# **Research strategy**

### Introduction

The preceding chapters demonstrate the lengthy history of archaeological and related research concerning the WHS. This is not surprising in an area that is defined as being of such great archaeological significance. It is also clear that research relevant to the WHS comprises not only projects that look at the Neolithic, but also those that cover both preceding and all other periods, up to and including the present day. It all adds up to an impressive foundation for future research. The preceding texts have combined the work of many authors in setting out a comprehensive review of existing knowledge of the WHS, identifying research themes, relevant techniques and gaps in knowledge. It is to the credit of the extraordinary quality and character of the archaeological remains that such a broad group of specialists could be assembled and persuaded to contribute.

A research strategy should provide priorities and methods for implementing a research agenda, and so this strategy has been formulated as a means by which the Research Agenda might be put into action. The strategy is intended to help those responsible for funding decisions to place individual projects within a wider context and assess the value of the proposed research, and to provide a means by which those who intend to carry out research can best plan their research.

Broad research themes were identified and discussed in Part 3; this section starts to break that down into a series of managable topics and projects. We have not tried to prioritise individual projects because the specific factors leading to prioritisation will change with time, but we have set out a method by which priorities can be drawn up.

We hope to see research moving forward within an ethos of sustainability which is, we feel, the spirit that best safeguards the future well-being, and our understanding, of the WHS. The following paragraphs outline this approach.

### Sustainable research

#### Sally M Foster

'Scotland's built heritage should be managed in a sustainable way, recognising that it is an irreplaceable resource' (Historic Scotland 2000, Article 3). How should this be applied in the context of research in general, for the Orkney WHS in particular? As a starting point, it is useful to paraphrase the Council for British Archaeology's definition of sustainable development: 'sustainable research meets the needs of today without compromising the ability of future generations to understand, appreciate and benefit from the historic environment of the WHS and its environs' (Clark 1993, 90). With this in mind there is only one serious point at which there is the danger of research not being sustainable and that is through the destructive process of archaeological excavation, as recognised above (pp 33-5). However, there are many ways in which the sustainable qualities of excavation, and indeed of non-invasive research, can be enhanced. Drawing upon the broad principles for conservation set out in the Stirling Charter (Historic Scotland 2000), and Historic Scotland's (2002) policy on sustainable management of the historic environment, it is possible to identify a set of principles that should underpin any research in the WHS and surrounding areas.

- Research aims should include the conservation of the WHS for the benefit and enjoyment of present and future generations.
- Research should recognise that the resource is irreplaceable and seek to ensure that all aspects of its practice are as sustainable as possible.
- There should be a general presumption in favour of preservation. Intervention should be the last resort, after all other avenues of research have been explored, and then it should be minimal.
- The precautionary principle should apply; unless it is possible to assess the impact of any interventions or other actions on the cultural and natural heritage resource, including that which is *not* to be disturbed, then potentially damaging actions should be avoided.
- In the case of invasive work, arrangements should be made for longterm monitoring of the condition of the site once works have been completed, in order to understand better the consequences of such intervention and feed this knowledge into future strategies.
- As in all aspects of archaeological work, the highest standards must apply, not least with regard to recording, ensuring that there are proper records before, during and after work.
- Parties should work together to share knowledge and resources, find solutions to common questions or problems, and maximise benefits, not least by ensuring that research objectives address the broadest possible spectrum of interests, including those of heritage managers.
- Addressing back-logged research must be a priority in order to make all available information widely accessible.
- Those undertaking research, particularly in the case of excavation, must have the highest quality knowledge, skills, technologies and resources available to them. All periods of human activity should be valid subjects for research, not just the main

periods of the monuments in the Site.

- Investigation should, where possible, contribute to the understanding of the broader environment and the impact of human actions on natural resources through time.
- Appropriate measures should be taken to assist all people, particularly the local community and tourists, to enjoy, appreciate, learn from and understand the WHS.
- All research should aim not only to address the specific requirements of the WHS and its environs, but to constitute examples of best practice with wider applicability.

