Orkney Archaeology Review

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Contents

Introduction

Welcome to the third Orkney Archeological Review. Once again, our ambition is to expand the Review with more articles and illustrations, more pages, and a wider coverage of the groundbreaking and exciting archeology that is happening in our islands.

We open with the Ness of Brodgar and explore not just the recent revelations of the site, but the necessary realities of modern archeology: funding; closed season research; possible endgames for the site; and the place of the Ness in the tourist and wider economy of Orkney. This is followed by an account of photogrammetry - cutting edge digital technology - being used at two of our major sites, The Ness and The Cairns.

We move from prehistory to medieval town expansion in an article that traces land reclamation in Kirkwall, particularly in the Norse era but also in the Scottish period. The illustrations show vividly just how much of the town's 900-year history is still extant. The next article takes the focus to Westray and a rich, but little explored site, The Knowe of Skea. What has been revealed is a complex and long occupation record from the Neolithic through to (possibly) Early Christian, and finally Norse use.

The stated 900th anniversary of St Magnus' martyrdom was an excellent opportunity for a research, training and community project, and is the subject of our next piece. Most activity focused on Palace in Birsay and the surrounding Barony. Magnus' life and death is Orkney's best loved story and this article shows how detailed archeology can work hand in hand with school and community enthusiasm.

Our next piece on Swandro in Rousay is a good illustration that the unexpected should always be expected when you start digging… The

Knowe of Swandro was thought to be Iron Age in date, however recent excavations have taken that date back to the Neolithic and forward to the Norse Period. The article also highlights the continuing tension between coastal erosion and archeological survival in Orkney.

We revisit the amazing YAARP project in its third year which has produced some amazing images, celebrating the links between art and archaeology.

Conservation on a much larger scale in Rousay features in our next piece that comes from Historic Environment Scotland, who are tasked with looking after our key monuments. This article looks specifically at work to update the interpretation of the well-known Neolithic sites on the island. This work includes digital technology similar to that featured earlier in the Review.

Our third article to feature Orkney's North Isles is an account of the recent Cata Sand excavation on Sanday. This dig was carried out in 2016 and 2017 and like Swandro, the site is under imminent threat from coastal erosion. An early Neolithic house is examined in detail and we have the bonus discovery of an intriguing whale pit on the site.

The marvellous Tomb of the Eagles Visitor Centre on South Ronaldsay is a tribute to the work of Ronnie and Morgan Simison in bringing that Neolithic tomb so vividly to life for thousands of visitors over more than thirty years. The next piece gives an account of the Neolithic tomb and the Bronze Age Burnt Mound, as well as discussing the important role of public presentation and interpretation of the site.

Our final article revisits the long-term excavation of The Cairns, also in South Ronaldsay. This Iron Age broch site has undergone extensive exploration and has featured in previous Reviews. This article takes us

outwith the broch itself to investigate Iron Age metalworking capacity in the north part of the site. Fascinating finds are described and linked to a suggested expression of Later Iron Age collective identity. This final piece ends the Review on a speculative and perhaps controversial note - as befits the exploratory and challenging nature of good archeology.

We have brought together articles that cover all the major periods of Orkney's pre-Twentieth Century archeology, and we have ranged over the Mainland and four of the North and South Isles. Not least, the contributors have pointed up the important role our local community and our annual visitors have in developing and supporting archeology in Orkney.

David Drever

Orkney Archaeology Society

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Ness of Brodgar: story of an amazing excavation

Interview with Nick Card & Anne Mitchell

The Ness of Brodgar is one of the most exciting prehistoric excavations currently being carried out anywhere in the world, never mind the UK or Scotland. OAS's George Vickers and Hayley Green spoke exclusively to Site Director, Nick Card and Finds Supervisor, Anne Mitchell, about this remarkable dig.

Could you tell us about how the site was discovered?

Nick: The site was discovered in 2002. ORCA (Orkney Research Centre for Archaeology) carried out an initial geophysics survey across the Heart of Neolithic Orkney World Heritage Site, and at the Ness of Brodgar a lot of complex anomalies showed up that were difficult to interpret. It wasn't until the following year, 2003, when a big notched stone slab was discovered, that we knew we had found something special. However, instead of excavating the Bronze Age cist we

Opposite, Trench T

expected it to be from, walls were found that turned out to be part of Structure One.

The uncovering of the site has been a gradual one, a long drawn out process over fourteen years. Obviously, the indications of a site were there - there are the two standing stones at the house of Lochview and there was also the discovery of the Brodgar stone back in the 1920s. Nobody could however really have known that it would turn out to be such a unique site. I think if we had discovered one of the structures in isolation we might have reached totally the wrong conclusion, deciding that it was probably more of a settlement site, like Barnhouse, rather than this communal ritual site that we think it is.

Looking out of the southern entrance to Structure 1 towards the central paved area and its standing stone

What were the initial objectives of the excavation?

Nick: When we started doing the geophysics, it was always our intention that this would be a project looking at the World Heritage site as a whole and which could then lead to an excavation. We planned on a series of small test pits to look at the sequence of anomalies across the landscape, plus perhaps excavating one of the anomalies in full so it could be viewed by the public. Another objective was to look at the agricultural damage that was being done because the stone slab in 2003 had been discovered by ploughing, and we wanted to see how much damage was happening by modern agricultural methods.

But since then the objectives of the project have changed as we've realised the importance of the Ness of Brodgar in Orkney's Neolithic, and then discovering it wasn't just Orkney's Neolithic that we were illuminating but the Neolithic of Britain. Some of our discoveries are totally unique: we have the largest Grooved Ware ceramic assemblage by far in the UK and also the largest assemblage of Neolithic art.

The Ness really gives us the potential to look at all these different types of material in an entirely different light, so the objectives continue to evolve and change as we go along. It really is changing our perceptions of the Neolithic.

We are developing and trialing new techniques and ideas at the Ness, such as our Smart-Fauna project and also the use of new technology e.g. 3D modelling and photogrammetry. [see Jim Bright's article in this Review]

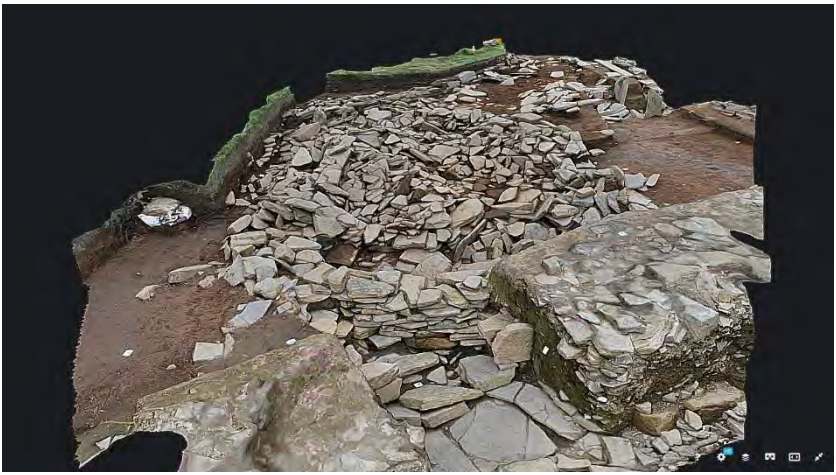
Anne: we also have Martha Johnson's PhD which is nearing its completion, looking at the rocks brought to the Ness, not obviously used there, but clearly not from the site itself and trying to understand why that's happening, to understand the geology a lot better and the

choices being made about the one of main ingredients of Neolithic life.

The Ness is not an excavation that is primarily funded from a single source. How do you bring together the resources, people, money and expertise, to carry out such a significant project? How is the dig organised? How is it funded?

Nick: Many people think that we get lots of funding through central government or Historic Environment Scotland or our sister US charity, the American Friends of the Ness of Brodgar. This is not the case. HES support us in various other ways. The American Friends support us by raising money but, like the funds we raise ourselves in the UK, every single penny is hard fought for and every single penny counts.

We do get ongoing support from the Orkney Islands Council through their Excavation Fund, and since last January we have been in receipt of some European LEADER funding which is supporting us with my job as site Director, and Anne part-time as Project Officer. However, most of the money, the vast majority of it, is raised by the Ness of Brodgar



Structure 26

Trust, the American Friends and from generous donations by individuals and other charities, including the great support we get from Orkney Archaeology Society and their work in running the shop at the site and organising events with us.

We also get a lot of in kind support, especially from the students, volunteers and the many archaeologists who come up to the Ness and give their time freely during the excavation. And it's a year-round project – we don't just turn up the day before we start digging, get everything quickly in place and start excavation.

When we are not digging there is a huge amount of processing and organising that needs to be done, as well as the post-excavation analysis which is immense [see the article in the 2017 Review] and we are always on the lookout for support whether that is in kind, from businesses, volunteer or financial support.

I've already said the generosity from individual people is key. That's from those who come to visit the site, who donate when they are there, who buy a Guidebook, who sponsor a square, who spend money in the shop and so on. Every penny raised goes towards archaeology.

Anne: We've also had great support from folk like Jo Bourne, Roy Towers and Mark Edmonds and all the work they have done over the two iterations of the Guidebook – which is also available online [insert link] and in many outlets across Orkney.

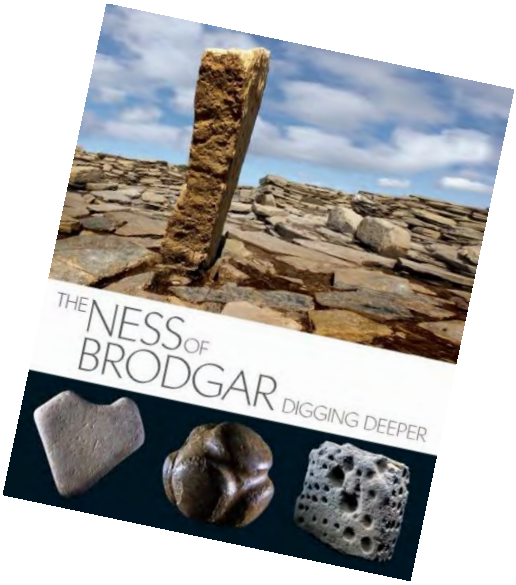
Nick: But what is funded now won't be funded forever. The funding from LEADER which part funds my fulltime and Anne's part time posts started in January 2017 and comes to an end in January 2019 (and we fund the other half, from Trust funds). We must find the money to carry on after this – there is so much to be done on the excavation and post excavation sides and that work is very important and we need to have a team in place, long-term, to run it all.

Part of the problem is that in many people's eyes archaeology is considered to be a gentleman's pursuit, not a profession. But it is a profession – not a well-paid profession I hasten to add, but it is a profession. The excavations of the Ness costs well in excess of £100,000 a year to run, probably nearer £200,000 when you look at the annual excavation costs and the post excavation costs, and all that money is raised by the very hard work of innumerable individuals.

Much of that money is raised outwith Orkney but is spent here in Orkney. We've seen the knock-on effect of the positive PR that the Ness brings to Orkney, and that archaeology generally brings to Orkney and to tourism, which is now Orkney's second largest business. The return on the investment is manyfold.

We've also helped create jobs, including the creation of jobs within Orkney College because the Ness and other big archaeology excavations help to bring new students to the Archaeology Institute.

Anne: We've also learned how to run our own tourist business for the 8 week period of the annual excavations and hope we do that well, in conjunction with OAS. The site has always been open to the public: we think everyone needs access to explore and learn with us. As Roy Towers always says when he ends his guided tours of the Ness "it's not our archaeology: it's your archaeology, it's everyone's archaeology".



At the beginning of the process, what did you think you would discover and how has your thinking changed over the last decade or so?

Nick: In 2004, when we discovered part of the wall which mirrored very closely the architecture of Structure Two in Barnhouse Village, we all thought that we would end up with a house village of the late Neolithic. But what surprised us was that it very quickly became apparent that what we were dealing with was something a lot more complex.

Unlike Barnhouse Village, the Ness had not been badly truncated by ploughing. What's astonishing is that you have this amazing preservation surviving under just six inches of topsoil. Also, how the Ness throws up so many new and exciting things that we couldn't have dreamt of discovering, such as the amount of Neolithic art that's been discovered in situ, built into the walls, on the walls and under the walls. And items such as the carved stone ball and the polished stone artefacts. Anne: And more utilitarian worked stone tools e.g. multi-hollow pieces which have rarely turned up elsewhere, and the spatula-type tools.

Selection of macehead fragments - HAW

Decorated stone from under rebuild of Structure 10

Nick: The site has really changed immeasurably since we've begun and sometimes we have to reassess things on a daily, an hourly basis. But that's also the excitement of it and sometimes when you think you have the site sussed it kicks back in a major way! Who would have thought, for instance, Trench T turning out to be this amazing Structure Twenty-seven [see the 2017 Review], the like of which has never been seen anywhere before. Our initial thoughts were that the big mound was going to cover a chambered tomb or cairn, but in fact it turned out to be a big midden - but then at the bottom of it was hiding this amazing, unique structure.

Anne: Much of what we find defies expectation, such as when we found all the animal bone around Structure 10, or last year's little 'incense' cup. Who knows what we'll find in 2018?

What are your plans for the future of the excavation?

Nick: You can't tackle any archaeological site without thinking about what the endgame will be. But of course, with a site like the Ness, which is bigger and more complex, and in a very sensitive area in the heart of the World Heritage Site, then that poses its own unique problems.

We know we can never leave the site open all year round exposed to the weather, because the stone work is just not suitable for that. It's quarried stone, not like Skara Brae which is basically beach pebble stones. If you left it open it would just disintegrate. It would likely take several years but it would become just a pile of rubble. So, I think, once we have finished this phase of the excavation, however long that will be, the buildings will be covered over again.

We will continue with other research relating to the Ness and its environment. We may do the equivalent of keyhole surgery across the site to try to answer specific questions. Maybe we'll be tackling some of the other parts of this amazing complex, the location of which is central to our understanding of the World Heritage Site

It would be good to be able to continue some form of access, a way of commemorating what was there and what is still there. Maybe through Virtual Reality or Augmented Reality where people could maybe still access the site at particular times and, with the aid of the latest technology, see the buildings as a hologram, like they were when they were being excavated and maybe as they appeared 5000 years ago.

There are lots of concerns here, lots of different stakeholders in the site and lots of other interested parties whether it's academics, archaeologists, tourists, locals, local landowners and saying that I must mention Ola and Arnie Tait who have supported us for so many years and been so kind letting us excavate their field.

The other thing that we've got to keep concentrating on is the post excavation programme of work. We have to be reaching out, we must get our thinking out to the wider world of archaeology and that's a big part of the stage that we're now coming to. We've obviously been recording, thinking, cataloguing and processing as we've gone along, and various academic papers have been published but this all now needs to move into a much bigger focus for us.

With a site as complex as the Ness all of this takes a long time. The amount of evidence we get from the site is massive and it takes a whole army of specialists and volunteers to deal with it, to help catalogue it and list it. We expect that there will be a major or maybe several major publications coming out of this phase of the work and we hope it continues to inspire future generations of archaeologists.

Remains of some of the orthostatic cladding in Structure 27

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Digging in to Digital – A summer of photogrammetry in Orkney

By Jim Bright

Introduction

During the 2017 excavations at The Cairns and The Ness of Brodgar, I was fortunate enough to complete a placement at the sites for the Archaeological Practice Masters degree which I was undertaking with the University of the Highlands and Islands Archaeology Institute. As my specialisation and undergraduate dissertation has been researching the use of digital techniques to record and disseminate our heritage, the placement would offer an ideal opportunity to test some techniques in the field.

Opposite: Photogrammetry in Structure 1 at the Ness of Brodgar (Photo by Andy Boyar)

My undergraduate dissertation focused on photogrammetry, a process whereby multiple photographs of an object or area are taken at different angles and then uploaded on to a computer where software generates a 3D point cloud to form a model from the data supplied in the photographs. I had created and disseminated 3D models of artefacts from museums and a heritage centre, using the photogrammetry technique, while creating surveys for archaeologists and the general public which asked questions about the models, in order to ascertain the value of creating virtual representations of artefacts. The response to the surveys was overwhelmingly positive and this inspired me to continue my research in my Masters placement.

