# ORKNEY ARCHAEOLOGY SOCIETY

## NEWSLETTER No 01 AUTUMN 2008

Scottish Charity No SC030611

### Editorial

*Chris* Read
The Editor @ P.O. Box 6213, Kirkwall, Orkney, KW15 1YD.

Welcome to your brand new Orkney Archaeology Society and to the inaugural newsletter. After considerably more trouble and effort than we expected, we finally managed to persuade the Office of the Scottish Charities Regulator to consent to the change of name from the Friends of Orkney Archaeology Trust (FOAT) to the Orkney Archaeology Society (OAS). As you will be aware, this change was necessitated by the change in role of the Orkney Archaeology Trust (OAT) brought about by the inception of the Orkney Research Centre for Archaeology (ORCA). This decision was ratified by an EGM in October and we will have the official launch of OAS at our Christmas lecture in December, so watch the press for details.

As a result of the change of name could we please ask any members who are paying their subscription by direct debit to get in touch with their bank and change the name at their earliest convenience.

Archaeology is vital to the economy of Orkney and is the single most popular reason given for tourist visits. It is, therefore, our intention to forge links with other organisations, such as the Orkney Tourism Group, the Orkney Heritage Society, the Museum Service, The Historic Scotland World Heritage Site Ranger Service and the Orkney Tourist Guides Association so that the society can play a more prominent role in the protection and management of the archaeological resource while continuing to promote responsible and sustainable access.

Finally, over the winter months we intend to redesign the old FOAT website and re-launch it as the OAS website by Spring 2009.

### The FOAT Summer of 2008

*Sue Barnard*
*Hon Sec OAS*

Here in Orkney the summer has been great. Not only has the weather been kinder than in most of the rest of the UK, but FOAT and its members have been at the forefront of exciting archaeology, getting involved in digs, debates and celebrations.

May was a busy month with Dr Lars Larsson of the University of Lund starting off the FOAT talks season with a lecture on an Iron Age ritual building in Southern Sweden. Later that week Orkney was full to bursting with archaeologists as the Maritime Societies of the Viking and Mediaeval World Conference got underway. Some FOAT members volunteered to be stewards and a number of us attended an excellent reception where Julie Gibson's book 'Rising Tides' was launched in an almost 'shocking' demonstration as FOAT committee member Andrew Appleby shredded a pristine copy into a fish tank, powerfully demonstrating the way in which rising sea levels are destroying ancient coastal remains. 'Rising Tides' is an excellent book containing stunning photography by Frank Bradford. It is dedicated to the memory of Orkney archaeologist Judith Robertson and the profits are being generously donated to FOAT to fund next year's Daphne Lorimer bursary to support an archaeology student at Orkney College. If you don't already have a copy of 'Rising Tides' (at £12 +p&p also

an ideal Christmas gift!) they may be ordered through FOAT.

This year's students took centre stage in another May FOAT evening where they introduced Dr Colin Richards who gave a well attended lecture on the Standing Stones of Orkney and Lewis. This was followed by animated discussion on the various theories of why the stone circles were built. Colin supports the 'community effort' theory where the process of digging out the ditches and erecting the stones is more important than the final structure. Later in the summer Colin Richards returned to Orkney to test his theory in a dig at the Ring of Brodgar with Dr Jane Downes, director of ORCA, Orkney College. Both FOAT and Heritage Society members were invited to the packed community hall in Stenness to hear their findings as the dig closed.

Another archaeologist on his annual excavation trip to Orkney was Dr David Griffiths from Oxford University who reopened and extended the site at the Castle of Snusgar to reveal Viking settlement remains – of which more in this Newsletter. FOAT members can volunteer to be site volunteers at Orkney digs doing everything (under supervision) from excavating to finds processing to making the tea! Indeed, FOAT volunteers flocked to Nick Card's dig at the Ness of Brodgar situated half way between the Ring of Brodgar and the Stenness Stones and Barnhouse settlement. This exciting dig revealed stonework on a monumental scale with finds of potsherds, pecked markings on some of the building stones and even a polished axe head. Nick and his team with the help of the Historic Scotland Rangers ran regular tours of the site and put on a much appreciated, special site tour for FOAT members towards the end of the dig. It appears that the site interpretation debates are only just beginning.

Listening to the Rangers on a FOAT Saturday afternoon guided walk of the Neolithic Landscape we heard how these theories are changing almost weekly as new discoveries are being made. We walked through the meadows in warm sunshine past Bronze Age mounds, marsh orchids and soaring skylarks with the Brodgar stones as a backdrop and the faint imprint of the old parish road running through the monuments. In such an evocative atmosphere it is easy to imagine the ancient voices that encompass the millennia of occupation in this area.

Another FOAT outing, this time to the Isle of Sanday under the enthusiastic and knowledgeable auspices of Sanday Ranger, Roderick Thorne sped us from the Bronze Age to World War II. Standing archaeology such as the nineteenth century steam operated New Model Farm at Stove and the WWII dummy airfield close to Cata Sands reminded us that Orkney's history extends so much further than the Neolithic.

Putting Orkney's timeline into context was Niall Sharples of Cardiff University who rounded off the June AGM with a whistle stop tour of Hebridean archaeology through the ages. Dr Nic Flemming from Southampton University reminded us in September that not all archaeology is on dry land with a fascinating insight into some of the hazards and joys of underwater archaeological exploration.

This year sees the fiftieth anniversary of the discovery of the Tomb of the Eagles by Orkney farmer Ronnie Simison who, by the time you read this, will have received his well earned MBE at Buckingham Palace in recognition of his services to archaeology and tourism in Orkney. FOAT celebrated with a wonderful reception in the old Town Hall in Kirkwall kindly provided by the Orkney Islands Council together with reminiscences of the discovery from archaeologist John Hedges and presentations to Ronnie and his family. The following weekend, FOATies and their friends enjoyed a spectacular walk at the Tomb of the Eagles with explanatory talks from John Hedges, a talk to challenge our perceptions and interpretations from Chris

Read (archaeologist, tour guide and editor of this newsletter!) and an experimental archaeology demonstration of malting cracked barley in a mock up of a burnt mound by Merryn and Graham Dineley. The afternoon culminated in a very enjoyable tea of home bakes and savouries kindly provided by Ronnie Simison's family and friends. We piled back into the bus to Kirkwall, 'archaeologied out' at the end of a fabulous summer of volunteering, walks, tours and talks.

