

Video 1

Glendalough: Artefacts and Archaeology

Video Transcript



museum

National Museum of Ireland

Ard-Mhúsaem na hÉireann



Video 1 Glendalough: Artefacts and Archaeology

Voiceover – Siobhán Pierce, Education Officer, NMI Archaeology:

All exhibitions at the 1. [National Museum of Ireland](#) – 2. [Archaeology](#) contain original objects and artefacts. But how did they come to be exhibited in the Museum, and how did we uncover the stories that they can tell us?

Each object has gone on a unique journey from discovery to display in the Glendalough 3. [exhibition](#). In this film we'll see the many ways in which 4. [archaeologists](#) find evidence about our past and the objects they discover, and the new technologies they use to unlock their secrets. We'll hear the stories of how they were found, what they were used for, and what they can tell us about the people and landscape of Glendalough over the last thousand years.

Matthew Seaver, Archaeologist, National Museum of Ireland:

Screen Image: Hand-bell, Knockatemple, Co. Wicklow, 8th - 9th century AD

This is one of the star objects in our exhibition at Glendalough, and it's a hand-bell and it was found in a valley close to Glendalough in the 1870s, by someone who was doing a very early form of archaeological 5. [excavation](#). And these kinds of people were called antiquarians. It was kept in an old collection and then was donated to the National Museum of Ireland by the Archbishop of Dublin. So, what can this hand-bell tell us about what was going on in Glendalough in the past?

Siobhán: Matt, this is a replica early Christian hand-bell.

Matthew: Yeah. So this is exactly the kind of bell that would have been used in Glendalough. Of course we don't have one surviving from Glendalough itself. But we have one in the exhibition that comes from a place called Knockatemple, which is about 10 kilometers away, and was found during an excavation. And we think that that bell was made here in Glendalough. And we know there were bells in Glendalough because they're there in the stories. Stories about saints, like Saint Berach, who carried a bell around the ditch of the monastery, and he rang it to cast out demons.

Siobhán: So it's a hand-bell, because it was rung by hand. But what kind of a metal was it made out of?

Matthew: So it's made out of iron, and it's made out of a single sheet of iron. And to make this much iron, you need a lot of resources, so it would be very expensive to make an object like this. They are a very, very significant object for Glendalough.

Siobhán: So the bell then wasn't just hidden away somewhere safe. It actually was used the whole time during the day. It would have been a very busy object here, marking the day and calling people to prayers, and then of course for funerals as well.

Matthew: Yeah, it was a central part of life at the 6. [monastery](#).

Siobhán: And a real symbol that Christianity was here as well.

Matthew: Absolutely, and they say that the sound of the bell was the limit of the power of the monastery. So how far it could be heard away from the monastery was how big the monastery was.

Siobhán: They were lucky they were in a valley in Glendalough – it would have rung through the valley.

Matthew: Yeah, true.

Siobhán: So later we're going to learn about what making a replica object can teach us. But now we're going to look at what happens to an object when it first comes in to the museum.

Voiceover - Siobhán:

Over the years, many objects have been donated to the museum to take care of, on behalf of the Irish people. This means the objects need to be looked after and preserved by specialist scientists called 7. [conservators](#). And it allows experts in many fields to study them.

Carol Smith, Archaeological Conservator, National Museum of Ireland:

Okay, so this is an iron bell that I worked on for the Glendalough exhibition, and when it came in to us, it was quite badly damaged. When it was discovered in 1873, there was an account of it getting a whack with a pickaxe, which could explain why a lot of it was missing, and it was quite badly damaged. I'm an archaeological conservator, so that involves looking after all of our archaeological collections. Something like leather and metal, when it comes out of the ground, it's gone into a completely different environment from the one in which it was buried, so changes can occur and that cause 8. [corrosion](#) or cracking and decay. So we have to make sure that we look after them so that this damage doesn't happen. When the bell came out of storage and into the Conservation laboratory, the first thing I did was check it, just to see if any corrosion was taking place. And on iron objects if its corroding you'll see this powdery orange substance that we know is rust, and that's a sign that the bell is corroding, because oxygen and water vapour actually cause iron to rust. So thankfully that wasn't happening. This bell is made from iron, but we wouldn't use iron to fix the bell, because it's too heavy and we're not able to work with welders and things like that in conservation. So I had to come up with a method that would give the bell enough strength and which we could also then colour in to make it look like it was part of the bell. So I used a thing called Japanese tissue, which is a paper that's used in conservation. It's very strong paper, and also it's, there are no nasty chemicals in it that might harm the bell. So I tore it into strips, and then I adhered these strips to the inside of the bell – kind of from here to here, and maybe from there to there – and just started bridging the gaps in between with the strips. In the front here, all of this is new. I really wanted to 9. [restore](#) it to kind of its former glory, to make it look like a bell again so that when it went on exhibition, the public would come in and they'd see a bell, rather than just a piece of old iron. So if you look inside, and you can see all of the cream-coloured paper, that's where the pieces were missing and then that's how I filled it. But a very important thing that we do in museums is we don't want to fool the viewer into thinking that all of this is ancient. So while from a distance it looks like one object, when you get up close, it's supposed to look as if this piece is repaired, and this is original, and the viewer should be

