in the form of a lithic flake fragment) towards the base of the currently excavated maximum extent.

Elsewhere in the cave, our excavation gave clues as to the extent and location of previous exploration. Excavation towards the centre of the cave revealed disturbance from recent historic activity. This included a thin layer of typical antiquarian spoil, containing clods of different sediment types and mixed-age archaeological artefacts (including clay pipe stems, early prehistoric lithics and pottery from different periods). While our investigation in this area was very limited, underlying this spoil are deposits that may be intact. If so, these may represent activity surfaces of historical date.

In the south-west corner of the cave there is further indication of historic excavation. Pickaxe marks are evident on the cave's southern wall, and on a truncated remnant speleothem formation up against the western wall. Both attest to previous large-scale removal of deposits. We recovered four worked lithics from clayey sediments adhering to the underside of this truncated speleothem formation. These are consistent in technology with those found in the opposite, eastern, side of the cave, suggesting that this speleothem formation might be analogous to the undisturbed flowstone deposit uncovered there. If so, the rich early Holocene archaeological layer found by us in the east of the cave may have been removed from the cave's western side by earlier excavation. These early excavations, however, may not have emptied the cave of all intact

deposits in this area; our limited excavation of the cave floor suggests that intact, probably Pleistocene-age deposits lie beneath the disturbed earth that forms the cave floor.

Despite (or possibly because of?) its impressive location underneath Pembroke Castle, our work hints that Wogan Cavern may have escaped the comprehensive antiquarian excavation common to many early prehistoric British cave sites. While largely limited to three incompletely excavated 1 x 1 m squares, our fieldwork confirms intact (or possibly intact) deposits of as-yet unknown depth in multiple areas of the cave, most notably against the cave's eastern wall, where an early Holocene finds horizon contains archaeological material. The nature and richness of this assemblage, and the possible presence of an intact Palaeolithic layer beneath it, demonstrates Wogan Cavern's national importance. Further work is aimed at clarifying exactly what Wogan Cavern has to offer. We hold hope that – like South Welsh caves have done for more than 150 years – it has the potential to answer many outstanding questions about our prehistoric past.

Acknowledgements

Many thanks are due to numerous people for their help with our work on Wogan Cavern, including (but not limited to): Andrew Chamberlain, Jesse Davies, Jonquil Mogg, Marion Hervé, Sid Howells, Edouard Masson-Maclean, Elodie Laure Jimenez, Catriona Pickard, Elizabeth Walker, Dee Williams, Jon Williams and the staff at Pembroke Castle, Sian Williams, Neil Ludlow, several colleagues at DAT, Mark Lewis at Tenby Museum, and Louise Mees at Cadw. We are grateful to the Prehistoric Society for funding the work described here and to the Natural History Museum's Human Origins Research Fund and the BCRA's CSTRI scheme for funding this and ongoing work.

*Rob Dinnis, University of Aberdeen (rdinnis@yahoo.co.uk),
Jennifer C. French, University of Liverpool and John Boulton,
Devon Spelæological Society*

Investigating radiocarbon offsets from marine molluscs on carbonate substrates

Shell middens are a common archaeological feature from Palaeolithic to Iron Age coastal settings around the world. However, complications arise when trying to date a shell midden in the absence of charcoal or bone remains. Our ability to reliably use radiocarbon dates of mollusc shells to estimate calendar ages may depend on the feeding preference and habitat of a particular species and the geology of the region. Gastropods that feed by scraping may be prone to the incorporation of geological carbon into their shells, as evidenced by studies comparing the radiocarbon dates of shells and flesh from different species on different rock types. The powerful radula (teeth-like structure in molluscs) of grazing gastropods are capable of gouging deeply into the rock to remove microalgae as well as other larger objects. The same mechanism, possibly combined with chemical dissolution using mucus, is used for creating the depression scar on which the grazing mollusc makes its home. A small preliminary research project was carried out at ¹⁴CHRONO, Queen's University Belfast. Results from modern limpets (*Patella vulgata*) collected on limestone and volcanic substrates on the coasts of Ireland indicated that the shells were formed in equilibrium with the seawater, with no significant radiocarbon offsets. These results suggest that shell middens in Ireland could be dated reliably using the normal marine reservoir corrections.

Following publication of the Irish results, we were contacted by Dr Darren Fa from the University of Gibraltar. A study using limpets from Gibraltar's limestone coast had resulted in significantly older dates. Dr Fa has a research interest in Palaeolithic evidence from Mediterranean coastlines, and much of this evidence is based on shell middens. ¹⁴CHRONO Centre agreed to collaborate and date different species of modern molluscs from Gibraltar to investigate the offsets. The results proved to be interesting, as only one species of mollusc (*Patella rustica*) returned a significantly older date. Further research was required, so with the aid of a research grant from the Prehistoric Society, modern *P. rustica* shells from different rock types were collected



Patella rustica, the Lusitanian or rustic limpet

from the coast of Sardinia. Radiocarbon measurements were again carried out at ¹⁴CHRONO and the results for *P. rustica* on limestone and carbonate sandstone indicated older dates, whereas the results from granite and basalt indicated no age offsets. Conclusions may be drawn that *P. rustica* cannot be used for radiocarbon dating in areas of carbonate geology, although it is unclear why this is the case. *Patella rustica* is a microphagous herbivore gastropod found in the upper intertidal zones of rocky shores in the Mediterranean. Its position on the upper shore means that it must withstand long periods out of water. To help avoid the risks of desiccation, *P. rustica* has a much slower metabolism than other molluscs and possibly has other physiological differences. Are these physiological differences the reason for the radiocarbon offsets, or are the offsets linked to a direct precipitation of the geological limestone through exposure to rainwater? We hope to collect further samples of various species of mollusc from other locations around the Mediterranean to confirm our conclusion is warranted and maybe shed some light on why this species is so different from others. *P. rustica* is a common species found in shell middens in the region and may have been consumed by the shore-dwelling humans and animals as well as being used for fishing bait. The results may then have a bearing on dating bones as well as shell middens, as any offset from carbon in the mollusc can be incorporated into bone collagen.