I haven't even got around to mentioning all the other site open days and ad hoc talks and tours along the way. A big thank-you to all our presenters and guides – we had a fabulous time. If you didn't come to any of this summer's FOAT events we hope you will make the effort and join us for more talks over the winter period and another packed season of events on Summer 2009 as the newly formed Orkney Archaeology Society proudly follows in the footsteps of FOAT.

## Ness of Brodgar 2008

*Nick Card.*

Superlatives are once again on the agenda when it comes to describing the discoveries at the Ness of Brodgar this summer. Every year the results seem to astound us and question many of the assumptions and theories regarding the Stenness Brodgar area in prehistory. This season the scale of what we have uncovered seems even to bring into question the dominance of the Ring of Brodgar and the Standing Stones of Stenness. As large and impressive upstanding monuments the stone circles have coloured our view and interpretation of the area, and have been assumed to be the main focus of Neolithic activity. However was it that in its heyday the extensive 2.5 hectare complex at the Ness of Brodgar was the dominant feature the landscape? The following discoveries may support this new theory.

Last year the scale and beauty of the architecture of Structure1 (partially revealed by GUARD in 2003) was the talking point. However we now have at least three stone built structures in excess of 15 metres in length (and surviving one presumes to over a metre in height like Structure 1) with more large structures hinted at by geophysical survey. Wonderful preservation, but with its own problems of the amount of time it takes to excavate these sometimes multi-phase structures. Not only are these buildings large but also display very regular and symmetrical architecture only paralleled in some chambered cairns and Buildings 2 and 8 at Barnhouse.

Fig 1: Overall shot of one of the trenches looking towards the Stones of Stenness

The largest, Structure 10, is in excess of 15 metres square (12 metres internally) with slightly obtuse external angles and rounded internal corners - and yet the geophysics suggests that this may still only be part of this structure! If roofed it would have been the largest enclosed space in Neolithic Orkney – a truly awe inspiring structure. The building is aligned on the chambered tomb

of Maes Howe, 1.5 km to the east. This respect for Maes Howe is also a feature of the Structure 8 at Barnhouse (very similar in plan to our Structure 10) where the entrance to its outer enclosure is similarly aligned with Maes Howe. Basically however this year all we have done is reveal the partial plan of this structure and we have to wait till next year to really get into the nitty gritty of the complexities of its architecture and its function – for instance are some internal wall lines that are becoming apparent a later addition or a primary feature of this building.


Fig 2: Structure 10

With the extension to the main trench in order to reveal Structure 10 we also discovered the other side to Structure 8. In 2007 we revealed a rather beautiful wall line with regular tapered piers projecting from it. It was not clear whether this was part of a building or perhaps a wall enclosing Structure 10. The mirror image of this wall (though less well preserved at this level) was uncovered showing that it did form one side of a very regular building, over 7m wide internally and circa 15m long (as suggested by the geophysics). Again the symmetry of this structure is particularly striking with its beautifully constructed tapered piers forming regular recesses along the inner wall faces. Next year we would hope to extend the trench even further to see the complete outline of this building.


Fig 3: Structure 1

This use of piers is also now more apparent in Structure 1 we started last year. With the removal of more collapse and infill the symmetry of its original plan is now clearer. Although closely resembling Structure 2 at Barnhouse with 6 recesses around a large central area, Structure 1 at the Ness differs fundamentally in that it had two opposed entrances, one at either end. How these relate to the original use of the building we will have to wait and see as it still seems we are still circa 0.5 metres above the original floor levels! A section we exposed against the outside revetment to Structure 1 revealed its basal courses at a depth of about 1 metre! These basal stones sit upon very typical ashy midden deposits that imply earlier activity on site as we suspected. Also cutting these middens was a stone lined drain perhaps relating to Structure 1.


Fig 4: Structure 8

Every where you look on site Neolithic art seemed to jump out at you – so much that it was difficult to keep count of them on a day to day basis during excavation. A rough count is that we now have over 25 separate

pieces of art with the 'jury' still out on a few. Some of the designs were created by heavy pecking while others are very finely incised. In general most are 'simple' geometric designs with parallels at Skara Brae and in some of the chambered tombs. However one very finely incised slab has what appears to be a fish head inscribed on it – another first for the site!


Fig 5: Incised slab

The potential importance of the complex is also highlighted by the 'Great Wall of Brodgar' (GWB) that defines the site's northern boundary and spans the Brodgar peninsula. At the end of last season there were hints in a small slot trench we opened next to the outer face of the GWB that there was a cut running parallel to the GWB. This was considered to be perhaps the very edge of a ditch, so this year we extended the trench to investigate this possibility.


Fig 6: Additional 2m wide section of the 'Great Wall'

Although a ditch was discovered this was only 2 metre wide and 0.5 metres deep, however sitting on the inner edge of the ditch was another wall line. This may represent a later addition to the GWB increasing its width from 4 to 6 metres. The monumentalisation of existing structures in the late Neolithic is well attested at several other Orcadian sites. Alternatively this additional wall may have formed an embellishment around an entrance through the GWB as suggested by the geophysics and also the ditch terminating within our trench.

Again these structures have complimented by a wonderful; array of associated finds – more beautifully decorated Grooved Ware pottery, another stone Macehead, axe heads etc.


Fig 7: Macehead

The designs on much of the pottery finds parallels on many other Orcadian Neolithic sites. Does this mean that pot was being brought here from all over Orkney and deposited, again emphasizing the importance of the site not just at a local level but regionally (and beyond??) ?? Future analysis of the various pot fabrics should be able to test this theory.


Fig 8: Pot sherd similar to Skara Brae

Overall these discoveries coupled with geophysical evidence for several other truly monumental constructions and the site's central location, not only between the two henges, but also in relation to the huge natural amphitheatre of the West Mainland of Orkney again emphasis's the site's significance.

