A prehistoric and post-medieval faunal assemblage from Aillwee Cave in the Burren, Co. Clare

Speleological Union of Ireland

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In the 1970s, quantities of animal bones were discovered in Aillwee Cave, Co. Clare, during development works to open the site as a show cave. Included in the assemblage were a partial brown bear cranium and other post-cranial bear bones for which the cave is now renowned. The assemblage has recently been analysed to modern zooarchaeological standards for the first time and a series of radiocarbon dates have revealed the presence of Early Mesolithic bear, Late Neolithic bear, Iron Age horse, and post-medieval pig and hare. The vast majority of the assemblage reflects natural processes, including use of the cave for bear hibernation in prehistory and occupation of the cave by fox in post-medieval times.

History of the Aillwee faunal assemblage

Aillwee Cave, located in the Burren, Co. Clare, was first discovered in 1940 but it was not until the 1970s that it attracted scholarly interest (Drew, 1974). Originally the cave entrance was only about 1m high and had been walled up, presumably to prevent farm animals from entering (David Drew, pers. comm.) (figs. 1 and 2). Faunal remains were first documented at the site in 1973 when bones of 'small mammals', horse and a bear tooth were found in one of the outermost cave passages, Horse Haven (Drew and Cohen, 1980: 227). Three years later, in 1976, works commenced to open the cave as a tourist attraction. At this time the entrance area was significantly enlarged, which involved removing almost all deposits from the outer sections of the Entrance Passage and Horse Haven (figs. 1 and 2). In the course of this work, bones were unearthed and collected by the labourers at the request of Mr Brian Ottway, a botanist at University College Galway. The precise locations where the bones were discovered were not recorded; as Ottway remarked, 'all of this material is unstratified and even its location in the cave must be uncertain' (1976: 1). Ottway later examined the spoil heap of the excavated deposits but did not encounter anything further. Subsequent to the initial bone discovery, 'some several thousand bones … at a density of about 200 items/m2' were exposed in a small chamber that appeared to be 'an old fox midden' (*ibid*.: 4).

Ottway carried out a basic identification of the Aillwee assemblage and wrote a brief report that was never published (Ottway, 1976). He examined 85 bones, which he believed had come primarily from Horse Haven, including horse bones and at least 23 bear bones. Edgar Tratman, a caver with the University of Bristol Speleological Society and director of the 1928 archaeological excavations at Kilgreany Cave, Co. Waterford, verified Ottway's identifications and noted the presence of bear, horse, sheep, bird, and a possible human bone in the Aillwee collection (Tratman 1976). Some years after the initial work, in 1979, a bear cranium was recovered from Bear Haven (Drew and Cohen, 1980).

In 2018, a project was commenced to reassess the faunal assemblage from Aillwee Cave, with the twin objectives of establishing the range of species present and dating the bear for which the cave is best known. This is a private collection in the ownership of the cave proprietors. In total, 414 mammal bones and 48 bird bones survive from the 1970s discoveries in Aillwee Cave (table 1). No fish or human bones were identified. It should be noted that now, four decades later, there is a discrepancy between the original report of 'some several thousand bones' from the Fox Midden and the 85 bones examined by Ottway versus the surviving assemblage.

Locations of bones within the cave

Aillwee Cave reaches approximately 1,500m in length (Mullan, 2003). All the animal bones known from the site were discovered in the outermost passages near the cave entrance, namely Horse Haven and Fox Midden (fig. 1). The bear cranium was discovered in Bear Haven and, since the 1970s, a collection of bones recovered from other parts of the cave has been on display here together with the cranium.

Horse Haven

At least 31 mammal bones and 3 bird bones appear to have originated from Horse Haven, including 11 bear bones and 6 horse bones (table 1). Three of these returned prehistoric dates: an Early Mesolithic bear cranium, a Late Neolithic bear tibia with a chop mark, and an Iron Age horse tooth. It appears likely that the majority of remains from this part of the cave are prehistoric. However, an adult hare pelvis with evidence of carnivore gnawing, two hare/rabbit tibia, a rabbit tibia, and six bones representing two lambs or goat kids also appear to have come from Horse Haven. The carnivore gnawing on the hare bone and the young age of the lambs or kids (0-6 weeks and 10.5-12 weeks) strongly suggest that these bones represent fox prey. In his 1976 report, Ottway had also noted remains of 'cervid' bones from Horse Haven but these were not identified in the present analysis.

