

An introduction to the work of the  
Swandro-Orkney Coastal Archaeology Trust



Registered Scottish Charity No: SC047002

Patron: His Royal Highness The Prince Charles, the Duke of Rothesay

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## About the Swandro – Orkney Coastal Archaeology Trust

The Swandro – Orkney Coastal Archaeology Trust ([www.swandro.co.uk](http://www.swandro.co.uk)) is a Scottish Charity (No. SC047002) which aims to respond to the threat to the finite resource of Orkney's coastal heritage that is being destroyed by the sea. Due to global warming, the effects of climate change and melting polar ice are promoting higher sea levels and changing weather systems with increased storminess, which is exacerbating an existing problem. Orkney has over 980 km of coastline and many of Orkney's archaeological sites are subject to ongoing coastal erosion (e.g. Gibson 2008 & 2012). The coastline of Westness in the island of Rousay has a particular series of vulnerable sites. These currently form the basis of the '*Gateway to the Atlantic*' Research Project.

The Knowe of Swandro, on the Westness shore, forms the current focus for the Trust due to its immediate vulnerability to coastal erosion. The site poses particular problems, being low lying with the archaeology being actively eroded by the sea. This results in a series of wave cut terraces in the archaeological stratigraphic sequence, covered by re-deposited beach cobbles and sand. This archaeological sequence has been investigated by evaluative excavation undertaken since 2010 in a joint international research and training project. Swandro and its long-term research is enabling the development of both understanding and methodology that may be used in the wider environs; the definition of 'environs' within the context of the Trust's activities is the valuable wider coastal archaeological heritage of the Orkney archipelago.

The Trust was established to provide Swandro and its environs with the attention, focused effort, care, academic and public accessibility which it merits. The Trust will support the management and development of the archaeological and historical resource of Swandro and its environs. The Trust will serve the interests of the general public, particularly the local community, and academia by its archaeological activity at Swandro and environs. It will do so by excavation, research, providing open access to the site, publications, web resources, lectures, conferences, exhibitions, educational output and involvement, and whatever else will secure interest in and the future of the site.

## Our Patron

In March 2019 His Royal Highness The Prince Charles, the Duke of Rothesay, kindly agreed to take on the Patronage of the Trust. Speaking at the time, our Chair Dr Steve Dockrill said: 'This is a great honour for us and we are delighted that His Royal Highness has accepted our invitation to become our Patron. The work of the Trust, and in particular our current research excavation investigating both the archaeology and the processes of erosion at the multi-period site at the Knowe of Swandro in Rousay, brings together two of His Royal Highness' interests. The Prince has long campaigned to raise awareness of the dangers of global warming and climate change, and read archaeology and anthropology as a Cambridge undergraduate. We hope that having such a distinguished Patron will raise the profile of the Trust and also make more people aware of the threat to our heritage posed by global warming'.



## The Trust's Charitable Aims

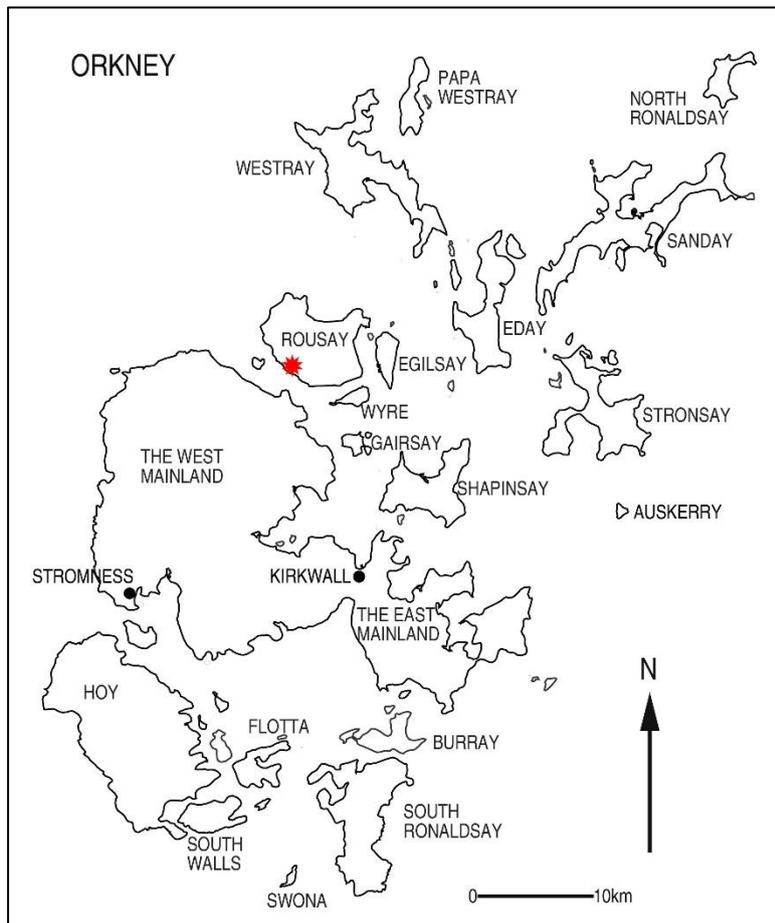
The Trust's main charitable aims are the advancement of education, heritage, culture and community development for people of all ages and backgrounds, to suit all relevant interests and levels of capability, through the pursuit of archaeological activities, in the widest possible ways, at Swandro and its environs.

It sets out to achieve these aims by the pursuit of the following activities at Swandro and its environs:

- encouraging and providing opportunities to learn about the heritage and archaeology of Swandro and its environs;
- encouraging and providing opportunities to become involved in archaeological activities at Swandro and its environs;
- offering a range of activities, including without limitation: public lectures; exhibitions; tours; visits; summer schools and work experience opportunities and public participation, in a volunteer capacity, in the widest possible range of archaeological techniques and tasks, all in pursuit of the widest possible understanding of, interest in and development of the archaeological work at Swandro and its environs;
- facilitating the publication of the results of and the maintenance of the records of archaeological activities carried out in relation to Swandro and its environs;
- facilitating the promotion of the preservation of and public display of the collections of archaeological artefacts and ecofacts, obtained from Swandro and its environs;
- working with other organisations and individuals, including schools and universities, to further the aims of the organisation; and
- serving Swandro and its environs by an active involvement in its future excavation and presentation.

## Archaeological Background to the Excavation at the Knowe of Swandro

The Knowe of Swandro forms the current focus for the work of the Trust due to its immediate vulnerability to coastal erosion.



*Map of Orkney showing main islands, with a red star indicating the location of the Knowe of Swandro, Rousay*

The Knowe of Swandro consists of a large eroding coastal mound on the edge of the Atlantic Ocean situated immediately behind a boulder beach on the Bay of Swandro. On the eastern flank of the Knowe is the Norse settlement site known as Westness, excavated by a Norwegian archaeologist in the 1970's (Kaland 1993). The Knowe provides the immediate focus for the work of the Trust due to the imminent threat of total destruction by the Atlantic Ocean. Excavation in 2010 indicated archaeological survival on the beach below the erosion face that forms the boundary between land and high water.



*Looking southeast across the Westness shore, the Knowe of Swandro marked by red star, the Atlantic Ocean on the right with Mainland Orkney in the background.*

Subsequent small-scale evaluations and excavation (summarised below) has shown that Swandro is a multi-period site, with a Neolithic chambered tomb, and Iron Age, Pictish and Viking period settlement. Swandro is actively and rapidly eroding. Midden deposits found during an examination of the beach at low tide in 2011 have been completely destroyed by the sea. The sea is actively destroying the eastern part of the site under the earthwork remains of the Norse houses; stonework still survives but most of the sediments and midden deposits have been washed away and the front stones of the remaining features show battering and wear.

The chambered tomb has suffered greatly from the effects of erosion since 2010, with much of the lower (seaward) circuit of the outer casement wall and the packing contained by it having been removed by the sea. Several of the large blocks from this lower revetment have been torn out and have completely disappeared. The water level at high tide regularly comes to this outer part of the tomb. The large stones that remain were angular when recorded in 2012 and now show significant smoothing by the action

of the sea and movement of smaller beach material.

On the beach to the east of the eroding chambered tomb there are walls and features which appear to pre-date the Iron Age sequence and represent an entrance passage to the tomb. These too are under threat; much of the lower terrace material has been destroyed and the remaining deposits are threatened. These middens are of vital importance as they contain an irreplaceable cultural and economic biography of the site. This research builds on the site and landscape studies undertaken at Tofts Ness, Sanday, Orkney and Old Scatness, Jarlshof, and the Viking Unst project, all in Shetland by project directors Steve Dockrill and Julie Bond (Dockrill et al 2007; Dockrill, Bond, Turner et al 2010 & 2015).