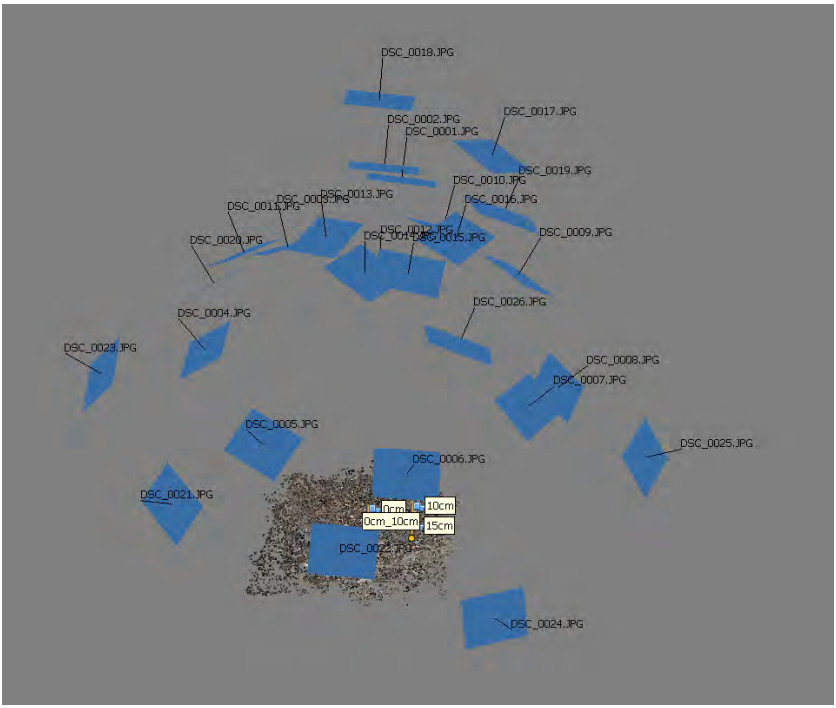
I wanted to further develop the skills and knowledge I had gained from my undergraduate dissertation, and attempt to place photogrammetry in a wider context, by undertaking this technique while on an archaeological excavation. The digital techniques I employed were not new to archaeology, indeed there have been many 3D models created of trenches and artefacts at sites all across the world, as can be seen on the website Sketchfab.com. There has been little research done to ascertain the value of having someone undertaking digital archaeology throughout the entirety of an excavation however, and this was an area I was keen to investigate.

The term 'digital archaeology' was initially described almost twenty years ago as a design / research discipline which involves the use of visualisation methods to present historical data, along with testing and evaluating the methods used while undertaking new techniques (Diaz 1998:283). My work would primarily focus on the photogrammetry technique, as it had during my undergraduate research, and so a brief definition of this technique is given below.

What is Photogrammetry?

There are many interpretations for the term, both inside and outside the world of archaeology, but for the digital archaeologist, photogrammetry is now most commonly known as the technique in which multiple photographs are taken of an object or area and then uploaded in to a software package in order to create a three dimensional model which can be viewed on a computer screen or on a virtual reality headset.

The process of creating a good 3D model of a structure or item is a multi-phased one. Firstly, I'd photograph around the object or area for modelling, making sure I took overlapping photographs at every angle. Once all the photos had been taken they are uploaded to the software. I used 'Agisoft PhotoScan Professional' during the placement. This software is becoming the most commonly used for creating 3D models in the heritage sector, although there were alternatives available. Within the software package, I would check each photo, and remove any blurry or unwanted areas of a photograph using the masking tool. This tool tells the software to ignore the parts of a photo that you don't want processed, which can cause problems pertaining to the quality of the final 3D model. The alignment process can then begin. This is where the software takes millions of points in each photograph, compares them to the other photographs to identify the position and angle in which they were taken, and from this, generate a sparse point cloud. A point cloud is essentially a set of data points in a three-dimensional coordinate system, these points are intended to represent the external surface of an object. Much like a collection of pixels can display an image on a computer screen, points in a 3D point cloud can present an image of a model, as can be seen in the image below.

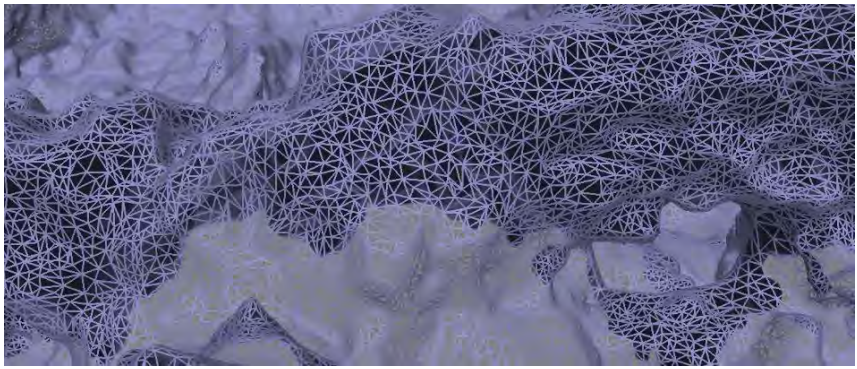


Sparse point cloud during 3D model creation

Once this is done, any potential errors or bad data can be removed by viewing the sparse point cloud and by selecting certain parameters in the software before beginning the dense point cloud generation, this is where even more points in a model are created. As with the alignment process, the software offers a variety of reconstruction parameters for the dense point cloud, and settings such as depth filtering modes can be changed depending on the type of model being created. In order to get good quality 3D models, this technique was something which I had to develop by comparing the quality of a model created using the same photographs but with differing parameter settings during the workflow process. This way I was able to

get an impression of which parameters would be better suited to the type of model I was creating.

Once the dense point cloud has been created, a mesh is generated. For this, the software utilises connectivity data to triangulate information and create a set of what are termed 'faces'. These are essentially millions of triangles which join the points, ready for a texture to be added, as can be seen in the image below.



Mesh creation during the 3D modelling process

Finally a texture was created for the model. The texture was made up of the photographs taken in the photogrammetry process and applied to the mesh by the software. Various configuration options exist to improve the quality of the texture applied to the mesh, including colour correction and texture pixel size and count, along with various modes for mapping the texture to the mesh. Once all these steps are completed, a 3D model has been created.

Photogrammetry at The Cairns

The Cairns project was the first excavation where I would be able to undertake photogrammetry throughout the dig season and I initially set up my equipment in the site cabin. This equipment consisted of a light box (where I could photograph small finds), my Nikon D60 digital SLR camera (my workhorse throughout the placement), and the laptop with the PhotoScan software on (generously provided to me throughout the placement by the Orkney Research Centre for Archaeology).

Photogrammetry setup at The Cairns excavations (Photo by the author)

Photogrammetry of small finds became a daily activity when working at the Cairns excavations, with a mixture of successful and unsuccessful results. Opportunities to test the limits of the software

presented themselves as I attempted to create models of very small objects which are well known to present severe difficulties for their 3D reconstruction. Indeed, studies have been undertaken by Evgenikou and Georgopoulos (2015:101) which have attempted to tackle these issues, however the known problems of model recreation using the photogrammetry technique persist. One particular small find from which I had attempted to create a 3D model, was a tiny glass bead, which had been discovered inside one of the cells within the broch complex.

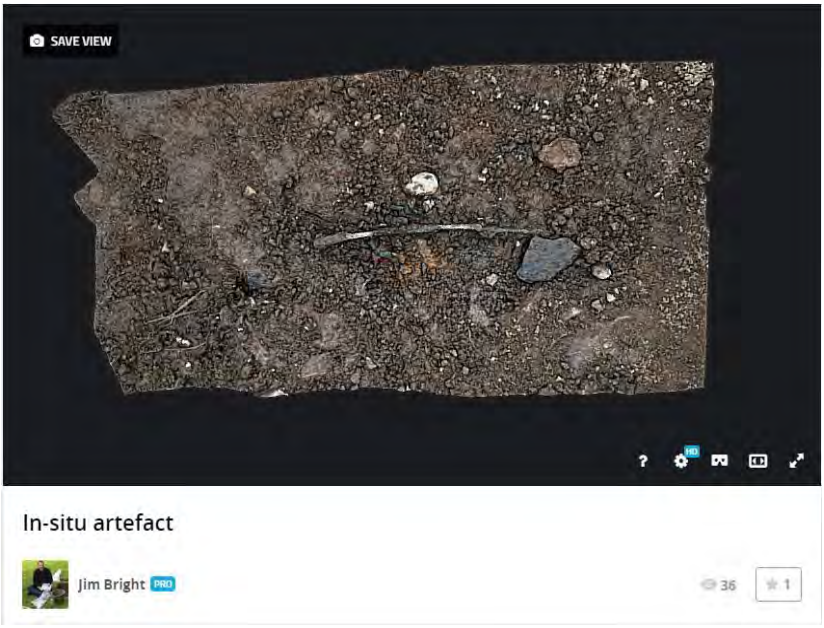
I had been cleaning the cell in preparation for the creation of a 3D model of the area, and the next day the tiny bead was spotted within the cell by archaeologist and small finds catalogue specialist, Kevin Kerr.

Preparing the Red Cell for photogrammetry (Photo by Sean Page)

Photogrammetry of this object proved to be unsuccessful and confirmed the issues digital archaeologists are confronted with when

attempting model creation of small artefacts. Shiny glass objects such as the bead present further difficulties relating to their reflectiveness, which confuses the software rendering the data useless. Solutions to these issues have been recently developed however. Developer spray, a talc based product, is now being used which is said to greatly enhance the quality of 3D models of these types of artefacts (Porter, Roussel and Soressi 2016:77).

A good reason to have a digital archaeologist on site throughout an excavation, is that 3D models can be recorded of small finds while they are still in the ground, waiting to be lifted. This means that in the unfortunate event of the find falling to pieces while being lifted from the ground, there is still a record in 3D of the item in one piece. This could help with reconstruction of the item and could even allow 3D



3D model of the Iron Age 'pin' in situ at The Cairns

printed replicas made if required. Moreover, there is a 3D record of the find in context, which could aid in understanding how the item was initially deposited.

One such item was a large pin-like object, discovered at The Cairns, of which I created a 3D model while in-situ.

Another good advantage of working as a digital archaeologist throughout an entire excavation season was I had the opportunity to record structures and features at different phases of excavation. I was first able to attempt this with deposits of bone being removed from a souterrain in structure F. Site director Martin Carruthers had suggested I record this area as the bone was being removed, and so I undertook photogrammetry at this location on three separate days. The models were then uploaded onto the Sketchfab website and added to a "collection", a feature offered by Sketchfab to disseminate 3D models in groups.

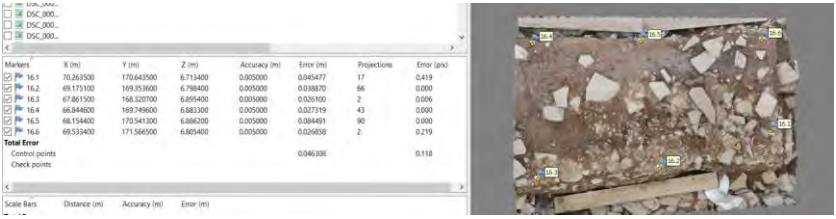
Multiple 3D models of the souterrain at The Cairns

The models could then be viewed one at a time, or all together, in order to ascertain potential structured deposition of the bone.

Photogrammetry at The Ness of Brodgar

I was able to develop this aspect of the work further at the Ness of Brodgar. A north east facing wall in structure 1 was to be removed and after discussions with site director Nick Card and structure supervisor Andy Boyar, it was decided that I would employ the photogrammetry technique each time a section of the wall was removed.

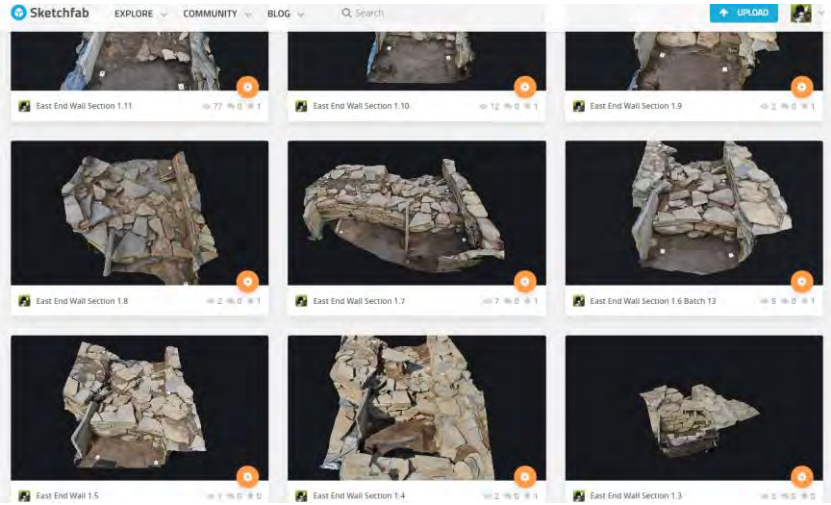
The Ness of Brodgar offered the opportunity to add extra data to the 3D models which would make them even more useful. That data was geolocation coordinates recorded using a total station theodolite (an electronic/optical instrument used for surveying and building construction). This was done by physically placing coded targets around the area to be modelled, with the positon of each target being plotted by a geomatics officer using the total station. All measurements are recorded in 3D space, with an X, Y and Z value. These measurements are then input to the software after the 3D model has been generated.



Coordinates input in to the PhotoScan software

Once the coordinates have been entered, accurate measurements of the model can be made down to the nearest millimetre using PhotoScan's Ruler tool. The 3D models made from the deconstruction of the wall proved to be useful and were viewed on multiple occasions by the structure supervisor in order to ascertain where certain stones had been positioned before they had been removed. Traditional plans may have provided this information. However, viewing the wall in 3D

would enable speedy identification of where stones had been. The models of the wall sections were uploaded to Sketchfab and put into a collection so that they could be viewed by the public and also by the supervisor when not on the site.

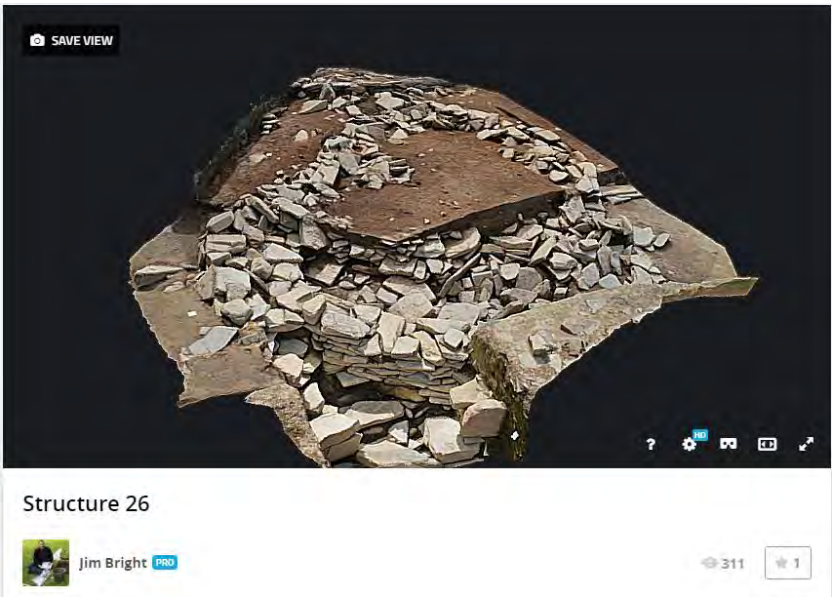


3D model collection of the wall in Structure 1

Utilising models for planning

An aspect of the creation of 3D models of structures and trenches which enhanced the value of having a digital archaeologist on site for an entire season, was the use of photogrammetry to replace traditional planning. Structure 26 contained a vast amount of stone which had collapsed, and traditional planning would have taken a long time. Therefore the site director, Nick Card, decided that this structure would benefit from the creation of an accurate 3D model using photogrammetry. I undertook this, using the coded targets technique, to ensure accurate measurements could be made. This saved the

structure supervisors a great deal of time in planning this area. Once I had created the model I was asked to print out screenshots of it at different angles, which I then gave to the structure supervisors to help aid interpretation.