Kerry Allen (k.allen@qub.ac.uk), Queen's University Belfast

Sourcing prehistoric materials – new perspectives: the contribution and legacy of Joan Taylor

An online conference organised by the South West Implement Petrology Group and the Prehistoric Society, Saturday 12 November 2022

Joan Taylor made major contributions to the prehistory of Britain, Ireland and beyond over some six decades. One of these centred on gold work and the sourcing of metals, another the sourcing of stone used for axeheads. The conference will therefore focus on recent research into stone and metalwork. Speakers will include David Dawson, Alison Sheridan, Gabriel Cooney, Christina Tsoraki, Christopher Standish, Katharina Becker, Chris Carey, Andy M Jones, Benjamin Roberts, Alan Williams, Emma Wager, and Richard Bradley. Full details will be posted on the Prehistoric Society website.

Programme of meetings 2022–2023

Date	Venue/Format	Details
2022		
Thurs 7 Jun 7.30pm	Lecture Ratray Lecture Theatre, University of Leicester, LE1 7RH	<i>Kindred: Neanderthal life, love, death and art</i> , by Dr Rebecca Wragg Sykes Joint lecture with Leicestershire Fieldworkers and Leicestershire Archaeological and Historical Society
Fri 14 Oct 7.30pm	Lecture The United Reform Church Hall, Church Road, Welwyn Garden City, AL8 6PR	<i>Staging the World of Stonehenge: reflections on the British Museum exhibition</i> , by Dr Neil Wilkin, British Museum Annual joint lecture with Welwyn Archaeological Society
Wed 19 Oct 5.00pm	Lecture Blended (physical/online) Society of Antiquaries, Burlington House	<i>'I see the hands of the generations' – perceiving the past through later prehistoric artefacts</i> , by Dr Sophia Adams, British Museum 22nd Sara Champion Lecture
Sat 5 Nov 2.15pm	Lecture Norwich Castle Museum, Castle Meadow, Norwich	<i>Using visual psychology to interrogate early prehistoric art</i> , by Dr Lisa-Elen Meyering, Durham University Annual joint lecture with Norwich and Norfolk Archaeological Society
Mon 7 Nov 12.00pm	Lecture Online	<i>Early China and prehistoric silk routes</i> , by Professor Li Zhang, Zhengzhou University, China Global Pasts lecture
Sat 12 Nov (time tbc)	Conference Online	<i>Sourcing prehistoric materials – new perspectives: the contribution and legacy of Joan Taylor</i> Day conference with South West Implement Petrology Group
Wed 30 Nov (time tbc)	Lecture Online	In conversation with Professor Colin Haselgrove (working title) Prehistoric Society Europa 2021 event
Sat 3 Dec 2.00pm	Lecture Blended (physical/ online tbc) Swarthmore Education Centre, Woodhouse Square, Leeds, LS3 1AJ	<i>Recent advances in our understanding of the Neolithic in northern and south-west England</i> , by Dr Gill Hey, University of Oxford and Dr Jodie Lewis, Bradford University Annual joint lecture with Yorkshire Archaeological and Historical Society
Mon 5 Dec 7.00pm	Lecture Online	<i>Un-erasing the indigenous palaeolithic: re-writing the ancient past of the western hemisphere (the Americas)</i> , by Dr Paulette Steeves, Algoma University, Canada Global Pasts lecture
2023		
Mon 6 Feb 7.00pm	Lecture Online	Title tbc, by Dr Sada Mire Global Pasts lecture
Mon 3 Apr 7.00pm	Lecture Online	<i>Human evolution research in South Africa: the role of HERI in shaking up our family tree</i> , by Professor Rebecca Ackermann and Dr Robyn Pickering, University of Cape Town, South Africa Global Pasts lecture

All times stated are GMT. We continue to work on our programme with more lectures to be announced later in the year. Please note that meetings may be liable to change. Further details, including how to join virtual meetings, will be available online: <http://www.prehistoricsociety.org/events/>.

Early Bronze Age livestock farming at Swalecliffe, Kent

Swalecliffe lies on the north coast of Kent, between Whitstable and Herne Bay. Before the construction of concrete promenades here, erosion of the low sedimentary cliffs yielded some significant archaeological finds. These include a Late Bronze Age hoard discovered in 1922 and a cremation urn.

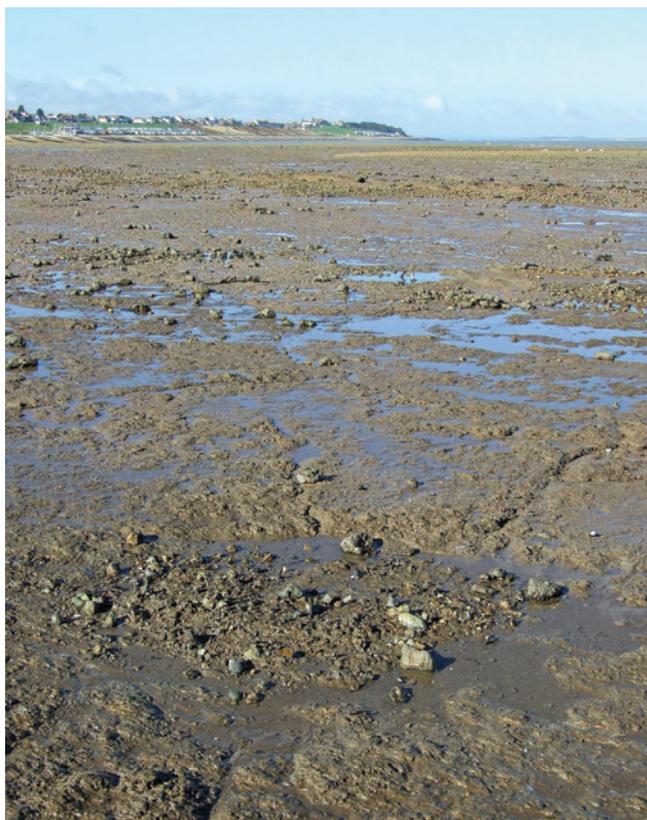
In the early years of the present century, a group of wells dating approximately from the late 13th century BC to the 7th century BC was discovered at the local Wastewater Treatment Works. These are reported in 'A later Bronze Age well complex at Swalecliffe, Kent', written by Masefield *et al.* and published in the *Antiquaries Journal* in 2003, with a second paper following in 2004. The majority of these wells had water draining through their sides at the interface of permeable gravels and the underlying impermeable London Clay. Sheep/goat bones, cattle bones and fragments of dung beetles demonstrated that livestock were nearby.