The key research questions for the project are:

(1) What is the extent of the Iron Age settlement and how does this change over time? The understanding of the Iron Age settlement sequence in cultural and economic terms by the excavation and sampling of these truncated archaeological surfaces will provide a current and informed understanding for people living in Rousay in the Iron Age and how this changes over time.

(2) What is the stratigraphic association with the Norse settlement and how does this inform on the question of the Pictish/Viking cultural interface? The taking of existing estates by Scandinavian settlers is still a contentious issue in terms of its nature and date. Only with more detailed excavation will it be possible to gain an insight into this important transition on what increasingly seems to be a vital site for this transition period.

(3) What is the potential of the Chambered Cairn in providing new data to complement the burial monuments excavated previously in Orkney? The site has the potential to establish the relationship of this monument form to the later Iron Age settlement, a phenomenon observed at a number of sites in Orkney, as well as providing a unique opportunity to investigate the construction of the mound due to the erosion.

(4) The investigation of this eroding site takes place within a research framework, which also demonstrates the relevance of the disappearing record. The long settlement history or 'biography' revealed by the erosion enables the study of human behaviour in this particular place through major changes in culture, climate and environment.

This would facilitate the following:

(1) To provide an understanding of the erosion processes and the archaeological survival and to develop recording methods so as to inform future management of such sites.

(2) A definition of the extent and nature of the archaeological survival (structural elements and sampling the in situ midden deposits) on the eroding beach with the sampling strategy informing on the economic and environmental exploitation and change, the site's chronological development and its cultural biography within the archaeological record of Rousay and Orkney as a whole.

### Summaries of the Archaeological Evaluations and Excavations

Small-scale evaluations have taken place on an annual basis since 2010, followed by larger scale excavations supported by the Trust. The following pages contain brief summaries of the results of this work as published annually in *Discovery and Excavation in Scotland*. More information about the excavation, including our excavation diary and downloadable copies of reports, together with more information on the work of the Trust may be found on our website at [www.swandro.co.uk](http://www.swandro.co.uk)

Excavation videos may be found on our YouTube channel:

<https://www.youtube.com/c/SwandroOrkneyCoastalArchaeologyTrust>

You can follow us on Facebook at:

<https://www.facebook.com/SwandroOrkneyCoastalArchaeologyTrust/>

## 2010 Archaeological Evaluation

(Brough: HY33SE10; HY 3727 3037; Swandro: HY32NE19; HY 3753 2966; Ditch: HY33SE2; HY 3723 3036).

A team from the University of Bradford, Orkney College (UHI) and City University New York cleaned, recorded and sampled three sites from 23<sup>rd</sup> June – 14<sup>th</sup> July 2010 as part of the ‘Orkney – Gateway to the Atlantic Project’. The project aims to investigate and record coastal sites in Rousay, Egilsay and Wyre which are threatened by rising sea levels and coastal erosion.

### The Mound of Brough

The man-made mound at ‘Brough’, also known as South Howe, on the SW shore of Rousay contains an eroding Iron Age broch and houses. These structures seem to be overlain by Late Norse buildings which in turn are overlain by nineteenth-century middens. This broch is only a few hundred metres away from the Broch of Midhowe (HY33SE2). Coastal erosion has exposed the remains of a settlement mound that is surmounted by the ruins of the farm of Brough.

The active area of erosion extends for at least c.70m along the low cliff face. In the centre of the eroding area are the remains of walling which appears to be the outer wall and entrance passage of a broch. This wall survives to a height of 2.5m and varies in width from 4.2m at its base to just under 3m at its highest point. Erosion to the west of this structure appears to be recent, with a cove-like zone extending 2m inland. This zone contained orthostats and flagging. A second zone of active erosion appears c.20m to the east. Examination of this area revealed a number of walls; their construction strongly suggests that these remains represent a later phase of settlement, probably dating to the later medieval or early post-medieval period.

The aim of the 2010 season at South Howe was the characterisation and examination of the potential of the surviving archaeology by tapestry excavation of the cliff exposure. The large expanse of exposed wall core that forms the apex of the visible mound was not cleaned and was left in situ in order to maintain the stability of the

wall. Turf and slippage was removed to reveal the outer wall face and the exposed wall core.



*Laser scanning of the eroding broch mound at South Howe from the shore.*

To the east of this truncated wall a wall face ran north; this wall face turned at 90° into a second wall that appeared to run west into the mound and form the inner wall of a broch-like roundhouse. The north-oriented face is interpreted as the west side of an entrance passage. The in situ remains of a broken lintel stub projected from this wall. Midden containing nineteenth-century pottery, probably originating from the farm of Brough at the summit of the mound, appeared to seal the interior of the broch. The broch seems to have suffered from one or more severe erosion events and this material may represent re-deposition from in situ deposits at the top of the mound. This area was not excavated and requires further investigation to resolve the depositional sequence. The elevations of the eroding cliff sections were photographically recorded, with geo-referenced markers placed in each frame. This season formed Stage 1 of several years projected work on these exposed remains.

## The Ditch North East of Midhowe

A fluxgate gradiometry survey of the area northeast of the guardianship boundary of the Midhowe Broch by staff and students of Orkney College demonstrated a clear magnetic anomaly running northeast for c.50m and then turning in a south – south-southeast direction. The strength of the anomaly was high, although the data suggested that this was a ditch-like feature of anthropogenic origin. An assessment trench, 9.55m x 2.8m, was machine-cut across the anomaly. When excavated, the ditch contained little in the way of cultural evidence, with no artefacts to suggest an infill date. Further geophysical survey after the excavation indicated that the ditch did not continue, but turned to form a small enclosure. The infill sequence suggests material being deposited from the northwest. The uniform nature of the stone in the greater part of the ditch corresponds to the type seen in prehistoric clearance cairns. One possibility is that this ditch represents a field division associated with the broch, possibly designed to contain cattle.

## The Knowe of Swandro.

This site (HY32NE19) which consists of a mound with stone inclusions and is located behind a beach on the Bay of Swandro, close to the Norse house site known as Westness (HY32NE17), is also thought to be Iron Age in date. Visual examination prior to this season's excavations suggested that the mound is subject to coastal erosion.

The objectives for the 2010 season's work were to locate a reported earlier excavation trench and to characterise the mound, which has been variously described as a broch, a 'mutilated turf-covered mound' (Canmore: HY32NE19) and a 'stony mound' (RCAMS 1946, vol. II, 220, no. 579). The planned investigation extended onto the beach rather than along the coastline as it became obvious that the site extended under the storm beach towards the tide line.

A small trench, 2.5m x 8m, was opened across the southeast end of the curving bank and hollow on the top of the mound. The hollow centre of the mound, which had appeared to be the result of earlier investigations, seems not to have been disturbed; there was a fine and even layer of shillet sealing this area which appeared to be a

weathering deposit. A tumble of rocks sealed the shillet and butted a stone feature which appeared to be structural and may be a partially destroyed length of wall. Two other small stone features may also be fragments of walling but this cannot be determined without more extensive excavation. There was an area of paving composed of large, flat worn stones in the east of the trench. This was sealed by a small patch of limpet midden in the northeast corner. The very top of an orthostat was visible in the southeast corner of the trench. The area was cleaned, planned and photographed and the contexts recorded. A number of conclusions can be drawn on the basis of the evidence from this season's work. There are a number of phases to this part of the mound and the presence of worn paving at the very top of the sequence, sealing or butting an earlier wall, suggests that the site is composed of more than a single structure. The presence of the undisturbed shillet suggests that wherever the earlier investigations were located, the hollow area is not the result of this but rather represents a weathering layer over undisturbed contexts.



*Archaeological deposits including structural remains exposed on the beach at Swandro.*

The tops of a series of orthostats had been noted among the boulders and shingle of the storm beach and appeared to be a previously unrecognised part of the site. Investigation of these features completely changed the interpretation of the mound. An area, c.5 x 6m, stretching from the erosion bank at the top of the beach down towards the sea was cleared. The orthostats, which had appeared level with the boulders and shingle, survived to a height of at least 0.5m and appeared to form the backs and sides of three cells of a curving dry stone structure, whose projected centre was somewhere below the current high tide mark. The largest cell, to the east of the feature, contained several phases of paving and also had paving in front of a long, dressed kerb stone which formed the front of the cell. The two smaller cells to the W also retained areas of paving and patches of ash rich midden survived between and on top of the stones. This midden produced well preserved bone and pottery which on initial examination appears to be of Late Bronze Age or Early Iron Age date. The structure appears to continue towards the high tide mark and lies well within the area of the spring tides and of storm events. The back of the structure was sealed by more midden of a later date, which appeared to be earlier than the features investigated at the top of the mound, although this cannot be confirmed without further investigation. Bulk samples were taken from the midden contexts within the structure. The charred plant remains and animal bones will provide palaeoeconomic information and radiocarbon dates.