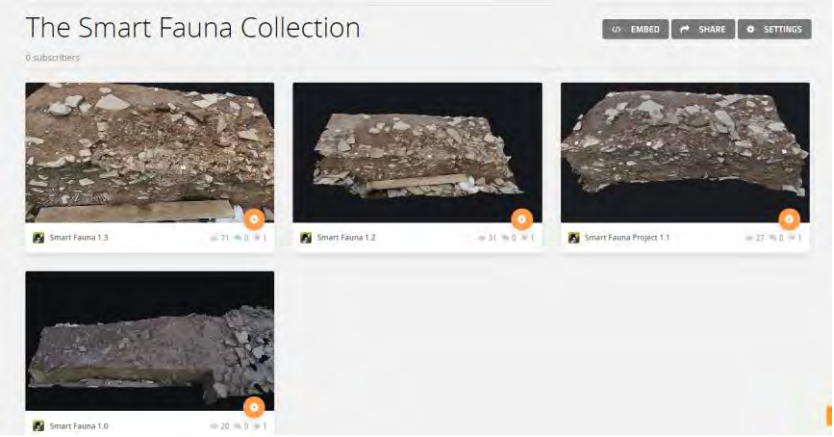
3D model of structure 26 at The Ness of Brodgar

Smart Fauna

One of my research objectives at the Ness of Brodgar was to build on work undertaken by Macheridis (2015:246) where photogrammetry of faunal remains had taken place, and attempt to create 3D models of a central midden area where the Smart-Fauna technique was to be applied. The Smart-Fauna project is a part of a wider research initiative into late Neolithic faunas at the Ness of Brodgar and was created in response to an unusual bone deposit recovered from the site

(Mainland et al 2014:868). The Smart-Fauna project involves geolocations of both sides of each bone in a deposit being recorded using a total station and uploaded into a software package called 'x-bones'. This represents the bones using vector lines, so that faunal analysis can then take place (Mainland et al 2014:870). The application of photogrammetry to the area where the Smart-Fauna project was to be undertaken for this season would add a visual aspect to the data which had previously only been displayed as vectors. Moreover, fauna specialist Ingrid Mainland, would be able to identify bone post excavation within the midden context using the 3D models.

Photogrammetry was undertaken after each phase of recording, using the Smart-Fauna technique, but before the bone was lifted to begin recording the next layer. As with the other work, the models were uploaded to Sketchfab and put into a collection. The models were also georeferenced using coded targets (as described before), so that measurements of bone deposits could take place using the ruler tool in PhotoScan.



Smart Fauna 3D model collection

Conclusion

The work undertaken throughout the seasons at The Cairns and The Ness of Brodgar proved to be useful in terms of ascertaining the value of digital archaeology. The dissemination of 3D models of finds and trenches to the public during a live excavation and the 3D models ultimately being used to inform interpretation for supervisors while excavating a structure in real-time, allows a picture to be drawn up as to how this technology will be developed and used in the future.

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All 3D models created during the placement can be viewed at https://sketchfab.com/jimbright and further information about digital archaeology can be accessed on my website at https://www.virtualpasts.com/.

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rd Ordinary dated the 17th January 1837 by Will Mathison
LITTLE SEA
GARDENS
Broad Street
Street
Mr James Smith
Mr David Erskine
Mr D. Erskine
Miss Cunningham
John Cunningham
Mr D. Spence
Mr David Erskine
Mr Oliver Scot
Mr R. Berwick
Cabbage Yard
Stile
Little Crafty - consisting of bare ground overflowed by the sea at High Spring tides
Heirs of Mr Jno Miller

The Changing Shoreline of the Peedie Sea from the Medieval Period until 1930

By Kath Page

Archaeological Evidence of Land Reclamation of the Peedie Sea Shoreline along Victoria Street to Albert Street, Kirkwall, Orkney.

The city of Kirkwall, situated on Mainland Orkney, was the only town to be established in any of the medieval North Atlantic Norse colonies (Lamb and Robertson 2005:161). This was in part due to strong links and a special relationship with Norway, and because it was chosen as the resting place of St Magnus. Access to safe harbour within Kirkwall bay and the Oyce (for the purpose of this paper referred to as the Peedie Sea), helped to ensure the prosperity of the town. Tradition holds that the Peedie Sea once reached the West Door of the cathedral (Hossack 1900: 31, Thomson 2008: 161), but the shoreline is now 160 metres away. Can historical and archaeological evidence prove that the shoreline has receded that far from the Cathedral and has the same rate of land reclamation occurred across Kirkwall?

Opposite: William Mathison's 1827 Map showing the extent of the Peedie Sea and the burgage plots created from reclaimed land to the left of Victoria Street. Image Authors Own Courtesy of Orkney Archives (2017)

Fig 1: Aerial photograph of Kirkwall and the Peedie Sea in the foreground. The red dot indicating the location of St Magnus Cathedral and the original shoreline of the Peedie Sea. Image: Alan Moar (2017)

The name Kirkwall derives from the Old Norse Kirkuvagr which translates as "Church Bay" or "Church inlet". The Kirk referred to in the name is not St Magnus Cathedral, but the Church of St Olaf, built by Earl Rognvald Brusison in 1035, situated on the edge of Kirkwall bay. Prior to 1137 and the construction of the cathedral, Kirkwall, according to the Orkneyinga Saga "had only a few houses" that were centred

around Papdale burn (Palsson and Edwards 1978:105, Crawford 2013: 141). Described as a triangular village, Kirkwall was situated between the burn and the bay, protected by the Ayre (or Aire) - a shingle spit jutting out into Kirkwall Bay (Hossacks 1900: 19). This statement implies that the original settlement of Kirkwall was in fact situated further north of the current town.

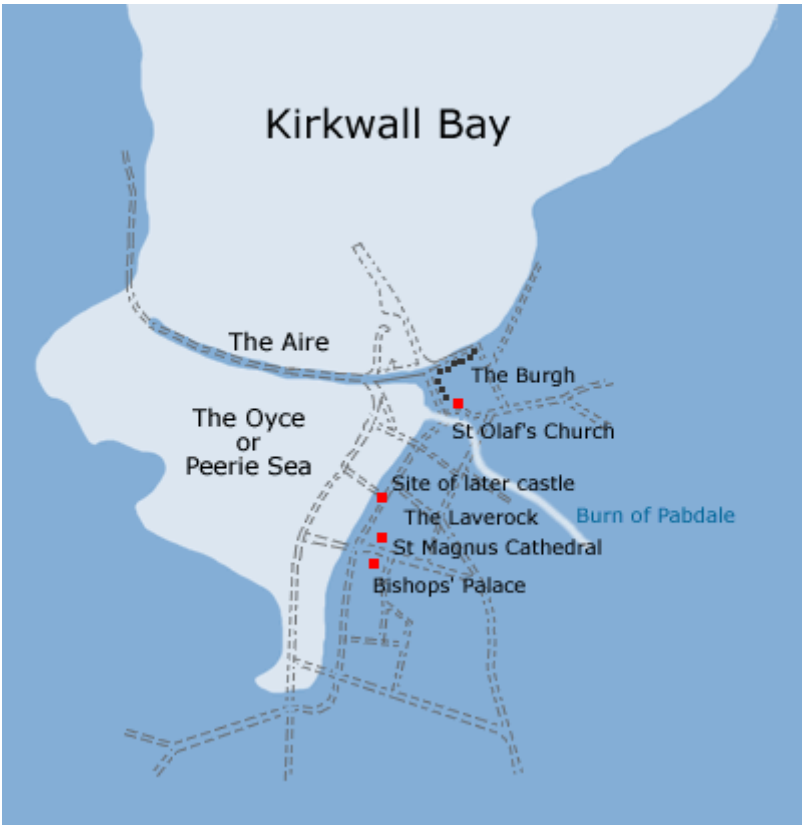

Fig 2: Papar Project Map of Kirkwall (2005) – Original location of medieval Kirkwall between the Burgh and St Olaf's Church. Modern reclaimed land and roads indicated with the dotted lines.

Fig 3: The 16th century restored doorway to St Olaf's kirk is all the remains of the church. Image: Authors own (2017).

The location of Kirkwall cathedral may have been chosen for its proximity to the sheltered sea that is set within a natural harbour, called the Oyce. Oyce refers to an inlet of the sea almost cut off by a shingle bar (the Ayre); however, Orcadians refer to it as the Peerie Sea, Orcadian dialect for tiny. The sea is now more commonly known as the Peedie Sea, a variation of Peerie. Hossack in 1900 stated that the location of the St Olaf's kirk and the hamlet of Kirkwall, was valued because of the Oyce, since it ran into the "commodious vagr" (Kirkwall bay) so offering anchorage for galleys in all seasons (Hossack 1900: 3).

Fig 4: 1821 Painting by William Daniell of sail ships at anchor in the Peedie Sea when it was still navigable. The Cathedral is visible in the rear of the painting. Image Tate (2017)

Fig 5: 1920 photograph of the same view. Ships can no longer navigate the Peedie Sea since the building of the Ousemouth Bridge in 1858. Image Orkney Communities (2017)

At the time of the cathedral's construction in 1137, the cathedral site is described by Crawford (2013:211) as being on a steep slope above the shore and fronting its own harbour where the bishop's own ship could moor. Merchant vessels too could moor, as well as the knars - trading ships bringing the distinctive pink and yellow sandstone for the cathedral's construction, across the bay and into Peedie Sea. This lends credence to the tradition of the medieval shoreline lapping the

West Door. Both Hossack (1900: 31) and Thomson (2008: 161) state that the stone was unloaded by the west door near the Peedie sea.

Land reclamation and the development of the town south of the original hamlet along the shoreline of the Peedie Sea, seems to have begun with the construction of St Magnus' Cathedral, so, what archaeological evidence is there to identify the original 12th century shoreline and subsequent development?

Excavations undertaken by McGavin et al in 1978 discovered that the medieval shoreline was most likely to have been underneath Tankerness House and gardens, currently Orkney Museum and some 50m away from the cathedral. A seaward sloping platform, possibly a jetty made of grey flagstone was discovered in the gardens at the rear of the museum, probably dating after 1137 and in use until the early 14th Century when it was replaced by a substantial sea wall. McGavin stated that the area under Tankerness house would have been open beach prior to the construction of the cathedral. This area of Broad Street would have been the first area of the Peedie Sea to have seen any development.

The location of the shoreline at Tankerness house would imply that waves could not have reached the West Door of the cathedral. When geology is considered, as Crawford (2013:11) has previously identified, the steep slope of bed rock meets a layer of boulder clay by the West end of the cathedral. McGavin noted that the cathedral was 5 metres above the modern tidal range, so the jetty found at Tankerness House was the most likely landing place for building materials.

However, in 1986, 18 years after McGavin's excavations, work men digging a sump hole in Broad Street between the cathedral and the town hall discovered a vertical face cut into the bedrock. This may have been to create a wharf, the full extent of which is unknown, but it is possibly 12th Century in construction, but was later filled in to

enable land reclamation in the area. So, although the sea did not lap the West door, it may have come close.

Fig 7: Sump hole being dug on Broad Street outside the cathedral in 1986. The ranging pole at the vertical base of the rock cut. Image National Monuments record of Scotland (1986)

Further excavations within Broad Street in 1986 found the remains of an Iron Age settlement next to the current site of Spence's newsagents. A probable Broch site which would have been located on the margins of the Peedie Sea, evidence of habitation and hearths were uncovered (Lamb and Robertson 2005:186). Directly behind are the ruins of the Bishop's palace and later Earl's palace. The Bishop's palace would have also been located close to the shoreline, "near the margin of the oyce" (Mooney 1943:96). The "Watergate", implying a fortified access directly onto a quay or harbour, remains, although it was moved from its original position in 1877 during road improvement work.

Fig 8: Close up of the Watergate which was moved in 1877 for road improvement works. Image: Authors Own (2017).

Archaeological evidence proves that the shoreline of the Peedie Sea ran along the current Broad Street in the 12th Century. Historical records indicate that it also ran along Albert Street, Victoria Street and "touched the east corner of the ancient Glaitness" (Mooney 1943: 101). William Mathison's 1827 map of Victoria Street shows how even in the 19th century the Peedie Sea still covered much of the same area as in the 12th century south of the cathedral. The extent of which covers the present area of the A963 from McEwens furniture shop to Wellington Road and Glaitness Park. This area was known as Little Crofty and was left free from development due to flooding every spring tide.

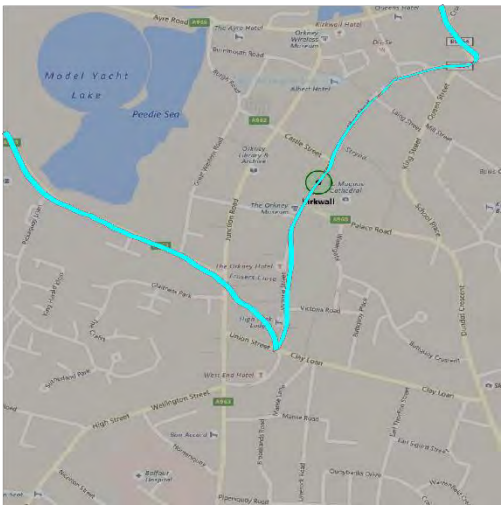

Fig 9: Modern Map (2017) showing the extent of the land reclamation compared with 1827. The cathedral in the centre. Image Google Maps (2017).

Excavations by McGavin et al in 1978 identified jetties and sea walls as far south as Union Street, indicating that this part of the Peedie Sea was still navigable well into the 19th century as suggested by Mathison's map. Excavations in Gunn's Close produced stone-built slipways and a sea wall dating from the medieval period which was later in filled by 1865 when Union Street was created. Mathison's map also show the burgage plots backing onto the Peedie Sea. These were created by systematic land reclamation since 1137 and mostly were uniform in width.

In 1380 Earl Henry Sinclair built a castle to the northwest of the cathedral "on the shore" of the Peedie sea (Tait 1999: 72), the remains of which were demolished in 1865 for city improvement as part of the Kirkwall Harbour Act of 1859. The building of the castle saw the start of rapid land reclamation, spreading 50-60 metres north and west of the original shore line, to make space for dwellings and commercial properties (Thomson 2008: 167). 1986 excavations in the car park behind the bank by McGavin et al found that the castle on the shore

side had a "westward protrusion", a great defensive tower, some of which survived until the 1865 regeneration.

As land reclamation continued during the 14th century, the "city fathers" reclaimed waste and submerged lands of the burgh to build wide road ways and "commodious warehouses and dwellings" (Mooney 1943: 103). Land reclamation continued in the following centuries and the shoreline of the Peedie Sea moved out beyond the limits of the medieval Royal burgh.

Fig 10: Great Reform Act of 1832. The Map shows that Kirkwall still maintained its medieval burgh boundary which included the Peedie sea as the western boundary. Image National Library of Scotland (2017)

Historical evidence suggests that land reclamation was carried out in a piecemeal fashion, with no obvious planning and the burgh records evidence this. For example, in 1544, Mr James Tait was granted permission to extend his mansion and grounds on Broad Street (the site of the present town hall), "westward into the Oyce" (Hossack 1900: 226). It is also around this time that the first references to the Oyce as the "Peedie Sea" appear, and the 1788 Scallay Titles refers to the Peedie Sea as a "southern burgh boundary" (Hossack 1900: 126).

Excavations to the rear of properties in Albert street have found evidence of deliberate infilling with dateable finds from the 1600s, such as copper working and broken floor tiles found in the car park to the rear of Hazel's hairdressers. Further up the street remains of sea walls dating from the 15th century have been found, along with evidence that these were demolished and in filled during the 18th century and then turned into burgage plots and gardens. It is interesting to note that during the 1978 excavations McGavin noted that his excavations were hampered by "seepage of tidal waters" (McGavin et al 1982:399).

By the 1830's Kirkwall was in industrial decline (Wickham-Jones 2015: 178) as Stromness rose in significance. With the Great Reform Act in 1832 came a period of regeneration and saw the building of the now landlocked, Ousemouth Bridge and the Ayre Road blocking off the Peedie sea from Kirkwall bay, so it was now no longer accessible for ships (Tait 1999: 197.).

Fig: 11 The Ousemouth Bridge (now landlocked) built in 1858 to connect the newly built Ayre Road to the new road to Stromness, blocking entry to ships to the Peedie Sea. Image Authors Own (2017)

Fig 12: 1882 Map showing the new Harbour Act developments including the new Ayre Road and Ousemouth Bridge. Image National Library of Scotland (2017)

With the 1859 Kirkwall Harbour Act, Kirkwall saw the building of Junction Road and the Great Western Road on land further reclaimed from the Peedie Sea and city regeneration began again. By 1930 the shore line had reached its current position.

Fig: 13 Junction Road under flood at high tide 1914. Image Orkney Communities (2017)

Most of the archaeological evidence for the changing shoreline of the Peedie Sea dates from over thirty years ago. However, in 2016, a team from the University of the Highlands and Islands Archaeology Institute began a community excavation in the garden of the RBS bank to uncover the site of the original shoreline on Victoria Street.

Their brief, to discover the location, character and depth of the former shoreline and piers to the west of the town centre (Broad Street and Junction Road) and to discover what was the nature of the material used in the process of land reclamation along the shoreline in the post-medieval period. The excavations did indeed discover a structure, possibly a medieval jetty in the RBS garden.

Fig 14 and 15: Excavations in the RBS garden uncovers a stone structure, possibly a jetty. Image, Authors Own (2016).

In 1776, a report stated that a dwelling owned by Hugh Craigie on Broad Street had a garden that extended back to the Peedie Sea and "like its neighbours houses it had a jetty for boats" (Hossack 1900: 237), and it is easy to imagine that the view of medieval Kirkwall from the Peedie Sea would have been similar to the views across the bay at St Margaret's Hope or Stromness today.