Bear Haven 'bear bone display'

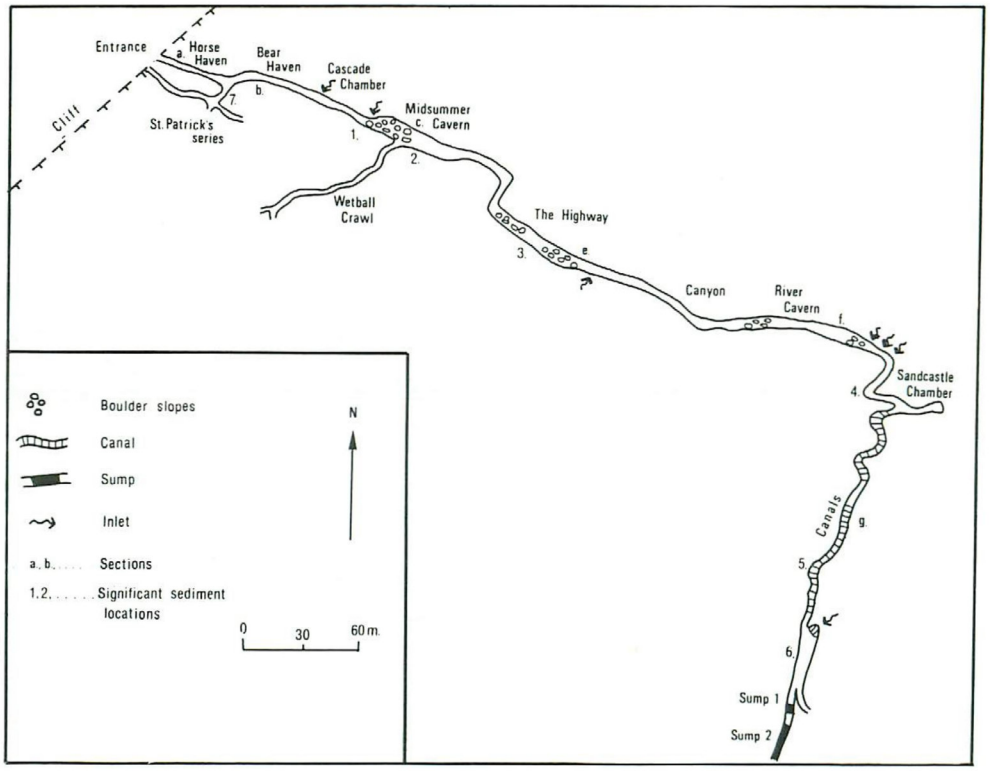

Figure 1. Plan of Aillwee Cave indicating location of Horse Haven and Bear Haven (Drew and Cohen, 1980).

Figure 2. Enlarging the entrance of Aillwee Cave in the 1970s. (David Drew)

The only faunal remains discovered in Bear Haven consist of a bear cranium retrieved in 1979. However, a 'bear bones display' was arranged on the cave floor in Bear Haven as a feature of the tourist trail through the cave. The display was originally intended to showcase the Aillwee bear, but the 2018 project revealed that it consists of a mix of bones of prehistoric bear, modern bear, hare, rabbit, chicken, and domestic duck (table 1). Apart from the bear cranium, these other bones probably originated from Horse Haven and/or Fox Midden. The display also includes modern bear bones that were purchased from Russia in the 1970s to augment the ancient remains. Unfortunately, moss growth, discolouration and deterioration of the display bones mean it is now not possible to separate out the prehistoric Aillwee bear bones from the modern Russian ursine remains. The bones in the display (including the Early Mesolithic bear cranium) are annually washed with modern household cleaning products. This, combined with artificial lighting which shines directly onto the bones, has caused considerable damage.