The excavated beach area was consolidated with geotextile, sandbags and boulders, whilst the area at the top of the mound was backfilled and re-turfed.

## 2011 Archaeological Evaluation

(Brough: HY33SE10; HY 3727 3037 and Swandro: HY32NE19; HY 3753 2966).

A team from the University of Bradford, Orkney College (UHI) and City University New York cleaned, recorded and sampled the site at Swandro, 22<sup>nd</sup> June – 27<sup>th</sup> July 2011, as part of the '*Orkney Gateway to the Atlantic Project*'. The project aims to investigate and record coastal sites in Rousay, Egilsay and Wyre which are threatened by rising sea levels and coastal erosion.

### The Mound of Brough

The man-made mound at 'Brough', also known as South Howe, on the SW shore of Rousay contains an eroding Iron Age broch and houses. These structures seem to be overlain by Late Norse buildings which in turn are overlain by nineteenth-century middens. This broch is only a few hundred metres away from the Broch of Midhowe.

### The Knowe of Swandro

Work on the Knowe of Swandro this year again concentrated on two areas, the mound itself (Area B) and the eroding beach deposits (Area A). An area 4m x 10m was de-turfed on the mound and features defined. The structural elements noted in the 2010 season were investigated and appear to be the remains of a substantial double-faced curving wall. A small area of paving close to the beach section appears to be later in date. On the storm beach, the cleared area was extended to 4m x 10m, to assess the extent of the remaining deposits. Midden and other features were found to extend to the high tide mark and further test pitting at low tide revealed that anthropogenic deposits stretched under the storm beach and sand deposits to the low tide line. A sondage in the east corner of the excavated area showed a complex series of stony midden deposits to a depth of over 1.5m below the eroded surface; at this depth, a freshwater spring made excavation difficult, but the sondage demonstrates the depth of midden deposits under the eroding beach. Finds from these middens include a worked bone pin, pottery and well-preserved bone.



*Test pitting on the beach at Swandro, in the foreground Area A is laser scanned*

The remains of a prehistoric structure, first investigated last year, were further excavated and samples taken for environmental evidence and radiocarbon dating. A single radiocarbon date indicated a date in the 1<sup>st</sup> to 2<sup>nd</sup> centuries AD. Archaeomagnetic dates obtained from an earlier hearth indicate use in the 4<sup>th</sup> to 2<sup>nd</sup> centuries BC. Clearance of large beach boulders on the west edge of Area A revealed large dressed stones, much battered by the storm beach, forming a substantial wall which could be shown to be the continuation of the large curving wall seen in Area B. Stratigraphically above the structure excavated last year, and physically further up the beach, a paved area, a fragment of hearth surround and a series of cells formed from orthostats indicated the presence of a later structure. The evidence suggests that Swandro is a multi-period settlement. This year's excavations have demonstrated that the deposits at Swandro are much deeper than initially suspected and the extent of the site much greater. Marine erosion has proceeded in a stepped fashion, so that the earliest deposits survive in greatest extent below the storm beach, whilst the later deposits are fragmentary.

## 2012 Archaeological Evaluation

(Swandro: HY32NE19; HY 3753 2966).

A team from the University of Bradford, Orkney College (UHI), William Paterson University and City University New York cleaned, recorded and sampled the site at Swandro, 20<sup>th</sup> June – 19<sup>th</sup> July 2012, as part of the 'Orkney – Gateway to the Atlantic Project'. The project aims to investigate and record coastal sites in Rousay, Egilsay and Wyre which are threatened by rising sea levels and coastal erosion.

### The Beach

The investigation of odd stones just visible among the pebbles on the beach below the eroding site has completely changed our understanding of this enigmatic mound. Initial clearance of the overlying beach material revealed the remains of an Iron Age structure. This was confirmed by an AMS radiocarbon date of 25BC – AD130 at 95% confidence for carbonised barley from a midden which sealed flagging in one of the compartments. Work in 2011 (Dockrill et al 2011) enabled the nature of the erosion to be more fully understood together with an indication of archaeological survival and potential. The sea had created terraces or steps within the archaeological mound, with each of these eroded scars being covered by redeposited beach material.

In 2011, on the north-western side of the cleared archaeological surface, the remains of a substantial outer wall forming the arc of a large circular building seemed to form the continuation of a crescent shaped ridge at the top of the mound, and it was thought to be the outer wall of a large roundhouse of broch proportions.

### A Chambered Cairn?

In 2012 this substantial wall was investigated more fully; clearance of the overlying beach material revealed a circular structure. This was formed by a number of concentric outer wall faces. Each arc of wall was backed by a stone and midden core. Rather than the expected broch, the structure of this monument more closely parallels the construction of a Neolithic chambered tomb. A wall running eastwards is suggestive of an outer-work leading into an entrance passage. Cutting into and sealing

the top of this enigmatic monument were further Iron Age buildings represented by truncated flag floors and orthostats. Despite aggressive erosion, shown by the worn outer faces of the walls which have been battered by the sea and the constant movement of the boulder beach, this probable chambered cairn still remains intact, and has great archaeological potential.



*Overhead view of the probable Neolithic tomb at Swandro. Concentric walling typical of chambered tomb construction as demonstrated in previous tomb investigations in Orkney e.g. Quanterness, St Ola (Renfrew 1979) or Maeshowe, Stenness (Childe 1956).*

The excavation of the seaward outer rings proved difficult, as the sea would cover these at high tide and work had to be timed to coincide with low tides, after substantial amounts of bailing. Bone from the Iron Age middens and between the concentric walls of the cairn survives well even in areas truncated by the sea. This means that the potential for in situ human remains within the tomb is high and in consequence this is an extremely important site. Re-evaluation of existing tomb assemblages are currently challenging previously held interpretations (e.g. Lawrence 2006 & 2012). This site offers the rare opportunity to excavate using modern methods and techniques, a tomb which in a few years' time will be completely lost to the Atlantic.

Work to the southeast in 2012 saw the continuation of Late Iron Age walling on the foreshore under the boulder beach and now indicates that the Norse Hall overlies earlier settlement material. This year's excavations have demonstrated that the deposits at Swandro are more extensive and the deeper deposits are much earlier than initially suspected.



*Looking south-east across the site at Swandro, with the concentric walls of the chambered tomb in the foreground, the Atlantic Ocean on the right.*

## 2013 Archaeological Evaluation

(Swandro: HY32NE19; HY 3753 2966).

A team from the University of Bradford, Orkney College (UHI), William Paterson University and City University New York cleaned, recorded and sampled the site at Swandro, 23<sup>rd</sup> June – 19<sup>th</sup> July 2013, as part of the ‘Orkney – Gateway to the Atlantic Project’. The project aims to investigate and record coastal sites in Rousay, Egilsay and Wyre which are threatened by rising sea levels and coastal erosion. Work on the Knowe of Swandro this year again concentrated on two areas, the mound itself and the eroding beach deposits.

In the first season of the project, upright stones just visible among the pebbles on the beach below the eroding site were investigated and proved to be part of a series of structures and features surviving beneath the storm beach. Subsequent investigation of this area has completely changed our understanding of this enigmatic mound.



*Iron Age structures surviving below the storm beach at Swandro*

Initial clearance of the overlying beach material revealed the remains of what appeared to be an Iron Age structure. This was confirmed by an AMS radiocarbon date of 25BC–AD130 at 95% confidence for carbonised barley from a midden that sealed flagging in one of the compartments. Work in 2012 (Dockrill et al 2012) enabled the nature of the erosion to be more fully understood, indicating significant archaeological survival and potential. It can now be seen that the sea has created terraces or steps within the archaeological mound, with each of these eroded scars being covered by redeposited beach material.

In 2011 on the northwest side of the cleared surface, the remains of a substantial and well-built outer wall forming the arc of a large circular building were revealed. Further clearance of the beach material in 2012 showed that there was a series of three substantial concentric outward facing walls, and the structure appears to be a Neolithic chambered cairn, surrounded by later settlement.



*A Pictish building, finds included hammer scale and copper alloy indicating use as a possible smithy*

Work in 2013 concentrated on the continuation of the site to the southeast of the mound, extending towards the Norse house site known as Westness. Investigation this year has demonstrated a Late Iron Age and Pictish phase of Swandro, indicated by cellular structures contained by the infilled remains of more substantial Iron Age structures. Material recovered from these structures included fragments of glass and copper alloy, hammer scale, slag, vitrified material and a small copper alloy projecting-headed pin. It can now be seen that the truncated remains of the Norse hall of Westness clearly overlie the Swandro Late Iron Age settlement.

On the beach close to the chambered cairn, the truncated remains of the earliest Iron Age building (Structure 1) were further investigated and found to contain an orthostat and stone construction interpreted as an oven. This feature has a close parallel with the 1st century BC oven excavated by the authors in Structure 8 at Old Scatness, Shetland (Dockrill, Bond, Turner et al 2015).