The present report looks at the nearby foreshore, and in particular at archaeological evidence preserved there in pockets of Early Bronze Age sediment located 450–670 m north-east of the Wastewater Treatment Works. Details are included from the author's Masters dissertation in Environmental Archaeology at the University of Reading. This focussed on using animal bones, molluscs and other biota preserved in alluvium to determine the environment of the foreshore area before its erosion and inundation by rising sea levels.

The main location of interest lies close to where a small stream, the Swalecliffe Brook, crosses the foreshore. Marine erosion, especially by storms, has swept aside areas of shingle to reveal the underlying clays, loams, Pleistocene gravels and other sediments.

Monitoring of the eroding shingle between 2012 and 2015 led to the discovery of at least eight pits or wells located 100–135 m north of high tide line. They were visible as patches of soft silty sediment set in a band of harder silty clay loam and gravel, this being the same gravelly palaeochannel that lies under the Wastewater Treatment Works. Roundwood timbers could be seen in at least three of the pits/wells, several others contained brushwood, and one contained a fragment of wickerwork. Some of the pits/wells were clear of shingle for relatively short periods of time, so they were not investigated in any detail. Where dimensions were recorded, they range from c.1.5 m x 1 m to c.4.9 m x 2 m.

A small branch (little more than a twig) embedded in the upper layer of the easternmost pit/well was radiocarbon dated to 1680–1500 cal BC (95% probability, UBA 29383, 3316±28 BP). Analyses of mollusca and seeds from sealed sediment underlying the C14 sample show evidence of a largely open terrestrial landscape, with some areas of shade. Insect remains from the same sediment suggest a damp location near water, with some evidence for grassland and



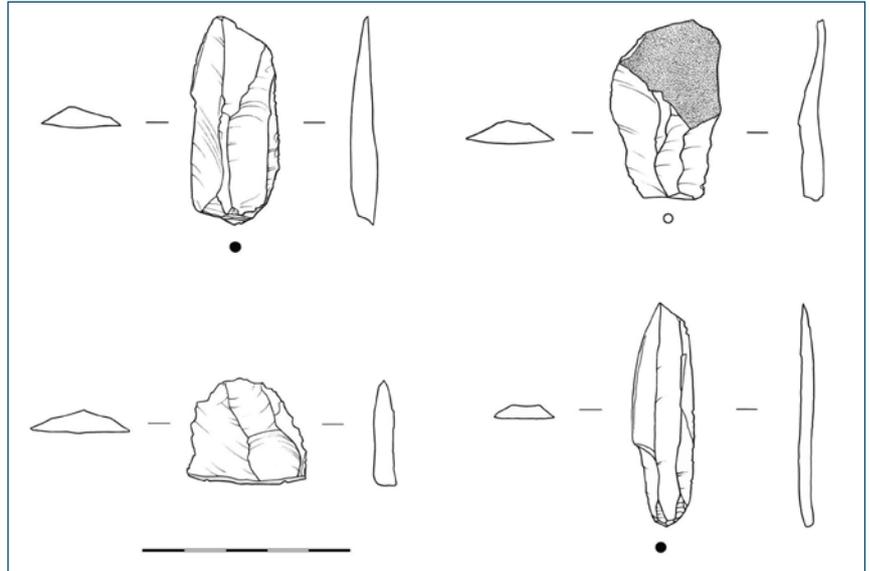
Swalecliffe foreshore at low tide in 2015. The oval, stony feature in the foreground is radiocarbon dated to 1680–1500 cal BC, and is most likely to be the remains of a well

running water not far away. The presence of dung beetles indicates nearby livestock; a tooth from a sheep or goat was also found embedded in one of the pits/wells. There was no indication of occupational waste in the sediment, nor any other evidence suggesting nearby dwellings.

Investigations of this part of the foreshore ended in 2018 following a period of increased erosion and heavy deposition



Probable well 127 m north of high tide line, as seen in 2013. None of the other pits/wells on the foreshore was outlined by stakes in this way. The surface of the foreshore comprises hard silty clay loam to the left of the well and gravel to the right



Left: Goat skull found embedded in grey silty sediment 243 m north of the high-tide line at Swalecliffe. Also embedded in this context was a withy-tie radiocarbon dated to 1740–1540 cal BC. Right: Flint tools found embedded in grey silty sediment approximately 260 m north of the high tide line. Scale bar in cm

of shingle caused by a change in course of the Swalecliffe Brook. Reviewing the evidence recovered and noting the similarity with the wells at the Wastewater Treatment Works, it appears most likely that the eight patches of silty sediment on the foreshore are the remains of wells. Furthermore, the evidence of nearby animals and absence of human occupation suggests it is more probable they were used for watering grazing animals than serving any nearby habitation.

In a separate study area, monitoring of erosion during 2017–2021 led to the recovery of 164 animal bones from an approximately 200 sq m area of grey silty sediment 240–270 m north of the high tide line. The elevation was -1.11 m OD in 2018, much of it eroding down to about -1.4 m by the summer of 2021.

A first radiocarbon date from this context was obtained from a yew withy-tie found embedded in the surface of the sediment near its southernmost limit. This was dated to 1740–1540 cal BC (95% probability, UBA 40352, 3362±29 BP). A virtually complete skull of a goat was recovered from the sediment 4 m to the east.

