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The archaeological potential of Wogan Cavern (Pembroke, UK): results of the first fieldwork season

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Abstract: The impressive Wogan Cavern, lying beneath Pembroke Castle, has been subject to several historic phases of antiquarian investigation. None of these is well documented, however, so little can be said about the cave's archaeological status. Here we summarize previous work at Wogan Cavern and describe the initial results of our 2021 fieldwork at the site, focussing mostly on our investigations close to the cave's eastern wall. Despite the restricted extent of our excavation, it is clear that Wogan Cavern has significant archaeological potential. We identified an intact Early Holocene archaeological layer containing diagnostic Mesolithic artefacts in the eastern part of the cave, sealed beneath a flowstone floor. Underlying this stratigraphically, securely within Pleistocene deposits, is a layer containing palaeontological and possible archaeological material. Elsewhere in the cave there is clear evidence for large-scale disturbance, although initial indications are that substantial intact deposits of ancient sediments might remain. Overall, the nature and richness of Wogan Cavern's Mesolithic archaeological remains, as well as the existence of Pleistocene fauna and possible presence of an intact Palaeolithic layer, demonstrate its importance as an early prehistoric site. Future work will aim further to establish the extent of its archaeological potential.

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Introduction:

British caves and early prehistoric archaeology

The last two decades have seen numerous new analytical techniques applied to archaeological caves, which have added significantly to our understanding of early prehistory. These notably include the identification of animal and human DNA surviving in cave sediments (Vernot *et al.*, 2021; Zavala *et al.*, 2021), the development of proteomic methods capable of identifying to species even extremely small bone fragments (Buckley *et al.*, 2009; Brown *et al.*, 2021), and advancements in the reliability and precision of radiocarbon dating (Jacobi *et al.*, 2006; Fewlass *et al.*, 2020; Devière *et al.*, 2021). While some of these methods are being successfully applied to British cave sites (e.g. Jacobi *et al.*, 2006; Buckley *et al.*, 2017), the potential for their application is limited. One major reason for this is the oft-lamented efficacy of nineteenth-century antiquarians, who often cleared the most promising caves of all, or almost all, of their archaeological deposits, with little meaningful record of their work. Extant collections from these excavations are markedly incomplete and of limited research value. Recent work has been carried out on collections from later (usually twentieth century) excavations, but, because of the limitations of these archives, conclusions must usually be tempered (for a recent example see Higham *et al.*, 2011 vs White and Pettitt, 2012 vs Proctor *et al.*, 2017). More-recent fieldwork has generally been limited to the very fringes of what were once important sites.

The result is that Britain's record of early prehistory is still lacking, relative to that of neighbouring countries in continental Europe. For example, the record of environmental response to rapid climatic changes through and out of the last glacial cycle is much coarser and more incomplete than that evidenced in nearby countries such as France and Belgium (Dinnis *et al.*, 2016). Even the basics of when people did or did not occupy Britain during this time are still unclear (Jacobi and Higham, 2011a, 2011b). It seems likely that new sites – or at least hitherto unrecognized high-quality archaeological sequences remaining at known sites – will be needed to resolve these questions.

One archaeological cave about which very little is currently known is Wogan Cavern in Pembrokeshire (south Wales). In some respects, Wogan Cavern exemplifies the problems described above. It underwent early investigations, during which archaeological material was found, but next to nothing is known about the details of those investigations. It was therefore unknown what (if any) intact archaeological deposits remain at the site.

In 2019 a British Cave Research Association Cave Science and Technology Research Fund-supported assessment of the site and searches of archive collections currently housed at Tenby Museum were carried out by two of us (RD and JB), with the conclusion that the site merited test excavations. Results of the first phase of those excavations are reported here.



Figure 1: View of Pembroke Castle, looking southeast. [Photo: Drew Buckley.]

Wogan Cavern: history, antiquarian exploration and historic collections

Wogan Cavern is situated at British National Grid Reference (NGR) SM 9817 0165, and lies beneath the Great Hall of Pembroke Castle (Fig.1; Fig.2; Fig.3; see also figures in Gunn *et al.*, 2022). We prefer the name “Wogan Cavern” here due to it being the name given above the entrance door to the cave, although the cave is also known by several other variants: Wogan Cave, Wogan’s Cave/Cavern, or, more simply, Wogan or the Wogan. The cave is formed in Early Carboniferous Limestone of the Pembroke Limestone Group (see Gunn *et al.*, 2022). It is large, with a floor area of approximately 400m² and with a wide and high, north-facing, entrance. The present-day cave floor is uneven but broadly level overall, with a height above Ordnance Datum of 9–10m.