It is also important not to lose sight of the fact that significant, if less visually impressive, archaeology lies on the doorstep of the WHS, and indeed is to be found throughout Orkney. With an eye to sustainability, undue concentration of effort on the WHS should never be prejudicial in the long-run to other archaeological (and associated social) interests. The first question to be asked of any research proposal must be whether it can *really* only be addressed through work in the WHS. It is vital to continue to ask questions of what has happened in the past and what we are doing now, but we have to make sure that individual research designs be assessed against a broader research agenda, the horizons of which extend well beyond the WHS itself.

### **Research rationale**

Jane Downes and C R Wickham-Jones

Research can be related to various basic themes within archaeology and, as set out above, this document has chosen to eschew the traditional period, subject, or management-based themes for two broader themes into which all traditional themes can be bound.

Artefacts, monuments and cultural identity looks both at groups of artefacts, such as pottery, and at the monuments themselves, such as the stone circles. In doing so it removes the distinctions of scale often applied by archaeologists to their material. The interplay between the different elements of archaeology is examined to see how they related and were used to construct a world, both at various times in the past and in the present. In this way all archaeological finds within the WHS are recognised as valid research objects in their own right, whatever their size or period. It is also recognised that at any one time in the past there have been previous pasts to which people have related. At the same time, the rôle of archaeology in the world of today is a source of interest.

The formation and utilisation of the landscape looks at the different processes that have gone on to produce the landscape of the 21st century. Under this research theme it is appropriate to stop the process at any one particular time, in order to highlight that period or process: for example early Holocene climate change or the introduction of agriculture. By building up a series of slices of information, projects that work within this theme will be contributing to the wider picture.

It is recognised that research relating to the WHS will not only take place in the WHS. The WHS has never existed in isolation; it is part of a wider system. Information from outwith the WHS has great bearing on the WHS, both as part of its natural setting and at an individual level as detail from sites elsewhere can be used to explain gaps in our knowledge of the WHS sites. From the perspective of Orkney, there are thus four geographical frameworks for research that may be set out, though they are not intended to convey any sense of project value:

- site-specific research;
- WHS-specific research;
- zone-specific research;
- research that is specific to Orkney as a group of islands.

### Sample research

For the purposes of this document, examples of research have been divided into broader topics and then set out as specific projects. In this way it is possible to see how research might go forwards as a series of manageable actions that combine to provide wider information. The broad scale topics have been set out first, but it should be emphasised that this list is by no means exclusive. It is not intended as an end point in itself, but rather as stimulation to the individual reader.

### Sample research topics: artefacts, monuments and cultural identity

Siân Jones, Colin Richards, Artefacts, Monuments and Cultural Identity Group, Temporality and Period-Based Research Group

### Archival assessment and synthesis

Successful research depends on a good knowledge of the artefact assemblages and related archival material held in museums. At present there is no archive of relevant material. The finds from Orcadian sites are scattered across many museums, within Scotland and further afield, and in some cases finds from a single site reside in several different locations. A basic assessment and synthesis of museum-based material (to include both finds and archive material) in relation to the WHS and its buffer zones is necessary. An inclusive and accessible archive, perhaps in the form of a web-based index, would provide a vital tool as a starter for any research.

### Architectural life histories

Much research has been carried out on the architecture of the Neolithic sites and monuments included with the WHS area and its buffer zones. This has, however, largely ignored the length of time over which these monuments have survived and their differing rôles throughout that time. There is a great need for research which explores the durability of the architecture over time, and the ways in which these sites and monuments have been rethought, re-fashioned and reused. This research extends beyond the Neolithic to include sites and monuments from other periods, and especially the dynamics of their relationships to the Neolithic remains.

### The creation of the monuments

Detailed studies of how the monuments were created – including both the mechanics of construction, and the selection and acquirement of suitable materials, as well as a consideration of the act of construction as an ongoing project.

### The life histories of artefacts

The production, use, consumption and deposition of artefacts. Ultimately this research should extend beyond site specific projects to comparative and synthetic research. This might, for example, look at networks of production, circulation and consumption. Most artefact studies focus on particular materials and it seems likely that there is useful information to be gained from trans-material studies.

### Review and strategy for detailed physical and chemical studies of artefacts

This research should focus particularly on existing museum collections and address questions such as:

- What is the status of current analytical techniques?
- What artefacts might benefit from analysis?
- Where are these artefacts currently housed?