A radiocarbon date was also obtained from the base of the most northern part of the sediment area, namely 2210–2030 cal BC (95% probability, SUERC 99445, 3728±21 BP). The sample was from the remains of a wattle structure, comprising both horizontal elements and vertical stakes embedded in underlying brickearth. More than half the bones recovered from the sediment were embedded in an area of 14 sq m encompassing the wattle. These included a second goat skull (cranium and mandible).

Analysis of the full assemblage of recovered bones showed they derived from a minimum of four pigs, four sheep/goat, one ox, one dog, one red deer and one pine marten. The latter species, although now very rare in southern Britain, was once more widespread. Some of the animals were juveniles, one

of the piglets being about 2–3 months old (deduced from the teeth), another being 4–8 months or a little older.

Other items found embedded in the silty sediment were heat-fractured flint and flint tools, including a scraper and a blade/knife. Microscopic analyses of molluscs, ostracods and seeds from sieved sediment samples indicate a variety of habitats in an open landscape, with areas of fresh water such as lakes or slow-flowing rivers, and no clear evidence of marine influence. The characteristics of the sediments suggest they are most likely to represent a palaeochannel associated with the Swalecliffe Brook, based on their similarity to palaeochannels at comparable locations such as Peterstone in the Severn Estuary.

Investigations are to continue when erosion uncovers further areas of sediment, and more information will be published in due course. One conclusion from current evidence is that, in the Early Bronze Age, farmers raised pigs, goats, and possibly cows and sheep near the Swalecliffe Brook over 240 m north of the present high tide line. Regular monitoring of the eroding foreshore has also demonstrated the presence in the later Early Bronze Age of livestock and probable wells 100–135 m north of the present high-tide line. These discoveries, together with the wells at the Wastewater Treatment Works, show that livestock farming in this riverside landscape can be traced back in time from the dawn of the Iron Age to the Early Bronze Age, and probably to late third millennium BC.

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Peter Slaughter (peter.j.slaughter@googlemail.com)

Call for proposals for Trans-National Access to scientific facilities and expertise

Do you wish you could use a scientific technique and work with experts experienced in its use to answer research questions about a site or assemblage you are working on? Is there a collection or archive you would like to visit for comparative purposes? If the answer is yes, then please consider putting together a proposal to the IPERION-HS project for funded access to heritage science infrastructure that crosses national boundaries: <https://www.iperionhs.eu/catalogue-of-services/>

You don't have to be based in a university to put in a proposal and your travel, accommodation and time to undertake your piece of research will be funded by the project. A proposal can involve visits to, and collaboration with, more than one institution and can be made by an individual (user) or a group of individuals (user group). Visits can range from a few days to several weeks, can be virtual or involve equipment and experts coming to your site or museum. Proposals can be put in any time in the year with evaluation happening every five months; the next call closes on 30 September 2022.

If you are interested in putting in a proposal, there are videos on how to apply on the IPERION-HS website (<https://www.iperionhs.eu/iperion-hsaccess/>). The user helpdesk (userhelpdesk@iperionhs.eu) is also there to answer your queries and help match potential users with heritage scientists based within the 67 organisations that make up the IPERION-HS partnership.

The IPERION-HS project (Integrating Platforms for the European Research Infrastructure ON Heritage Science) is an initiative funded by the European Commission as part of the Horizon 2020 programme (grant agreement no 101004469). It seeks to develop a connected infrastructure of research facilities situated across Europe and beyond, bringing together researchers in humanities and sciences fostering a culture of exchange and cooperation. The core activity of IPERION-HS is to provide access for researchers to scientific instruments, data, tools and knowledge outside of their core area of expertise so that they can develop their competence and advance the understanding and conservation of cultural heritage: from artefacts to archaeological sites.

Gill Campbell, Historic England

The South West Implement Petrology Group Stone Axe website and online catalogue

In 2019 Cornwall Archaeological Unit was funded by Historic England with support from the Royal Albert Memorial Museum (RAMM), Exeter and the South West Heritage Centre, Taunton to produce an online catalogue of the thin-sections and associated record cards made by South West Implement Petrology Group (SWIPG). The aim of the project was to create an accessible resource for researchers, archaeologists and interested members of the public.

SWIPG arose from the South Western Federation of Museums and Art Galleries Implement Petrology Sub-Committee and has been analysing stone axeheads since 1935. The purpose of SWIPG is furthering understanding of prehistory by the identification of the geological and geographical origin of stone tools from excavations and museum collections. Precise identification requires the preparation of a petrological thin-section of each implement, which can then be viewed under a microscope. Today artefacts are only thin-sectioned where absolutely necessary and the digitizing of the existing sections will help reduce the need for further intrusive sectioning, as researchers will be able to cross-reference photographs and information held in the online catalogue.

Since 1935 SWIPG has thin-sectioned stone axeheads and other prehistoric artefacts. This originally involved the slicing,

and more recently less intrusive coring, of stone tools to create a polished thin-section which can be mounted on a glass slide and examined under a polarising microscope. This enables petrology of the artefacts to be identified and geographically cross-referenced with the 36 rock types which have currently been assigned to established geological Groups across Britain; for example, the Group I metagabbros (greenstones) which outcrop in Penwith, Cornwall.



Stone axeheads held in the collections of the Royal Albert Memorial Museum (© Royal Albert Memorial Museum)



The thin-sections take up a total of 59 trays in three cabinets. These are Cabinet 1, Tray 1 containing Group I 'Greenstone' stone tools. (Photograph: Mik Markham)

In the past, data collected by SWIPG was incorporated into a series of reports which were published within the pages of the *Proceedings of the Prehistoric Society*. However, although SWIPG data was included within the *Stone Axe Studies I and II* volumes, after the movement of axes in the Neolithic period was established beyond doubt, interest in publishing lists of thin-sections from stone axeheads declined. There has been a move away from the presentation of axe numbers by Group towards more synthetic papers, and it is fair to say that, prior to the development of high-resolution colour photography, it was difficult to publish thin-section images in either a useful or interesting way.