Fox Midden

The majority of the Aillwee Cave assemblage, 402 bones, originated from Fox Midden (table 1), which originally was somewhere in the general vicinity of the modern cave entrance. Ottway (1976: 4) referred to 'thousands' of animal

	Horse Haven	Bear Bone display in Bear Haven	Fox Midden	Total
Mammal				
Brown bear (*Ursus arctos*)		1		1
Bear (*Ursus sp.*)	11	12		23
Horse (*Equus sp.*)	6	1		7
Cat (*Felis silvestris*)			1	1
Weasel/Stoat (*Mustela sp.*)			1	1
Hare (*Lepus sp.*)	1	2	33	36
Hare/Rabbit	2			2
Rabbit (*Oryctolagus sp.*)	1	2	25	28
Sheep (*Ovis aries*)			4	4
Goat (*Capra aegagrus*)			3	3
Sheep/Goat (*Ovis/Capra sp.*)	6		94	100
Pig/Wild boar (*Sus scrofa*)			1	1
Small/Medium mammal			1	1
Medium mammal	4		16	20
Medium ungulate			10	10
Medium/Large mammal		2		2
Large mammal		1		1
Unidentifiable		3	170	173
Bird				
Domestic fowl: chicken (*Gallus gallus*)	1	2	9	12
Domestic goose or greylag (*Anser anser*)			19	19
Domestic duck or mallard (*Anas platyrhynchos*)	1		12	13
Duck/goose	1		3	4
Total	**34**	**26**	**402**	**462**

Table 1. Faunal and avian remains from Aillwee Cave.

bones in this section of the cave and rightly deduced that it had been used as a fox den, hence the name. Of the 359 mammal bones from Fox Midden, 170 were not identifiable to any taxonomic category due to their highly fragmented nature. Of the remaining identifiable fragments, sheep or goat were the most numerous, followed by hare, rabbit, sheep, goat, cat, pig or wild boar, and weasel or stoat (table 1).

Generally, a relatively large number of individuals were represented by a small quantity of bones, and the species are typical of what a fox might take. For instance, the 94 sheep or goat bones derived from at least 11 individuals including six lambs or kids under ten months and five lambs or kids under four weeks. The 25 rabbit bones represented at least three adults and one juvenile, while the 33 hare bones included at least four adults and one juvenile. The frequency of carnivore gnawing and tooth pits support the theory that the vast majority of the bones here are fox prey: nine rabbit bones, two hare bones, two sheep bones and two bones from medium sized ungulates (e.g., sheep, goat, or deer species) displayed evidence of carnivore gnawing. When considering the sheep or goat remains, the majority consisted of cranial elements, loose teeth, and fore and hind leg elements; very few phalanges and no rib or vertebra material were recovered. Taken together, this suggests that heads and legs were brought into the cave from elsewhere, but there is no evidence of complete carcasses. Some remains from the Fox Midden may be natural occurrences unrelated to fox occupation, such as fragments of a kitten ulna (<10 months old) and a weasel or stoat humerus.

The bird bones from Aillwee are similarly suggestive of prey consumed in the cave. At least 43 of the 48 bird bones were found in Fox Midden and represent chicken (*domestic fowl, Gallus gallus*), domestic goose or greylag (*Anser anser*) and domestic duck or mallard (*Anas platyrhynchos*).

Figure 3. Early Mesolithic bear cranium (Ken Williams).

Twelve bones from at least two chickens represent one large bird comparable to capons or cockerels of several modern 'large fowl' breeds, and a smaller type comparable to large bantams or females of several breeds. The 19 geese bones are from at least two birds, probably domestic goose based on size. The 13 duck bones represent at least four individuals, again probably all domestic. Four incomplete bones are intermediate between small goose and large domestic duck. There are no cut marks to indicate that this collection of fowl bones reflect human food waste, and the assemblage is more typical of predator activity, such as fox. Similar to the mammal bones, at least 15 bird bones have traces of carnivore gnawing and it is highly likely that several more have been entirely consumed.

Radiocarbon dates

A core objective of the 2018 project was to obtain radiocarbon dates on some of the faunal remains from Aillwee Cave to assess what periods of animal and human activities were represented by the collection. Two bear bones that had originated from different parts of the cave were selected for dating, to assess whether more than one ancient bear was present. Bones from horse and hare were chosen as these mammals have a long presence in Ireland. The pig or wild pig bone displayed signs of human manipulation and was dated to assess the period of activity. The resultant radiocarbon dates indicated an extremely broad range spanning over 9,000 years from the Early Mesolithic through to recent centuries (table 2).