Fig 16: View across the rear of the houses on Front Road St Margaret's Hope with their private jetties. Image, Author's own (2017)

McGavin et al (1982:393) state that due to having two different waterfronts, Kirkwall Bay and the Peedie sea, two distinct street patterns developed within Kirkwall, one before and one after the construction of the cathedral. The focus of the town therefore is either to Kirkwall Bay, where most of the public houses, industrial facilities and ferry terminals are located. Or the Peedie Sea where there is more of a mix of residential and retail buildings and although today the Peedie Sea is significantly smaller than in 1137, it is still an important feature in Kirkwall. The Pickaquoy road area to the south of the Peedie Sea has been significantly reclaimed and developed, with retail businesses, a school, housing estates and a skate park on its shore. The area to the west has been made into a boating lake and park, and is popular with residents and tourists, particularly in the summer months. From the Peedie Sea, the cathedral still dominates the skyline, despite being 160 metres away from its shore, a permanent reminder of nearly 900 years of history that has shaped the cathedral, the city and the shoreline.

Fig 17: 1884 Foundation stone for the Town Hall being laid with the Peedie Sea in the background, taken from St Magnus cathedral tower. Image Orkney Communities (2017)

Fig 18: 2016 Image from the same location, the town hall in the foreground, the library behind on Junction Road and the Peedie Sea in the distance. Image G, Gutteridge (2016)

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Knowe of Skea, Westray: the 4000 year history of a remarkable place

By Hazel Moore and

Dr. Graeme Wilson

Site Background and the Field Project

The Knowe of Skea is a prominent artificial mound, located on a tidal islet at the tip of the Berst Ness promontory on Westray. Prior to this project, the site had been variously described as a broch settlement and as a cairn (www.canmore.org.uk/site/2838). A number of low mounds and earth banked structures on the adjacent promontory had been defined both as 'Shetland' houses and as cairns (www.canmore.org.uk/site/2841). The uncertainty as to their true nature, in combination with the threat of erosion, commended these sites for further investigation.

Opposite: Structure A

The project was undertaken as an EASE Archaeology Research project. The fieldwork was carried out from 2000 to 2009 by a small team of professional archaeologists. Student training opportunities were provided in collaboration with University of York, and Orkney College. The team included the late Sean Mullen (faunal remains specialist) and Dawn Gooney who went on to complete a doctoral thesis on the human remains (University of Edinburgh).

The sites on the promontory of Berst Ness were revealed to be prehistoric burial monuments. The Knowe of Skea, 'mound' was found to comprise more than 12 distinct buildings, ranging from the early Neolithic to the Early Medieval periods and the largest Iron Age cemetery yet discovered in Scotland.

Knowe of Skea, aerial photo

The Findings

The Knowe of Skea, surrounded by sea on three sides, is reached by a tidal causeway. It is exposed, elevated and remote from other settlement; its liminality further emphasised by its position at the far end of a promontory rich in funerary monuments but with no evidence of cultivation or houses.

The nearest settlement of any date lies some 1 km inland, on the modern farm at Langskaill. Here, a substantial Bronze Age - Iron Age farmstead, latterly incorporated into a Viking Longhouse has recently been excavated (Discovery and Excavation in Scotland, 2005, 101). Further to the north, on the coast, lies Burristae Broch (Discovery and Excavation in Scotland, 2006).

Monumental Neolithic Construction

From the third millennium BC to the 8th century AD, the Knowe of Skea was dominated by a monumental stone building (Structure A) which stood on top of a natural ridge at the highest point of the islet. Irregularly curvilinear on the exterior, it measures 14m in diameter. The interior is sub rectangular with recesses, measuring 8m long by 4.2m wide at maximum. The walls stood to 1m high and were over 3m wide in places. Built during the early third millennium BC, it occupied the site of an earlier structure, of which very little remained. The ground plan and the skilful execution of its faced masonry interior are characteristically Neolithic in design.

This building would have always been clearly visible for miles in all directions from both land and sea; it remains a significant landmark to this day, forming the southernmost of a string of early prehistoric monuments, assumed to be burial cairns, which run north to south along the hilly western side of the island.

An investigation of the building plan and analysis of the associated deposits indicated that it was not a cairn but a monumental building. The interior survived largely in its original form, with minor

modifications, and the architectural detail was directly comparable to Neolithic domestic architecture seen elsewhere in Orkney. The scale of the structure and its exposed location are, however, atypical.

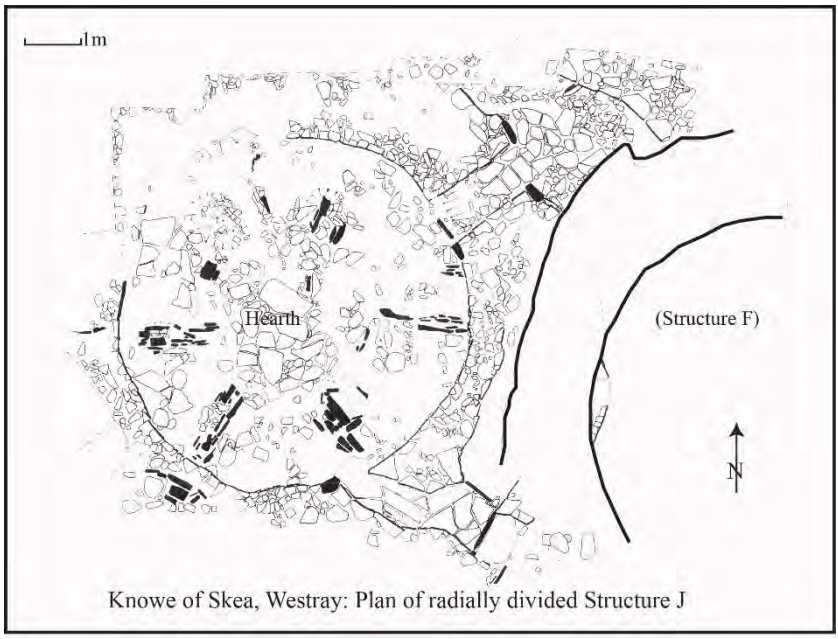
In view of the location and scale of the building, it must always have been difficult to keep a roof in place, but nonetheless, the evidence suggested that it remained covered throughout its life, implying a considerable investment of resources. It was modified on numerous occasions, mostly by way of adding walls and cladding to the existing structure.

Intriguingly, the deposits found inside suggest that this structure was used lightly and very occasionally between the Neolithic and Early Iron Age periods and the lack of domestic and agricultural artefacts and midden deposits is notable. In short, the evidence suggests that it was neither lived in nor used as a tomb. Seen as encompassing a probable communal and ceremonial role, it is perhaps most comparable to Ness of Brodgar, or Stanydale in Shetland. The recognition of another such structure hints at the existence of a class of Neolithic monument hitherto not clearly defined or recognised. Where Knowe of Skea differs, is in its extreme longevity and the apparent continuity of function as a place of special importance into the late first millennium AD. While the meanings attached to it and the ways in which it was used must certainly have changed with the times, it seems to have retained its status up to the coming of the Vikings. Perhaps here again is the evidence for the extreme perseverance of memory and tradition in a stable farming community.

The Development of the Complex

Further, smaller, buildings were erected on the north side of Structure A over time. Respecting the larger structure, they neither replaced nor usurped its central position.

The earlier sequence comprises several structures of Bronze Age to Early Iron Age date, including radially partitioned examples (Structure J), paired structures and buildings with walled yard areas.



Plan of Structure J

From the Middle to Late Bronze Age, activity within the exterior complex increased. Associated assemblages indicate that a range of craft activities were taking place, but again agricultural and food processing tools are notable absent. It is thought that rather than representing a farmstead or place of 'primary production' where animals were kept, or crops were processed, the buildings in this complex fulfilled a more specialised function. The segregation of activities and range of specialised buildings suggested here indicate that society in Bronze Age – Early Iron Age Orkney was considerably

more complex than is generally appreciated. This is also supported by the elaborate burnt mound complexes and range of storage and crop processing structures that are currently being excavated at Links of Noltland.

Cist burial, Knowe of Skea

The Cemetery

Most of the buildings surrounding Structure A went out of use and were demolished before the mid first millennium BC; only one was used again, and this was probably more in the nature of an opportunistic reoccupation of a ruin. The site now began to be used predominantly as a cemetery. In the period between approximately 200 BC and 400 AD, several hundred bodies were interred here. Most were laid in graves cut into the rubble derived from the destruction of old buildings; a few were interred in cists or lined pits. A high percentage of the burials were infants or young children, although

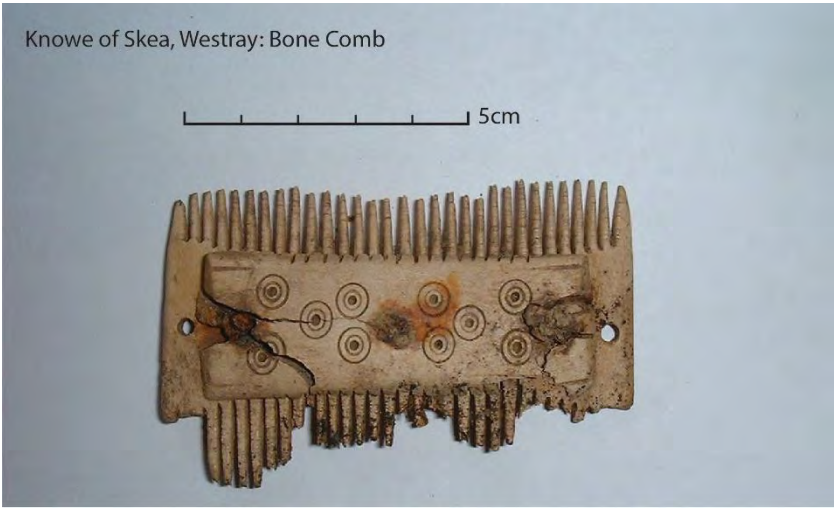
individuals of all ages and both sexes were present. Very few had grave goods of any kind. In addition to providing much needed information on Iron Age funerary practice, the analysis of the burials has provided a wealth of information about human health and demographics. The individuals buried here may have been the builders and occupants of the settlements at Langskaill and Burristae Broch: their origins and connections to one another form part of a programme of ongoing genetic analysis which will also investigate links with other prehistoric people from Westray.

Throughout this period, Structure A continued to dominate the site and, apparently, to retain its high status. It appears to have been used more regularly now than in its early days, but again for a limited range of activities and none linked to primary food production or processing. Numerous burials were placed in clusters around its outer wall, reminiscent of the partiality for burial alongside church walls in Christian cemeteries. Notably, however, no burials or, in fact, any human remains whatsoever, were recovered from inside Structure A. Given the opportunistic nature of many of the burials and the ubiquity of stray human bone throughout the site, this indicates a conscious restriction.

Metal Working and Later Iron Age Structures

While the cemetery was in use, several new buildings were constructed or re-fashioned from older ruins. One was used as a workshop for metalworking (Structure C) another was built directly over human and animal burials (Structure E). The metalworking assemblage is particularly significant and includes copper alloy and silver casting. The silver, which is very pure in content, may derive from recycled Roman plate. Moulds and crucibles are represented and appear to have been deliberately deposited. The range of artefacts being produced included ring headed pins and possible sword fittings and a set of pieces which may have been components of a single item- possibly a special object. It has been noted that the nature of

the site might lend a power and presence to the making of a special item (F. Hunter, pers com).



Bone comb deposited in final phase of Structure A

By the mid first millennium AD the cemetery had gone out of use. The interior of Structure A was refurbished to provide a series of box beds arranged around a central hearth. Traces of charred linseed recovered from the hearth suggests small scale cultivation, possibly for medicinal purposes. The artefacts found in association with this phase of activity is sparse and unlike that of contemporary settlements. They include a group of special objects carefully deposited within the building. These include a cetacean bone with incised bird and cross motif, a whalebone weaving sword, a decorated comb and a decorated weaving tablet. A rare hand bell, made from sheet iron with a copper alloy coating and intact clapper, was also recovered. Only the fourth such bell to have been recovered from Orkney, it has associations with the early Irish Church and Columban missionaries in Scotland. Its presence here may suggest the use of the site by a small Christian

community and certainly indicates that the site retained a significance, or even some sort of ritual status for the local community.

Whether this phase was short lived or transitory by design, or whether other forces came into play, can only be surmised. What is apparent is that after this time the site fell into ruins. The latest use of this once revered place was as a fish processing station by Scandinavian settlers. With the passing of native title, the knowledge and stories about this remarkable place, accrued over millennia from the time of the first settlers, was finally lost.

The project was Grant aided by Historic Environment Scotland and a contribution from OIC archaeology fund'.

Excavation of Structure A

Mapping Magnus: Research, training and community

By Dan Lee and Sarah Jane Gibbon

The University of the Highlands and Islands (UHI) Archaeology Institute undertook a staged research, training and community project based around the story of St Magnus during 2017, the 900th commemorative year of his death. A number of interlinked themes were explored: Movement and Pilgrimage; Religion and Power; and Stones and Bones. These framed an interlinked, inspiring and memorable programme of activities. These had an emphasis upon hands-on archaeological research and fieldwork opportunities along with creating engaging heritage experiences for the local community.

Activities included archive research, excavation, walkover survey, geophysical survey, measured survey and coastal survey. These were primarily focused in and around Palace (village), Birsay (Figure 1). Other key places in the Magnus story were included, such as the site of Magnus' martyrdom on Egilsay and the Mansie Stane sites where his body was traditionally rested during transit. Activities in the Palace

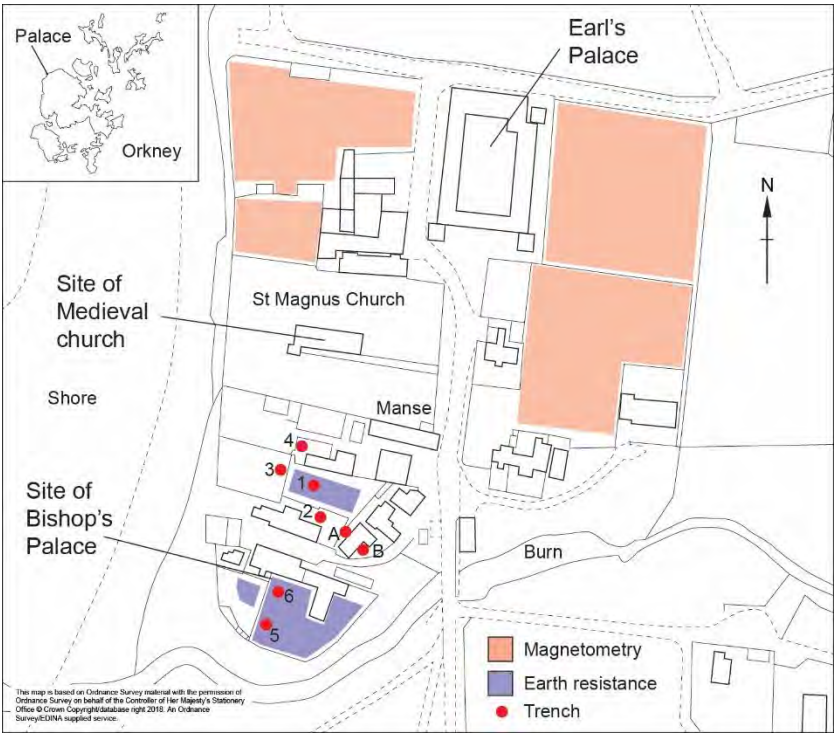


Figure 1: Palace, Birsay, showing geophysical survey areas and trenches.

focused upon the area within the present house gardens around the site of the medieval Bishop's Palace.

The archive research focused on the area of Birsay known today as The Barony. This fed into a detailed background report of the area in the form of a desk-based survey. Outreach elements were two public workshops training participants to undertake archive property history research and an exhibition of key findings, supported by and held in the Orkney Archive. These were well attended resulting in incredibly useful knowledge exchange and volunteer contributions which are forming an ongoing database of known properties in the Barony area.

Much of the wider context of the area was based on a map of The Barony drawn in 1760 by Alexander Aberdeen (OA: D8/W20) and the work of the late William PL Thomson. Development of the area over time was outlined along with the identification of a settlement focus of power and religion along the burn which runs from Boardhouse Loch to the shore. A lost drinking hall and manorial farm are remembered in the place-names Langskaill and Bu and show that the estate centre was near the present day Boardhouse Mills. This estate was the largest in the Earldom being over twice the value of the second largest and as such was the primary earldom seat in the 11th century.