At a recent lecture Dr Colin Richards has suggested that the stone rings might have been built around an existing pathway along the Ness, with the rings marking stages in a journey along the Ness — a journey which had a distinct end-point at the Ness of Brodgar. Colin thought it was the large partially quarried mound at the very tip of the Ness that was the end-point, however was it the whole site of the Ness of Brodgar - a ceremonial centre comprised of several huge, imposing structures all together and enclosed by the Great Wall of Brodgar – that truly was the Heart of Neolithic Orkney.
If this was the case were two henges merely 'portals' into the Ness complex? - something one had to pass through en route to the complex and not necessarily, as has been long believed, the end-points, or sole purpose, of the journey?

This is only one aspect of the site of the Ness of Brodgar – a site with a long and obviously complex history that is only now beginning to reveal its secrets – secrets that would remain hidden if not for the support of the OIC, the Robert Kiln Trust, Orkney College, Sigurd Towrie, the Historic Scotland Ranger Service, volunteers from every corner of the globe and of course the Friends of Orkney Archaeological Trust. I would like to thank you all for your support, and the landowners Arnie and Ola Tait, and John and Carol Hoey for their help, support, hospitality and again allowing us to excavate on their land.

Already we are looking into continuing the excavations next year and are busy chasing potential funders, sponsors and volunteers. Please send all enquiries to nick.card@uhi.ac.uk.

**New ideas about Burnt Mounds: experiments in Dublin and Orkney**.
*Merryn Dineley*

This summer I went to the Sixth World Archaeology Conference in Dublin to meet up with some friends. We were there to demonstrate the art and craft of hot rock mashing in a reconstructed Fulacht Fiadh. Billy Quinn and Declan Moore, archaeologists of the Moore Group, County Galway, had this crazy idea that people may have used the wooden troughs as mash tuns in the Bronze Age. They drove over in their pick up truck, loaded with trough, fuel, rocks and bags of crushed malted barley. All we needed was the water.

I first met them in Barcelona in 2004 at the First International Conference on Brewing in Prehistory where I gave a paper about brewing in the Neolithic and possible uses of large Grooved Ware pots. Billy and Declan introduced themselves and asked if I thought beer could be made in a hole in the ground. At first I said 'No!' but then I decided to be more positive and said 'Go on, then, do it and prove me wrong!' And so they did. And so we met up four years later in Dublin to demonstrate mashing in a wooden trough.
Billy and Declan came to Orkney in 2005 to watch my husband, Graham, making beer and to learn from him the fundamentals of malting, mashing and fermentation on a domestic scale. The sweetness of the wort amazed them. The quality of the ale was astounding. They returned to Ireland determined to become brewers and to master the simple rituals involved.
We know Fulacht Fiadhs as Burnt Mounds here on Orkney: a mound of burnt stone and ash, dated to the Bronze Age and usually associated with a building that has access to water. On Orkney and Shetland you get the remains of stone buildings and stone troughs beside the Burnt Mounds - there is a fine example at Liddle, South Ronaldsay. You can see it on the way to Tomb of the Eagles, but more of that later.

Elsewhere in Britain and Northern Europe, buildings associated with the Burnt Mound were made of wood. Archaeologists have been known to say that they are boring to excavate – nothing to be found except an ash heap, burnt stones and postholes, if you are lucky. There are over 4500 such sites in Ireland and a few hundred on Orkney and Shetland. They have been interpreted as saunas, bath-houses or perhaps a place where meat was cooked in the trough, using hot stones.

Although 'Fulacht Fiadh' means 'cooking place', there is a significant lack of animal bone found at excavations of such sites, casting doubt on this possible function. About 10% of Irish sites have evidence of grain processing. Other suggestions include felt making or some form of textile processing, but these have not yet been demonstrated experimentally.

Fundamentally, the hot stones are used to heat the water, and so almost any activity that involves the use of hot water would have occurred at these sites. Hot water, in itself, was luxurious in Bronze Age Orkney. Billy and Declan see the trough as a Bronze Age kitchen sink, albeit a very large one, and most likely multi functional. Mashing and brewing would have been only one of these possible functions.

What is hot stone brewing?

The hot stones are used in the mashing process. This is the conversion of crushed malt into sugars. The secret is to trick the malt into digesting itself to make sugars for human consumption. Malt is slightly germinated grain. It contains enzymes that convert grain starch into sugars – the food source for the growing plant. In a moist environment, at temperatures of between 65 and 67 degrees Centigrade, the enzymes re activate. The mixture becomes sweet.

There was a sweet, delicious aroma as the mash was heated, the smell of pure barley malt. Many people said it smelt like Horlicks, which exactly what it is. Just add milk. As a sweet malty drink, the wort is high in B Vitamins, healthy and nutritious, an important food resource in prehistory. Billy and Declan decided to brew with it and they boiled the wort with herbs and a few days later had fine, drinkable bog myrtle ale. We sampled some they made earlier. It was great.

Over two days at WAC-6 Billy, Declan and Nigel ran two demonstrations and each time successful wort was made. It was easy to regulate the temperature of the mash. Too hot? Add some cold water. Too cool? Add a hot rock. The correct temperature was simplicity itself – at finger temperature, it needed to be slightly too hot for comfort, but not so hot that it burned you.

Back to Orkney

Recent celebrations at Tomb of the Eagles and Liddle Burnt Mound have honoured Ronnie Simison who, fifty years ago, discovered these two sites on his land. FOAT decided to join the party and some members came along, one glorious late summer's day, to take a walk out to the tomb and congratulate him on his MBE.

*Liddle Burnt Mound. Discovered 1957, by Ronnie Simison and excavated 1974/5 John W Hedges*

John Hedges was there – he excavated Liddle Burnt Mound in 1974/5. So, on such an auspicious occasion, Graham and I decided to demonstrate Billy and Declan's hot rock mashing, aiming to entertain, amuse and inform our esteemed guests. We had never tried this particular mashing

technique before. We hoped it would work. It did, spectacularly.

Especially for the event, Graham made a small-scale wooden trough. We used local sandstone, made a fire, heated the rocks and mashed the malt. Some previously sceptical archaeologists seemed to be impressed at the saccharification – 'Now I understand what you are on about!'
The following pictures tell the story of the spectacular and magical transformation from starch to sugars.