***Mesolithic and Neolithic brown bear* (Ursus arctos)**

Twenty-four bear bones survive from Aillwee Cave: 11 from Horse Haven and 13 from the 'bear bone display' in Bear Haven. The latter includes an unknown quantity of modern bear bones that were purchased from Russia in the 1970s. Based on osteological analysis alone, the 24 bear bones were deemed to derive from one brown bear and one non-brown bear (i.e. the modern Russian bear). Radiocarbon dating, however, revealed the presence of two prehistoric bears (table 2). Therefore, the assemblage from Aillwee Cave represents at least three bears – two prehistoric Irish brown bears and one modern Russian bear. Unfortunately, it is not now possible to separate the modern Russian bear bones from the ancient Irish bones and thus only two of the 24 bear bones can be confidently attributed to Aillwee Cave: the Early Mesolithic cranium and the Late Neolithic tibia. Two other bear bones, fragments of a metapodial and an atlas, were conclusively identified as not brown bear and must be from the modern Russian bear. The remaining 20 bear bones are a mix of prehistoric Irish remains and modern Russian bones.

The Early Mesolithic brown bear cranium (fig. 3) was discovered in Bear Haven in 1979 (Drew and Cohen, 1980) and has been part of the modern 'bear bone display' since. The cranium is that of a sub-adult male brown bear, aged between 1.5 and 5 years old at the time of death. Part of the skull, the glenoid bone, was radiocarbon dated to 9264±70 BP, which calibrates to 8640-8300 cal BC (table

Lab code	ID	Description	Context	Element	Radiocarbon age BP	Calibrated date
UBA-37358	226	Brown bear. Adult or sub-adult. Male	Bear Haven	Partial glenoid bone; refits with bear cranium	9264±70	8640-8300 BC
UBA-37359	228	Bear. Adult	Horse Haven?	Right tibia frag. with chop mark	4064±55	2865-2470 BC
UBA-37362	217	Horse. Adult	Horse Haven	Tooth - L. maxillary M3	2086±41	203 BC-AD 4
UBA-37360	191	Pig or wild pig. Adult	Fox Midden	Right femur frag. Rodent damage. Saw marks	251±48	AD 1490-1810
UBA-37361	176	Hare. Adult	Fox Midden	Left femur frag.	172±30	AD 1660-1950

Table 2. Radiocarbon dates on animal bones from Aillwee Cave.

Figure 4. Late Neolithic bear tibia with chop mark (Ken Williams).

2). An adult brown bear scapula of Early Mesolithic date is known from Glencurran Cave just 7km from Aillwee. It dates to 8999±31 BP, which calibrates to 8290-8020 cal BC (Dowd, 2016: 61). As the largest mammal on the Mesolithic landscape, bear bones have been recovered from Mesolithic hunter-gatherer sites such as Baylet, Co. Donegal; Dalkey Island and Sutton, Co. Dublin; and Moynagh Lough, Co. Meath (Woodman, 2015). Woodman (2015) conjectured that Mesolithic bears would have weighed somewhere in the region of 180kg for males and 130kg for females. Few traces of Early Mesolithic human activities are documented from the Burren. The only sites currently known in the area consist of two Late Mesolithic hunter-gatherer-fisher campsites at Fanore More, which date from 4870 BC, located 12km to the west-northwest of Aillwee Cave (Lynch, 2017).

Part of a Late Neolithic adult brown bear right tibia was recovered during development works in 1976, possibly from Horse Haven, and has formed part of the modern 'bear bone display' in Bear Haven since discovery. There is a chop mark at an approximate 45 degree angle just distal of the proximal condyle on the posterior aspect of the tibia (fig. 4). The tibia has been dated to 4064±55 BP, which calibrates to 2865-2470 cal BC. It is possible that this bear was hunted and killed in or near the cave. A common strategy for hunting bear is to identify a hibernation den and kill the bear as it exited (Woodman, 2015). To date there is no evidence from Ireland that Neolithic people hunted bear, but this is entirely possible as they offered a range of valuable resources: furs, hides, bones (for tools), teeth (for jewellery), fat (for cooking and lamps), meat and bone marrow (for food). Alternatively, Late Neolithic people may have encountered the carcass of a bear that had died by natural causes, and then proceeded to butcher and exploit it. A juvenile brown bear femur from Moneen Cave, some 2.5km north of Aillwee Cave, has also been dated to the Neolithic at 4373±38 BP, which calibrates to 3090-2905 cal BC (Dowd, 2016) making it older than the second Aillwee bear.