Figure 2: View, looking southwestwards, of the north wall of Pembroke Castle, behind which lies Wogan Cavern. [Photo: S Howells.]

Given its large size and location, Wogan Cavern is clearly a usable and useful space, but only little is known of its historic use. Use during the medieval period is uncertain until the early thirteenth century, when the Earl of Pembroke, William Marshal, built a wall across its mouth (Fig.2; Fig.3), incorporating a gateway and a spiral stair from the castle inner ward. The work formed part of Marshal’s transformation of Pembroke into a stone fortress, which included the construction of the magnificent cylindrical keep, and might have been undertaken between 1204 and 1207. Current sill-level at the cave mouth appears more-or-less to respect the medieval level, perhaps also implying that no significant change in cave floor-level in this area has occurred subsequently. It lies several metres above the present High Water Mark, which all topographical evidence suggests has not changed since the thirteenth century. An apparently artificial embayment or cutting from the river to the cave mouth, infilled by the mid-nineteenth century, is shown in antiquarian prints, but it is very steeply-sloping indicating that the entry cannot have been a water-gate in its strictest sense.



Figure 3: Wogan Cavern during excavation in 2021, looking north towards the cave mouth from the rear of the cave. [Photo: R Dinnis.]

Nor, we suspect, can it realistically have been a ‘boat-house’, as suggested by King (1978, p.112). In the absence of any evidence, either above or below ground, for any storage buildings in the Marshal-phase castle (Day and Ludlow, 2016, 72–78), the most probable use for Wogan Cavern would seem to be as a large cellar-space, the cutting or embayment at the cave mouth facilitating loading and unloading. It is unlikely, however, that goods were taken up to the castle itself via the spiral stair, and transport by water to one of its several ‘postern’ entries is implied.

A long-standing tradition that a spring rose within the cave appears to have arisen from a misreading of the Elizabethan antiquarian George Owen, who produced a pamphlet on the defence of Milford Haven in 1597. In it, he stated that “...within Pembroke Castle is a great cave called the Wogan, and in the same is a well of fresh water of great depth, for the use of the people within the castle...” (Owen, 1897, p.558). This has traditionally been taken to mean that the well was in Wogan Cavern, but the phrasing “in the same” should probably be read as meaning that the well lay in the castle enclosure itself, where a possible well was revealed through geophysics in 2016 (Day and Ludlow, 2016, p.82). The absence of physical evidence for a well in Wogan Cavern, and indeed its unlikelihood, led subsequent authors to twist Owen’s words, replacing “well” with “spring” (e.g. Fenton, 1811, p.366, p.370; Lewis, 1833).

Although no detailed accounts of Wogan Cavern’s uses during the Medieval and Post-Medieval periods exist, the cave’s sedimentary fill will certainly have seen significant modification over this time. The most extensive disturbance will probably have come with construction of the wall across the cave mouth and the now-infilled embayment at its entrance. Furthermore, as described below, pick-axe marks and remnants of a truncated speleothem layer in the southwestern corner of the cave are testament to the lowering of the cave floor in this area.

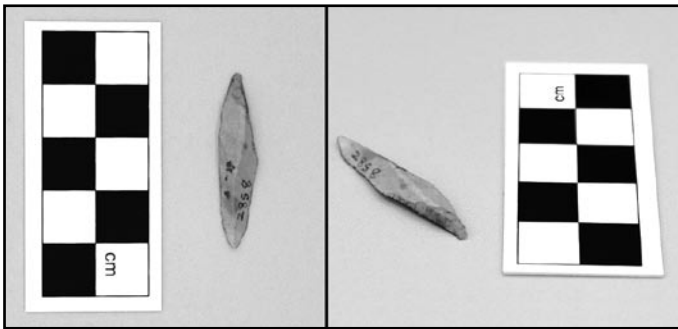


Figure 4: Mesolithic obliquely blunted point in the early collections from Wogan Cavern.
Left: dorsal view; **Right:** oblique view of retouched edge.
 [Photos: Eloise Chapman.]