able to see the difference. It's amazing if you just see an iron object with your eyes, it mightn't look very impressive, but then when you look under a 10. [microscope](#), you might see remains of 11. [mineralized organics](#) – like you might see the scabbard on a Viking sword or 12. [textile](#) remains on the back of a brooch. So, it's quite exciting actually when you get to see an object up close and you learn a lot more about the object, and you feel that bit more connected to the person who used to own the object.

Siobhán: Whilst most objects are discovered during planned excavations and by archaeologists, some objects are discovered during Sunday afternoon strolls, people out for a walk, and completely by accident.

Matthew: So this is the 13. [archive](#) room in the National Museum of Ireland. All of the objects we've seen have a file connected to them. This is a file relating to a leather shoe that was found in Lugduff townland in Glendalough in 1989, by a hill walker. It was found in some bog land, on the side of the mountain. The hill walker reported it. Staff from the National Museum went out to retrieve, to collect the shoe, and collected a whole series of records, which include a map which shows where the finder has marked the location of the shoe, and also all the records then of the shoe, after that date. The shoe is made of leather. It's heavily worn. It was probably worn by a woman and is over 1100 years old. So this is where all the pieces of the jigsaw come together and we can tell the full story of an object.

Siobhán: So we say that this woman's shoe is at least 1,000 years old. But how do we really know that? For the answer, we have to look to science.

Voiceover – Siobhán:

Archaeologists work with lots of science laboratories and scientists, to discover information about objects. We sent the shoe to Belfast, to a carbon-dating laboratory where they were able to work out how old it was.

Dr. Gerard Barrett, 14CHRONO, Queens University, Belfast:

So this is the only 14. [radiocarbon](#) dating lab on the island of Ireland. 15. [Radiocarbon](#) dating is a wonderful scientific technique that allows us to date anything that lived once upon a time, up to about 50,000 years ago. So as far back as the Ice Age. So archaeologists can come to us with 15. [organic material](#) that they've excavated, and what we can do is we can radiocarbon date it.

Niamh O'Neill-Munro, 14CHRONO, Queens University, Belfast:

So we receive the samples in our lab. So that's the piece of leather, or the bone or the charcoal, and through a four-step process, we transform it from the sample into a small 16. [graphite](#) pellet, which is what goes into the 17. [AMS](#). So we need to load a small amount of this sample into the tube. We need to extract the carbon dioxide gas from it, cos its 'radiocarbon date', we need the carbon, not the whole sample. And to do this, really simple, you just burn the sample. So we have the carbon dioxide gas, and now we need to turn that into solid graphite. We reduce the carbon dioxide, we remove the oxygen, and that just leaves us with carbon - the graphite powder, just like in your pencil. And then we manually press this into a pellet in an aluminium target, which is loaded onto the sample wheel, which is what is put into the AMS.

Dr. Gerard Barrett: So here in 14CHRONO, we use an [accelerator mass spectrometer](#). And that's really important in terms of its ability to filter out all other molecules, all other atoms, and only

identify and detect and measure radiocarbon. So the power of radiocarbon is that, anything that has lived or existed, has and contains radiocarbon. Plants take up carbon dioxide during 18. [photosynthesis](#). Animals eat those plants, so also take up radiocarbon. For example, with the Lugduff shoe, we got in a piece of leather. We're not given any information as to how old this piece of leather is gonna be. Now, with radiocarbon, if we know how much is left, we have an estimate of how much radiocarbon there was to begin with. We also know how quickly radiocarbon 19. [radioactively decays](#). So with all of that information, we can provide an estimate of when the organic artefact was last alive. So the leather shoe that we radiocarbon dated, dates from the medieval period. So the 10th to 11th century. One type of material that we can analyse is human bone. And we would regularly date bone from all periods, from all parts of the world. And we will be able to go back to an archaeologist or even the police force, and tell them whether it's something more recent, or something that could be prehistoric, and is more of concern to an archaeologist than it is to a policeman. You know, it's fascinating for us too, because we're getting in samples we're not necessarily told what they are, and we'll give them back to the archaeologist and then we get the full story, and the more interesting story of what actually happened, or what the sample actually was.