Nonetheless, SWIPG has continued to record stone axeheads and today over 2000 artefacts have been thin-sectioned and stored in cabinets, curated at the South West Heritage Centre. Each sectioned axehead also has a paper record form, with a written description of the axehead and a line drawing, so that the artefact can be identified in the future. The paper records, which cross-reference with the thin-sections, are curated at the RAMM. Recently, high resolution microphotographs were taken of newly made thin-sections but the majority of the collection remained un-photographed. The split location of the SWIPG archive, together with a lack of an online platform from which the existing microphotographs could be made available, meant that it was hard to access what is a very large and significant thin-section collection.

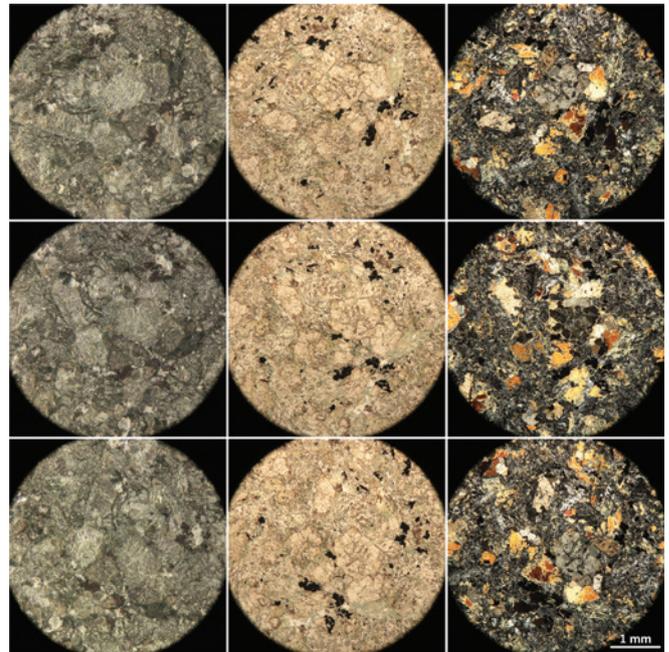
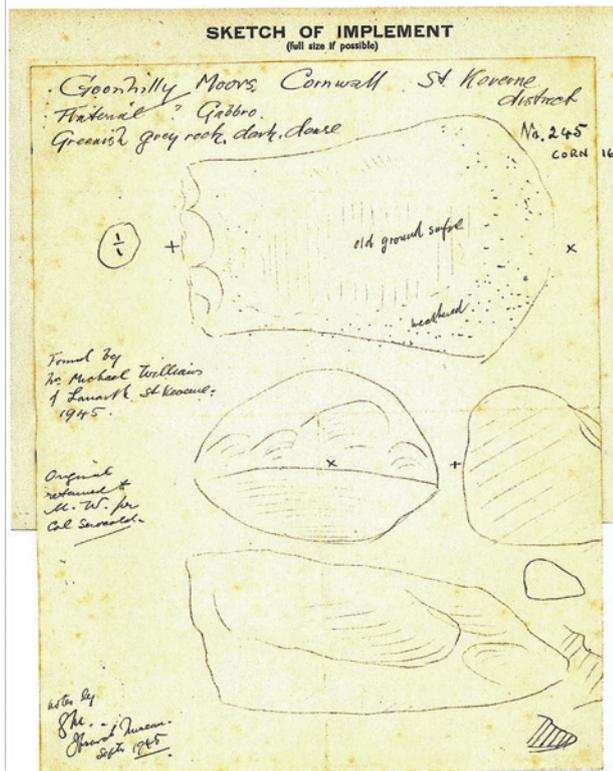
The project was therefore set up to draw the components of the SWIPG archive together via a website. In addition, all the thin-sections in the cabinets were microphotographed to create a complete pictorial record that can be accessed online.

The project began in March 2019 with a workshop group agreeing terminology to be used in the catalogue that would be user-friendly and compliant with other national catalogues and databases, including Historic England's FISH thesaurus. The decision was taken to host and maintain the catalogue as a sub-site of South West Collections Explorer. This is currently an aggregator site for collections from RAMM, South West Heritage Trust and Devon Museums Group and hosting of the SWIPG catalogue on this site will ensure that it is maintained and updatable over the long-term.

All 2042 paper records were scanned and the project spreadsheet populated with the information. The thin-sections in the collection were microphotographed in 0°, 45° and 90° orientation using reflected light, plane polarised light and cross polarised light using x40 magnification (field of view 4.7 mm) and/or x100 magnification. All of the 1677 thin-sections which are currently available in the collection were photographed and are available to view via the website. The catalogue therefore represents a major open access resource for stone axe researchers, students, prehistorians and archaeologists studying implement petrology or the

SOUTH-WESTERN GROUP OF MUSEUMS AND ART GALLERIES I
REPORT OF STONE AXE SUB-COMMITTEE

TYPE OF SPECIMEN <i>Axe (part)</i>	SERIAL NO. <i>245</i> <small>GROUP I COLLECTION</small>
SITE County <i>Cornwall</i>	<i>No Michael Phillips</i>
Parish <i>Greenhilly Moors, St Kew</i>	<i>Lanarth, St Kew</i>
Map Refs. <i>Trevelan Road, SW LXXXI SW</i>	<i>SW 735. 205 G Cornwall.</i>
ASSOCIATIONS <i>Surface find in 1945</i>	<i>SW 732170</i>
REFERENCES <i>Proc. Inst. Br. Mus. (1902) 45</i>	<i>(2)</i>
PETROLOGY (a) Macroscopic <i>Greenish-grey rock weathering rough.</i> (b) Microscopic <i>Typical Group I though epidote rather more prominent than usual.</i>	
Suggested Locality <i>Group I.</i>	P.T.O.