The form of the present-day floor of Wogan Cavern might be shaped in part by antiquarian exploration, but frustratingly little is known of all previous archaeological work. Collections and documentary archives at Tenby Museum, as well as a few early publications, suggest archaeological investigation and possibly structured excavation, but there is scant evidence to say much more. Tenby Museum's collections from the cave include 33 flint artefacts. According to Leach's (n.d.) retrospective summary of the Reverend Gilbert N Smith's work, written several decades after Smith's death, Smith "dug up" this assemblage. No reference to Wogan Cavern has so far been identified in Smith's (n.d.) "scrapbook" (a collection of correspondence and notes about his work), despite frequent mention of other sites on which he worked, including the Caldey Island caves, Hoyle's Mouth, and Coygan Cave. The presence of refitting lithics in this small assemblage (RD and JB, pers. obs., 2019) suggests that systematic collection of the artefacts occurred via excavation, rather than their recovery being simply as stray surface finds.

Accession notes in Tenby Museum record some of the flints from Wogan Cavern as being Upper Palaeolithic. This is possible, especially given the presence of Final Upper Palaeolithic material from nearby Priory Farm Cave (Grimes and Cowley, 1933; Barton and Price, 1999) and the presence of Pleistocene sediments in Wogan Cavern (see below). However, there is nothing in the Tenby Museum's Wogan Cavern collection that can be attributed confidently to the Upper Palaeolithic. The only artefact in the Tenby collection that is diagnostic chronologically is a Mesolithic microlith (Jacobi Type 1b; Fig.4).

In addition to the lithic assemblage, comments by Cobb (1883, p.197) might imply the collection of Roman coins from the cave (rather than simply from the castle grounds) by him and others, and it seems probable that these discoveries resulted from digging. Leach (n.d.) records his own discovery of fragments of Romano-British pottery on the surface of the cave floor, and further notes that "...much casual digging has been done and objects found by various people...". Although originally accessioned to Tenby Museum, the whereabouts of the pottery found by Leach is currently unknown.

Present work: results of the 2021 excavation

Given the lack of information regarding Wogan Cavern's archaeological status, a programme of excavation was initiated. The aims of the programme were: to test for intact archaeological deposits in the cave; to attempt better to contextualize its historic collections; and to establish the site's research potential. This work began with a small-scale excavation carried out by a team of five over a two-week period in late June/July 2021. Work was largely limited to three 1x1m squares, spread across the rear of the cave. None of these was excavated completely. Despite the restricted volume of deposits tested, initial results indicate that Wogan Cavern is an important prehistoric site. Here we outline the 2021 excavation and present the initial results of our post-excavation analysis.

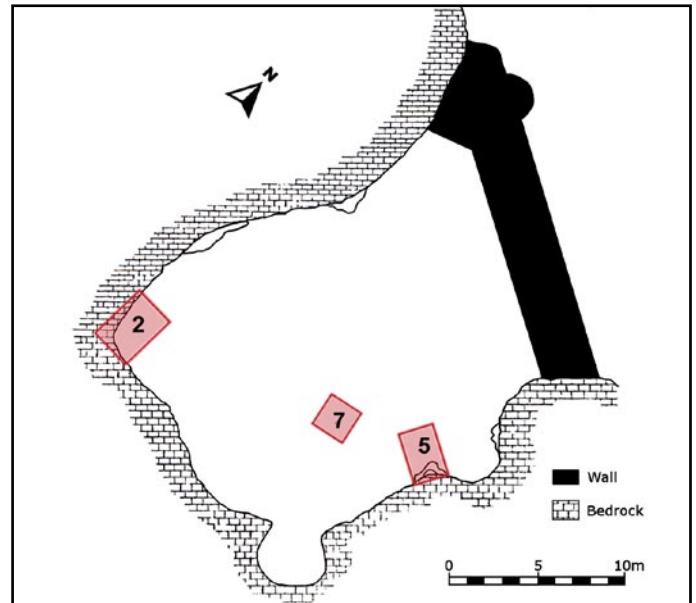


Figure 5: Plan of Wogan Cavern (modified after King, 1978, p.111) showing the locations of the work areas started in 2021 (trenches 2, 5 and 7). **Note:** only a small part of each of these was excavated during the 2021 season.