*An Iron Age oven excavated in Structure 1 paralleled by those excavated at Old Scatness, Sumburgh, Shetland.*

Excavation of the shoreward part of the Swandro mound continued in 2013 and indicated that stone from the upper parts of the Neolithic chambered cairn had been robbed in antiquity. Excavation identified shillet and midden deposits in this area of disturbance, though the date of this activity has not yet been established.



*The 2013 dig team at Swandro – a multi-national team of volunteers and students*

## 2014 Archaeological Evaluation

(Swandro: HY32NE19; HY 3753 2966).

A team from the University of Bradford, Orkney College (UHI), William Paterson University and City University New York cleaned, recorded and sampled the site at Swandro, 16<sup>th</sup> June – 26<sup>th</sup> July 2014, as part of the Orkney Gateway to the Atlantic Project. The project aims to investigate and record coastal sites in Rousay, Egilsay and Wyre which are threatened by rising sea levels and coastal erosion. Work in 2014 focused on the beach where investigation of set orthostatic stones just visible among the pebbles on the beach indicated archaeological survival below the eroding site. Investigation of these features has completely changed our understanding of this enigmatic mound. Initial clearance of the overlying beach material revealed the remains of an Iron Age structure. This was confirmed by an AMS radiocarbon date of 25BC – AD130 at 95% confidence for carbonized barley from a midden which sealed flagging in one of the compartments.



*Orthostats protruding from the storm beach indicating archaeological survival*

Work in 2012 enabled the nature of the erosion to be more fully understood, indicating significant archaeological survival and potential. The sea had created terraces or steps within the archaeological mound, with each of these eroded scars being covered by redeposited beach material. In 2012 on the northwest side of the cleared archaeological surface the remains of a substantial outer wall forming the arc of a large circular building seemed to be the continuation of a crescent shaped ridge at the top of the mound. It was thought at first that this was the outer wall of a large roundhouse of broch proportions. However, the presence of a series of stepped concentric outer wall-faces with a mixed midden and rubble core suggests that the core of the mound is a Neolithic chambered cairn. Work in 2013 concentrated on the continuation of the site southeast of the mound. Investigation demonstrated that a Pictish phase, indicated by cellular structures contained within the infilled remains of more substantial Iron Age structures, show a continuation of the site on the foreshore and under the boulder beach. The truncated remains of the 'Norse Hall' of Westness, previously excavated by Kaland (1993), clearly overlies the Late Iron Age settlement.

Excavation of the centre of the Swandro mound continued in 2014 and this now clearly indicates that the mound forming the Neolithic chambered cairn had been partially robbed in the Iron Age and infilled with Late Iron Age (Pictish) midden. On the seaward area of the beach under the mound, the truncated building (Structure 1) was further investigated and midden was found to continue seaward, but was clearly affected by the tidal action.

Work was concentrated on the excavation of the later Iron Age (Pictish) elements of the site. Here buildings were found to be nested in larger structures which had been truncated by the sea. The truncations were cleaned as sections, sampled and recorded. The excavation of one of these later truncated buildings (Structure 2) saw the sampling of floor surfaces down to the primary flag floor. The continued excavation and sampling of the infill of a third building (Structure 3), close to the Westness houses, but partly within the eroding beach area, confirmed its form as a Pictish style multi-cellular building and revealed the presence of slag and crucible material suggesting copper alloy working in the deliberately deposited infill.



*Survival of Iron Age buildings below the storm beach at Swandro including a hearth (the red area in the foreground).*

One of the larger structures into which the later structures are nested became clearer during this season's excavation, with a substantial wall in the erosion section and a series of paved surfaces butting the wall on the outside face of the curve. A feature consisting of a set of paving slabs which had cracked and tipped downwards appears to be related to this structure. When the flags were removed what appears to be a well was revealed, with dry stone walls, a flagged area around the top and a set of steps inside. When some of the rubble was removed it was found that the well was still active, refilling to the base of the steps with spring water.

## 2015 Excavation

(Swandro: HY32NE19; HY 3753 2966).

A team from the University of Bradford, Orkney College (UHI), William Paterson University and City University New York cleaned, recorded and sampled the site at Swandro, 16<sup>th</sup> June – 26<sup>th</sup> July 2015, as part of the Orkney Gateway to the Atlantic Project. The team included students, freelance archaeologists and academics. The project aims to investigate and record coastal sites in Rousay, Egilsay and Wyre which are threatened by rising sea levels and coastal erosion.



*Aerial view of the site: on the right the concentric rings of the walls of the chambered tomb, with the Iron Age buildings to the left and the Atlantic at the top (west) of the photo. Note the damage done to the walls of the tomb by coastal erosion in the years between 2012 and 2015, compared to the photo taken in 2012 (see above page 26).*

Excavations at Swandro in 2015 saw a continuation of the work on the terraced beach with the further examination of the eroded Iron Age buildings investigated in the

previous year. Structure 3, a Pictish building at the top of the series of eroded terraces, continued to be excavated with further signs of metalworking debris consisting of slag, furnace lining and crucible fragments being found. These infilling deposits were sampled and have high potential for botanical remains in the light fraction recovered from flotation. It now appears that the construction of the main Norse house excavated by Sigrid Kaland (1993) destroyed the eastern part of this structure, though the infill deposits may be earlier than this. To the west there seems to be a short passage leading out of the structure, with two possible steps. Further definition of other structural remains took place all along the upper terrace.



*Close-up of the chambered tomb wall showing flooding and damage to the lower courses.*

The Neolithic chambered cairn on the western boundary of the Iron Age site was uncovered to assess the tidal damage to the remains. This area was originally uncovered in 2012 and the structure of the cairn determined before being carefully recovered. However, observations last year suggested that the large boulders had again shifted and that the outer of the casement walls was eroding. Excavation of the

overlying beach and removal of the membrane laid down in 2012 showed an alarming amount of attrition to the monument. The stones forming the seaward part of the outer casement had been rounded by the sea and much of the retained material had been washed out. The other casement walls also seem to be tipping seawards. This summer saw a lot of rainfall and a spring developed at the foot of the cairn draining towards the sea which may be hastening the erosion.



*Looking across the site with flagged areas and orthostats*

The passage entranceway on the eastern side of the tomb was located this season; two parallel wall faces lead through the cairn wall and are continued by a further wall which butts the outer casement walls of the cairn. It seems likely that this passage originally continued to the east but whether it was destroyed by Iron Age activity or continues in fragmentary form under the Iron Age structures which surround this side of the cairn is not yet known. This passageway has been deliberately filled with rubble and fine earth; a fragment of copper alloy and bone fragments, human and animal, were found in the top of the fill, but no further excavation took place on these deposits.

## 2016 Excavation

(Swandro: HY32NE19; HY 3753 2966).

Evaluative excavation at Swandro continued in July 2016. The archaeology is suffering from erosion from the sea which has cut into a settlement mound (Iron Age to Norse) developed upon the eastern flank of a Neolithic chambered cairn. Previous seasons have established the presence of a sequence of structures which has been exposed by the sea cutting into the archaeology forming a series of terraces. The erosion has provided an opportunity to examine and sample this archaeological sequence. Unfortunately, the deposits surviving at the lowest terrace have suffered from extensive erosion, with much of the midden material having been washed away and the larger structural stones having been smoothed by the movement of water and beach material.

### The chambered cairn

The outer casement wall of the Neolithic chambered cairn is butted by a single-faced alignment of stones, suggestive of a retaining wall. This was first observed in the 2012 season and again in 2015, when a much greater degree of erosion was noted. In 2016 this feature was investigated further in order to determine whether an old ground surface or underlying archaeology had survived the effects of the erosion by the sea. A number of large water worn boulders were found to be redeposited, implying the movement of large 'storm thrown' rocks. These sealed a dark yellow sand and a black compacted sand containing decayed seaweed with no surviving evidence of any anthropogenic deposits or an in situ old ground surface. Despite this sequence of redeposited material in the scoured area seawards of the cairn wall, the remains of a reddish ashy midden deposit were found to be sealed by the secondary retaining wall.

The entrance passage leading into the chambered cairn was also defined in 2015, upon the uppermost (landward) erosion terrace. The passage walls are single faced and the upper infill formed by a layer of small angular stone (shillet) containing copper alloy fragments, large fish and mammal bones appeared to reflect late activity. This was confirmed by the finding in post-excavation of a coin of EANRED, King of

Northumbria AD810 – 840, together with the near complete skeleton of a cat. This disturbance and infilling might represent Viking period activity. Work in 2016 continued to define the top of the passage and to assess the nature of this later activity. The further excavation of the passage revealed more faunal remains including of several sheep displaying metal butchery marks. This deposit sealed large angular rubble which appears to be the infill of the passage.