This is a composite of thin-section images of axehead COR 016. The columns, left to right, are reflected light (through a coverslip), plane polarised light, and cross polarised light. The rows are the same position rotated 45° clockwise illustrating pleochroism, if any (plane polarised light), and birefringence (cross polarised light). The 3 x 3 grid is a composite of 9 original high-resolution images. Each of the thin-sections was examined for a view that encompassed the main features of the rock to provide the catalogue entry; detailed analysis would need access to the thin-section and appropriate microscope. In this case, COR 016 (COR 16) SWIPG 245, has been assessed as IPG Group I Cornish 'greenstone' (or uraltised greenstone, epidiorite), now defined as a 'metagabbro' (Photograph: Mik Markham)

A typical SWIPG history card. These cards were used to develop the lists in the early SWIPG reports and then in Stone Axe Studies I and II. Note that additional information has been added, including the Ordnance Survey grid reference (Photograph: Mik Markham)

long-distance distribution of prehistoric stone tools across the British and Ireland. It will also be valuable for amateur archaeologists and members of the public interested in prehistory or geology. The catalogue can be accessed from <https://collections.stoneaxes.org.uk/>

It was also recognized that there was a need to engage with people with no previous interest in archaeology, prehistory or implement petrology. Part of the project was therefore concerned with 'demystifying' the science which lies behind the petrological analysis, by showing the public how we know what we know about stone axes, via a linked website. This reaches beyond specialists to engage with young people and a general audience, thereby giving the project a broader public benefit.

In order to achieve this ambition and to provide a portal to the online catalogue, a website was designed which contains

non-technical explanatory text that is readily accessible to the wider public. In addition, good eye-catching images were selected for use on the website and videos with talking heads explaining petrology have been uploaded. The website can be accessed at <https://stoneaxes.org.uk/>

The records which make-up the SWIPG archive represent a significant resource for researchers and the public alike to make use of. The thin-sectioning cataloguing project is a major step forward towards making this possible, and the authors of this article hope that it will be well used.

Looking forward, the catalogue will continue to be updated, which means that unlike previous published lists, it is not a static resource. It will continue to expand over time to include new sections, and missing thin-sections from the collection can be added. Ultimately it is hoped that the data included within the catalogue can be linked with catalogues and datasets created in other regions of Britain, to form a nationwide stone axehead corpus that is freely available online for all to use.

Andy M Jones (andy.jones@cau.org.uk), Cornwall Archaeological Unit, Tom Cadbury, Royal Albert Memorial Museum, Amal Khreisheh, South West Heritage Trust, Mik Markham Independant Researcher, David Dawson, Chair, SWIPG, Henrietta Quinnell, University of Exeter, and Anna Tyacke, Honorary Recorder, SWIPG

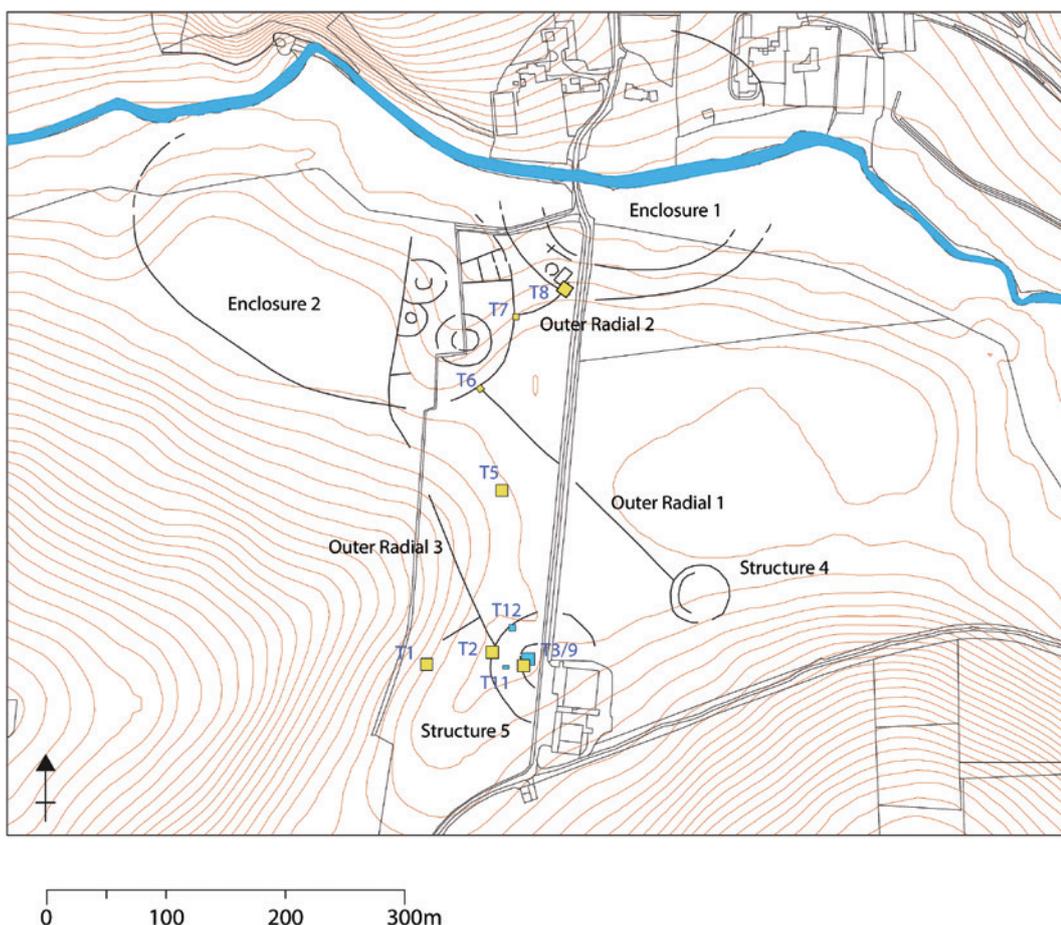
Between a rock and a soft place: a Beaker-period double burial at the West Kennet Palisade Enclosures, Avebury