An unidentified drawing from the later 18th century proved extremely useful for clarifying the more localised context. The drawing shows the Earl's Palace prior to demolition, the parish church of St Magnus, Rev George Low's manse with a series of enclosure walls and the Schoolhouse adjacent to the burn (Figure 2). The approach is indicated by the bridge showing that access was directed from the south, not from the north as it is today. The large double house to the southeast of the palace is the predecessor of Low's manse. The area between Low's manse and the Schoolhouse is where the Bishop's Palace was traditionally said to have been located.

The Birsay Bay Project conducted excavation and survey along the coast to the north and south of Palace (village), and undertook excavations at St Magnus Kirk, Beachview and the Earls Palace in the late 1970s. Excavations of the coastally eroding areas of the Brough of Birsay either side of the Viking/Norse settlement were also excavated in 1974 – 1982 (Hunter 1986). Excavations and survey in Palace (village) have focused upon the area immediately around St Magnus Kirk (in advance of new drains and renovations in the 1980s) and the area south of the Burn of Boardhouse around Beach View. Coastal survey was conducted along the southern shore of the burn and south towards the links, and north along the coast towards the Point of

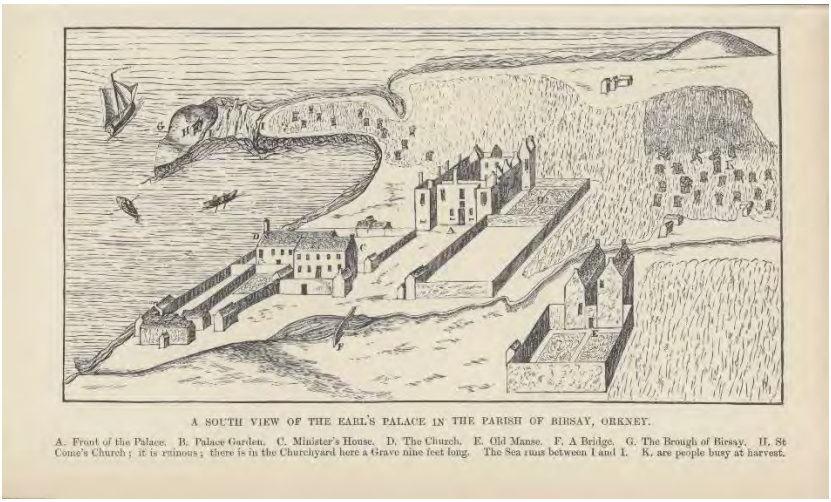


Figure 2: A south view of the Earl's Palace (after Low 1879)

Buckquoy (both in 1977). Small excavation trenches targeted sites eroding along the shore and burn, as identified during the survey and late Viking / Norse buildings were found.

Until now, no excavations had taken place in the area outside St Magnus Kirkyard or on the site of the medieval Bishops Palace. Likely remains of the Bishops Palace have been recorded on the ground surface and within walls to the east of the Old Schoolhouse by Robert Rendall in the early 20th century (Morris 1996, Illus 202, p260). These areas were targeted, where access allowed, with geophysical survey and sample excavation within the Mapping Magnus project. The aim was to establish the depth, character and date of archaeological remains, leading to new interpretations of the ecclesiastical complex and medieval Birsay at the time of Magnus. It was deemed likely that significant remains would be present at a shallow depth given the depth of structures in the trenches around St Magnus Kirk and that old walls were visible on the ground surface within the village until recently.

Firstly, Geophysical survey was undertaken in and around Palace (village) with three small areas of earth resistance (good for finding walls) undertaken within residents' gardens and four areas of magnetometry (good for finding settlement evidence) undertaken in the fields surrounding the Earl's Palace. The aim was to identify and characterise potential buried features, and place key sites in Palace in a wider context, such as the Earl's Palace. Little of note was revealed in the results of the resistance surveys relating to the Bishop's Palace site and the existing houses and deep areas of wind-blown sand are likely

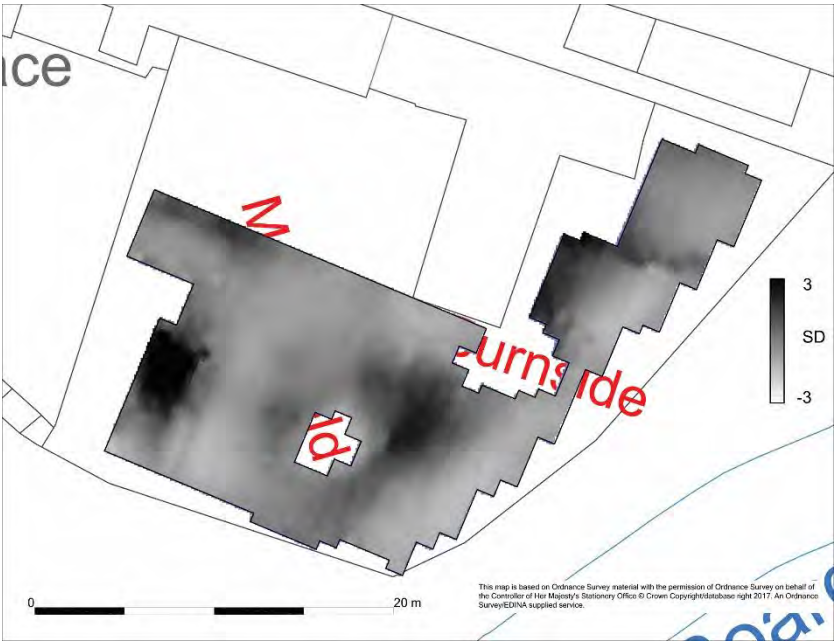


Figure 3: Earth Resistance results from the garden at Burnside. The dark anomalies could represent buried structures. Trench 5 demonstrated that the large anomaly on the western side corresponded with a layer of rubble which sealed the wind-blown sand.

to obscure any medieval remains (Figure 3). Data from the magnetometry surveys around the Earl's Palace show clear linear anomalies (walls) and other features within the former garden area immediately to the east. This corresponds well with garden features, such as paths and walls, depicted on 18th and 19th century maps and drawings (Figure 2).

In order to place Palace (village) in a wider context, walkover survey focused on the settlement and the area to the east of Barony Mills. Four sites were recorded including a stone structure, a bridge abutment along the Burn of Boardhouse, the Mans Well and nearby earthwork featuring a stone revetment in the field to the east of the mill. The latter is said to be the site of a click mill, although this is unclear from the surviving remains. The Mans well is thought to be where Magnus' bones were washed when he was moved, although there are conflicting stories around this.

Figure 4: Recording the beach section to the north-west of Palace during the coastal survey.

Coastal survey was undertaken around the Point of Buckquoy with the aim of reassessing the sites recorded during the Birsay Bay Project and the many sites noted in the National Monument Record; further contextualising the sites in Palace (Figure 4). In total, 26 sites were recorded including midden, rubble, stones, structures, nousts, and cut features. These correspond with the numerous prehistoric, medieval and post-medieval features recorded in the Birsay Bay Project coastal survey along the same sections. Coastal erosion remains highly active, although many of the sites corresponded to those previously recorded.

Linking in with the project theme of pilgrimage and movement, previously unrecorded Mansie Stane sites, traditionally marking where Magnus' body was rested when carried from Evie to Birsay and where his shrine was rested when processed from Birsay to Kirkwall, were visited and recorded at Strathyre and along Northside from Skipi geo to Crustan (Figure 5). The Mansie Stanes provide tantalising evidence of possible routes used by pilgrims visiting the grave and shrine of Magnus. In addition, they add to the debate about whether Christ Church (where Magnus was buried) was located on the Brough or at St Magnus Kirk. The balance of historic and folkloric evidence supports Barber's archaeological discoveries and point towards Magnus having been buried near St Magnus Kirk, rather than on the Brough, particularly if one accepts the tradition that his body was washed at Mans Well and that it was the last resting place of the body prior to burial. That there is no Mansie Stane tradition at the Point of Buckquoy further suggests St Magnus Kirkyard as the location of Christ Church. The location of the Bishop's Palace, like Christ Church, is unknown. Local tradition records that it stood near the Old Schoolhouse, although an alternative story locates it on the south side of the burn. The first permanent episcopal seat of the Earldom was founded in Birsay and it is most likely that the bishop's residence would have been close to Christ Church. A 16th century letter and carved stone fragments built into the church wall and the wall of the

farm to the north, indicate the Bishop's Palace was in Palace, and most likely in the area between the church and the burn. This area was extensively redesigned in the late 16th century by Earl Robert Stewart when he had the Earl's Palace built and it is likely that the Bishop's Palace was incorporated into this remodelling.

Figure 5: Recording the only known surviving Mansie Stane at Strathyre, Twatt, Birsay.

Whilst Birsay was the main focus of the project, Egilsay was an area we were keen to explore. There are multiple stories and places associated with Magnus on the island, none more impressive than the round towered St Magnus Church and at least three possible martyr sites, and yet few have previously been recorded. The Egilsay walkover survey day afforded an excellent opportunity to obtain a better understanding of the various sites in their landscape context. Although

the survey was just a snap-shot, it provided insights into the medieval and later landscape and seascape of Egilsay and the need for further investigations were determined.

Continuing the project theme of pilgrimage and movement in Birsay, measured plane table survey was undertaken at the boat nousts at Skipi Geo (12 nousts and stone hut) and Point of Buckquoy (13 nousts). Nousts are boat-shaped hollows or stone wall settings located above the high tide marks where vessels were stored during the winter months. Along the Birsay coast, some of the nousts are likely to originate from the Viking and Norse periods and continued to be used until the mid 20th century. Scaled hachured plans were drawn with the help of volunteers to record these important sites in their current state. This is the first time any such detailed recording has been undertaken here.

Following the geophysical survey and walkover survey in Palace, a total of 8 trenches were excavated within the gardens of domestic properties, targeting the area thought to contain the medieval Bishop's Palace. Excavation was undertaken by over 30 volunteers and students under supervision from Archaeology Institute staff. In addition, several local primary school classes enjoyed visits during the excavations taking part in a series of hand-on activities, including excavation, sieving and finds washing.

The main trench (Trench 1, 10m by 2m) was excavated in an area of gardens behind the shop and formed the focus for activities. This revealed a probable flagstone floor and stone wall. Quantities of animal and fish bone and shell were recovered from the stony and midden-type deposit associated with this floor, along with sherds of Norse/Medieval pottery. This horizon is likely to date to the Norse period and was sealed by a substantial layer of wind-blown sand. Progress in this trench was hampered by a series of severe gales, and it was not possible to investigate below the exposed floor level.

Figure 6: Cleaning the medieval flagstone surface and wall in the main trench.

A series of seven smaller test pits were excavated in the surrounding gardens (Trenches 2-6, A and B). The most substantial remains were found in Trench A which was located below the path to the rear of Heimdall (see the first picture). The foundation courses of a substantial stone-built wall, with dressed stone faces was exposed (c.0.9m wide and 0.45m high). Another, smaller stone wall butted this on the northern side. Midden-type deposits similar to those found in Trench 1, but also containing lime mortar, abutted the base of both walls. The alignment of these structures indicated an earlier phase of construction than the surrounding standing stone-built walls and house, and so could date to the medieval period. Due to the fact that these walls overlay the windblown sand, however, these walls most likely relate to the 16th century stables and barns for the Earl's Palace.

Fragments of a copper alloy cup, along with animal and fish bone, were recovered from the deposits butting against the main wall and radiocarbon dating may establish a broad period of use for these structures.

In the garden immediately to the west, two phases of structural remains were identified in Trench 2. The later structure consisted of a flagstone floor, which probably dated to the 19th or early 20th century. The earlier structures below the floor appeared to be a continuation of the large stone wall revealed in Trench A, probably dating to the late medieval period. Midden-type deposits were also identified in Trench 2. The wall was not evident on the eastern side of Heimdall (Trench B).

Other test pits contained wind-blown sand (Trench 3), which seemed to thicken in depth to the west and south of the garden area (e.g. Trench 5). A midden-type deposit and a possible robbed-out stone-built structural deposit were identified on north-western side of the gardens (Trench 4). In the area south of Burnhouse, a midden-type deposit, a possible floor surface and wall foundation were exposed (Trench 6). A few sherds of medieval pottery were recovered from the midden in Trenches 4 and 5.

A layer of wind-blown sand was encountered in all trenches, except Trench B, and was seen to seal the medieval deposits where these were present. In Trench A, the sand was found below the wall and midden. This layer of sand was significantly thicker in those trenches located west of the current boundary wall west of Trench 1. This suggests that the western edge of the medieval settlement was further inland to the east than in later periods, and that there may have been a short period of abandonment in this part of the settlement in the later medieval period. Excavations confirmed the presence of medieval activity (structures and middens), which may have related to the medieval ecclesiastical complex around the Bishop's Palace, clustered in the eastern part of the present-day settlement. It will be interesting

to compare the make-up of this assemblage with the other sites that have been excavated in the area. At the time of writing, post-excavation work, finds analysis and radiocarbon dating are still in progress.

The Mapping Magnus project, with its focus in and around St Magnus Kirk in Birsay and the story of Magnus, has added significant new contributions to our understanding of medieval Birsay and the ecclesiastical centre in Palace. The project has demonstrated the potential of the unusually extensive resource available in this area, in terms of both archival material and archaeological remains in the ground. When explored through a range of small-scale community-based activities, the story of Magnus is all the more familiar as a result. Archaeology and history in Birsay and the story of Magnus has certainly come to life during the 900th commemorative year.

Acknowledgements

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Between Land and Sea: Beneath the Beach at Swandro, Rousay

By Dr Stephen Dockrill &
Dr Julie Bond

The beach below the Knowe of Swandro, on the Westness coastline of the island of Rousay, has revealed an unexpectedly rich archaeological sequence spanning several millennia (Fig 1). Since 2011, the clearance of beach material and evaluation of the archaeology has provided important new information relating to a hitherto unknown Neolithic Passage Grave and a settlement spanning the Iron Age and into the Norse Period (Fig 2).

The Knowe of Swandro (HY 3753 2966) itself is a low mound and had originally been thought to be Iron Age in date. It was described in 1946 by RCAHMS as 'the much-disturbed remains of a stony mound'. The Knowe was generally considered to be the remains of an Iron Age

Opposite: Fig 8. Coin of the Northumbrian King EANRED dating to the ninth century.

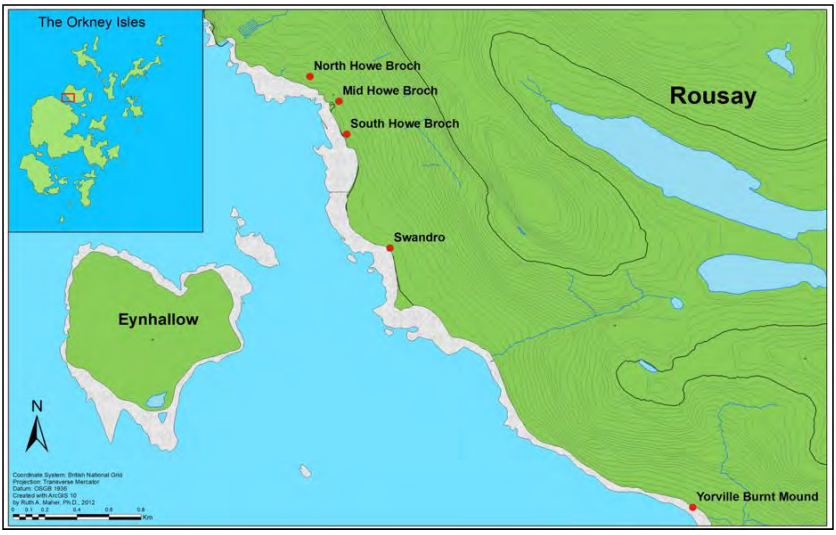

Fig 1 Map: Location of Swandro and other eroding coastal sites.

building. At the top of the mound a crescent-shaped wall or ridge faces towards the sea, which looked like the disturbed remains of a curving wall surrounding an area which had large tumbled stones visible in the grass. Ordnance Survey records suggested it had been investigated at some point in the past but there is no published record. The mound may have been disturbed during Radford's investigation of the nearby Westness Norse houses in the 1950's or 60's. To the south east of the Knowe the remains of Norse long houses can still be seen. This is the settlement site known as Westness, which was previously excavated by the Norwegian archaeologist Sigrid Kaland in the 1970's (Kaland 1993).