The trough, water and crushed malt


Stones heated on the fire.


Add hot stones


. . . .and crushed malt


The finished product - the sweet barley mash


. …. after settling out

## Neolithic mashing

Over the last ten years I have been investigating ancient and traditional grain processing techniques. I have run a Neolithic style mash using an earthenware bowl, sealed with beeswax and/or fats and placed in the warm ashes of a fire. It is also easy to make malted barley 'cakes' on a hot stone. They need to be kept constantly moist, however. These techniques have worked every time, and I have been demonstrating it for over ten years. However, quantities of grain that could be mashed were small.

At WAC-6, in July, I was astounded at the efficiency and spectacle of the trough mash using hot stones and wondered if I had got it wrong – perhaps in the Neolithic they were using very large pottery vessels and hot stones. I determined to try and find out and shall let you know how I get on with my experiments.

Imagine my surprise, however, when in August, during a guided tour of the excavations at Ness of Brodgar, we were told that a pile of burnt stones had been discovered, as well as large amounts of Grooved Ware sherds from huge pots. I wonder what they were using them for? …

Further reading and references
http://www.mooregroup.ie/
Archaeology Ireland, Autumn, 2007
You Tube – search for 'Bronze Age Beer' to see Billy and Declan's experiments.
Dineley, M. 2004 'Barley Malt and Ale in the Neolithic' BAR S1213, J & E Hedges

## New Excavations at the Brough of Deerness

*James Barrett and Adam Slater, University of Cambridge*

The Brough of Deerness is a sea stack in the north-east corner of the Deerness peninsula near Mull Head. Its grass-covered top, surrounded by 30m cliffs, holds the remains of a Viking Age settlement interpreted as a chiefly stronghold or monastery. The co-occurrence of a Viking Age chapel and approximately 30 associated buildings make the Brough of Deerness a remarkable site. Past archaeological excavation, by Professor Christopher Morris, focused on the area around a stone church. Under it was discovered the remains of an earlier timber chapel predating a layer containing an Anglo-Saxon coin minted between AD 959 and 975. This chapel is thus among the earliest known evidence for Viking Age Christianity in the Scandinavian North Atlantic region – possibly predating the traditional conversion date of AD 995. Trial excavation in the summer of 2008 set out to explore the state of preservation, chronology and function of the site – focussing on the buildings around the chapel. These have never before been excavated. The results were illuminating.

Figure 1. The Brough of Deerness under excavation (V. Herring)

Firstly, the settlement is remarkably well preserved despite evidence of shelling for target practice during both the First and Second World Wars. Wall foundations, house floors and middens are largely intact. Shell holes are small and discrete. In areas of deep stratigraphy (where cultural deposits buffer the natural soil acidity) even bone is very well preserved.

Secondly, the settlement was very long-lived. The uppermost layers seem to date to the 11$^{th}$ to 12$^{th}$ centuries, with evidence for a long sequence of earlier phases. Artefacts from the latest floor levels of House 20, for

example, included a glass bead of 11th century date and a copper alloy pin attributable to the11th-12th centuries. House 20 has at least three successive floor layers and was remodelled at least once. It was originally a three-aisled building with two rows of internal posts supporting the roof. Late in its life, however, these posts were removed and their postholes covered. They seem to have been replaced with posts along the walls. Thus the life of this single building encapsulates a change in Scandinavian architectural fashion dated to the 10th century in Denmark – if a few centuries later in Iceland. We have not yet found the earliest floors of this house, but its successive phases point to a long period of at least intermittent occupation. Moreover, it appears to have been built on top of an earlier building – part of which extends from under its south-east corner.


Figure 2. House 20

House 23 has not yet been investigated in such detail, but it too overlies pre-existing deposits. It appears to have been dug into earlier middens that are rich in animal bone, but produced no distinctive artefacts. Radiocarbon dating of this material will provide additional information in due course, but it is enough for now to know that a lengthy occupation sequence is also evident in this part of the site.

Thirdly, the settlement was a focus of domestic occupation. In addition to the bead and pin mentioned above, the site produced a soapstone vessel shard (of Norwegian type), a soapstone loom weight, spindle whorls of both soapstone and sandstone and a variety of other domestic objects. These are consistent with 'normal' occupation, perhaps by men and women, rather than use as either a periodic refuge or a monastery. The previously excavated cemetery evidence may point to a similar conclusion. Of the six excavated graves five were of children, one of which was newborn. It seems likely that families were living in the settlement on the Brough of Deerness over many decades or even centuries. Nevertheless, the small number of skeletons associated with the church must indicate that this occupation was intermittent, and/or that only a select few (perhaps members of single family) had burial rights there.

Given these discoveries, how might one interpret the function of the settlement? Hypotheses regarding possible pre-Viking Age monastic occupation would be premature, given that we have just begun to uncover the top of the sequence which is clearly late Viking Age. The deep stratigraphy does suggest that much earlier phases may exist at the site, but none have yet been excavated. Conversely, monasticism can perhaps be ruled out for the excavated Viking Age phase because the archaeological record suggests habitation by families.


Figure 3. Glass bead from the floor of house 20

If not monastic, what was the nature of the settlement? Christopher Morris has suggested that it should be interpreted as a

chiefly stronghold with a private chapel, a possibility that is supported by the new excavation and the obvious defensive qualities of the site's location. One might speculate that it was both a safe refuge and a dramatic location from which to dominate the local 'seascape' – a suitable settlement for the magnates and 'pirate fishermen' who one of us (JB) has argued elsewhere made the late Viking Age earldom of Orkney the economic and political powerhouse that it was.

Much research is still to be done. Was there pre-Viking Age settlement on the Brough of Deerness? Will soil micromorphology (the study of soil thin-sections) indicate continuous or intermittent occupation of some of the buildings? Is there evidence from artefacts or architecture for both elite and humble domestic settlement? These are answerable questions which clearly have a bearing on our understanding of the site.

Over the next few years it is hoped that this work will help improve the interpretation of what is a much-visited site within an Orkney Islands Council nature reserve. The Brough of Deerness is a Scheduled Ancient Monument and much is owed to the forward thinking of Historic Scotland in recognising the value of both preserving the site for the future and exploring targeted areas of it to increase our understanding and knowledge today.