*Excavation of the erosion terraces at Swandro, revealing the later infill to the entrance passageway of the chambered tomb.*

### Structure 1: A Middle Iron Age Roundhouse

This truncated Middle Iron Age roundhouse is represented by just one segment of its circumferential cells, the interior and southern portion having been lost to the sea. The circumference of the building is formed by orthostats; the floor of the northern radial cell was formed by a single flag, which had been made to fit the cell. Several notches

had been cut into the flag, which appear to be post settings. It seems likely that this would have supported a mezzanine level around the circumference of the structure. The presence of such mezzanine structures is paralleled by Middle Iron Age remains at Old Scatness, Shetland.

### Structure 2: A Late Iron Age roundhouse

Definition of the upper eroded terrace of the beach identified the remains of what appeared to be half of a cell-like circular structure. In 2016, investigation indicated that an orthostatic divide with flagging either side which had been identified in 2015, were found to be clearly later elements forming a modification to the building.



*Structure 2, the Late Iron Age roundhouse on the upper erosion terrace at Swandro*

These were removed to reveal the original form of the building, the curved line of orthostats together with a door sill (threshold stone) indicating a western entrance.

The seaward section demonstrated a greater degree of erosion and did not survive. A floor level was formed by large flags with evidence of orthostatic radial divisions. Entering this structure via the threshold stone, one of these radial orthostats blocks any turn to the left (north/landward side), confining movement to the centre or to the right. This phenomenon of barring entry to the left has also been observed within other Iron Age roundhouse structures in the Northern Isles at Old Scatness (Shetland). The flag floor and the hearth are clearly part of a sequence of floors representing several modifications to the building as the remains of part of a rectangular stone tank could be clearly identified under the flags.

### Structure 3: The Pictish Smithy

A cellular structure with features suggesting a Pictish date, mostly still sealed by the northern landward section.



*The entrance (on right) to the Pictish smithy (Structure 3) with adjacent cupboard*

The southern wall was identified and excavated first, and revealed evidence of an intramural cupboard, adjacent to a complete in situ cupboard. The contexts in the lower sequence under the rubble infill were found to contain some evidence of metal working with finds of slag, small crucibles and mould fragments together with evidence of fragments of copper alloy.



*The steps leading into the Pictish smithy (Structure 3)*

A series of steps was found to lead from the north (landward) section into the building, in a curved passageway whose stones demonstrated wear consistent with rubbing caused by the passage of the past occupants. The presence of a threshold stone in the narrow passage, together with a bolt hole clearly indicates that there would have been a physical door dividing the passage and the central area of the structure.

## 2017 Excavation

(Swandro HY32NE 19; HY 3753 2966).

Evaluative excavation continued upon the eroding beach at Swandro, Rousay, Orkney for a 4-week season between the 3<sup>rd</sup> – 28<sup>th</sup> July 2017. The archaeology is suffering from erosion from the sea which has cut into a settlement mound (containing a Mid Iron Age to Norse sequence of settlement) that had developed upon the eastern flank of a Neolithic Chambered Cairn (or Passage Grave). Previous seasons have established the presence of a sequence of structures which has been exposed by the sea cutting into the archaeology, forming a series of terraces. The erosion has provided an opportunity to examine and sample this archaeological sequence. Unfortunately, the deposits surviving at the lowest terrace have suffered from extensive erosion, with much of the archaeological matrix having been washed away, leaving the larger structural stones which have been smoothed by the movement of water and beach material.

In 2017 work concentrated on the later deposits within the passage of the Chambered Cairn, the eroding area south east of the outer casement wall of the Cairn, and investigation also continued within two of the Iron Age buildings (Structure 2 and Structure 3).

### The Chambered Cairn

The outer casement wall of the Neolithic Chambered Cairn is butted by a single faced alignment of stones, suggestive of a retaining wall. This was first observed in the 2012 season and again in 2015, when a much greater degree of erosion was noted. In 2016 this feature was investigated further in order to determine whether an old ground surface or underlying archaeology had survived the effects of the erosion by the sea. A number of large water worn boulders were found to be re-deposited, implying the movement of large 'storm thrown' rocks. There is no surviving evidence of any anthropogenic deposits or an in situ old ground surface on the seaward arc of the outer casement wall of the cairn. A sequence of deposits was found to be retained by a second wall butting the outer casement wall and was investigated in 2017. These deposits have

been subject to some tidal scouring but appear to be a sequence pre-dating the mid Iron Age roundhouse (Structure 1). Investigation in 2017 provided strong evidence to suggest that there are also stratigraphic elements (structural and depositional) in this area that predate the construction of the outer casement wall of the Passage Grave.

The entrance passage leading into the Passage Grave was defined in 2015, upon the uppermost (landward) erosion terrace.



*Looking down the entrance passageway into the chambered tomb, with the later building butting up against the entrance in the foreground.*

The passage walls are single faced and the upper infill formed by a layer of small angular stone (shillet) containing copper alloy fragments, large fish and mammal bone appeared to reflect late activity. This was confirmed by the finding in post excavation of a coin of EANRED, King of Northumbria AD 810 – 840, together with the bones of

several cats. This disturbance and infilling may represent Viking period activity. Work in 2016 continued to define the top of the passage and to assess the nature of this later activity. The further excavation of the passage revealed more faunal remains, including bones of sheep displaying metal butchery marks. The remnants of these later deposits were excavated in 2017 and the large angular rubble which appears to be the infill of the passage was defined along the length of the passage. The area outside of the passage was also investigated in 2017 and evidence of in situ lintels of a cell-like feature was found on the landward side of the passage entrance outside the casement wall.

### Structure 2: A Late Iron Age Roundhouse

Definition of the upper eroded terrace of the beach identified the remains of what appeared to be half of a cell-like circular structure. In 2016, investigation indicated that an orthostatic divide with flagging either side (which had been identified in 2015), were clearly later elements forming a modification to the building. These were removed to reveal the original form of the building, the curved line of orthostats together with a door sill (threshold stone) indicating a western entrance.



*The Late Iron Age roundhouse with tank*

The seaward section demonstrated a greater degree of erosion and did not survive. In 2016 a floor level defined by large flags was identified. The flag floor and the hearth are clearly part of a sequence of floors representing several modifications to the building as the remains of part of a rectangular stone tank could be clearly identified under the flags. In 2017 these flags were lifted and the sequence of ash, mixed 'midden like' material and stone packing were investigated. The rubble infill of the tank was excavated and the lower infill sampled. During the excavation a coin, a Nummus of Constans dating to AD348 – 350, was found.

### Structure 3: Pictish Smithy

Structure 3 is a cellular structure with features suggesting a Pictish date, mostly still sealed by the northern (landward) section. The southern wall was identified and excavated first and revealed evidence of an intramural cupboard, adjacent to a complete in situ cupboard. In 2016 the contexts in the lower sequence under the rubble infill were found to contain some evidence of metal working with finds of slag, small crucibles and mould fragments together with evidence of fragments of copper alloy. A series of steps were found to lead from the north (landward) section into the building, in a curved passageway whose stones demonstrated wear consistent with rubbing caused by the passage of the past occupants. The presence of a threshold stone in the narrow passage, together with a bolt hole clearly indicates that there would have been a physical door dividing the passage from the central area of the structure. Investigation in 2017 (aided by the archaeometallurgist Dr Gerry McDonnell) identified more evidence of metal working including part of a fired clay tuyère.

Evidence of a hearth which had two phases of use and an associated ash rich surface was investigated and sampled. Further archaeological evidence for both copper alloy working and iron working was recovered in the 2017 season. A fallen, large elongated beach cobble appeared to have been once set upright adjacent to the hearth. The end of this stone had damage which was suggestive of its use as an anvil. Earlier wall elements representing a larger building, in which this Pictish cellular structure was constructed, were further defined in 2017.



*Looking northwest across Structure 3, the Pictish Smithy, towards the entrance showing the flagged hearth in the centre.*

## 2018 Excavation

The 2018 season between the 25<sup>th</sup> of June and the 3<sup>rd</sup> of August saw the completion of the excavation of the Pictish Building (Structure 3) and the start of a new phase of the project with the excavation of the suspected Chambered Cairn forming the Knowe of Swandro.

### Structure 3 the Pictish Smithy

The Pictish building floor had been identified in 2017 and revealed significant metalworking debris suggesting both iron and copper working, with spheroidal slag and hammer scale suggestive of sophisticated blacksmithing including fire welding. The presence of a number of crucible fragments strongly pointed to the structure having been used for copper ally working. Subsequent analysis of the crucible fragments by Dr Gerry McDonnell using X-Ray Fluorescence (XRF) indicated that the crucible fragments were used to cast an alloy with a high zinc composition forming a brass rather than a bronze (with a higher tin content in the alloy). In the summer of 2018 Dr McDonnell supervised the excavation and sampling of the floor of the Pictish building.