The cave's eastern side (Trench 5)

Most of the archaeological material recovered during the 2021 season came from near the cave's eastern wall, in Trench 5 (Fig.5). Cleaning back of the thin surface tread revealed a granular calcium carbonate flowstone, which forms the cave floor in this area (Fig.6). A one square-metre area of Trench 5 was excavated to a maximum depth of 75cm, revealing an intact sequence of deposits (Fig.6; Fig.7).



Figure 6: Screenshot of a 3-D model of the maximum extent of the excavation of Trench 5, showing: the entire planned trench area, the speleothem formations against the cave's eastern wall, and the excavated Square 4 (top); a view of the excavated square showing the west-facing and north-facing sections and excavation base (bottom left); and showing the south-facing section (bottom right). [Model produced by R Dinnis.] For context descriptions and locations see Figure 7 and Table 1.

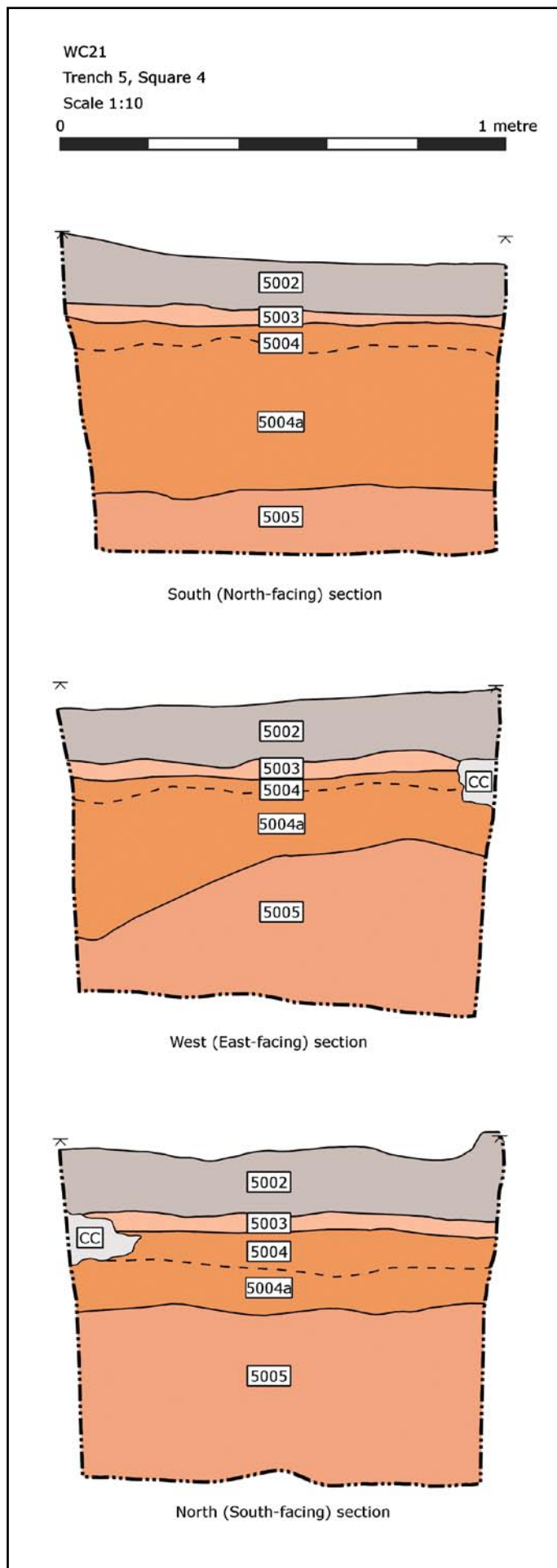


Figure 7: North-facing, east-facing and south-facing sections of the 1m² excavated in Trench 5. See Table 1 and the main text for descriptions of the contexts and their contents. CC = hardened calcium carbonate deposit.

Details of this sequence and its archaeological contents can be found in Table 1. It can be summarized, from top to bottom, as:

- Flowstone layer, containing a marine shell assemblage (= Context 5002)
- Red-brown cave earth, containing a rich, early-prehistoric, lithic assemblage that includes diagnostic Mesolithic tool types (= Context 5003)
- Orange-red clay with abundant angular limestone clasts, containing archaeological material, at least some of which probably related to that found in the overlying context (= Context 5004 / 5004a)
- Red-brown clay within a clast-supported matrix of tightly packed limestone scree, largely sterile, but with fragmentary bone and some potential anthropogenic material at the base of the excavated extent (= Context 5005)

Overall, the geological sequence is consistent with Late Pleistocene–Holocene sequences elsewhere, with the limestone scree a cold-period deposit and the overlying flowstone a Holocene formation.