The excavation was conducted with the permission of Historic Scotland and the Orkney Islands Council. It was jointly funded by the McDonald Institute for Archaeological Research, the Orkney Islands Council, the Royal Norwegian Embassy (London) and the Norwegian Consulate General (Edinburgh). Contributions in kind were generously provided by Orkney College and the Orkney Museum. Special thanks are owed to Julie Gibson (Orkney Archaeologist), Christine Skene (Orkney Islands Council), Anne Brundle (Orkney Museum) and Allan Rutherford (Historic Scotland) for helping make the project happen. Last but not least, the residents of Deerness have generously welcomed us onto their lands and into their heritage – they cannot be thanked enough.

## Excavations and Survey at Bay of Skaill, Sandwick, 2008

*David Griffiths and Jane Harrison, Oxford University*

A team of 20 students from universities in Oxford, Aberdeen and Dublin, together with local volunteers, returned to the north side of the Bay of Skaill to continue field investigation in August 2008. Helped by unusually good weather, a month of exceptional progress was made and many visitors were able to see the site on the Open Day on 24th August. In addition there was a capacity-attended evening talk at Sandwick Community Centre given by David Griffiths on 20th August.

General view of excavation, 2008, from North

This work forms part of the ongoing Birsay-Skaill Landscape Archaeology project, which began in 2003 with the support of Orkney Islands Council Heritage Fund and has continued with support from Historic Scotland and Oxford University. Since 2004 (when it was launched) we have worked in close collaboration with Orkney College Geophysics Unit, which has undertaken all extensive survey since with us since then.

The basis for the project is to use methods of extensive landscape investigation – principally magnetic geophysics – to survey

and map areas which are under long-term threat from coastal erosion and climate change. In the case of this project, the low-lying and partially sand-covered bays of the NW Mainland were selected as the focus. A strong reason for this was that these areas already have well-known and internationally recognised monuments, but these are small in area compared to the wider landscape, where much potential remains for further investigation. Archaeology in the 1970s responded to coastal erosion on a 'rescue' basis – excavating sites, often rapidly and partially, many of which were already in a state of exposure and collapse. Newer techniques of landscape investigation have enabled us to look at the wider context of the erosion zone, and to cover much larger areas. We cannot arrest the problem of erosion, but we can hope that enhanced information about the archaeological landscape will assist in the effective management of coastal and environmental change in the future.

So far extensive geophysics has been carried out across the north side of Birsay Bay (Point of Buckquoy) and on the Birsay Links. In 2006, in connection with the forthcoming publication of excavations on the Brough of Birsay by Chris Morris, an extensive area on the Brough of Birsay was subjected to geophysical survey, meaning that we now have an arc of coverage - which still remains selective in places - from the Peedie Brough, around the bay to the south links near Saevar Howe. In 2008 Marwick Bay was brought into the picture when a survey was begun in the vicinity of the scheduled chapel site near the bay frontage.

At the Bay of Skaill, a small trial survey near Skara Brae in 2003 has now been superseded by more extensive WHS survey, but a much larger area completed in 2005-6 across the north of the Bay has provided the focus of further investigation. A cluster of five enormous sandy mounds has been surveyed using magnetometry, with selective resistivity and ground-penetrating radar. The most prominent of the mounds – the 'Castle of Snusgar' was the original focus of the work but this has now expanded considerably to encompass a wide swathe of the sandy links inland from the shore. In addition, we are working with Orkney Shorewatch volunteers to monitor and record the state of archaeological exposure in the bay frontage.

Excavation has been used to test the character of deposits mapped by geophysics, and to extract cultural, dating and environmental information. In 2004-6, this activity comprised two trial trenches (T1 and T4) focused on Snusgar itself. The robbed-out traces of the edge of a large stone building complex were uncovered, stratified within middens of the Norse period. These were rich in Norse finds such as bone pins and comb fragments. The build-up of mound deposits was examined in vertical section, revealing layer upon layer of midden, stabilised with stone, interleaved between episodes of windblown sand. The midden had been used to create stable land surfaces for occupation and agriculture. Environmental evidence has been rewarding – revealing a mixed economy of cultivation of oats, flax and six-row hulled barley, together with husbandry of cattle and sheep. Dog and cat bones have been found too. Exploitation of wild resources is revealed by sea-bird bones (predominantly gannets), sea-fish, periwinkles, limpets, and smaller groups of bone fragments suggested the hunting of red deer, seal and whale. Flotation also revealed the presence of hammerscale and other metalworking debris.

In 2005 a small trench (T5) was opened on the large 'East Mound' some 100m east of Snusgar. This mound is less prominent in the landscape so initial expectations were relatively low, but the appearance of well-preserved stone walls deeply buried under windblown sand gave rise to an increased sense of potential. In 2006-7 this area was widened and the landscape context examined. By the end of 2007 season we had exposed a cluster of well-preserved but small stone buildings, with intact internal deposits and stone orthostats arranged as

divisions or ‘furniture’, and surrounded on all exterior sides by midden deposits. Finds were consistent with a Norse date – bone pins, some splendidly-complete combs, steatite vessels, a bronze ringed pin and a blue glass bead. For the first time pottery, both glazed and unglazed, came to light from layers associated with the end of the life of the buildings, before the walls were covered up by blown sand. Derek Hall and Alan Vince have examined these sherds and consider (subject to ongoing analysis) that they are probably twelfth or early thirteenth century in date. Other dating evidence including 20 radiocarbon dates obtained in early 2008, tell us that the building complex was in use between 1000 and 1200 AD, with layers from Trench 4 on Snusgar giving a slightly earlier range extending back to the tenth and ninth centuries AD. Optically-Stimulated Luminescence (OSL) has been used in conjunction with radiocarbon to provide an additional dating parameter. This has closely agreed with the radiocarbon when applied to occupation and midden layers, but as it is based on mineral quartz properties it has the advantage of being feasible to use on layers without significant organic content, such as the windblown sand overburden and interleaved episodes of sand deposition. OSL suggests that the main sand overburden accumulated in the fifteenth century AD - a date consistent with a period of severe climatic change witnessed across the North Atlantic, as the ‘Medieval Warm Period’ gave way to the ‘Little Ice Age’.