Set in the valley of the River Kennet c.2 km to the south of Avebury henge, in the shadow of Silbury Hill, the West Kennet palisade enclosures form a significant component of the monumental record of the Avebury World Heritage Site. The palisades comprise two large timber enclosures, themselves containing further timber structures, and external radial palisade lines that link with further circular enclosures to the south and south-east (Structures 4 and 5). Excavations by Alasdair Whittle between 1987–92 showed remarkable constructional uniformity, and evidence of feasting associated with the use of Grooved Ware pottery. Programmes of radiocarbon dating have returned both Middle Neolithic dates (on charcoal) and Latest Neolithic dates (on bone and antler). Our current reading of these is that the construction and use of the palisades most likely dates to the second half of the 3rd millennium cal BC, a horizon that overlaps with the earliest Beaker presence in this landscape.

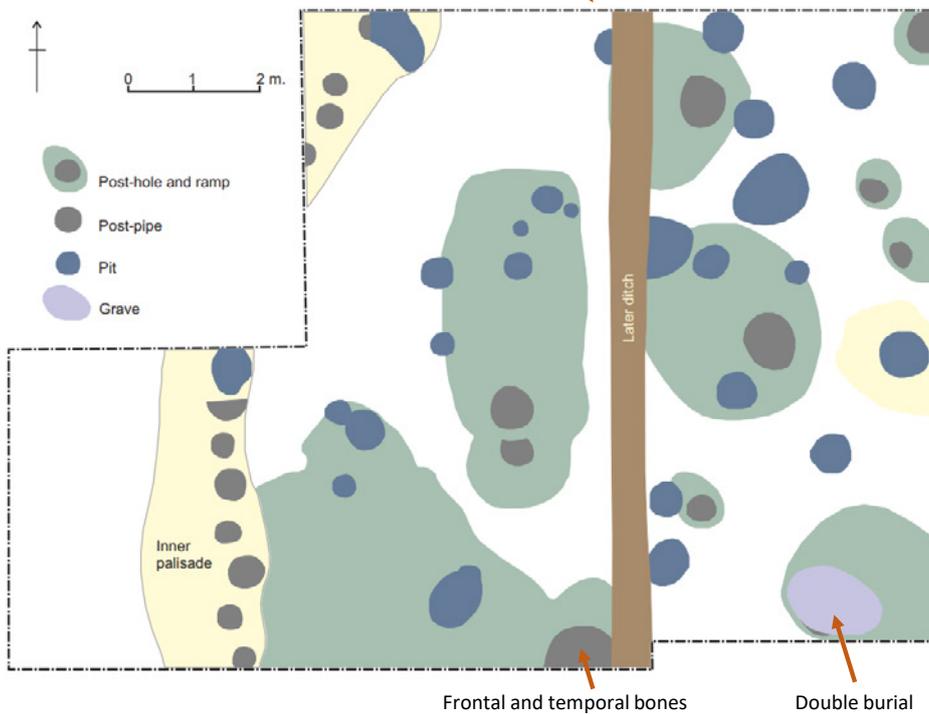
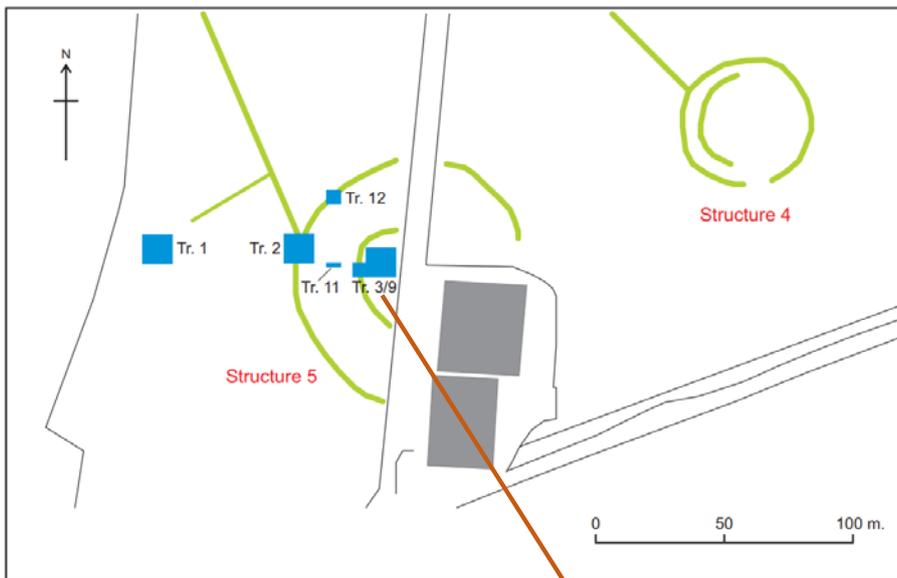
Excavations by the AHRC-funded *Living with Monuments Project* in 2019 and 2021 sought to address matters of chronology and sequence, and the relationship between the palisades and extra-mural flint scatters. Our work included a special focus on Structure 5, which was discovered by aerial photography after Whittle's work. The double concentric circuits of the enclosure were found to be of the same

palisade construction as the rest of the complex, though the inner ring began as a short-lived henge. The greatest surprise was the discovery of a monumental rectilinear post-built setting in the centre, pre-dating the inner enclosure. With individual post-pits reaching 3 m in depth, this structure may have been free-standing or roofed. It finds analogy in scale, if not form, with the great multiple timber circles at the Sanctuary, Woodhenge and Durrington Walls. Richard Bradley has talked of these as 'Great Houses' – monumental structures created to reinforce existing social links in times of change. We found very few artefacts associated with the Structure 5 timber settings. Animal bone represents the most frequent category of find. The discovery of fragments of adult frontal bone and left temporal bone in the post-pipe of one of the post-holes of the central structure in 2019 was unexpected, these being the first human bones from the palisades complex. Since the feature was not fully excavated, it is unclear whether they had been part of an articulated burial, but it seems very likely that they represent disarticulated elements which had been broken and curated.