Ottway recorded seven shallow circular pits in Bear Haven, still visible, that he believed were bear hibernation pits (fig. 5). The pits vary in diameter from 1.10m to 3.60m, and range in depth from 0.06m to 0.37m (Ottway, 1976). Ottway excavated one of the pits and revealed three stratigraphic units. The pit cut through a layer of silty sand which was overlain by a gravel layer. Both were sealed by a thin clay stratum that contained some bat bones.

***Horse* (Equus sp.)**

Six horse teeth representing at least one individual are currently recorded from Horse Haven and led to the naming of this part of the cave. The assemblage comprises maxillary and mandibular premolars and molars. The occlusal surfaces are all worn. One tooth returned an early Iron Age date (table 2). A seventh tooth, a worn adult mandibular second premolar, was part of the modern 'bear bone display' in Bear Haven but probably also originally came from Horse Haven. It is curious that horse is only represented by teeth at Aillwee Cave with no other skeletal remains present. This may be a product of preservation and survival, but the possibility should not be dismissed that these teeth were special ritual offerings placed in the cave, as has been found elsewhere in Ireland (Dowd, 2015). Horse was one of the most significant animals across Iron Age Europe. Horse bones (particularly skulls) and horse equipment (such as bridle bits) were frequently ritually deposited at important places in the landscape, and horse burials in their own right are also known. Very little material of Iron Age date has been recovered from the Burren, but it is interesting that several of the known finds also relate to horse including a bronze horse bit found near Corofin and a bronze bridle pendant from a bog at Lisdoonvarna (Jones, 2004).

Pig or wild pig, and hare

Two animal bones from the Fox Midden returned post-medieval dates. The butchered pig or wild boar femur metaphysis had been sawn at both ends with a metal hand saw; it also displayed evidence of rodent gnawing (fig. 6). It was dated to 251±48 BP, which calibrates to AD 1490-1810. This was the only pig bone from the site. A hare femur was dated to 172±30 BP, which calibrates to AD 1660-1950 (table 2). Both bones were probably introduced by fox, suggesting several centuries of fox occupation (probably intermittent) in this part of the cave.

Human activities at Aillwee Cave

Aillwee Cave is not a registered archaeological site and the

Figure 5. Bear hibernation pit in Bear Haven, containing some of the bones from the modern tourist display. (Ken Williams)

Figure 6. Post-medieval sawn pig femur. (Ken Williams)

overwhelming majority of the animal bone assemblage seems to be of natural origin. A small number of bones, however, display signs of human mediation and hint at the presence of human activities in or near the cave. For instance, the chop mark on the Late Neolithic bear tibia suggests butchery of a bear carcass in the environs. Similarly, a bear sp. rib fragment from Horse Haven displayed a possible cut mark. Also from Horse Haven, a complete bear metatarsal that had fully fused epiphyses and was adult-sized, displayed an angled cut mark on the shaft that potentially reflects skinning of a bear carcass. The date of the bear rib and metatarsal are unknown but they may relate to the same episode of butchery (and indeed, the same animal) as reflected by the bear tibia.

The post-medieval butchered pig or wild boar femur potentially derives from a domestic pig that was reared in a nearby farmstead and subsequently butchered to provide meat. After it was discarded, the bone may have been picked up from the farmstead by a fox and brought to the cave den. An undated adult-sized hare calcaneum fragment from Fox Midden was decalcified through burning. This also suggests human activities, but with no evidence for fires or burning within or near the cave, it is likely that the calcaneum was also introduced into the cave by a predator.

Conclusions

The 2018 assessment of the 1970s faunal assemblage from Aillwee Cave has demonstrated the value of reassessing 'old' collections. In all, 414 mammal bones and 48 bird bones were analysed. Radiocarbon dating demonstrated the presence of an Early Mesolithic bear and a Late Neolithic bear in the collection, important additions to the database of Irish brown bear. Cut marks on the Late Neolithic tibia suggest butchery of a bear carcass by humans, and may be related to two undated bear bones that also have cut marks. Circular pits in Bear Haven seem to indicate that the cave served as a hibernaculum in prehistory. The greater part of the Aillwee faunal assemblage represents prey and use of the cave as a fox den in post-medieval times. Many of these bones have carnivore gnaw marks and tooth pits, and the animals represented are typical of those taken by fox, including lambs, goat kids, hares, rabbits and domestic poultry. Though the faunal assemblage from Aillwee Cave is small, the range of species and the spread of dates highlight the likelihood of further *in situ* animal bones within the sediments of Aillwee Cave.

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