Shell material was generally fragmentary and was found only in the upper part of the sequence. More specifically, most of the recovered shell came from the granular calcium carbonate flowstone formation (Context 5002), which yielded a notable number of limpet shells (Table 2). All taxa represented are endemic to British coastal waters. Some of the represented genera (e.g. oyster, limpet, cockle, mussel) have been exploited since prehistoric times (e.g. Pickard and Bonsall, 2014; Hardy, 2016; Pickard, 2017) and targeted as foods from the mid-1st millennium AD up to the present day (Stott, 2004). However, small specimens and genera not typically exploited as foods are also evident. Whereas some taxa used in prehistory for the manufacture of shell beads are represented (e.g. periwinkle, tusk shell: Pickard and Bonsall, 2014; Roberts, 2015), none of them shows any modification that demonstrates such use.

Most of the archaeological objects recovered, including >300 worked flint and stone blades and other pieces/debitage, came from a thin horizon within contexts 5003 and 5004 (see Table 1). These contexts underlie the flowstone deposit but overlie, or are located at the top of, the clast-dominated sedimentary unit. The lithic assemblage from contexts 5003 and 5004 is a laminar/lamellar technology that includes diagnostic Mesolithic tool types, consistent with the historic collections from the cave. Context 5003 contained three characteristically earlier Mesolithic obliquely blunted point microlith forms, as well as a microburin. The latter could potentially be of either early or later Mesolithic age, but it has a narrow width and is therefore in line with Welsh later Mesolithic technologies (microliths traditionally being allocated to one or other period based on their width: Radley and Mellars, 1964). Such distinctions are being challenged in some areas as new dating leads to new chronological distinctions, but in Wales, with its paucity of well-dated sites, this distinction remains (David, 2007). Contexts 5003a and 5003b (apparent cut-features that might represent prehistoric disturbance; see Table 1) yielded one typically early Mesolithic obliquely blunted point and one fragment of a later-Mesolithic-type narrow-blade microlith. The underlying Context 5004 contained one possible later Mesolithic microlith fragment. At face value this could indicate stratigraphical problems, but it might instead accord with the field observation that contexts 5003a/b are cut-features, which could have introduced younger material to a lower position in the sediments. Overall, the presence of tool types of earlier and later Mesolithic character suggests that the finds horizon might reflect more than one period of activity. Furthermore, two pieces from Context 5003 – a large proximal blade fragment and an abruptly blunted point – might hint at an additional Late Upper Palaeolithic component, although neither can be considered diagnostically Palaeolithic.