In examining the Knowe in 2011, Dr Julie Bond (Senior Lecturer in Archaeology at the University of Bradford) with Julie Gibson (the Orkney Archaeologist), viewed the site from the beach. To their surprise, among the boulders forming the beach below the grass-covered mound a set of upright stones or orthostats could be seen protruding from the other stones. Investigation soon suggested a

significant survival of structural archaeological features under the beach. The tops of the upright stones partly buried by the boulder beach turned out to be set orthostats, forming part of a prehistoric building sitting around the high tide mark. Although the tops of the stones are worn and battered by the sea, the beach had partly protected the deposits and animal bone and pottery were recovered, the finds suggesting an Iron Age context. Initial clearance of the overlying beach material revealed the remains of an Iron Age structure. The archaeology here is extremely vulnerable as it is affected daily by tidal movement as well as the extreme energy of the storms which batter this coastline.

Fig 2 The Swandro beach under excavation, showing the passage of the Chambered Cairn and the archaeology truncated by the sea.

Since this first identification the excavation of the beach formed a priority for the research project. The work has helped us to gain some

understanding of the process of erosion and of the archaeological survival. The archaeology in this part of the beach survives due to a set of unique circumstances. A small bay has been created by erosion of the soft coastline and the resistance of the stonework of the Passage Grave, the remains of the Neolithic cairn providing a degree of protection for the settlement archaeology to the south east. The sea has cut into the settlement deposits, and has created terraces or steps within the archaeological settlement mound, with each of these eroded scars being covered by redeposited beach material. The remains represent the last remnants of a significant Iron Age settlement of long duration.

Excavation of the site has revealed a complex use of buildings, many with evidence of having been being modified and rebuilt and with a build-up of deposits in and around them forming a settlement mound. The sea has since cut into this mound and the stone walls and floors, offering more resistance to the sea, have formed the terraces. The excavation is informing a greater understanding of the erosion process and may help in the future management of similar sites across the North Atlantic. The examination of the site and observations of the extent of the erosion and effects of the sea over several seasons has demonstrated the damage that the archaeology has suffered from being pounded by the violent high energy power of the sea during winter storm events and by the constant attrition caused by the suction effect, which takes place with every tide, removing the finer midden and ash-based deposits.

Understanding of the complexity of the archaeology increased when in 2012, work on the beach identified a series of concentric walls associated with the low grass-covered mound forming the Knowe. Subsequent investigation indicated that the Knowe actually represents the remains of a Neolithic Passage Grave, rather than an Iron Age roundhouse as previously thought.

Fig 3 Structure 2, a small Iron Age roundhouse form whose seaward wall has been destroyed by the sea.

The site is significant as the settlement appears to relate to the Pictish and Viking period cemetery at Westness. The excavation and sampling of these truncated archaeological sequences is beginning to provide a current and informed understanding of people living on Rousay from the Middle Iron Age to the Pictish period and how this changes over time.

Excavation on the lower terrace revealed that the protruding upright stones actually formed part of the outer circumference of an Iron Age roundhouse (Structure 1). Much of the building had been taken away by the sea, however the remains of one of the outer cells and an oven survived. The cell, formed by orthostatic divisions around the circumference of the building, contained a large flag. Circular notches carefully cut out of this flag suggest the position of posts, possibly once supporting a mezzanine floor level around part of the building. The remains of a stone oven had been built on the north western

circumference of this roundhouse. Adjacent to this was a hearth structure; radiocarbon dating suggests a first century AD date for the use of this building.

Fig 4. The nummus of Constans, as found.

In 2016 and 2017 two Iron Age buildings on the terrace higher up the beach formed the focus of study. These structures had been less heavily affected by erosion, allowing a more informative and detailed study of these buildings to take place. Structure 2, a building dating to the first half of the first millennium AD, provides clear evidence for a number of alterations. The building's archaeological sequence shows a complex history of use; excavation has revealed several floor levels. The removal of a flagged floor this year provided a glimpse of earlier levels and some in situ metalworking evidence. An earlier stone built tank pre-dating the floor proved to be of special interest, as it was unusually large; it is hoped that samples from the infill might give us

some insight into its last use (Fig 3). A significant find from the building was a Roman coin providing a 4th century AD context. The coin is a nummus (a 4th century bronze coin) of Constans which dates from 348-350 AD (the obverse says [DN CONSTA]NS PF AVG). The reverse depicts the Emperor on a galley standing left holding a Victory on globe (Fig 4). It was made in Trier (at the bottom of the reverse are the letters TRP, which indicates the Trier mint). This coin although common probably had only a short duration of use and was only made between 348 and 350 AD.

The third structure under investigation is actually built into the remains of a much earlier and larger building, part of which has been lost to the sea. A cellular building, Structure 3, had been built into the shell of this larger building and the style of drystone build is typical of the Late Iron Age or Pictish period. Excavation in 2017 revealed floor and hearth structures. The central hearth had been re-lined and was surrounded by a floor made up of an ash-rich deposit. The room was entered from a corridor and a set of steps leading down from ground level on the north western side, meaning the room was semi-subterranean (Fig 5). The doorway was formed by a stone threshold stone and door jamb and a bar keep was constructed against the wall on the inside of the cell, enabling the building to be locked from the inside. An intact door pivot indicated that the door opened inwards.

The ash-rich floor proved to be very interesting as broken pieces of fired clay, slag and other indicators of metal working appeared to have been trodden into the ashy surface. The quantities of spheroidal slag and hammer scale, and other metal working materials such as part of a fired clay tuyére, strongly suggest that the building had been used for working metal. A large elongated beach cobble which was found lying partly across the hearth may have been originally set upright adjacent to the hearth and used as an anvil; its upper end showed damage consistent with it having been repeatedly struck. This artefact, together with its location in this semi underground building and the

evidence of slag, crucible and tuyére fragments, suggests that the structure may have functioned as a smithy.

The earliest and one of the most interesting parts of the site was the unexpected finding of a new Neolithic Chambered Cairn. The eroding beach has revealed part of the tomb structure. A series of concentric casement walls indicate a circular form, which might have originally been stepped (Fig 6). The passage was located on the upper erosion terrace and by the end of 2017 the evidence for the collapse of its roof was defined. Above this rubble infill we had evidence for later activity with an infill of mixed material including animal bone (Fig 7). What was unusual about this deposition event was evidence that indicated the disturbance was very late indeed, probably dating to the first Viking settlers. They may well have found that the tomb was a good

Fig 5. The Pictish building (Structure 3), showing the hearth, ash floor and doorway.

Fig 6. The concentric walls of the chambered cairn as the tide is rising.

source of stone and they infilled the top of the passage with a number of butchered sheep, at least three cats and a coin of Eanred, a ninth century king of Northumbria (Fig 8).

An unexpected discovery in 2017 was the identification of cultural material that appeared to run under the casement wall of the chambered tomb, suggesting that the Passage Grave was not the earliest feature on the site and that it overlies earlier Neolithic material. The last few days of the 2017 season produced clear signs that the casement walling of the cairn overlaid earlier stonework and ash layers. Unfortunately, this area has been hit hard by the sea and much of the integrity of the lower (seaward) deposits have been evidence still remains a little further from the tideline to enable us to unravel this intriguing story before it is lost to the sea.

Fig 7. The passage way showing the rubble collapse overlain by later (probably Viking age) material containing animal bone.

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YAARP 2017 GPSr Tracks

Yesnaby Art & Archaeology Research Project (YAARP): Fieldwork Season 3

YAARP is an interdisciplinary, collaborative team-based Art & Archaeology project, devised and co-directed by archaeologist Dr James Moore, and visual artist Rik Hammond. The project focuses its research and practice on the landscape, archaeology, and history of the township of Yesnaby on the west coast of the Orkney Mainland.

2017 saw a small team focusing on the Breck of Linkquoy, with the aim of identifying any possible continuation of the known later prehistoric settlement on Peerie Hill and Billia Fiold to the southeast. We also hoped that the geophysical survey could provide further information on a dyke visible in aerial photographs that we posited might represent a section of the medieval/post-medieval head dyke.

Continuing the core research aim of investigating and presenting the landscape of Yesnaby in different ways, from different perspectives and at different times we made use of daily provocations, this included drawing the soundscapes of the areas in which we were working, producing conceptual maps of the area and using walking to create drawings within the fields. We also utilised time-lapse cameras to record the changing weather, light and movement of animals in the landscape; and a newly purchased Unmanned Aerial Vehicle (UAV) to

provide a low-level aerial perspective, and to record us moving around the landscape.

The Yesnaby coastline was a favourite subject of Orcadian artist Stanley Cursiter, and to acknowledge this and further explore the different ways in which people can experience and present the world in which they dwell we also spent time painting in the landscape. A day was spent at the Noust of Bigging, producing works after Cursiter's 'Geo at Yesnaby and Brough of Bigging' (the original is on display at the Pier Arts Centre), and a second day was spent producing a range of work at the Broch of Bigging.

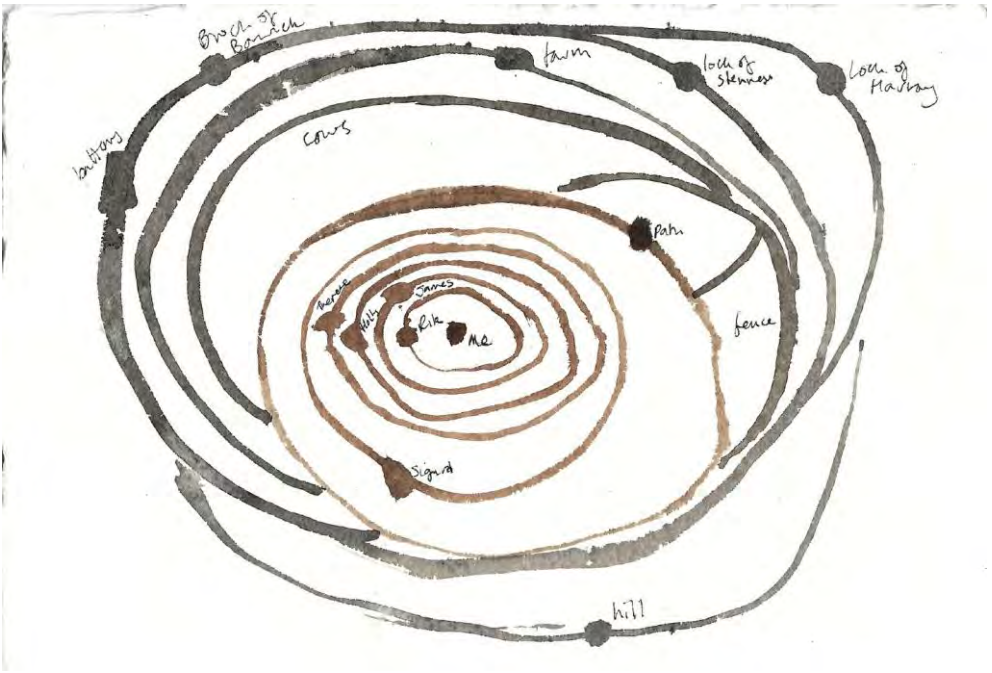
YAARP is grateful for the generous support of Orkney Islands Council's Culture Fund, Orkney Archaeology Society, and the University of the Highlands & Islands Archaeology Institute.

Many thanks to the 2017 fieldwork team: Clare Gee, Therese McCormick, Sigurd Smith, Jasmijn Sybenga and Holly Young.

Find out more about the project at: www.yaarp.org.uk.

Fieldwork Team Painting at the Broch of Borwick

Survey Area, Breck of Linkquoy, Yesnaby



Peerie Hill Warlpiri Drawing - Clare Gee 2017

Setting up the GPS Prior to Geophysical Survey

Caring for Cairns

By Historic Environment Scotland

Historic Environment Scotland (HES) cares for four of the sixteen chambered cairns across the island of Rousay, as well as Midhowe Broch. As part of a rolling programme of revising and updating interpretive material at their Properties In Care, HES have been revisiting the presentation of a number of Neolithic sites on Rousay, including the unusual, double-storeyed Taversöe Tuick, and the stalled cairns of Midhowe, Blackhammer, and the Knowe of Yarso where the remains of at least 29 people and 36 red deer were found in the 1930s. The organisation now has efforts underway to improve digital records of the sites, upgrade signage and to conserve the 1930s structure protecting Midhowe cairn.

HES Interpretation Manager Steve Farrar and Assistant Cultural Resources Advisor Georgina Ritchie have been working with archaeologist and photogrammetrist Hugo Anderson-Whymark to document the cairns in exact detail through photogrammetry. This technique uses a number of 2D images – thousands of individual photographs in the case of the Rousay Cairns – which undergo digital processing using specialist software to build up detailed three-dimensional reconstruction. The work to document the sites, which took place in summer 2017, was both meticulous and time-

consuming, with the resultant imagery to be used on new interpretation panels and, soon, 3D models that can be explored on a phone, laptop or virtual reality device using Sketchfab – a website for sharing 3D models.

Speaking about her work on the interpretation project, Georgina Ritchie was positive about the difference this digital technology could make to visitors, both on the ground and in virtual environments: She said: "The digital models allow you to examine the cairns from any angle, in a way that wouldn't be possible from a single viewpoint in reality. This offers an unparalleled opportunity to engage with and explore these remarkably well-preserved structures. We do have to overcome some challenges in the production of the models – the skylights of the modern protective coverings that encase these sites can create lighting aberrations in some of the models, which wouldn't have reflected how they appeared in Neolithic times. This requires more editing time to make sure the models are as authentic as possible."

Recent aerial view of Taverso Tuick (255202)

One way to deliver a more representative view of the chambered cairns is to the use static images of the detailed models to hint at how the Cairns might have been used in day-to-day life in the Neolithic.

Georgina said: "We've been working with Bob Marshall – a hugely talented digital artist - to develop accurate illustrations of the tombs for our new interpretation panels. He's taken the photogrammetric models and reworked them to remove modern elements, like the concrete dome at Knowe of Yarso, allowing the ancient architecture to be viewed, unobstructed. We will be using these images in the new panels to highlight activities relating to items found in the tombs, such as flint knapping or axe polishing."

"We're planning to roll out the new interpretation panels later in 2018. As well as the new illustrations and models, we're also carrying out some new radiocarbon dating with the National Museum of Scotland to better contextualise the tombs within our wider understanding of Neolithic Orkney."

Meanwhile, work has been underway elsewhere on Rousay. The excavation of Midhowe Chambered Cairn in the 1930s, provided a ground breaking look at a remarkable Neolithic structure. To protect the newly exposed site from wear from the elements, the familiar dry stone and iron hanger was erected around it by the Office of Works – one of HES' predecessor organisations - drawing on the traditional skills of the Islanders.

The very features of the shelter which helped maintain the stability of the site in the 1930s – access to the natural air flow, allowing for natural changes in temperature and humidity – affect the shelter itself, with the ironwork becoming corroded due to the sea salt and exposure. The extent of the corrosion resulted in an eight month conservation project, which has seen the Cairn closed to visitors since August 2017.

With team members from the Orkney Monument Conservation Unit (MCU) required to operate heavy machinery, remove corrosion, apply thick, corrosion resistant paint - similar to that used on the Forth Bridge - and ensure the paint had the right conditions to cure, all the time working in restrictive protective suits in close proximity to valuable archaeological remains, a scaffold which protected the whole of the Cairn while still allowing easy access was necessary.

Talking ahead of the expected completion of work in spring 2018, HES district architect Stephen Watt outlined some of the challenges HES had faced during the work; "Nearly all of our sites pose unique challenges when you are working on them, he said, "and Midhowe is no different. With no power or running water on site, all supplies for the operation of our machinery had to be transported to the site. The open ventilation has also caused issues, with the paint taking longer to cure than we initially expected due to the cold. The short autumn and winter days limited the time we could actually work at the site, which is why we had to start the process in August.

"The restoration and treatment of the shelter helps protect the Cairn at Midhowe, but the work also represents a wider investment in Orkney. We've bought new equipment to help clean the beams and trained up the team to use it, so it'll see further use across the Islands."

With investment at Midhowe coming to more than £30,000, and significant investment in research and modelling of the tombs as part of the new interpretation, HES is keen to make sure Rousay attracts visitors to the islands seeking more insight into Neolithic life and traditions.

Midhowe Chambered Cairn is due to reopen in Spring 2018. New interpretation panels are in development and are expected to be installed in 2018/19.

Drawing of Knowe of Yarso, part of the work created for HES's new interpretation panels. © Historic Environment Scotland.

Neolithic settlement at Cata Sand, Sanday: Excavations in 2017

By Vicki Cummings, Jane Downes, Chris Gee and Colin Richards

Introduction

On the eastern side of Cata Sand, Sanday, a small sand dune known as the Grithies Dune is located in the intertidal zone (grid reference: HY 704 397: Figure 1). In December 2015, we identified archaeological material eroding out of the sand immediately to the south of the Grithies Dune. We returned in March 2016 to undertake an evaluation. We opened up a small trench roughly 8 x 5m over an area where we had previously seen archaeological deposits. The work involved the removal of windblown sand only rather than the excavation of any of the archaeological layers revealed. This simple cleaning exercise, however, produced 41 artefacts including flint debitage, Skaill knives, coarse stone tools and pottery. The evaluation revealed that the remains of occupation, including a house, lay exposed just beneath windblown sand. In-order to ascertain the extent of the occupation here we then conducted a large-scale geophysical survey of the area using magnetometry. This revealed an area of magnetic enhancement around the Grithies Dune roughly 20m in diameter (Figure 2). We returned for a four-week period in 2017 to excavate the archaeological remains concentrated at the Grithies Dune site.