*Dr Gerry McDonnell investigating the floor of the Pictish smithy using a portable XRF machine.*

The floor was carbon rich and the hearth demonstrated two phases of use. In between the upper hearth fragment and the lower primary hearth a further fragment of crucible was found. The excavation revealed further evidence of metalworking, with crucible fragments and the remains of several fragments of fired clay from a tuyère, which would have protected the snout of the bellows.

Magnetic susceptibility and XRF survey of the floor, together with the in situ remains of the furnishings of the building, have provided a unique understanding of the use of space within the structure. The building was clearly semi-subterranean in nature, with a shallow set of steps leading into a passage flanked on the left-hand side by the wall of the structure and by a large orthostatic slab on the opposing side. A door would have opened into Structure 3, the doorway being defined by an in situ threshold stone and door pivot. Anyone entering the building would have to enter to the left (clockwise) of the hearth and its back-slab that would have protected the hearth from drafts. The strongest signatures of copper working determined by Dr McDonnell's detailed XRF analysis of the floor surface indicated the working position of the smith would have been on the left-hand side of hearth, facing the doorway and hearth back-slab and in front of two beach cobbles set into the floor.



*Beach cobble used as anvil in the Pictish Smithy; hammer marks can be seen on the upper surface and what appear to be carbon handprints on the side and edge. The scale is 0.5m long.*

These cobbles, one an elongated block and the other smaller and squarer in shape, had clear percussion damage indicating their use as anvils. Whilst preparing to illustrate the larger cobble, archaeological illustrator Mr Alan Braby noted carbon staining appearing to represent the finger or hand marks of the smith. McDonnell's survey of the floor and the presence of the tuyère fragments suggest the bellows were located on the opposite (right hand) side of the hearth.

A cupboard or aumbry constructed within the wall of building would have been to the left of the smith and may have been used either as storage or the location of a lamp. The layout and sophisticated design of the building strongly suggests that this was a purpose-built smithy. The hearth furnishings seem to have been constructed as part of the building's primary usage. The semi-subterranean nature of the building and the location of the doorway formed an effective means of reducing natural light. Added to this, the doorway presented clear evidence of two means of barring the door, one from the inside, further reducing any light incursion. The observation of flame colour by the smith would have been critical to enable them to gauge metal temperature.



*Sondage below the Pictish Smithy showing (at left) the possible stone revetment wall of a ditch, with Alan Braby at work drawing the section through the building*

It is worth noting that a second bar hole was present, indicating that the door could also be secured from the outside. This metalworking building (Structure 3) had been constructed within two parallel single faced stone walls that had in previous years suggested the presence of an earlier building.

Further investigation in 2018 suggested that this earlier stonework actually represented the stone revetments of a ditch. The fill of this suspected ditch below the ash and carbon-rich floors of the Pictish smithy had been compromised by the tidal action of the sea, consisting of vacuous rubble with lenses of beach sand. A small fragment of plastic was observed within this material, although the layers of floor above this fill were intact and undamaged. The pressure of the sea from tidal and storm surges appears to have horizontally penetrated the archaeology below Structure 3, removing finer archaeological sediments. This erosive action has affected the walling of Structure 3 (the Pictish smithy) on the seaward side and seems to be responsible for the subsidence of the wall into the top of the infilled ditch.

### The Neolithic Chambered Cairn

This year, excavation commenced on a new area encompassing the central zone of the Neolithic chambered cairn. The cairn was revealed in previous investigations in 2012 and 2015 as a series of casement walls and packed core under the boulder beach around the high tide line. The new area included the entrance first identified in 2016 and further defined in 2017; it also took in a new area on the landward side of the entrance. Excavation revealed a complex archaeological sequence in contrast to the eroded sequence investigated under the boulder beach in 2012 and 2015. Excavation in 2018 within this landward zone indicated a structural sequence that was secondary to the monumental structure interpreted as being the Neolithic Passage Grave. This structural sequence comprised of a round house form (Structure 6) which had been inserted into the monumental structure, re-using and extending the original entrance passage. The structure was represented by an inner-faced wall with a difference in alignment to the earlier casement walling. This round house appears to have had a complicated history of collapse, rebuilding and use, being subdivided by later structural elements characteristic of the late Iron Age or Pictish period. This late phase was represented by a dividing wall and orthostatic alignment forming a large inner cell

on the landward side of the passage (Structure 5) with a doorway that had later been blocked by stone walling. The preservation in this area suggested a complex sequence of modification, with a deep stratigraphic sequence surviving. An infill of mixed midden material, rich in animal bone and pottery, was recorded inside this cell whilst outside the wall and blocked doorway there was evidence of more than one structural collapse of the round house, the latest involving the fall of very large orthostats, one of which lay against the blocked doorway. Several of these elements suggested the collapse of corbelled roofing structures. This new exposure of the inner end of the passage provided evidence of structural collapse. Two long and substantial stone slabs just under 2m in length were found lying along the axis of the passage and partly inside the roundhouse. These stones might represent either a pair of fallen orthostats or uprights, or possibly lintels associated with the roofing of the passage. If these stones were set upright they would coincide with a change in width and orientation of the passage at the point where the secondary Iron Age roundhouse was inserted.



*Looking down the passageway of the chambered tomb showing some of the rubble and possible collapsed roofing slabs. Standing figures on the right are in the later Iron Age house inserted into the top of the tomb.*

The removal of the boulder beach overburden of the area of cairn previously assessed was deeper than expected and indicated that the archaeology here had been badly truncated by the sea. The area at the top of the boulder beach which had been exposed in 2015 had suffered greatly in the intervening years despite the archaeology being covered; much of the finer sediments had been washed out, the survival of archaeological sediment-based deposits was poor and in contrast to the material on the landward side. The suction of the finer deposits caused by the receding tide seems to be the main cause of this. This effect seems consistent with the evidence for Structure 3 discussed above. Very little of the tertiary Pictish deposits survived the aggressive action of the sea in this zone.

Within this eroded zone of the Cairn a stone cist was identified. The fill of the cist had been completely scoured out by wave action and entirely replaced by beach deposit. However, a fragment of steatite vessel was found on the surface of the archaeological deposits just below the cist. This fragment appears to be Bronze Age rather than Norse in character and suggests the possibility of a Bronze Age use of the cairn. Adjacent to this cist the top of a corbelled cell was identified, possibly representing part of a side chamber to the cairn. This feature was recorded and carefully packed and will be fully investigated next year.



*The scoured out cist below the chambered tomb which may possibly be a later Bronze Age burial inserted into the tomb mound*

Outside the wall of the cairn, a corridor-like structure had been identified in 2017. This structure was built against the outer wall face with several *in situ* lintels set upon two scarcement-like ledges. The extended excavation area allowed more of this structure to be investigated. The excavation revealed further parts of this corridor, which appears to have at least two major phases of construction with its secondary and latest use dating to the Pictish period. A poorly-constructed single faced wall formed the end of this secondary passage. This single-faced wall stratigraphically sealed an earlier and better-constructed corbelled wall associated with the ledges and lintels. The backing material to both of these end walls was composed of midden, including a layer rich in limpets and pottery. Two sequences of backing material corresponding to the two phases were identified. The lower fill sealed the top of the corbelled end to the lintelled corridor. A series of slabs at a 60-70 degree angle appeared to represent structural elements consistent with the collapse of a corbelled roof; they sealed the material backing the secondary and poorly-constructed single faced wall.

The opposing long wall of the secondary use of this corridor was formed by several large orthostats. These orthostats were backed by a mixed midden-like infill, which was contained by a much earlier well-constructed wall of a distinctly different build. This earlier wall had been truncated by the construction of Structure 4, a Pictish building partly excavated in 2015 during the evaluation of the eroded beach section.

Excavation of Structures 5 and 6 and the primary cairn will continue in 2019.

## 2019 Excavation

(Swandro: HY32 NE19)

Excavation in 2019 concentrated on the remains of the large Iron Age roundhouse (Structure 6) and the adjacent area to the south-east containing Structure 4, a Pictish building, and Structure 1.

### Structure 6: Iron Age Roundhouse

The monumentality of the roundhouse and its focal position within the settlement parallels the positioning of many Orcadian broch sites such as the near-by broch of Midhowe. However the construction of Structure 6, although monumental in proportion, did not provide evidence of standard broch architecture.