Context	Context description	Contents	Preliminary interpretation/notes
5001	Thin dark brown sandy mud on cave floor. Excavated across whole area present.	Glass (modern); pot sherd (medieval), shell; bone/microfauna; metal.	Modern tread containing mixed-age material.
5001a	Mottled deposit: contains some fine red-brown clay and some patches of darker brown clayey earth with abundant charcoal flecks. Present against cave wall / atop 5002 in eastern end of trench (see Fig.5, top). Unexcavated.	N/A	Mixed spoil of various deposits.
5002	Granular calcium carbonate flowstone formation, c.10–15cm. Infrequent large (~6cm) clasts of stalagmite and angular limestone within matrix. Apparently present across the entire trench except possibly in its northwesternmost corner. The formation is flat in squares 3–6 and part of Square 1; against the cave wall (squares 1 and 2) it is present but stands in raised formations (see Fig.5). Excavated only in Square 4.	Shell (abundant, especially limpet shells); bone/microfauna; worked lithics (rare).	
5003	Dark, red-brown moist cave earth underlying 5002, generally c.2–6cm thick. Matrix-supported but contains infrequent limestone clasts (<5cm) along with abundant charcoal flecks. Small, cemented lenses present. Excavated only in Square 4.	Shell (rare); bone/microfauna (fragmentary); burnt bone; abundant worked lithics.	Early Holocene archaeological layer. Two small “cut” pits in the underlying 5004, filled with 5003, were denoted 5003a and 5003b.
5003a	Depression in the underlying 5004, ~30 x 25cm and ~10cm deep, filled with 5003.	Bone; worked lithics.	Possible early prehistoric disturbance of the cave floor (bioturbation?).
5003b	Depression in the underlying 5004, ~10 x 15cm and ~7.5cm deep, filled with 5003.	Burnt bone; worked lithics; fauna remains.	Possible early prehistoric disturbance of the cave floor (bioturbation?).
5004	Orange-red clayey earth; matrix contains abundant angular limestone clasts (~5cm); less moist, and stiffer, than the overlying 5003. c.3–10cm thick. Excavated only in Square 4.	Bone/microfauna; burnt bone (two pieces); shell; worked lithics.	Archaeological material same as in overlying 5003?
5004a	Broadly similar to (overlying) 5004 but differentiated by a greater abundance of limestone clasts (5–10cm) and a more clast-supported matrix. c.10–15cm thick in the northern part of the excavated square; c. 30–35cm thick in the southern part of the square. Excavated only in Square 4.	Bone/microfauna; burnt bone (two pieces); shell (rare); worked lithics (rare).	Pleistocene deposit. Worked lithics pieces found only in the uppermost part of the context.
5005	Tightly packed limestone scree deposit. Red brown clay (stiffer and darker than 5004a) within a clast-supported matrix. Excavated only in Square 4.	Bone/microfauna; possible incised bone; possible struck flake fragment.	Pleistocene deposit. Bone/possible lithic confined to only the lowermost excavated part (spits 6, 7).

Table 1: Trench 5 contexts. Note that the difference between contexts 5004 and 5004a was very slight and they graded into one another.

Context	Taxon (MNI)										
	<i>Ostrea edulis</i> (oyster)	<i>Patella</i> sp. (limpet)	<i>Cerastoderma edule</i> (cockle)	<i>Veneroida</i> spp. (marine clam)	Trochidae (top shell)	<i>Littorina fabalis</i> (flat periwinkle)	<i>Littorina littorea</i> (common periwinkle)	<i>Littorina</i> sp. (periwinkle)	<i>Mytilus edulis</i> (common mussel)	Scaphopoda (tusk shell)	Terrestrial molluscs
5002	P	12	P	2	1		1		P		22
5003		P		P	P	1		P	P	P	13
5004	P										

Table 2: Quantification of marine molluscs (MNI) by taxon and context for Square 4 in Trench 5. For gastropods, MNI was derived from a count of the number of intact apices, while for the bivalves MNI was calculated from the greater of the counts of left and right valves. (P = present.)

Context	Taxon	Element	Notes
5003a	<i>Sus</i> (pig/boar)	Lower deciduous premolar (dp3)	Left side
5003a	<i>Sus</i> (pig/boar)	Upper premolar (P4)	Left side; no wear, root not yet formed so not yet fully erupted, under 1–2 years old
5003b	cf. <i>Sus scrofa</i> (pig/boar)	Phalange 2	Burnt; fused proximal epiphysis, at least 1 year old
5003b	Bird?	Shaft fragment	
5004a (spit 2)	Bird, cf. <i>Lagopus</i> (ptarmigan)	Right humerus	

Table 3: Identifiable faunal specimens from contexts 5003–5005 in Trench 5, recognized using traditional identification methods. Note the table does not include microfauna, nor does it include numerous fragments identifiable only to a specific size, such as large, medium, small mammal. *Sus*: NISP = 3; MNI = 1; teeth and bone fusion indicate an age at death for the pig remains of around 1–2 years old. See also Table 4.

Table 4 (right):

Taxa identified for faunal material from Square 4 in Trench 5, recognized using collagen peptide mass fingerprinting (a technique that is also referred to as ‘Zooarchaeology by Mass Spectrometry’, which is commonly abbreviated to ‘ZooMS’; Buckley et al. 2009). In addition to these results, one further sample (from Context 5005) failed to yield enough collagen for successful fingerprinting. See also Table 3.

The presence of deer and pig/boar remains in the same finds horizon (Table 3; Table 4) is consistent with a Mesolithic age. A notable quantity of burnt bone found in contexts 5003 and 5003a/b, as well as some pieces in the underlying 5004 and 5004a (upper part), are likely to be anthropogenic, and therefore associated with the lithic assemblage. Taken together, the quantities of charcoal, lithic assemblage and burnt bone in this finds horizon testify to a significant amount of early prehistoric activity in the cave.