One intriguing hint in 2007 was the presence of a large stone entrance on the north side of the opened area, apparently leading into the building complex: it was unclear whether this was part of a surrounding wall, or in fact was integral to another building – by the look of the stonework, perhaps a much more substantial building.

Stone steps

Excavation in 2008 therefore concentrated on exposing and characterising this area to the north of areas exposed in 2006-7, whilst continuing to elucidate the sequence within the existing structures. It was clear that whatever it was, it was deeply buried under windblown sand, and many days were occupied with carefully removing the overburden. Gradually, but intriguingly, massively-built curvilinear or ‘bow sided’ walls began to emerge on either side of the ‘entrance’, with a matching wall alignment 4.5m to the north marking the opposite side of the building. This was initially dissimilar, as its upper courses had been robbed and then rebuilt in a much more rubbly manner apparently as a field dyke. However from beneath these upper courses emerged a more finely-built dry stone wall-face, almost identical to its opposite number to the south. Between the walls, sandy abandonment deposits gave way as we went down to darker and richer floors and occupation surfaces. A stone walkway, with edge stones marked by sockets for wooden uprights surrounding flagstones, was visible on either side of the entrance heading into what we interpreted as an animal-area or byre. This had earth surfaces on either side of the stone walkway, where traces of animal hoof prints were still visible under the sandy post-abandonment layer. Excavation revealed an astonishingly-preserved flight of stone steps leading up to the upper level of building near the top of the mound, which was part of the area originally exposed in 2005-6. To the SW of this building, a small

square external yard area produced a marked concentration of burnt deposits and metalworking waste – further post-excavation analysis is ongoing, but we expect this will turn out to be a metalworking hearth with associated deposits.

The excavation in 2008 revealed that the cluster of buildings on the 'East Mound' is centred on a large Norse longhouse, which we exposed the central section of. Within the domestic area (distinguished from the 'animal' area of the building) by a stub wall, the walls were particularly well-made with stone box benches lining the side of the interior, at the centre of which was dark burnt material, suggesting we were coming down upon a hearth. At one part of the wall (which was intact to its original full height although subject to in-situ collapse in places), there was a faintly-visible 'tally mark' of nine vertical and one horizontal strike-through, scratched on the face of a wall stone. Finds were consistent with previous seasons, with steatite, worked bone and antler predominating. Large numbers of small iron pins, ties and rivets were found within the abandonment deposits in the longhouse, suggesting they came from a now-vanished wooden superstructure. Finer objects included several beautifully-made whetstones, part of a circular amber bead, and a coloured (if now oxidised and somewhat opaque) polychrome bead.

Post-excavation work on the 2008 material has begun but will be a major task, and as a result, the 2009 season of the project is more likely to concentrate on completing the coverage of our landscape survey and catching up with laboratory-based analysis, than with further deep excavation in the short term.

Polychrome bead, just after it was found

However we have every intention of re-exposing these fascinating structures for further definition at a subsequent stage, perhaps in summer 2010, subject to appropriate funding being in place. At every step, fascinating questions about the development of the landscape arise, and a combination of survey and excavation is beginning to yield significant dividends in answering them.

Figures: all © Oxford University
See also: 'New Insights into Viking Orkney' *British Archaeology* Nov-Dec 2008, p.6.

## Excavating an Experimental Prehistoric Pottery Kiln at Harry, Orkney

*Stephen Harrison*

A previous contribution (Harrison 2008a; see also Harrison 2008b, 2008c) drew attention to a three-year experimental research project into the replication of Neolithic pottery at Fursbreck Pottery, Harray, Orkney, which aims to come to some potential understanding of the processes involved in the manufacture and firing of prehistoric ceramics and their use during the third and second millennia BC within a specifically Orcadian context. Over the past eighteen months around 500 pots have been made and four firings have taken place, with more scheduled for later this year and during 2009.

*Plate 1*. Kiln 2 prior to reconstruction,

In September 2008 the existing kiln (Kiln 2; *Plate 1*) was reconstructed in readiness for a further firing (*Plate 8*). The turf-built structure (c.1.2m internal diameter x 1m height) was originally constructed in 2007 and had already seen two successful firings (August 2007 and May 2008). The inner wall had, however, become severely heat damaged, much of which damage occurred during the second firing (*Plate 2*). This had resulted in a partial collapse of the upper wall levels on the north- and west-facing sides. Elsewhere around the circuit, again particularly on the western side, the c.0.6m-thick wall had more or less completely burned through in places. The reconstruction work afforded an opportunity to excavate the accumulated ash deposits within the firing chamber, undertaken by the author, with the assistance of Andrew Appleby, between 12 and 16 September 2008. This paper provides a short interim account of that excavation.

The fuels used in the two firings were different. In the August 2007 experiment, peat mould was the only material used. Following the firing, the fuel ash lay undisturbed for just over seven months, and remained *in situ* for the subsequent firing.

*Plate 2*. Close-up of severely heat damaged kiln wall after the second firing, May 2008. (Photograph: Stephen Harrison

The May 2008 fuel consisted of peat mould, cattle dung, and seaweed. A quantity of wood was also used in the later stages of the firing. Both firings achieved a maximum temperature of a little over 1000°C. One further point should be noted: with fewer and smaller pots (91; small- to medium-sized bowls and beakers) available for the 2008 firing, the size of the firing chamber was reduced by the insertion of a stacked turf-block partition wall, which ran parallel to the original south-facing circuit (*Plate 3*). Resting on the ash deposits from the previous firing, this wall was c.0.4m in width x 0.6m in height, and resulted in the creation of an oval firing chamber measuring c.1.2m E-W x 0.8m N-S.

*Plate 3*. The internal turf wall (top of photograph, immediately beyond the fire) at the beginning of the second firing, May 2008. (Photograph: Stephen Harrison)

The ash deposit, which had an overall maximum thickness of 0.62m, was excavated by hand trowelling in 0.10m spits down to the base of the firing chamber (which was left *in situ* for future geophysical survey), with each level being planned and photographed. Pro-forma context sheets and other field notes, together with a full photographic record, were maintained throughout. Plan and section drawings were made at 1:5 and 1:10 scales. A bulk sampling strategy was also adopted. A copy of the excavation archive will be deposited in the Orkney SMR.