Screen Image: Leather Shoe, Lugduff, Co. Wicklow, 899 - 1033 AD

Siobhán: Another way of finding out about an object is to look at how it was made. To look at the style, which might tell us the date, but also to make a replica. To recreate an object such as the shoe here. This is part of a process called 20. [experimental archaeology](#). And in the last 10 years, it has given us another way of finding out information about an object.

John Nicholls, Leather Finds Specialist:

Well I suppose the whole idea behind [experimental archaeology](#), which is what I'm trying to work here, is to take the material that an archaeologist finds, and then try and deconstruct it, in order to find out how it was made. You're learning the tricks that were necessary, and the kind...it can sometimes explain little anomalies that can be found in an artefact. What I'm going to try and explain to you here is the process which is involved in trying to make a 21. [replica](#) of a 1000 year old shoe, such as the Lugduff shoe, which was found near Glendalough. The seam which runs down the front, or the vamp of the shoe, is quite unusual, and it is completely different to the seam at the back, at the heel of the shoe, which is just a very simple series of knife cuts to join the two pieces together. And it may suggest that the shoe was started by an experienced shoemaker and finished by an inexperienced shoemaker. As far as possible, you only use the technology of the period. And to me that's the fun of experimental archaeology, it has to be a very simple awl, for piercing holes. It's using wax thread, possibly using a needle, and a very sharp knife, and that's it. Now on this attempt here, you can see how we have one type of stitch here, running up the centre of what's called the vamp, running up the front of the shoe. And then at the heel, we have a sequence of 10 slits, on both edges, which then are essentially laced together. Interesting one I came across, was working on a shoe from an archaeological dig, where you can actually see the imprint of the person's foot in the shoe. Right down to the imprint of the big toenail, which was a bit odd. The interesting thing about these shoes is, there were no needles used. The sewing medium, in this case artificial sinew, can be twisted until it becomes extremely tight. And it's possible, as I can show you here, to push it through the hole without having to use a needle, and it makes the stitch. But you can see here, the way in which when I pull the cord, it pulls the edges together, and it's as near to the original detail as I can manage to get. Shoes were patched and repaired and worn and patched,

until they were eventually beyond repair. Then they get thrown in the town ditch and a thousand years later, somebody digs them up. And that's the kind of process that is going on within archaeology, and within experimental archaeology as well. As I say, it's the stories that come out of the objects, and it kind of brings the object alive, which I find is quite interesting.

Siobhán: While the shoe tells us the story of the woman who travelled a distance to come here on pilgrimage, other objects tell us other stories about the connections between Glendalough and the wider world. And the clue to that, lies in the material that the objects were made out of. In the exhibition, we have this really tiny little object here, the smallest object in the exhibition, which has many hidden stories Matt, can you tell us a little bit more about it?

Screen Image: Jet Cross, Seven Churches or Camaderry, Co. Wicklow, 11th – 12th century AD

Matthew: So, this is a really tiny little jet cross. It's about the size of the top of your fingernail, and it's got a little hole for stringing around your neck. And it's made from a stone called jet. And it's got these tiny little cup marks in it, which are filled with tin. And it was actually found on an excavation in 2018, and it was found by someone who was 22. [sieving soil](#) through a sieve. Sieving, sieving, sieving all day long, and not finding a whole lot. And at the end of the day, suddenly he saw this glinting in the sieve, picked it up and it was an amazing find - this 12th century jet cross.

Siobhán: Other objects in the exhibition were only discovered recently as well, in the last two or three years. So, it would have looked very different, this exhibition, if it hadn't been for those archaeological excavations. I suppose the other thing about the little cross is, it's made of jet, which has a great story behind it, what it's made out of as well, doesn't it?

Matthew: So to understand the jet cross properly, you have to look at where other jet objects are found in Ireland and elsewhere. And then you also have to look at where do you find [jet](#)? Where in the world would you find the source of jet? So, if we look at this map of Europe, we can see where other jet crosses, like the one from Glendalough have been found. You can also see that there are relatively few of them, and that they're quite a rare object. You can see that there's quite a concentration of them in the northeast of England, in a place called Whitby, and also in York. And Whitby is the source of jet, and it's probable that this material came from there, and the crosses were made there, and then taken through York, along what were the older Viking sea routes, to places like Norway, Greenland, and a small number to Ireland, probably through the port of Dublin. So, looking at where these jet crosses are found, and looking at the kind of material it's made from, tell us something about the journey it made to Glendalough, in the 12th century, with its owner. Of course when we think of archaeologists, we think of them digging, and many of the objects we've seen, like the jet cross, came from digging a hole in the ground. But it's not as simple as that.