Context	Taxon	Notes
5003	Bird	
5003	<i>Vulpes vulpes</i> (red fox)	
5003	Deer	
5003a	<i>Sus</i> (pig/boar)	Small find №.80
5004	Deer	
5004a (spit 2)	Bird	Small find №.92; Specimen recognized as possible ptarmigan in Table 3
5004a (spit 3)	Bird	Small find №.97
5005 (spit 6)	<i>Rangifer</i> (reindeer)	Small find №.98
5005 (spit 6)	<i>Equus</i> (horse)	
5005 (spit 7)	Deer	Small find №.105
5005 (spit 7)	<i>Rangifer</i> (reindeer)	Bearing modification consistent with carnivore digestion
5005 (spit 7)	<i>Equus</i> (horse)	
5005 (spit 7)	<i>Mammuthus</i> (mammoth)	Small find №.106



Figure 8: Screenshots of a 3-D model of the maximum extent of the excavation in Trench 2, showing:

Top: an overview of the entire planned trench area;

Bottom: highlighting the truncated sediments adhering to the cave wall.

[Model produced by R Dinnis.]

The lower, clast-heavy, unit (= contexts 5004, 5004a, 5005; see Fig.7) is interpreted here as dating to the Late Pleistocene. The lower part of Context 5004a and the upper part of Context 5005 were sterile, whereas towards the base of the excavated extent was a horizon of fragmentary bone and possible archaeological material. One lithic piece appears to be the distal part of a struck flake, bearing possible retouch. Our initial assessment is that the material is speckled rhyolite, although further work is required to verify this. Rhyolite can be found as transported boulders as well as cropping out at several locations <10km from the cave, and it is known to be suitable for stone tool manufacture because it is present in early prehistoric assemblages elsewhere in south Wales, including Paviland Cave (Swainston, 2000) and Worms Head Cave (Davies, 1989). In addition, a small fragment of bone bears incised lines that are difficult to explain with reference to post-deposition and/or non-human agents. Whereas this too requires further work to verify the marks as anthropogenic, these two pieces together suggest that the lower finds horizon might contain archaeological material. If so, it is likely to be Palaeolithic in age, given its position well into Pleistocene deposits. The presence of bones of mammoth (presumably *Mammuthus primigenius*), reindeer, horse, and deer (Table 4) is consistent with the layer's Pleistocene age, although these taxa cannot be used to distinguish between a pre- and post-Last Glacial Maximum age (Currant and Jacobi, 2011). It is also noteworthy that two bone fragments in this layer (one of which is a reindeer bone: see Table 4) show carnivore digestion marks. This is a common occurrence in Late Pleistocene faunal cave assemblages.

Overall, our excavation in Trench 5 demonstrates: a) that a substantial volume of intact deposits remains within this area; b) that the stratigraphically higher deposits are archaeological, and contain a significant Mesolithic assemblage; and c) that the underlying deposits contain a Pleistocene palaeontological layer, which possibly also includes archaeological material. The thickness of intact deposits remains unknown, however, because the excavation was concluded before the underlying bedrock was reached.

Elsewhere in the cave (trenches 2 and 7)

Small areas of Trench 2 and of Trench 7 (Fig.5) were also opened during the 2021 field season, although excavation of these was limited compared to that in Trench 5.

A one square-metre area of Trench 7 was excavated to a maximum depth of ~11cm. The excavated deposits represent relatively recent disturbance. Beneath the most superficial sediments was a layer of redeposited material (spoil) containing clods of different sediment types (including those more akin to Holocene and to Pleistocene sediments), mixed age archaeological artefacts (early prehistoric lithics, recent and probable-Pleistocene-age bone, Roman and seventeenth/eighteenth century pottery), and clay pipe stems. This post-medieval spoil is reminiscent of that from early antiquarian excavation at other caves, during which large volumes of sediment were excavated at pace, with inconsistent retention of finds. Underlying these spoil deposits is a much more coherent clayey layer, which in some areas at least is underlain by a charcoal-rich layer. The small area of these deposits exposed (and even smaller area trowelled) does not allow for firm conclusions, but it is possible they represent intact historic-age activity surfaces pre-dating the deposition of the spoil.