Half-sectioning of the ash deposits revealed a clear history of use, with the two firing episodes unambiguously differentiated (*Plate 4*). The (un-excavated) base of the firing chamber consisted of a hard, compressed, light brown to light grey layer, with light pink tinges and occasional dense black areas *(Plate 5*). The surface also contained many small- and medium-sized pieces (<20cm) of sandstone, naturally occurring in the clayey subsoil on which the kiln was built, which had become burnt or scorched during the firing. An homogenous dense black stain, embedded with pockets of carbonised vegetation (stems and roots), circled the outer edge of base, abutting the surviving turf wall. It varied between 0.15-0.3m in width, had an irregular inner edge, and was observed running up through the ash deposits. This is interpreted as the footprint of that part of the kiln's perimeter turf wall destroyed by heat penetration during the firing process. Resting on the base of the firing chamber was an intermittent spread, dense in places, of charcoal and charred wood, which represented the remains of the fire used to begin the fuel ignition process for the August 2007 firing. Mixed with, and covering this, was a loosely compressed and largely undifferentiated dull reddish-brown to orange layer of peat ash, between 0.15-0.2m in thickness. This deposit, representing the spent fuel residue from the 2007 experiment, also contained numerous flecks of charcoal and the occasional piece of charred wood, as well as fragments of pottery from vessels that failed to survive the firing. Sealing this was a thin layer, between 2 and 4cm in thickness, of loose, light grey to light brown loamy material, thickest at the interface between the kiln wall and ash deposit, the upper surface of which showed considerable evidence of burning. Effectively a weathered surface that accumulated in the seven or so month interval between the first and second firings, it consisted of eroded soil and tumble from the kiln wall, and represented a clearly defined chronological marker in the history of the kiln's use.

*Plate 4*. The ash deposits in half-section, September 2004, with the base of the firing chamber exposed at the bottom of the photograph. (Photograph: Stephen Harrison)

*Plate 5*. Base of the firing chamber. Photograph: Stephen Harrison)

The deposits above the weathered surface all related to the May 2008 firing. Given the short time gap between firing and excavation, this material, with a maximum

thickness of c.0.4m, was altogether looser, fresher and more vibrant in appearance, with many subtle colourations; and, in terms of stratigraphy, it was also much more complex, largely the result of using a wider range of fuel materials. On the northern side of the kiln the ash deposits were contained by the remains of the turf wall, which had been constructed in order to reduce the size of the firing chamber. This wall, built directly on the underlying weathered surface, had been completely consumed during the firing and survived only as a well defined bank of crumbly light orange loamy soil (*Plate 6*); no individual turf blocks could be identified, except at the base of the wall. The inner edge of the bank (that is, kiln side) was near vertical in profile, but the outer edge had slumped at an angle of around 25º from the vertical; further slumping had been prevented by the presence of the original kiln wall on this side. Essentially, the above-described weathered surface provided the kiln base for the second firing. On this, a spread of charcoal and partially consumed wood indicated the seat of the blaze that initiated the firing process. The ash deposits over this comprised a complex sequence of differently coloured and textured lenses, representing the inter-mixing of the different fuels used in the firing: coarse textured browns, reddish-browns, oranges and yellows of the peat mould; fine textured blacks of the seaweed; and the powdery greys and off-whites of the animal dung. The upper levels also contained patches of charcoal and charred wood, the remains of additional fuel used in the latter stages of the firing. Whilst the complexity of the deposit reflected the range of fuels used and the ways in which they were dumped/placed around the pots, it was also, in part, a product of disturbance caused by the lifting of vessels following firing.

A range of 'archaeological' artefacts and ecofacts were recovered from within the fuel matrix of the August 2007 and May 2008 firing events, all of which could be directly associated with one or other of these episodes of use (*Plate 7*):

*Plate 6*. The remains of the internal turf wall (left of photograph) after the May 2008 firing. (Photograph: Stephen Harrison)

five complete vessels (missed during the unloading process); twenty pottery sherds (from seven failed vessels); three fragments of applied ceramic strip decoration, which had become detached from an otherwise successfully fired vessel; six heavily calcined sheep bones (rib and shoulder blades; placed in the kiln as a separate experiment); a quantity of fused and very fragile marine winkle shells (from the seaweed fuel, a remarkable survival given the temperatures achieved); and a number of nails, screws and small metal brackets, these all from the joiner's off-cuts used as additional fuel.

*Plate 7*. *In situ* pottery vessel and sherds from the August 2007 firing. Immediately to the right of the pottery, calcined sheep bones can be seen. (Photograph: Stephen Harrison)

Ash samples from the excavation are currently undergoing chemical analysis, and will be reported on at a future date.

Discussion

The excavation proved to be an archaeologically informative and interesting exercise. It was possible to excavate a structure whose exact history was known and documented. It was known that the kiln was built in early August 2007 and had been used on two separate occasions for the experimental firing of Neolithic pottery. It was known that the ash from the first firing had been deliberately left *in situ* and that an interval of seven months had passed between the first and second firings, during which time a weathered surface had developed on the ash deposits relating to the first experiment. It was further known that the second firing took place directly on top of the earlier ash deposits, and that on this occasion the insertion of an inner turf wall on the northern side had reduced the size of the firing chamber.

It was interesting to note that the separate use-events could be precisely correlated with the observed archaeological evidence. Even without the above foreknowledge it would have been possible to construct a connected historical narrative and interpretive account of the kiln and its use. All the recovered artefacts could be directly associated with each use episode; the pottery sherds showed none of the typical signs of wasters, but those from the lower ash horizon (firing 1) showed clear evidence of having undergone re-firing. Both the sherds and the complete vessels, in association with large quantities of ash, charcoal and charred wood, and extensive areas of burnt soil, attest the original function of the structure as a pottery kiln. Combining the excavation data with that obtained during the two firings will allow an unusually detailed account of the kiln's behaviour and dynamics during those firings to be arrived at. That, however, is something for another time and place.
Furthermore, and potentially of great significance, some of the recovered evidence can be paralleled in the archaeological record. In particular, structural features encountered in 2006 at the Knowes of Trotty, Harray, and interpreted by the excavators as a Neolithic pottery kiln, bear an uncanny resemblance to aspects of the experimental kiln (Card, Downes and Sharman 2006: 24-5). Attention is likewise drawn to a structure excavated at Allt Chrisal, Barra, in the 1980s, also interpreted as a turf-built Neolithic pottery kiln (Branigan and Foster 1995: 85-8). However, much more analysis needs to be done on these comparisons before any considered statements can be made.