### **Residue analysis**

This is a specialised study incorporating a variety of techniques. Residue analysis locates, extracts and identifies ancient residues from a range of tools, including tools made of stone, bone and pottery. The high quality of artefact survival in Orkney means that the development of residue analyses holds particular potential. Work to date on pottery has shown that the survival of lipid/organic residues is variable but well worthwhile. Further work is, however, needed. For example, it is possible to find a chemical indicator for barley but as yet it is impossible to say whether this implies porridge, 'bread' or beer. Work so far has been small scale and there is a general lack of comparative or control data. The high concentration of Neolithic pottery in the WHS and surrounding area mean that a large project incorporating pottery from several sites would be valuable.Work on residues and wear on lithic tools has been shown to be of value to archaeology, notably in the identification of ancient plant remains, though this has largely been ignored in Britain. In the context of the early farming communities who built the monuments of the WHS. examination of the survival and identification of starch grains would be of particular relevance. Residue work on bone tools is currently being developed for Britain. The survival of a unique suite of well contexted bone tools in Orkney means that the application and development of this work has especial relevance here.

# Period-specific research on social identity

Broader programmes of research can be linked to examine the changing nature of social identity through different times and locales.

### **Typological reviews**

Typology is a complex tool of artefact research and many existing typologies have not been reviewed for a long time. The most popular basis for typology is shape, sometimes combined with manufacture, but this has rarely been examined in the light of recent knowledge and techniques. What, for instance, do the different pottery types mean? If the apparent mutuallyexclusive distribution of collared Unstan Wares and of flanged-rim bowls is real, what else does it involve and what implication does this have for our interpretations of Orkney's Neolithic? Similar work could look at the distribution and meaning of different lithic assemblages, bone tools and so on.

### Experimental archaeology

Experiment is vital if we are to fully understand the remains of the past. It provides an important dimension to the build-up of a lifestyle picture, forces investigators to consider practical elements of interpretation, social questions and environmental issues, and helps to form a dynamic link between an excavation and the post-excavation study of artefacts. In comparison with work elsewhere, it has been largely neglected in Britain. Experiment also provides an excellent medium for education and interpretation. It is of particular value in that it broadens the base of archaeological expertise to include present-day craftspeople. This is of especial relevance to Orkney where there is a largely untapped source of local expertise.

### Landscape survey

Including studies of both the experiential and the physical landscape - terrestrial, marine and celestial. There is a need for clear and detailed knowledge of the relationship between the sites and the landscape. Experientially, this should include research on how the landscape was viewed, inhabited and negotiated, and it should compare and contrast results through different periods of time. Physically, further exploration and evaluation of the landscape, both in the Neolithic and more recent times, would serve to enhance our understanding of the archaeological and historic landscapes (see also Formation and Use of Landscape).

#### **Boundaries**

The landscape has been used and compartmentalised from the earliest times to the present day, but little is known of how those divisions were manifested and manipulated. This must include both architectural, physical, divisions and mental boundaries; and it should look at their changes through time.

Useful research includes:

 establishing the date of boundary dykes;

- research into the construction of boundaries, including both techniques and organisation, as well as materials;
- the elaboration of the purpose of boundaries and how they may reflect variously stability or change within the social, economic, religious and political life of the world around them;
- research into the use of boundaries through time, including an examination of maintenance, change, reuse, dislocation and abandonment, including an exploration of the existing Sound Archive for references to boundaries;
- an understanding of the ways in which boundaries may affect the interpretation and experience of landscape, both in the past and today (see also *Formation and Use of Landscape*).

### Astroarchaeological meanings

It is generally accepted that certain celestial events were important to prehistoric people with concomitant consequences for our interpretations of monuments and for culture. Research into the WHS should take account of this. Events such as the prediction of eclipses, the appearance of the moon at 'maximum standstill', the heliacal rising of certain stars or asterisms, like the Pleiades, the sun touching a special mountain, or the periodic appearance/ disappearance of a planet are all of potential significance. One approach is to collect surveys that integrate landscape and 'skyscape' (ie skyline measurements, prominent features, favoured or limited ranges of visibility, etc) and to try to correlate these with data from neighbouring sites. This, more or less, is the classical approach. Another approach might pay more attention to both quantitative and qualitative details of the landscape and combine these with findings from the specialised analysis of finds.