Opposite: Complete skeleton of a bottlenose.

Figure 1. The location of Cata Sand, Sanday, Orkney. The Grithies Dune is highlighted in red

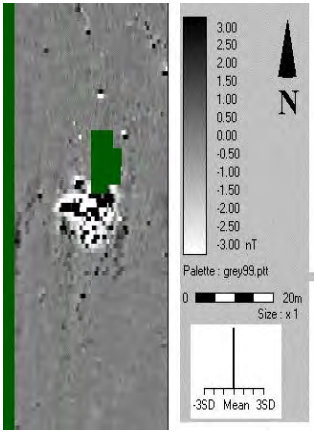


Figure 2. Detailed plot of the geophysics around the Grithies Dune showing a large feature roughly 20 x 20m across. The green patches in the middle are dummy readings indicating where the extant Grithies Dune is located.

Aims of the excavation

We had already identified the presence of architecture and associated deposits to the south of the Grithies Dune. Our initial assessment suggested that this might be a late Neolithic and possibly even early Bronze Age structure. This was of particular interest to us as we hoped to explore this transition period, with previous work on Orkney having been focussed on earlier and later Neolithic houses (see Richards 2005; Richards and Jones 2015). However, one of the key aims of the excavation was to reveal the structure in its entirety in order to get a more precise date for the occupation. It was also immediately clear from our 2016 exploratory trench that this archaeology was under serious threat of being destroyed through ongoing erosion. This was particularly pertinent here because up to 2012 the Grithies Dune had been longer, covering and effectively protecting the archaeology. A storm removed a substantial piece of the larger dune to the east which in turn effected the stability of the Grithies Dune (Colin and Heather Headworth pers. comm.). While the larger dune is beginning to return, the smaller Grithies Dune is not, leaving the archaeology exposed.

In summary the aims of the project were:

> The excavation of archaeological deposits at the Grithies Dune, particularly those at highest risk from being destroyed.
> The subsequent analysis of all artefacts and ecofacts recovered from The Grithies Dune including the radiocarbon dating of samples to date and characterise the nature of the occupation.

Methodology

We opened an area which incorporated the area of magnetic enhancement identified by the geophysical survey. We did not remove any standing dune. Once the archaeology was exposed we then targeted specific areas for excavation. We removed any windblown sand by hand to ensure we were not removing any archaeological

contexts. All contexts and features were then excavated by trowel and hand shovel and fully recorded (plans/sections, photographs and single context recording). We dry sieved all contexts. We kept the spoil from 100% of cut features for wet sieving. 10% of other contexts were also retained for wet sieving, following English Heritage guidelines on good practice in environmental archaeology (Campbell et al 2001). All finds were retained and recorded in three dimensions using a GPS total station. Unworked animal bones were kept by context apart from the whale skeletons which were excavated and extracted as individuals (see below). At the end of the excavation the site was returned to the condition it was found prior to excavation.

Figure 3. Vertical shot of the trench at Cata Sand showing the early Neolithic house and the two later cuts filled with whale bone.

Context narratives

The trench at Cata Sand incorporated three key elements, each of which will be dealt with in turn.

Early Neolithic house and later midden deposits.

Stratigraphically, the latest component of the site was a short portion of walling overlying a thick midden deposit (003). Disappearing under the Grithies Dune to the north and cut through by the whale pit [038] to the south, only a small portion of this wall survived. It consisted of two wall faces (040 and 041) and a rubble core (042). This short portion of wall lay on top of a thick deposit of dark brown midden containing limpets and unworked animal bone (003). A number of small finds were also recovered from the midden including pottery (SF109, 115, 117) and stone tools (SF106, 110, 114). This midden is clearly the remains of a significant occupation event or events. It also acted to preserve a considerable component of an earlier structure underneath: the remains of an early Neolithic house or houses. The components of this house will now be detailed in turn.

The remains of the early Neolithic house were defined to the north by the scant remains of what was once a substantial wall. Only one course of the wall survived: an outer face (008), an inner face (009) with a sandy core (010). This wall was well-defined in the north-east sector of the house which would have been protected by the standing Grithies Dune before it was reduced in size but petered out to the west. To the east the outer wall face was largely missing once 003 had been removed but it was possible to see where the wall had once stood by virtue of a bank of wind-blown sand which had built up against the now-missing wall (083).

To the south of the site the wall was virtually entirely gone. Two stones survived (062) which may be the remains of a wall, but whether these are contemporary with the better-preserved northern wall is debateable. There is good evidence for internal divisions within the

house. A large slab (066) ran at right angles to the northern inner wall face (008) which may be a partition. A large linear deposit (073) was visible opposite 066 which may be the fill of a cut for another divisional orthostat.

Figure 4. Walling on the northern side of the house. Outer wall to the right (009), inner-facing wall in the middle (008) and a partition stone (066) visible to the left

Within the house there were a number of features including hearths and deposits including occupation layers. In many places, where investigated, it was not always possible to demonstrate the stratigraphic sequence of these different elements. This is because of differential weathering and erosion processes at work on a site built on sand. Potentially one of the last structural components of the site was a rectangular block of stones abutting the inner wall face (071). This was described as a 'pier' due to similarities with a similar feature at the Braes of Ha'Breck on Wyre. Whether it was the remains of an internal division, a later structural feature creating a raised platform

within the house or simply a dump of stone is not clear. However, upon removal it cleaned down to reveal the remains of a hearth. One hearth stone remained in place (099) but the others had been removed although the cuts in which they once stood were clearly visible [118, 120]. Two stones on the south side might be displaced hearth stones (128).

Figure 5. The north-eastern extent of the early Neolithic house wall after the later midden (003) had been removed. It is possible to make out sand blown up against the now-robbed out wall. The line of stones to the left of the picture is most likely a drain.

This hearth was located just over a metre from the inner facing wall (008) but directly abutting the wall was an occupation deposit with a clearly defined edge just to the north of the hearth (see Figure 6). There may well have been furniture here, and a large slab (103) may have been part of that. This slab overlay a cut [069] which may be the remains of another internal division. The fill of this cut (070) contained

a small number of stone tools (SF116, 118, 119). This all needs investigating further next year.

Figure 6. Central hearth found under the 'pier' (071) after the hearth fill had been removed (view looking north). One slab (099) remained in place (right) while only the outlines of the others could be seen.

The central hearth (fill 100) was clearly later, but there were also two hearths which appeared to be earlier. One was exposed in our 2016 investigations (004) and was well-preserved. However, we did not expect to find another hearth to the west of the site, but here another large and well-preserved hearth survives (032; see Figure 7). Both of these hearths are surrounded by occupation layers which butt up against the hearth stones. We left the occupation around the western hearth intact (028) and did not investigate this area any further this season, although there were a number of small finds, mainly flint, on the surface of 028 (SF107, 128-138, 141, 175). We concentrated our

efforts instead on hearth 004 and its surrounding occupation layers. In places the occupation was patchy but in other areas, especially around the hearth, it was thickly deposited – we could not demonstrate any stratigraphic differences between the patches and main occupation spread so this is now considered part of one context (084). The interior of the house was gridded into metre squares and 084 excavated using this grid. Those squares around the wall (008) were the most vulnerable and were removed first. Those around the hearth were left in situ to be excavated next year (because they support the hearth stones). The occupation produced some small finds including pottery (SF160) and stone tools (SF172, 174).

The hearth itself was also half-sectioned (fill 068 and see Figure 8).

Figure 7. Western hearth (032) looking east into the house and surrounded by dark brown occupation layers.

Figure 8. Hearth 004 half-sectioned (fill 068) looking west. The whale pit cuts into one side of the hearth (bottom left) and occupation (084) can be seen abutting the right hearth stone. indicating where the extant Grithies Dune is located.

The occupation layer 084 peeled off onto clean sand in most places, demonstrating the house was built on sand. In one place, however, a feature was found underneath 084. This was a roughly circular pit cut into the sand [128]. It contained two fills (113a and 113b) and may be the deposition of two deposits, or, possibly, a recut feature. Its position underneath the main occupation layer indicates it is primary.

Interior features. There were also several other features found within the house. Two consisted of large stones placed on smaller supporting stones – one (064) has been left in situ. The other (063) was removed but it was not clear what this feature had been. The remains of a possible posthole were also uncovered with three packing stones (129) visible to the west of 004.

Drains. Two possible drains were identified in association with the house. One ran east-west and was immediately north of the bank of sand blown up against the wall (083). This drain [091] with a sandy fill (092) would have either been outside the house or later. Another possible drain [088] with a fill (089) and possible capping stones (090)

ran from outside the house in towards the hearth (004). Neither were excavated this season.

Figure 9. Section through pit [128] showing deposits of ashy material (113).

Features outside the house.

A small number of features were identified outside the house. These were defined by dark occupation/midden deposits cut into clean golden sand. Three of these were excavated in 2017. All three were half-sectioned and then fully excavated; 100% of the fill was retained for wet sieving.

Feature cut 051. This feature was roughly circular when first exposed and contained a single homogenous fill (052). The fill was dark ashy midden material with charcoal flecks and containing four small finds (a flint flake and three Skaill knives SF120-123).

Figure 10. Feature 051 in plan (left) and half-sectioned (right).

Feature cut 053. This feature appeared to be rectangular when first revealed but upon excavation was revealed to be circular in shape with an undulating base. It was actually a rather superficial cut containing a dark brown silty fill (054).

Feature cut 049. Circular in plan, this feature contained two fills, a lower orange-brown silt (112) which contained a quantity of burnt bone (SF161-169). The upper fill (050) was a darker brown sandy silt. This context also contained Skaill knives, a pot fragment and burnt bone (SF143, 145-157). The cut of this feature bowed out towards the bottom, suggesting either the sandy sides had slumped into the pit higher up, or that the pit was recut at a later date.

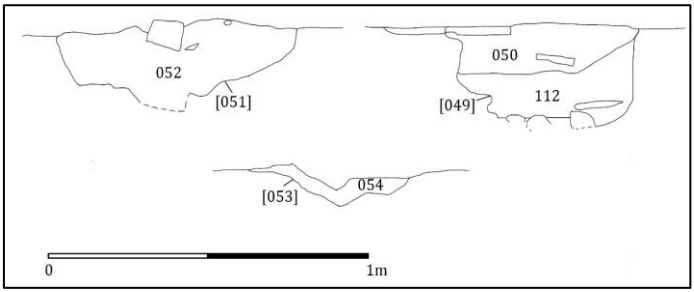


Figure 11. Sections through the three excavated features beyond the house.

The relationship between these cut features and the house cannot be demonstrated stratigraphically, however the presence of prehistoric material culture within them suggests contemporaneity as does the fact that some features were cut into clean golden sand within the house. Radiocarbon dates will ultimately indicate date.

Whale pits. There were two large elongated pits at Cata Sand, one on the eastern extent of the trench running roughly north-south [038] and another running through the middle of the trench on a WNW-ESE axis [079]. As soon as the trench was opened we could clearly make out a series of spinous processes sticking up through the sand, and in places, vertebral bodies: it was clear that there were a series of mammal skeletons buried within these pits. Due to the size of the vertebrae it was suggested that these were the remains of whales. We chose to focus on the eastern pit [038] and as such left the other pit unexcavated.

The whale pit [038] contained a single fill which was a light and loose golden sand (039) which dried differentially to the other golden sand on site enabling us to identify the cut. A small quantity of stones were found within this sand, and it cleaned down, in places, to the gravel bank. While the stratigraphy was very straightforward the mix of skeletal components was more testing, and we attempted to excavate and extract individuals as units (Associated Bone Groups). This endeavour was complicated by the fact that no individuals had their skulls and flippers had been separated from individuals and placed in the cut haphazardly. Moreover, whale remains had been placed in the cut two-deep and as they had decomposed some of the remains of some individuals closely overlay those of others. Those higher up were better preserved than those lower down which were affected by high tide and had started to rot. In amongst the fill were modern finds including iron objects (SF104, 105) and glass (SF112).

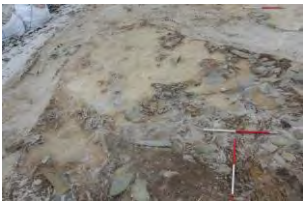


Figure 12. The whale pits (left and top) at Cata Sand with the tops of whale vertebrae sticking out of the sand.

Figure 13. Upper layer of whale carcasses representing the remains of multiple whales.

Discussion

The site at Cata Sand has revealed the remains of an early Neolithic house. The presence of three hearths within the house are suggestive that this house was occupied over a period of time and that the house was remodelled on a number of occasions. The occupation layers associated with this activity are thick and well-preserved in places, but patchy and diffuse in others. This is most likely the result of post-depositional processes, including the site being covered by later occupation remains (the 003 midden deposit) which may have included a separate structure, and a dune system. Part of the site is underwater at high tide, but the most destructive element at the site is the wind, which removes deposits when the site is very dry. It is this

combination of factors which seems to have produced the partial remains which survive today.

While the archaeology is significantly truncated and under threat of complete destruction imminently, the preservation at the site is remarkable. There is good bone preservation as would be expected in a sandy environment and quantities were retrieved not just from the whale pits but also from Neolithic contexts. The bone will not only provide material for radiocarbon dates but will also offer us insights into the economy of people living at the site. Of particular interest will be the presence (or absence?) of fish remains since the early Neolithic is typically characterised by a lack of marine resources in the diet (Montgomery et al. 2013; Schulting 2008). A good quantity of stone tools were also recovered, but the pottery was very poorly preserved. Fortunately, pottery is well preserved on comparable sites on Mainland but where there is no bone preservation (see Richards and Jones 2013).

The whale pits were a complete surprise at Cata Sand. We removed the remains of up to a dozen individuals, but this count was complicated by the lack of skulls. We were sure that these were modern because they were still greasy in places and because there were accounts of whales being beached here in recent centuries. An account reads about someone visiting Tresness:

> often necessary to ride three or four. As I was pursuing my solitary way, I discovered upon the beach a large number of whales (the *Delphinus deductor* of zoologists), or, as seamen call them, "bottlenoses." They varied in length from ten or twelve to twenty-five feet; the blubber had been cut off, and they were in a horrid state of decomposition, tainting the air for miles.

Extract from Sketches of Old Times and Distant Places by John Sinclair (1875).

This account might well be a document of the whales we were excavating, and the smell from them may also indicate why they had

been disposed of in shallow pits. Certainly, the tide at Cata Sand is not strong enough for the whales to be disposed of at sea, and the presence of the large sand dune immediately to the east presumably meant the digging of a quick pit was preferable to hauling smelly and decomposing bodies over a sand dune. This evidence would also be in keeping with the lack of skulls on site, which in modern times were removed and given to the admiralty.

Outline of future work and post-excavation strategy

The site is at severe threat of being destroyed. It would be good, therefore, to return to the site to completely excavate the early Neolithic house and all associated features. Pending appropriate permissions, we are planning to return to Cata Sand in 2018 to complete the excavations. However, we would not propose to excavate the remaining whale pit since a good sample of the whales have been recovered for analysis.

Post-excavation is already underway (as of September 2017). The priority is to finish off the wet sieving of the samples we did not process on site, and then do the residue sorting and have the macro fossils identified. The animal bone component will also need analysing. One of the largest jobs is the analysis of the whale remains.

Acknowledgements

We are very grateful to Colin and Heather Headworth who allowed us access to their land. Scottish Natural Heritage granted permission for this work to take place on an SSSI. The project was funded by the University of the Highlands and Islands, the University of Central Lancashire and the Orkney Islands Council. Hugo Anderson-Whymark came out at short notice to conduct photogrammetry at the site, and we are also grateful to Tristan Thorne for taking aerial shots with his drone. Ingrid Mainland and Jen Harland came out to site to help us with the whales. The Sanday Archaeology Group were as supportive as ever and in particular we would like to thank Caz, Ruth and Cath for

logistical and practical support, both on site and in terms of storage! Ruth and Ean Peace organised the talk in the community centre and also provided us with historical accounts of whaling. John Muir at Anchor Cottage and Paul and Julie at Ayres Rock must be thanked for providing accommodation. We are grateful to Sinclair Haulage for acquiring (and securing!) our portaloos and to the Sanday Community Shop for arranging to transport the whales to Kirkwall. Sean Page helped with the press releases. We are very grateful to our volunteers who worked incredibly hard in such a beautiful but exposed setting: Justin Ayres, Edd Baxter, Irene Colquhoun, Ana Cuadrado, Grant Gardiner, Stephen Haines, Joe Howarth, Arnold Khelfi, Mike Lawlor, Rob Leedham, Therese McCormick, Ginny Pringle, Alex Shiels, and Cemre Ustunkaya.