*Plate 8*. The reconstructed kiln, September 2008. (Photograph: Stephen Harrison)

## The Rising Tide Project of Orkney

*C R Wickham-Jones & S Dawson*

Introduction

Orkney is renowned for its archaeology. There are monuments, tombs and houses from prehistory to the present and many sites have become key sites by which we study the past. Orkney archaeology is special because of two things: the range of material and the high quality of preservation here. There is, however, an unrecognised side to Orkney archaeology which has yet to be studied: the submerged landscape of prehistory which existed after the end of the last Ice Age. The Rising Tide project was set up in 2005 to investigate this former sea-level change and assess the impact on prehistoric settlement around Orkney.

Background

During the last Ice Age Orkney was located at the edge of the Scottish ice sheet where the land experienced less pressure when compared to areas such as Oban, which lay closer to the maximum thickness of ice. Differential crustal rebound since the end of the Ice Age means that relative sea-levels around Orkney have, in fact, been slowly rising with the result that Orkney has undergone gradual submergence over the last 10,000 years. The shape of the archipelago has thus changed dramatically. When the ice first retreated Orkney would have formed one large island, and Scapa Flow was a large landlocked bay.
The rate of relative sea-level rise since this time is unknown, but it is thought that sea-level may have been as much as -45m below present some 10,000 years ago. This means that areas that once were land now lie underwater, with obvious implications for our early settlement.

The project has several strands:

Coring and dating

Since 2006 a programme of coring has taken place in the lochs of Stenness and Harray, as well as at Waulkmill Bay and in Echna Loch.

In the loch of Stenness, changes in the microfossil assemblages in the sediment reflect the increasing salinity of the water with the rise in relative sea-level. At Echna Loch the sediments reflect decreasing salinity as rising sea-levels led to the creation of a storm beach which served to cut off an arm of the sea.

Two dates have now been obtained which start to give a more precise idea of the period at which the sea reached present level. In both cases gyttja (organic sediment), associated with the gradual changes in diatom (microfossil) assemblages, has been dated.

Voy, Stenness: 3090±40BP (Beta 242127)
1440 – 1270 cal BC
Echna Loch: 3950±40BP (Beta 242126)
2340 – 2570 cal BC

Voy lies at the inland extremity of the Loch of Stenness and the date relates to the change to marine and brackish conditions from freshwater/lagoonal conditions.

The Echna Loch date relates to a change to freshwater conditions from marine with the closure of the marine embayment after the emplacement of the barrier (a storm beach) along which the present day road runs. These dates give an initial idea of the age range when sea-level reached present levels around mainland Orkney. They have serious implications for understanding the human history of the islands as well as for the well-being of the archaeological remains.

The side scan sonar equipment on the deck of the Charles-Ann prior to survey work in the Bay of Firth

Over the coming 12 months the sediments from the loch of Harray will be analysed for information relating to the history of the loch. It is particularly relevant to the archaeological history of the area to consider the size and nature of the loch at times of lower sea-level.

In addition, the sediments from Waulkmill Bay will add to the information relating to rising sea-levels and supplementary cores from the deeper Seatter embayment at the seaward end of the Loch of Stenness will be analysed.

Topographical reconstruction and archaeological modelling

Archaeologically the dates are important because they indicate just how much the landscape of Orkney has changed since the earliest settlement of Orkney some 10,000 years ago. It is salutory to consider that the evidence so far suggests that the stone circles of Neolithic Orkney had already been in use for some 1000 when sea-levels reached their present heights.

The Neolithic farmers of Orkney experienced a world that was changing in many ways comparable with our own. This is well illustrated at the World Heritage sites where the landscape can now be understood to have changed dramatically since the Ring of Brodgar was first built c. 5000 years ago. Environmental reconstruction from coring suggests that rather than being connected to the sea the Loch of Stenness may have comprised a freshwater lake with reed beds at the time when the Ring of Brodgar and the Stones of Stenness were first built. While the sites were in use the ingression of sea into the Loch of Stenness must have been a notable event.

The changing sea-levels also mean that evidence from both Mesolithic and Neolithic Orkney is likely to lie underwater. In order to understand prehistoric Orkney we need to investigate the subsea landscape. Once the dating programme is complete it will be possible to reconstruct the previous topography of the islands at different time slices through prehistory. Information relating to the locations of Mesolithic and Neolithic settlements elsewhere can then be used to build models of the likely locations of sites on the submerged landscape. This can be related to models of the survival of sites underwater in order to predict likely areas of archaeological survival. This is not only a useful tool for research but it is necessary if we are to look after the sites underwater. The Orkney seabed is under increasing threat from development.

Seabed survey

The final strand of work relates to the possibility of underwater archaeology. The prospect of submerged Neolithic sites and landscapes in the shallow seas between the islands is given sharp focus by accounts of submerged structures and walling. Several of these accounts centre on the Bay of Firth and relate to a submerged stone structure with upright slabs. In order to verify this, in late August 2008, a side scan sonar survey was carried out in the Bay of Firth. This has resulted in a varied pattern of anomalies which need further investigation. Many no doubt will be unremarkable, but we hope that some will relate to the past landscape prior to submergence and perhaps, just perhaps, we may have found some elusive trace of those Orcadians whose farms and fields lay underneath the present waters of the Bay.

Bay of Firth from Wideford Hill

Endnote

The project is still at a preliminary stage, and progress is hampered by lack of funds. Work is slow. Next steps include a more intensive programme of dating together with further analysis in order to refine interpretation. Further seabed survey will take place and gradually we hope to build up a picture of a forgotten dimension of prehistoric Orkney.