### Visitor surveys

Little exists by way of baseline statistics for visitors to unstaffed monuments. This data

is required to inform site management and interpretation as well as to monitor and assess visitor impact. This should relate to contemporary experience (see below).

### **Contemporary experience**

There is a general lack of research on the attitudes and experiences of residents and visitors within the WHS and surrounding area. Little is therefore known as to how the monuments figure in people's memories, identities and attitudes. Research in this field might involve two specific techniques, each with its own time-frame:

- interview-based research would provide immediate results and should be considered a high priority. In particular, this might look at the impact of WHS status and its associated management and presentation demands;
- ethnographic research over a longer period of time, involving participant observation should provide more detailed and fine-grained insights.

### The rôle of archaeology in education in Orkney

An assessment of the current rôle of archaeology in education in Orkney, and of the educational potential of the WHS, is important if the aims of increasing public education and enjoyment of the WHS are to be fulfilled. This should include an examination of the ways in which artefacts from the WHS (both from existing museum collections and newly excavated sites) can be used in education and display.

### Local history

Little is known of the place of the archaeological sites and landscape in the local history of the area. In this respect, the use of oral history techniques to focus specifically on the archaeological monuments and antiquarian/archaeological practices would provide great insight into the ways in which personal memories and narrative have been informed by the archaeology. An exploration of the existing Orkney Sound Archive for memories and experiences relating to the monuments would also prove valuable and extend the period of study beyond current living memory. This should include traditions of folklore and land use.

### Literary research

Orkney has a strong and long literary tradition, but little is known of the influence of Orcadian archaeological sites on this. Conversely, the influence of literature on archaeological research is also unknown. Both constitute useful areas of research, necessary for a rounded picture of the part played by the WHS over the ages.

### Folkloric research

Again, there is a strong tradition of folklore in Orkney, and archaeology plays a prominent part in this, but its rôle has never been quantified in detail. A synthesis and analysis of folklore concerning both archaeological materials in Orkney in general, and also the monuments within the WHS and IBZ in particular, would be of great interest.

### Visual representations and the perception of landscape

There are many artistic representations of the archaeological landscape, and these derive from Orcadian artists as well as from many who visit from further afield. This resource has been little studied, however. Studies of the representation of landscape, and the historic material within it, in a variety of media, are important because they can provide a clear insight into the ways in which the perceptions of landscape and monuments changed through time. This may then be used to examine the rôle of visual representation in constructing a sense of place and identity.

#### Place-name research

Existing work on place-names took place some time ago, and a critical evaluation would be worthwhile, especially in conjunction with specific research focussing on archaeological sites and monuments both within and beyond the WHS.

# Sample research topics: the formation and utilisation of the landscape

Ingrid Mainland, Ian A Simpson, Richard Tipping, Palaeoenvironment and Economy group and Formation Processes and Dating group

### **Soil formation**

One priority is to establish the nonanthropogenic component of soil formation as a baseline. During rapid inundation terrestrial deposits may have been preserved underwater. The complex patterns of currents in the archipelago mean that the pattern of islands has changed over time so that some deposits may have been lost. Nevertheless, it is likely that pockets of early soils survive and it may be possible to identify sealed remains of soils and sediments in contexts such as the currently brackish Loch of Stenness that will allow characterisation of purely non-anthropogenic soils. Other preservation contexts may include the currently fresh-water Loch of Harray. Good soil baselines will facilitate the identification of natural and anthropogenic changes in subsequent periods. In addition, the study of soil formation processes must both acknowledge and contribute to our understanding of wider landscape changes.

# Modelling of landscape changes over time

This is an important component of the research framework. The major changes in the coast line at Skara Brae, both before and after the construction of the settlement, are well known; and the pattern of aeolian deposition there can be retrieved for recent times through documentary research. The shapes of the Lochs of Stenness and Harray have changed over time, though it is not clear when the originally fresh-water Loch of Stenness was linked to the sea (see also *Artefacts, Monuments and Cultural Identity*).

### Monument formation processes

Elucidation of the processes of monument formation, from the pre-monument soil conditions through their construction and alteration, to the introduction today of new materials to the monuments as a part of conservation and management, is important. It is important to recognise the varied opportunities offered by the different groups of monuments; indeed, the presence of mounds and banks of different ages creates a great potential for a better understanding of the soil chronosequences, based on fossil soils under the monuments.