Voiceover – Matthew:

Increasingly, many new technologies are used to decide where to dig, and what to look for, and they let us see things never possible before. One team of archaeologists using these methods, are from the Discovery Programme and UCD. They use [24. geophysical](#) surveys to discover what's beneath the ground, and they also look at it from above, using drones. This gives archaeologists a different perspective, and they can look at the wider landscape for clues.

Prof. Graeme Warren, School of Archaeology, UCD:

Before we conducted any excavation here, we carried out different forms of archaeological survey, and they allow us to get a sense of what types of archaeology might be beneath the surface, that we can't see on the surface at all. And without going into too much detail, what they suggested was there was a very, very large possible, probable 25. [archaeological](#) feature running through the middle of this field here, right next to the main monastic complex. And we started excavating here, in order to test, what we call a 26. [geophysical anomaly](#). Something which is showing up on the geophysics, and that anomaly turned out to be the large enclosure ditch, which is curving round the monastic complex on which our 27. [trench](#) is on top of, just behind me here. We're in our main 28. [excavation trench](#), and it doesn't look like much at the moment, because this is, the last time we excavated here was over a year ago. And at the end of each year, we put a little bit of the mud that we've dug out of the trench back in, to protect the trench as a whole. But hopefully you can see we're in a kind of rectangle. It's in this excavation here that we found loads and loads of material, which is really important to understanding the story of Glendalough. And some of that is lovely artefacts, some of which is in the display in the museum now. So there's the little jet stone cross, 30. [high-status](#) Viking jewellery and pins for holding clothes together, and that's just fantastic to find. But there's lots of stuff that we'd never be able to recover by excavation by hand, so we take samples of the soil. That means we take a bag full, or a bucket full of the soil, and we take it back to the labs in UCD.

Voiceover – Siobhán:

Today, everything from the archaeology excavations is kept and analysed. So while we are looking for interesting objects buried in the ground, we might also find clues in the earth around them. From small grains and pollens to soil – these tiny particles can also contain hidden treasures of information.

Dr. Meriel McClatchie, School of Archaeology, UCD:

What we're looking at here is material that we've recovered from the excavations at Glendalough. So these are little burnt pieces of wood, and nutshell and seeds – little organic pieces of plants that have survived for hundreds of years in the soil at Glendalough. They're very difficult to see – you can see here they're very small, I've magnified them by about 15 or 20 times here, just to try and see them properly. But in my research, I really want to find out what people were eating, so what I'm looking for are food remains, things like 31. [cereal grains](#) and 32. [fruit seeds](#). And every so often you're looking through the dish in the microscope, and there's lots and lots of wood, and then suddenly you see it – a little wheat grain. And it's very exciting to see that and think this is part of someone's dinner from a thousand years ago, and I'm the first person in a thousand years to see that! And it's a part of my job I really enjoy. People are often surprised that you find these tiny fragmentary remains of plants, that have survived for hundreds, and sometimes thousands of years. And what you need are special conditions for them to become preserved. So, if you imagine, if you eat some cereals, or you eat an apple and chuck it away, it'll decompose quite quickly, maybe over the space of a few weeks or months and you won't find much of a trace of it. But if it becomes incorporated into certain conditions, it can survive for hundreds or thousands of years. And what we're relying on here, is people burning things in the past. So this might have been people cooking their food, and some of it dropped into the fire. There's lots of different ways that material can become charred and become preserved. So I can see here that we've got

pieces of charcoal, charred wood that might have been used as fuel on the fire. And we've even got some cereal grains – that's a little wheat grain we can see on the right-hand side there. And that's something the people were eating at Glendalough, hundreds of years ago – and here it is, dug up by archaeologists, and we can recover it and examine it and study it under the microscope. So what we see very clearly at Glendalough, are the early medieval communities were eating oats and barley, in particular, in terms of the cereal grains. And then in the later medieval period, a few hundred years later, we see a shift towards wheat. People are still eating oat and barley, but wheat has become much more common during this period. And that's what we see, is people making different food choices through time.

Siobhán: When not on exhibition, the objects are carefully archived in the museum stores, which has millions of objects. So as technology improves, we continue to find new ways to unlock information that's hidden in these objects. As that means, if they're safe in the stores, future generations of archaeologists and researchers can analyse the objects and discover new information about the past.