Further evidence for large-scale disturbance was found in the area of Trench 2, in the cave's southwestern corner (Fig.5). Against the cave's western wall in this area, 15–20cm above the current floor level, are the remnants of a truncated speleothem layer (Context 2002) (Fig.8). Judged by its form and by pickaxe marks visible in adjacent areas, this speleothem seems to have been clipped back during historic work in the cave. Adhering to the underside of this truncated speleothem are remnants of a stratigraphically lower clayey layer (= Context 2003; see Fig.8). Four worked lithics were recovered from this clayey layer. None is diagnostic of a particular period, but in their patination and technology they are consistent with the assemblage concentrated in Context 5003 (Trench 5, i.e. on the opposite side of the cave), which contains diagnostic Mesolithic pieces. The stratigraphical position of the Trench 2 lithic finds also appears consistent with the Mesolithic assemblage on the opposite side of the cave: assuming the truncated speleothem formation against the cave wall in Trench 2 (Context 2002) is analogous to the flowstone deposit in Trench 5 (Context 5002), the worked lithics in both trenches were located in immediately underlying deposits. In Trench 2, however, the archaeological layer appears to have been almost completely removed, possibly during early archaeological investigation, or possibly during earlier landscaping of the cave floor.

Excavation on the cave floor in part of Trench 2 (see Fig.8, top), to a maximum depth of ~26cm, revealed disturbed deposits containing mixed age material (shell, patinated worked flint chips, modern glass, nineteenth/twentieth century pot sherd and fragmentary bone) overlying a series of different clay deposits. The excavation of these clay deposits was limited, and no archaeological or palaeontological material was found in them.

Our limited testing of trenches 2 and 7 revealed, in both cases, evidence for previous disturbance to the cave's fill. In both cases, however, there is some indication that intact deposits remain below the disturbed layer.

Interim conclusions: the archaeological potential of Wogan Cavern

Although the planned work is at an early stage, some characterization of Wogan Cavern's archaeological status is already possible.

An intact flowstone floor is present on the cave's eastern side in the area of Trench 5. This floor caps a Pleistocene–Holocene sedimentary sequence. Towards the top of this sequence is a rich early prehistoric layer, which includes diagnostic Mesolithic lithic artefacts.

Lower down, and firmly in Pleistocene deposits, is a layer of palaeontological material with some possible archaeological objects. Importantly, the sequence contains organic material (bone, microfauna, shell), including that found alongside the early prehistoric finds horizon(s). This is commonly absent from early prehistoric sites – particularly from open-air sites – and offers the opportunity for detailed contextualization of lithic assemblages. Our success in carrying out ZooMS analysis (Table 4) confirms a good level of collagen preservation in the bone, which bodes well for our forthcoming attempt at radiocarbon dating material from Trench 5.

All of this indicates the potential for the application of a range of analytical methods, and shows that the sedimentary deposits in Wogan Cavern have significant archaeological potential. Despite this clear promise, however, the thickness of intact deposits in this area is still unknown. Further excavation will attempt to establish the thickness of the cave fill, and whether it contains further and potentially older archaeological and palaeontological material.

Perhaps unsurprisingly, we also found clues to large-scale, historic-age disturbance. The early thirteenth century construction of the wall covering the cave mouth will likely have seen removal and modification of a large volume of sediments, but there is also evidence for heavy disturbance towards the cave rear. This includes the apparent removal of an early prehistoric archaeological layer in the southwestern part of the cave, a layer that was potentially equivalent to the early Holocene layer still present against the cave's eastern wall. This might simply be the result of medieval or post-medieval levelling of the cave floor, in order to make it a more useful space, or it might result from antiquarian excavation. The thin skim of spoil present in the excavated area towards the centre of the cave speaks similarly of large-scale, post-medieval disturbance.

The extent to which the cave's original archaeological deposits remain intact will require further assessment, but our initial, small-scale testing indicates that a considerable volume of deposit might have survived various phases of historic-age work. In light of how few early prehistoric British caves retain sequences appropriate for modern-day archaeological investigation, this provides an important opportunity to investigate the Pleistocene and early Holocene record of human occupation. Our work has already demonstrated that Wogan Cavern is an important archaeological site, and it might yet transpire that it has the potential to answer many outstanding questions about our prehistoric past.

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