# Agricultural and social landscape formation processes

The survival of old land surfaces under monuments and colluvium of various dates in the Bookan, Wasbister and Brodgar locality presents various opportunities for the multi-period analyses of small areas. It may be possible to recover information about land division and land use and their variations in time (see also *Artefacts, Monuments and Cultural Identity*).

# A comprehensive programme of dating

This should be designed to provide an absolute chronological framework and it should include past landscapes, monument formation, use and reuse and the broader environmental context. It should make use both of newly available samples and dating techniques, as well as samples from older excavations and existing dating techniques. It is of crucial importance to reconsider the taphonomy of samples from old excavations before any dating is undertaken.

### Existing bioarchaeological data

Excavation in Orkney over the last hundred years has created an unusually rich resource of bioarchaeological evidence, albeit mainly faunal, which could potentially be used to address many research issues. To facilitate future investigations, there is a need to compile an inventory of this material indicating, at the very least, where the collection is stored, some basic information on the contents of the collection (eg faunal material and carbonised seeds), date of excavation, recovery methods (ie hand recovered or sieved), whether the collection has been analysed and the location of any archive or published reports on the material.

### **Further excavation**

This would be aimed specifically at the recovery of large, well-stratified and wellpreserved bioarchaeological assemblages and is necessary to implement many of the research themes identified. If analysis is to move beyond the site-specific interpretations of archaeofaunal and archaeozoological remains, there is a need to target excavation towards varied contemporary sites within the archaeological landscapes, and in particular to ensure the analysis of environmental data from sites of varying function. It can be argued that analysis of bioarchaeological evidence from multiperiod sites would allow useful insight into long-term palaeoeconomic trends and processes, and economic strategies, thus avoiding period-specific biases.

### Modelling climatic change

Precipitation is a major driving force behind climatic change (Vassijev et al 1998) and the least ambiguous results are to be obtained from the analysis of lakelevel changes (rises and falls) in upland, or gradually (or only modestly) anthropogenically modified catchments. In the last four years a sedimentological approach to interpreting lake-level change has been developed and this has resulted in the first continuous Holocene chronology for precipitation in the UK, from west Glen Affric in northern Scotland (Tisdall 2000). This approach uses the spatial and temporal changes between lake sediment and fen peat from transects of correlated cores. It allows for

the development of models of climate change, and a number of appropriate basins for this sort of analysis lie within the WHS and its buffer zones.

### Initial post-glacial colonisation of Orkney

An understanding of the initial postglacial colonisation of Orkney is important if we are to understand properly the basis for the flowering of culture that led to the monuments of the WHS. Very little information is currently available on this and it should be accorded a high priority. It should be recognised that rising patterns of sea-level mean that submerged sites are likely to play an important rôle in the recovery of information relating to the initial settlers of Orkney and their world.

### Use of plants, especially cultivated plants, in prehistoric Orkney

Current understanding of the balance between plant and animal diet in Neolithic Orkney and later is based more on inference than on sure data. Further recovery and analyses of plant remains from archaeological contexts are necessary and isotope analysis of human bone would be very useful.

# Non-economic values and activities apparent in bioarchaeological evidence

There is much scope for a reappraisal of existing data, and the targeting of future recovery strategies, to investigate the representation of particular species and their associations with particular contexts and or artefacts. Existing work has highlighted the potential non-economic value of certain species in various different contexts (eg sea eagle at Isbister; red deer at Noltland) and this is worthy of further development. This research would be focused on aspects such as the relationship of various species to social identity, symbolic significance, ritual and concepts of wild/domestic. Changes in practice through time should not be forgotten, nor the changing interplay between humans and animals/plants in different settings.

### Sample Projects

All Discussion Groups

### Background

The projects below have been drawn from the contributions made by those attending the symposium and members of the AHRCC at various stages in the consultation process. The list is not intended to be exhaustive, nor is it set out in any order of priority. Rather it is intended to act as a stimulus to those research workers and funding bodies who have an interest in the future of The Heart of Neolithic Orkney. An attempt has been made to classify individual projects to the themes and scale of research outlined above but, as readers will quickly realise, this is, in practice, difficult. Nevertheless, it is worthwhile because it helps to give a guide as to the scale and direction of each project.