Matthew: But sometimes we can't preserve these artefacts, as they're exposed to the weather and slowly erode and disappear over time. Like the sculpture over the door of the 'Priest's House', in Glendalough, which has now nearly totally disappeared. In the past, this was preserved by taking a 33. [plaster cast](#) or making a drawing. But here again, we turn to new technology for help.

Robert Shaw, The Discovery Programme:

This is a three-dimensional laser scanner, which we're gonna use today, to scan the 'Priest's House' at Glendalough. 34. [3D scanning](#) is a very high precision, high resolution survey technique that allows us to create very very high resolution 3D models. On the stones, each stone will have a point in space every five millimetres. So the overall survey will result in millions of points in space, defining the 3D-shape of the structure. So the 3D scans have to be done a number of times, we can only scan what we see. So at the moment I'm seeing the one façade of the building. But in order to join the different scans together, I've set out a framework of reference points, which I can then take the scanner and move it to the other side of the building, scan that façade and also include the spheres in the scan and in that way piece things together. So you can see here that we've scanned all the exterior and gone into the interior. It's all joined together, and it gives us this amazing three-dimensional model of the structure. We have enough detail there that we can then assess over time if we do repeat surveys, whether the building's stable, whether there's 35. [erosion](#) taking place, or whether there may simply be damage or weathering. But within the structure and on the structure, there are some very highly decorative pieces of stonework. And for these, the technique that we need to use might rely on a different scanner again, to go to a higher resolution, if we want to record those in the highest detail possible. And this is somewhat replicating what was done in the past, using plaster casts, as we find with the lintel of the doorway.

Screen Image: Plaster Cast from 'The Priest's House' Glendalough Co. Wicklow, Original 12th century, Replica 19th century

Matthew: The advantage of the laser scanning, over the original plaster casts, is that they preserve them in much finer detail. The models that they are able to create are in much finer detail. You can do things like alter the light that's shining on them, the artificial light created by the computer, and show details which couldn't be seen even when the scan was being carried out.

Siobhán: For all these new technologies, scannings and drones, sometimes the most effective way of finding out about an object is to try and recreate it using the old traditional methods. And here the experimental archaeologists at UCD, have been recreating early Christian hand-bells, like the ones that we saw earlier.

Dr. Brendan O'Neill, School of Archaeology, UCD:

We're melting metal to cast it. So 35. **casting** means to pour metal from a crucible, a little vessel, that you melt the metal in, into a mould. And this is the type of process that would have been used in early medieval Ireland. So this is what we find archaeologically. A crucible is a clay pot, and you get this glassy outside, so that tells us it's a crucible, and it can have residues on the inside of it then from the metal. You see like this piece here. On site at Glendalough we have these lovely braised bells, these iron bells that would have been beaten out, forged from iron – very complicated kind of process, where you've got to fold the metal, and then covered in this lovely coating of bronze, a very thin surrounding of it. So, I know that my crucible starts to glow at about 800 degrees. My metal will start to glow shortly after that. And then it will start to change colour and shimmer in front of me. These are all kind of indicators, and I'm sure many more, that people in the past would have used. When we find charcoal on a site, it's a really good indicator that we have an industrial process, a kind of a high-heat process. You would use wood to cook and to do a lot of your domestic things, but where we find charcoal, which is a deliberately-made thing, then we know that it's to reach high temperatures, to do hot stuff. So after you've cast the metal into the mould, then you can break it in half, take off the top and then you have your object inside. In this case it's a small penannular brooch. In one hand, what we have at the end of that is a lot of ideas about what went on on the site. And experimental archaeologists can use their understanding of materials and technologies, as a way to test them ideas. And it's important that we understand that because that can tell us things about how much time and effort went into something, about the different connections between different places, with technology moving from one to the other maybe, or the influence of somewhere like Glendalough that would have been a big epicentre for craft and production, and how that influenced its surrounding area. So that's in part what experimental archaeology can bring to our understanding.

Siobhán: The archaeologists have shown us the very many different ways that we can find out information about the past, by looking at the buildings or the monuments, the landscape and the objects themselves.

Matthew: Yeah exactly. And the National Museum is keeping these objects in safe storage and they still have many of their secrets left to reveal.

Siobhán: And it's really important I suppose, that those objects are kept safe because our understanding of history is changing. How we interpret the evidence, we might put the clues together slightly differently.

Matthew: Exactly, and constantly new scientific techniques are coming to the fore, and maybe the next generation of scientists, archaeologists and researchers, will unlock further secrets about the archaeology of Glendalough through its objects.