Investigation of the passageway into Structure 6 showed at least two structural phases. A cladding wall thickening the wall base of the original wall seems to have been added



*Drone photograph of the Late Bronze Age/Early Iron Age roundhouse and associated structures. The red-and-white photographic scales (top left and middle bottom) are 1 metre long. The sea is at the top of the picture just out of shot.*

and associated with this second phase of construction. Material contained in the core infill between this secondary wall and an earlier wall face, forming the cladding on the seaward arc of the roundhouse, returned an AMS radiocarbon date of 732–401cal BC at 95.4% probability (SUERC-88535 (GU52307)). Material stratigraphically later than this cladding and sealed by a wall butting the cladding returned an Early Iron Age AMS radiocarbon date of 760–430 cal BC at 95.4% probability (SUERC-88540 (GU52309)). A third date was obtained from the material butting the later wall and stratigraphically above SUERC-88540. This returned a date of 788–541cal BC at 95.4% probability (SUERC-88536 (GU52308)). These dates indicate that this building represents a monumental Early Iron Age roundhouse with evidence of continuity into the 1<sup>st</sup> millennium AD.

The southern area of the roundhouse under the boulder beach had been severely affected by the sea. Here much of the finer grained material forming the depositional sequence had been removed by tidal action. Survival was better on the landward side. However in the central zone of the building a major collapse event was evident from the position of slumped or fallen structural orthostats. The structure of this collapse was three-dimensionally recorded by photogrammetry and laser imaging. Evidence for several truncated hearth forms were identified and sampled for archaeomagnetic dating.



*White-tailed sea eagle skull recovered along with skull and bones of a Great Auk from the Middle Iron Age phase of the Swandro roundhouse.*

The northern circuit of the building provided a better insight into the archaeological complexity and potential of the site as it has not yet been exposed to the sea and the effects of tidal action. Part of the northern arc of the roundhouse (Structure 6) had been partitioned off from the seaward side by the construction of a medial wall in alignment with the northern wall of the entrance passage to form a smaller structure (Structure 5). An entrance led into this space which was formed between the north-eastern arc of the inner wall of Structure 6 and the medial wall which bisected the centre of the roundhouse. An upper floor surface was found within Structure 5 containing evidence for several hearths. A long-handled weaving comb and two Roman glass bottle fragments, whose forms suggest a 1st to early 2nd century AD date, were found at this level.



*The Iron Age long-handled weaving comb*

The doorway had subsequently been blocked and the space formed by Structure 5 was infilled with a complex sequence of midden material rich in bone, some articulated, and burnt stone. A short passage to the north-east of the entrance had been constructed against the outer wall face of the large roundhouse (Structure 6). A wall had been constructed against the outer roundhouse wall to form a scarcement-like

ledge to support lintels for the roof. The lintels, several of which were still *in situ*, spanned the roof to an opposing wall constructed against a large orthostat. This opposing wall incorporated a cell whose back was formed by the orthostat. The entrance to this passage had been blocked with a later wall continuing the alignment of the entrance passage. Excavation in 2018 demonstrated that there had been an upper passage using the lintels as a floor.

### Structure 1

Structure 1, an Iron Age building dating to the 1<sup>st</sup> centuries BC/AD, was re-investigated in 2019. This building contained evidence for a stone-built oven constructed against the circumferential wall of the building and an adjacent hearth. The hearth was sampled in 2019 for archaeomagnetic dating.

Structure 1 had been badly truncated by the sea and the severity of erosion of the deposits on the area to the seaward side of this structure, indicated the need to sample the surviving stratigraphic sequence which pre-dated Structure 1 while these deposits remained *in situ*. The deposits were excavated stratigraphically and fully sampled for environmental remains and for dating material. The sequence produced Early Iron Age pottery containing temper-rich rim sherds with a flat splayed rim form, and a perforated seal tooth interpreted as a pendant.



*The Early Iron  
Age seal tooth  
pendant from the  
deposits below  
Structure 1*

## Structure 4

The entrance to Structure 1 to the north-west appeared to lead into a corridor that would have linked this building to the main entrance of the large roundhouse, Structure 6. This passage was in part overlain by the southern walling of the Pictish building, Structure 4.

Structure 4 appears to be a Late Iron Age agricultural building, stratigraphically post-dating Structure 1. The building was characterised by a stone-flagged floor and a hearth constructed within the northern wall, suggestive of a threshing or processing floor and corn dryer. Archaeomagnetic dating samples and samples of carbon-rich ash were taken from the bowl of the hearth.

## Structure 7

An area to the north-east of this building (Structure 4) was investigated and remains of midden material with bands of winkle shell not seen elsewhere within the Iron Age deposits at the site was discovered. A decorated spindle whorl made from the femoral head sawn from a cattle femur and part of a decorated bone needle case were recovered from the midden. This midden and its characteristics suggest a Late Pictish / Viking date. The midden sealed the rubble fill of another building, Structure 7. The building, as with other structural elements within this north-eastern section of the site, showed evidence of structural collapse. The collapse appears to have taken place in a short period of time and might be associated with human action rather than natural abandonment processes. The rubble infill contained some structural integrity, again suggestive of an anthropogenic origin. The walls containing this rubble infill strongly suggested that corbelling was present and that the surviving building was potentially of some height.

## Metalworking at Swandro

The occurrence of a significant number of artefacts associated with metal working (both iron and copper alloy) are of great interest. This includes the presence of hammer scale indicative of forging iron and a large quantity of spheroidal slag which archaeometallurgist Dr Gerry McDonnell has suggested represents fire welding indicative of skilled workmanship.



*Spheroidal slag produced by fire welding indicating evidence of sophisticated iron working.*

Dr McDonnell examined much of the metallurgical evidence from the site in May 2017. The finding of crucible fragments from large and smaller crucibles and a mould fragment suggest that this is a high-status site in the Late Iron Age. The evidence for copper alloy working at Swandro are the crucible fragments and the droplets and fragments of metallic alloy. The evidence suggests small scale copper alloy working,

however the Swandro assemblage presents an intriguing challenge. The Picts made copper alloy objects from tin bronze (Cu/Sn) or leaded tin bronze (Cu/Sn/Pb), and not brasses (copper/zinc alloys), which are thought to be a Viking reintroduction, as they re-established trade routes with the Near East. So why is there evidence of melting brasses in the Pictish building at Swandro? X-Ray fluorescence analysis of the residues in the crucibles recovered from the Pictish smithy show high zinc content, providing evidence that brass was melted in the crucibles.



*Archaeometallurgist Dr Gerry McDonnell using an X-ray fluorescence machine at the University of Bradford to identify the metal composition of the artefacts from Swandro and the metal traces in the moulds and crucible fragments.*

## Broken bead or pendant roughout of jet-like material from Swandro

Alison Sheridan, National Museums Scotland (NMS)

In June 2015, excavations in Area E at Swandro uncovered an intriguing fragment of jet-like material that had broken across a hole that had been drilled through it. (The item is Small Find No. 2344, from context 3153.) The item was passed to the author for study and identification of the raw material; it was accordingly subjected to non-destructive compositional analysis by various techniques including particle-induced X-ray emission (PIXE) and X-ray diffraction (XRD) spectroscopy at the Louvre laboratory, Paris, the analyses being undertaken by Dr Lore Troalen (NMS) and Julia Novion Ducassou (an intern student at NMS in 2016) as part of a broader study of jet and jet-like materials.

The object consists of a flat, irregularly-shaped tabular fragment of jet-like (but not jet) material, 14.4 x 19.4 x 6.4 mm, which had broken when an attempt had been made to drill a narrow hole through it (Figs. 1–3). The diameter of the hole is c. 1.75 mm. The hole had been drilled from one of the two flattish sides, and the piece had evidently broken as the drill bit approached the other side. The perforation is parallel-sided and there is no rilling (i.e. grooving from the rotation of the drill bit) in its interior. Given the narrowness of the hole and its orientation, perpendicular to the broad flat surfaces of the fragment, it is likely that the intention had been to manufacture a bead or pendant (not a spacer plate, as some people had initially assumed). Since drilling a hole is the riskiest part of the bead-making process, it is not surprising that no attempt seems to have been made to shape the outer edges of the fragment (if the maker had indeed intended to modify the fragment's shape; one cannot rule out the possibility that the intention had been to wear it simply as a perforated piece of raw material).