During 2021, more human remains came to light in a small oval grave cut into the top of a neighbouring post-hole. Initially, the human bones were encountered as crushed cranial and postcranial elements of an adult male underlying a substantial, modified sarsen stone. Exposing the bones



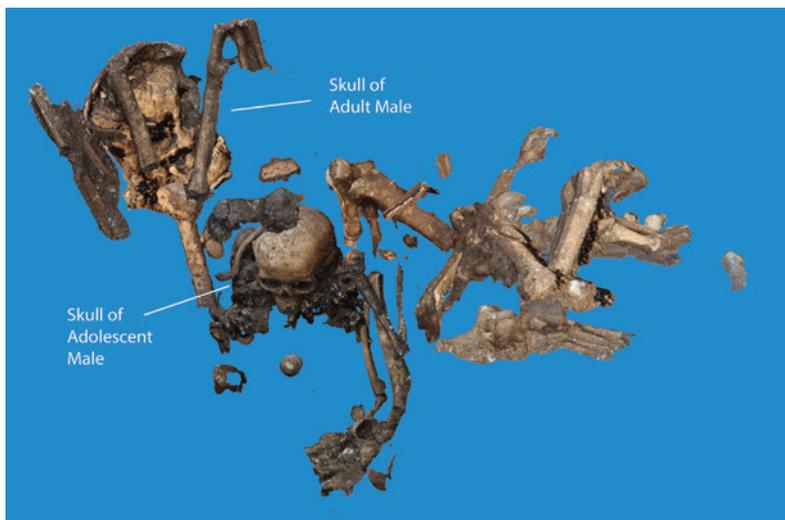
West Kennet palisades with trench positions (after Barber 2013)



The post-holes, pits and grave in the centre of Structure 5

over several days, it rapidly became clear that the grave originally contained a double inhumation of a mature adult male and an adolescent male, the bodies of both having partially slumped into the soft and unstable fills in the top of a massive post-pipe it had truncated. Fortunately, the remains in the post-pipe were in excellent condition, having been preserved in a soft, loose soil. In contrast, the remains in the upper level were in a poor state of preservation; those on the western side had been disturbed and broken by the sarsen boulder, while the lower legs and feet in the shallow eastern portion of the grave were heavily fragmented. From the observed position of the remains, it appears that the adult male was placed first in the grave, on their left side and facing north. The adolescent male was then placed overlying (or slightly adjacent to) the adult in the opposite position, on their right side and facing south. The sarsen boulder was placed over the grave as a marker, but then sunk into the soft post-pipe fills while skeletal elements still preserved a

degree of articulation. One wonders how those who buried these individuals rationalised the stone over the grave being 'absorbed' into the ground! At the base of the excavated post-pipe fill, the thoracic regions of both skeletons were mostly in anatomical connection, providing important evidence that the bodies were deposited as primary inhumations. The bodies were ringed by several 'cobbles' of imported granodiorite, likely brought from glacial till sources on the east coast of England. The only other finds were a barbed-and-tanged arrowhead and a flint knife. Both the arrowhead and burial format hint at a Beaker date. Except for the lowermost excavated layer, the successive excavation stages were recorded using digital photogrammetry (SfM-MVS). The resultant 3D models enable visualisation of the overall configuration of the skeletal remains within the grave and post-pipe. This is being used to better understand the impact of the slumping process and interpret the initial placement of the bodies in the grave.



Left: The central burial at Structure 5. a: crushed cranial and postcranial elements of an adult male underlying a modified sarsen stone. b: bones partially slumped into the fills of the post-pipe

Above: 3D visualisation of the overall configuration of the bodies within the grave and post-pipe (image: Mark Gillings)

Analysis of the skeletal remains identifies the individuals as a mature adult male (45–60 years old) and adolescent male (13.5–15.5 years old). Both displayed evidence of ill health and injuries experienced during their lives. The adult was likely in significant pain from a chronic infection in their maxilla, periodontal disease, a total of ten carious lesions, and several vertebral compression fractures which had caused curvature of their spine and loss of height. Their teeth (particularly the maxillary teeth) were extensively worn; the pulp was exposed on most, and the canines and incisors were worn above the level of the crown and therefore reduced to functional root stumps. This strongly suggests a habitual use of the upper teeth, for example related to processing materials such as hide, bark, sinews or fibres. The adult individual also had a well-healed left first rib, possibly fractured as a result of a fall, heavy lifting, or overhead throwing. The adolescent presents lesions throughout the cranium which suggest they experienced a metabolic disease, probably scurvy. Their right ulna and radius were fractured and had healed well before death, probably broken at the same time from accident or injury such as falling from a height or sustaining high force trauma.

Sarsen lined and capped Beaker burials are known from several other locations in the region, including Beckhampton Grange, Overton Hill and Winterbourne Monkton. There are, too, other multiple burials, notably against Stone 25b of the West Kennet Avenue. The evidence for extensive pathologies in older male adults is also borne out from inhumations at Hemp Knoll and West Overton G6b. Given the variable patterns of biological kinship recently revealed in Chalcolithic

and Bronze Age burials, we are keen to investigate whether these males were biologically related or buried together for other reasons. Further analyses are planned and ongoing, including aDNA sequencing in collaboration with the Pontus Skoglund laboratory, bulk and incremental isotopic analysis, histological analysis of bone preservation, and a programme of radiocarbon dating by the *TIME* Project, led by Seren Griffiths of Manchester Metropolitan University. Results will contribute to a detailed understanding of the lifeways and burial treatment of these individuals, who lived in a time of great social change and were interred in a historically significant location in a remarkable landscape. Their study will contribute to our wider understanding of the negotiated relations between ethnically different people, things, and practices in the later 3rd millennium BC.

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Jess Thompson (jet71@cam.ac.uk), University of Cambridge,
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