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Tomb of the Eagles

By Barry Constantine and Jo Constantine

In the south east corner of South Ronaldsay, visitors and locals alike are welcomed at the Tomb of the Eagles visitor centre. This family business has grown in popularity, year on year, since its earliest incarnation in 1982 in the nearby farmhouse conservatory. Opened in 2002 in a modern well-appointed building near the old steading, it now offers visitors an insight into three different periods of Orkney's past: the Bronze Age, Neolithic and Mesolithic.

As with many archaeological sites in Orkney, Liddle Burnt Mound and Isbister Chambered Cairn were chance discoveries, made by farmer Ronnie Simison in the course of his daily farm work.

Opposite: Ronnie Simison with skull

Liddle Burnt Mound

This Bronze Age site (Hedges 1977) is one of many such sites known across Britain and the only one in Orkney that can be visited in situ. The exact purpose of these sites is still unknown but a model and photographs help the centre staff to explain the extant features. The visitors are also introduced to the various interpretations archaeologists have put forward for the possible functions of such sites. These include a sauna or steam room, a brewery, a cooking site or textile processing room. There is still debate as to whether these sites are for ritual and ceremonial purposes or more mundane tasks. Whatever their original purpose they do seem to have been a communal enterprise and possibly multi-purpose, perhaps used for

Burnt mound

community feasts at times of planting and harvesting of crops, brewing at other times and so on. The time and effort required to build the original structures and then use them for cooking, for example, make it unlikely that they were built as day to day cooking facilities for a single, or even extended family. We hope to gain further knowledge of the site as Tom Gardiner at Edinburgh University has sampled the burnt mound as one of the sites he is studying for his doctorate. We eagerly await his results.

Plans for the future of the burnt mound site and its surroundings include tidying up and consolidation of the remains, and the intention is to fence off the structure itself. Visitors would be looking over a rustic style fence, possibly made from willow hurdles, to see the full layout of the building without walking in it, thus avoiding damaging footfall from the thousands of people who can be expected each year.

Soil samples for pollen analysis were taken during the excavation (Jones 1977) and a recent re-appraisal of the results, combined with the results of similar samples taken from the nearby Liddle Bog, (Bartlett 1983) have given us a better understanding of the late Bronze Age environment of the site. Removing the pollen that would have blown into the area leaves a good indication of what would actually have been growing in and around the burnt mound site. We have plans to add a winding walk through the area, with the plants that would have been growing there re-instated and labelled - with their possible uses as well as their names - which would further enhance the visitor experience.

Isbister Chambered Cairn

The cairn was found in 1958 and is now known as the 'Tomb of the Eagles', a soubriquet it acquired following an exhibition in 1981. Bryce Wilson, then director of Tankerness House Museum, and archaeology curator Ann Leith, (later Ann Brundle) put together a stunning exhibition for the whole of that summer. It was advertised as Tomb of the Eagles and the name stuck.

Tomb interior

Over 640 pieces of White -Tailed Eagle (Haliaeetus albicilla) bone were excavated from the tomb, three times more at this one site than the combined number from all the known sites of any date in Scotland over the past ten thousand years. More than 16,000 pieces of human bone and bone fragments were recovered from the tomb. Only one human skeleton was still partially articulated. As well as the eagle and human bone, other animal bones, limpet shells, red ochre, bone pins, beads - of bone, shell and an animal's tooth, - came from the tomb, along with more than 28 kilos of Unstan Ware pottery sherds. There

were also some significant and special finds made, sometimes referred to as the 'ceremonial objects' which include a beautiful amphibolite mace head, 3 stone axes, one of which is made of haematite, half of a cannel coal ring (the other half was found during work to consolidate the tomb 10 years later) and a bead or button of albertite, a type of hard bitumen (Hedges 1983). Human, eagle and other skeletal remains, the ceremonial objects, and some of the pottery are housed in the tomb room at the centre. Here visitors can handle some of the material whilst one of the guides explains the finding and interpretation of the tomb and its contents. Many visitors are overawed by this and say they feel a real connection with the past.

On the walk to the tomb, visitors go through a substantial dyke, up to 5m wide and a metre high. It runs inland from the cliffs at Dani Geo, 350m south of the tomb. It then circles round the back of Isbister farmhouse before returning to the cliffs at Rami Geo 500m north of the tomb. Although no dating evidence has been recovered, its construction is very different from that of the Norse and Mediæval dykes in Orkney, being made of stone and re-deposited boulder clay rather than turf. This suggests that the 75 acres that the dyke encloses, including the tomb, is part of a landscape which should probably be viewed as one entity.

Additional radiocarbon dates (Sheridan 2005) and a re-appraisal of the tomb's construction as seen in plans, elevation drawings and photographs, has brought into question whether or not the north and south end chambers were part of the original plan. They are the only parts of the tomb with flagged floors and shelves in them. They appear to be much later additions but this could only be determined with further excavation. In the original excavation report John Hedges(1983) stated, when talking about the stalls,

> …the two end ones (Stalls 1 & 5) are quite distinct from the central three (Stalls 2 – 4) and need to be discussed and thought of as such. page 3

Later in the report he adds,

> The disposition of the contents as well as the structure show that we are right to distinguish the shelved compartments from those comprising the stalled rooms… page 21

Whatever the actual phases of tomb constructions were, the tomb itself appears to have been used from circa 3150BC until circa 2420 – 2150BC, with closure occurring round about the same time as the last use of the Ness of Brodgar.

The Mesolithic Room

The exhibition in this room, opened in 2013, concerns the earliest period of Orkney prehistory, the Mesolithic. To begin with, the illustrated boards explain some of the work of Caroline Wickham-Jones and the other members of the Rising Tide project. The research uses a variety of methods to look at Orkney's drowned landscape and what it would have been like for the Mesolithic people living in Orkney 9000 years ago. Our visitors are always surprised and fascinated by the maps showing Orkney as one big island at that time. As sea level rose

and Orkney became an archipelago, it is likely that much of the evidence for these Mesolithic people has vanished under the waves.

Further round the exhibition there is information about the way of life of Mesolithic peoples and the materials they would have used, based upon finds made at various Mesolithic sites elsewhere. Replica artefacts and a large picture reconstructing a camp, based on evidence from Orkney and elsewhere, help add to visitors' understanding of the Mesolithic period. The Tomb of the Eagles visitor centre is one of the few places where it is possible to learn something of this little known chapter in Orkney prehistory.

We take our responsibility to Orkney archaeology and the important tourism industry very seriously. Every effort is made to make a visit to the centre worthwhile and interesting. The centre's guides are enthusiastic and well-trained in both customer service and the archaeological aspect of the centre. Several of the staff have degrees

in archaeology, and previously worked as professional archaeologists. Each of the three display rooms has activities to keep the younger visitors amused, and quizzes, toys and dressing up clothes also help to make visits entertaining, whilst a hot drinks machine, snacks and a well-stocked gift shop, including the work of local artists and craft workers, are available for adult visitors. Orkney weather can be cold and wet even at the height of summer and visitors may not be prepared for it. There is a room full of wet-weather gear and visitors of most sizes can be loaned everything from woolly hats down to woolly socks and wellies.

Once visitors are ready for the walk out to the sites they may find that they have acquired a canine guide as Tate, the adopted guide dog, will show them the route. He is well known for waiting whilst visitors look at the burnt mound site, but has been known to leave people at the tomb site whilst he shows other visitors the route back to the centre! If the cliff top route is chosen, visitors will see a wild flower trail marked out with labels helping them to name all the beautiful plants they have

photographed. And if weather permits, the walk back to the centre offers stunning views of the Orkney coastline, the birds and for the lucky few, seals or orcas.

The centre is open from the beginning of March to the end of October, half days in March and October but full days, 9.30 a.m. to 5.30 p.m. every day of the week from April to September.

Further reading and references

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New Dates for the Iron Age Metalworking at The Cairns: Making Metal, Casting Society

By Martin Carruthers

We have been very lucky at The Cairns over the years of the excavations to find a substantial set of remains and residues that relate to Iron Age metalworking. This includes at least two iron-working furnaces, and many other features and artefacts, but there is one particularly big and concentrated event that took place beyond the broch in the northern part of the site, in the area we call Trench M. The remains of this episode include furnaces, bronze waste; bronze splashes and droplets, crucibles, and very significantly: moulds for casting fine bronze objects. Over sixty moulds and mould fragments have been recovered. These were used to cast a variety of objects ranging from simple bronze rings, to distinctive decorated dress pins, called 'projecting ring-headed pins', and penannular brooches, which are the lovely open-ring, cloak brooches that are sometimes referred to as 'Celtic' brooches.

The volume and nature of the items being produced suggests that this was a socially significant collection of prestigious items aimed at denoting the identity, and status of those who were to wear the items; badges of their belonging and importance within the community. Importantly, it is the entire suite of materials found together, as well as their precise distribution pattern within the trench, that indicates strongly that this material relates to an in-situ metalworking event, rather than a secondary event, such as merely the refuse disposal of old moulds, or even their ritual deposition. This is important because the closer we can get to the actual context of the metalworking events the clearer and more direct our picture of the process becomes.

Ring headed pin moulds with cast pin

The moulds for casting the bronze jewellery were found in an area several metres in diameter, scattered within and across the remains of an Iron Age building (Structure K) that was already ruinous and

unroofed by the time the metalworking was happening. That building was itself found to overly the partially in-filled remains of a large enclosure ditch that had originally surrounded the broch period settlement. We therefore knew from the assessment of the layers (the stratigraphy) on site that the metalworking episode did not occur very early on in the sequence of events and buildings on site but it remained to be seen if it was going on towards the end of the monumental broch period on site, or if it was actually occurring after the broch was put out of use, which we know occurred around the mid-Second Century AD based on previously obtained radiocarbon dates. The calendar date of the metalworking was therefore of great interest. Did the jewellery-making episode date to the period late in the life of the broch, or was it happening after the broch itself was decommissioned and put out of use?

Craft and Chronology

Newly obtained radiocarbon dates make it clear which of these scenarios is correct. The new dates show that the jewellery-making occurred sometime between the AD240's and the mid AD300's. This places the metalworking very definitively after the end of the broch. Now, with this enhanced understanding of the chronological and structural context of the metalworking we can begin to consider the social context of this episode of metalworking. It is happening at a period of quite dramatic change in the material circumstances of Northern Iron Age communities in Scotland, at the end of the conventional Middle Iron Age and the beginning of the Later Iron Age periods, and contemporary with the mid to later Roman period further South.

It is very interesting that this episode therefore occurred after the culmination of the monumental phase of the site; after the demise of the massive broch at the heart of the community. One prominent

British Iron Age scholar (Professor Niall Sharples from Cardiff University) has previously suggested that across Atlantic Scotland a pattern can be observed in which, around the time of the end of the brochs, when monumental domestic architecture is on the wane, there is a very substantial rise in the volume of items that reflect the presentation of the individual through personal adornment. This phenomenon seems to be reflected at The Cairns also.

Two moulds for casting penannular brooches

Jewellery as social currency: Feasting, and gift-giving?

At the end of the bronze-casting event a fairly thick, very rich animal bone midden was laid down in the vicinity and slightly overlying the metalworking area. The close relationship between the metalworking and the animal bone is shown by the presence of a few of the crucibles and mould fragments amongst the midden also. What's in this midden? Well lots of domesticated animals, including cattle,

sheep and pig, especially large cattle long bones. In addition, there were other mammal bones such as red deer, otter, and even a small quantity of horse. The midden also contained carbonised soils, ash and broken fragments of pottery. Many fire-cracked beach cobbles were also excavated, and these represent the exploded remains of 'pot-boilers', heated cobbles that were immersed in vessels to heat up water and cook some of the food.

Four pieces of vessel glass, two clear and two green in colour represent shards of at least two Roman drinking vessels. These exotic vessels, emanating from the Roman province to the south, were also presumably used in the feast and may well have added even more pomp and significance to the proceedings. It seems that the people gathered at our feast were consuming beef on the bone, boiled pork, and roasted mutton and venison, some of which may have been washed down by beverages drunk from fancy Roman drinking vessels!

The close stratigraphic association between the fine metalworking and the feasting raises the question of what exactly was going on here. One possibility that I like very much is that the feasting could be the spectacular social event at which the products of the jewellery-making were handed out, or gifted, to their intended recipients by those who had sponsored the metalworking in the first place. We may therefore be peering into the social circumstances of the jewellery-making and the distribution of its products amongst the community at The Cairns. If this is so, then it is a fascinating insight into the moment at which objects like the pins, brooches and rings started off on their biographies, their journey through people's lives. This is a very rare opportunity to see more clearly the initial nature of the social and political significance of these objects from their start-point. It would mean that the sharing or gifting of the jewellery was surrounded in the circumstances of a big social occasion, a massive party, if you like. We are seeing their birth and the important role they played in the power-play and social strategies of Iron Age groups and individuals.

With the circumstances of the jewellery-making we are able, for once, to investigate the intended status and significance of these items within the context of their birth, rather than depending on the information we usually get, which is based on the discovery of these objects much later in their lives, in fact at the end of their lives, when they went in the ground, perhaps many decades, or more, after they were originally made and worn. Most theories about the brooches and pins and their role in society have been based on what we glean from them in this end-state, but the assemblage of metalworking evidence from The Cairns; the moulds, crucibles, and other items, together with the massive remains of the feasting allows us to grasp what was going on at the point in time when these jewellery items were instigated.

The big formal hearth in Structure B under excavation- a high status building at the time of the metalworking

Jewellery, Society and the wider Northern Scottish Iron Age

It is highly intriguing that the birth of these prestigious pieces of jewellery appears to have been accompanied by communal, outdoor feasting and judging by the volume of animal bone it involved a large part, if not all, of the community. In the absence of the big spacious monumental buildings, such as the brochs, which may have previously served to gather large numbers of people under one roof at important times in the life of the community, we can ponder whether feasting events like this were the new arena for expressing the identity and solidarity of the community.

If we now recall Professor Sharples' thesis that the changes at the end of the Middle Iron Age to late Iron Age involved a major transformation of the way people expressed their social identity, from the communal to the individual then this evidence for big community feasting in the early part of the Later Iron Age is very interesting. Perhaps this serves to somewhat modify that concept, because in the post-broch era at The Cairns, for one, the community appears to have retained ways of expressing their greater collective identity. Nevertheless, it seems unlikely that everyone was singled-out and gifted one of the pieces of fine jewellery that were produced.

At one level, perhaps, everyone in the community was involved in the feasting, but only some were ennobled by receiving a pin; a ring, or a brooch. So, it may well be that we are looking at the strategies for creating and maintaining the concept of the entire community at the same time as signalling social difference, and hierarchy in this post broch period. If so, the excavations are really coming up trumps in terms of allowing us to peer into the social circumstances of Iron Age communities.

New dates for Structure B1: Have we found the elite sponsors of the metalworking?

The period of the jewellery making is after the end of the broch and we were previously unclear which buildings amongst the many post-broch structures were occupied at the time of the bronze-working. The new dates also allow us to pin-point whereabouts on site, at least some of the community were living at the time the jewellery making was taking place. Armed with the new radiocarbon dates, it turns out that one of the large rectangular post-broch buildings (perhaps a Wag-like building of the type found in Caithness and at The Howe in Orkney) known to us as Structure B1, located about 30 metres to the south-west of the jewellery making area, was first constructed and occupied between the Mid-3rd to 4th Centuries AD, and therefore at the same time as the metalworking.

Structure B1 lies directly over the reduced and in-filled remains of the broch. One of the most remarkable aspects of this building is its very large, formal and complex central hearth, which was over three metres in length in its fully developed form. This hearth and the central location of the building directly juxtaposed with the remains of the abandoned broch almost co-opting its former position and grandeur have always made us wonder if it was one of the key buildings in the immediate post-broch period at The Cairns, quite possibly the highest status building on site at that time, and may be the successor to the central broch in socio-political terms. It is intriguing therefore to now know unambiguously that Structure B1 was contemporary with whoever was managing the wealth required to sponsor the lavish jewellery making on site. Pushing this further, it is tempting to speculate that it was the important and powerful household resident in Structure B1 who instigated and organised the production of the jewellery and the feasting - with all the capacity that those remarkable objects and events had for the creation and maintenance of the post-broch Iron Age community at The Cairns.

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The Review is dedicated to

Rik Hammond

Artist and archaeologist