The material is black, compact, light and slightly warm to the touch, and it breaks conchoidally to reveal a shiny fracture surface. The shape of the fragment indicates that it occurs naturally in tabular form, and microscopic examination indicates that it is structurally amorphous. While all of these properties can be found in jet, compositionally the material differs from jet in having a low zirconium content, fairly high iron and strontium content, and is low in titanium and chromium and has no

measurable amount of vanadium or germanium. It is neither a cannel coal nor a shale, and while its shiny conchoidal fracture is reminiscent of that seen in cloustonite (which can be found in the Yesnaby area of the west Orkney Mainland), the author is not aware of any deposits of cloustonite that are as thick as this, or are free from inclusions. Moreover, compositional analysis of a raw material sample of cloustonite did not provide a close match. Albertite was considered as another potential candidate material, and indeed the V-perforated button found at Isbister had been found (through analysis by Mary Davis, then of NMS, undertaken around 20 years ago) to be of this material. Albertite is known to outcrop at Dingwall on the north-east Scottish mainland. However, albertite was among the raw material samples that were analysed alongside artefacts of jet and jet-like material in the 2016 investigations, and it did not offer a match for the Swandro material. One of three black beads from Skara Brae that were analysed using PIXE, NMS X.HA 650, was found to be of the same material as the Swandro object. It is suspected that the material probably outcrops on Orkney, but that the source area has not yet been found. The raw material deposit is most unlikely to be extensive – otherwise one might have expected to see many more artefacts made of this material on Orkney. Geological fieldwork would be necessary to investigate this matter further.

*Comparanda* for the object are hard to find, not least because we are probably seeing an early-stage roughout rather than a finished object. Moreover, we also do not know for certain whether it was collected and perforated during the Neolithic period, when the chamber tomb was in use, or at a later period. Beads of black material (and indeed of bone painted black) are known from Neolithic contexts in Orkney, from Skara Brae and Stonehall (Sheridan 2016), while from the Early Bronze Age there is a jet necklace spacer plate from Tankerness Moss (on display in Orkney Museum) and the aforementioned albertite V-perforated button from Isbister (on display at Isbister visitor centre).

Whatever the final intended form of the Swandro object had been, and whatever its date, it may be that the piece of raw material was collected because it is of such an unusual and visually striking (and presumably rare) material. We do not know whether the person who collected it was aware of jet and of its supposedly special

powers (as discussed, inter alia, in Sheridan 2017), or even thought that it was jet. If this is a Neolithic artefact, then an analogy could perhaps be made with the presence of a bead of lead ore found at Quanterness (Davidson and Henshall 1989, 153, No. 47). There, a natural pebble of an unusual and visually striking material had been selected and made into a bead – perhaps in the belief that it possessed amuletic properties.

## Figures



Figure 1. View of the flat surface from where the perforation had been drilled.

Photo: © Alison Sheridan



2 mm

Figure 2. View of the flat surface showing the conchoidal fracture scar where the piece had broken during drilling of the perforation. Photo: © Alison Sheridan



2 mm

Figure 3. View showing the perforation; the drill had penetrated the material from the upper surface, and the piece had broken as it approached the other side. Photo: © Alison Sheridan

## A Guide to Archaeological Periods

The outline below is broadly accepted for Scottish archaeological periods appropriate to the multi-period site at the Knowe of Swandro, although the precise definition of some periods may be open to archaeological debate.

Early – Middle Neolithic c.3800 – 3000BC

Late Neolithic c.3000 – 2500BC

Chalcolithic c.2500/2450 – 2200BC

Early Bronze Age c.2200 – 1550BC

Middle Bronze Age c.1550 – 1150BC

Late Bronze Age c.1150 – 800BC

The 'Long Scottish Iron Age' c. 800BC – AD800

Early Iron Age c.800 – 200BC

Middle Iron Age c.200BC – AD300

*(Broch period begins c.400 – 200BC and broadly ends c.AD100/200)*

Late Iron Age (Pictish period) c.AD300 – 800

Viking Period c.AD800 – 1065

*(In Orkney the death of Earl Thorfinn the Mighty in 1065 generally marks the end of the Viking period, elsewhere 1066 is more commonly used)*

Norse period c.AD1065 – 1468

*(1468 marks the impignoration of Orkney to the Crown of Scotland)*

## References

- Bond, JM & Dockrill, S J forthcoming The Knowe of Swandro Evaluation and Excavation *Discovery and Excavation in Scotland*, New Series Vol 19, Council for Scottish Archaeology
- Bond, JM & Dockrill, S J 2017 The Knowe of Swandro Evaluation and Excavation *Discovery and Excavation in Scotland*, New Series Vol 18, Council for Scottish Archaeology
- Bond, J M, Dockrill, S J & Downes, J 2016 The Knowe of Swandro Evaluation and Excavation *Discovery and Excavation in Scotland*, New Series Vol 17, Council for Scottish Archaeology, 131 – 2
- Canmore: the online search facility of the Royal Commission on the Ancient and Historical Monuments of Scotland at <https://canmore.org.uk>
- Childe, V G 1956 Maes Howe, *Proceedings of the Society of Antiquaries of Scotland* 88, 155 – 72
- Davidson, J & Henshall, A S 1989 *The Chambered Cairns of Orkney*. Edinburgh: Edinburgh University Press.
- Dockrill, S J, Bond, J M, Downes, J & Mainland, I L 2010 The Mound of Brough, the Ditch NE of Midhowe and the Knowe of Swandro *Discovery and Excavation in Scotland*, New Series Vol 11, Council for Scottish Archaeology, 123 – 4
- Dockrill, S J, Bond, J M, Downes, J & Mainland, I L 2011 The Mound of Brough, the Ditch NE of Midhowe and the Knowe of Swandro *Discovery and Excavation in Scotland*, New Series Vol 12, Council for Scottish Archaeology, 136 – 7
- Dockrill, S J, Bond, J M, Downes, J, Mainland, I L & Maher, R 2012 The Knowe of Swandro Evaluation *Discovery and Excavation in Scotland*, New Series Vol 13, Council for Scottish Archaeology, 135 – 6
- Dockrill, S J, Bond, J M & Maher, R 2013 The Knowe of Swandro Evaluation *Discovery and Excavation in Scotland*, New Series Vol 14, Council for Scottish Archaeology, 141 – 2
- Dockrill, S J, Bond, J M & Maher, R 2014 The Knowe of Swandro Evaluation *Discovery and Excavation in Scotland*, New Series Vol 15, Council for Scottish Archaeology, 149
- Dockrill, S J, Bond, J M, Maher, R & Friel, R 2015 The Knowe of Swandro Evaluation and Excavation *Discovery and Excavation in Scotland*, New Series Vol 16, Council for Scottish Archaeology, 131 – 2
- Dockrill, S J, Bond, J M, Smith, A N & Nicholson R A 2007 Investigations in Sanday, Orkney Vol 2: Tofts Ness, Sanday An island landscape through 3000 years of prehistory Kirkwall, Orkney: The Orcadian Ltd
- Dockrill, S J, Bond, J M, Turner, V E, Brown, L D, Bashford, D J, Cussans, J E & Nicholson R A 2010 *Excavations at Old Scatness, Shetland Volume 1: The Pictish Village and Viking Settlement* Lerwick: Shetland Heritage Publications
- Dockrill, S J, Bond, J M, Turner, V E, Brown, L D, Bashford, D J, Cussans, J E M & Nicholson R A 2015 *Excavations at Old Scatness, Shetland Volume 2: The Broch and Iron Age Village* Lerwick: Shetland Heritage Publications
- Gibson, J 2008 *Rising Tides: The Loss of Coastal Heritage in Orkney* Kirkwall: Orkney Archaeology Society

- Gibson, J 2012 *Rising Tides Revisited: The Loss of Coastal Heritage in Orkney* Kirkwall: Orkney Archaeology Society
- Kaland, S H H 1993 The settlement of Westness, Rousay in Batey C E, Jesch, J & Morris, C D (eds) *The Viking Age in Caithness, Orkney and the North Atlantic*, Edinburgh: Edinburgh University Press, 308 – 17.
- Lawrence, D 2006 Neolithic mortuary practice in Orkney *Proceedings of the Society of Antiquaries of Scotland* 136, 47 – 60
- Lawrence D M 2012 Orkney's First Farmers Reconstructing biographies from osteological analysis to gain insights into life and society in a Neolithic community on the edge of Atlantic Europe University of Bradford PhD Thesis, available via British Library Electronic Theses Online Service <http://ethos.bl.uk/>
- RCAMS 1946 The Royal Commission on the Ancient Monuments of Scotland. Twelfth report with an inventory of the ancient monuments of Orkney and Shetland, (3 Volumes: Vol I Report & Introduction, Vol II Inventory of Orkney & Vol III Inventory of Shetland) Edinburgh: His Majesty's Stationery Office
- Renfrew, A C 1979 *Investigations in Orkney* London: Society of Antiquaries, Reports of the Research Committee of the Society of Antiquaries of London 38
- Sheridan, J A 2016 The black stone bead from Structure 1, Stonehall Farm. In Richards, C. & Jones, R. (eds) 2016 *The Development of Neolithic House Societies in Orkney*, 474. Oxford: Windgather Press.
- Sheridan, J A 2017 Towards a methodology for the study of prehistoric jet and jet-like jewellery. In R. Shaffrey (ed) *Written in Stone: papers on the function, form, and provenancing of prehistoric stone objects in memory of Fiona Roe*, 249–74. St Andrews: Highfield Press.

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