# Artefacts, monuments and cultural identity

### Site specific

- Refinement of the dating of the monuments of the WHS through the compilation of a comprehensive dating programme for the monuments and their surrounding landscape. New dates should include the use of a wide range of dating techniques. In addition, a register of all dateable and dated material should be built, as well as a re-consideration of the taphonomy of all existing dates.
- 2. New excavation to establish the chronological position of important complexes of monuments, such as those at Ring of Brodgar and Maeshowe.
- 3. A study of the mechanics of construction of the different monuments.
- 4. Examination of the possible meanings attached to the actions of monument construction.

- A study of each monument to produce a history, not only of its construction but also of its alteration and use through time to the present day.
- Experimental studies relating to individual types of artefact, eg of the manufacture and use of pottery. This should include work on the source materials and could be extended to look at the relationships between different types of artefact, such as the sources used in pottery production and stone tool production.
- 7. Residue analyses to determine the function of various artefacts, such as pottery, bone or stone tools.
- 8. An examination of the preparation for site construction relating to individual monuments: is there evidence of ground preparation and/or the use of introduced materials to create a platform? If materials were imported to the site, what is their nature and origin?
- 9. Maeshowe: examination of the complex construction of the core cairn. What rôle did its revetting walls play during natural consolidation of mound material and thus shrinkage after construction, and how did this relate to the built walls of the chamber? Was the choice of mound material made with consolidation in mind?
- 10. Maeshowe: what is the hydrological status of the mound and how does that affect its long-term stability?
- 11. Maeshowe: conventional geophysics is of limited value here but the mound would serve as a test-bed for GPR, electrical imaging and seismic study, while the base of the mound and platform would benefit from intensive survey.
- 12. Skara Brae: analysis of the middens to examine their development, use and modification over time. Fuel residue analyses of midden deposits will be important both in identifying the original fuels and understanding the importation of material to the site.
- 13. Skara Brae: functional analyses of the various occupation surfaces.
- 14. Skara Brae: analyses of site taphonomy including the decomposition products of bone, (calcium, iron and phosphate

features) and of shell (calcium carbonate features), the use of turf or other materials for roofing, and the decomposition of stone.

- 15. Examination of the impact of earlier excavation and conservation measures on the sites.
- Assessment of the impact of the introduction of new turf material and associated biological agents for the managed sites.
- 17. Assessment of the impact of the introduction of new stone material for managed sites.

#### WHS specific

- Compilation of an archive/synthesis of museum-held material relating to the WHS.
- Compilation of an updated inventory of historical, pictorial, oral history and cartographic sources relating to the WHS.
- 20. Compilation of a database of photographs relating to the monuments of the WHS. This should contain information on current locations and be suitable for annual updating.
- 21. New excavation to establish the chronological position of important complexes of monuments related to the WHS, such as the site at Bookan.
- 22. Investigation of the importance of the WHS area to preceding non-farming groups.
- 23. Exploratory geophysical survey of the WHS to locate new archaeological sites, using a combination of magnetic scanning and magnetic susceptibility sampling across detailed sample survey blocks.
- 24. Survey by geophysics of specific sites related to the WHS area, such as 'Stenness Palace'.
- 25. Construction of a detailed oral history of the WHS monuments in Orkney.
- 26. Examination of the rôle of the monuments of the WHS in contemporary Orcadian society.
- 27. Examination of the place-names of the WHS.
- 28. The continuation of a fieldwalking

programme to cover whole of the WHS.

29. The evaluation of the results of fieldwalking.

### Zone specific

- 30. A programme of astro-archaeological research relating to the major monuments and their relationship with the surrounding land.
- 31. Exploratory geophysical survey of the buffer zones to locate new archaeological sites, using a combination of magnetic scanning and magnetic susceptibility sampling across detailed sample survey blocks.
- 32. All future developments with the wider zones should be preceded by appropriate geophysical investigation.
- 33. Systematic topographic survey of the setting of the WHS in order to record new sites and provide a wider landscape context to the monuments of the WHS.
- 34. Field survey along the coast adjacent to Skara Brae and along the shorelines of the Lochs of Harray and Stenness, as well as coastal survey within the OBZ, in order to record eroding sites.
- 35. The continuation of a fieldwalking programme to cover whole of the IBZ.
- 36. The evaluation of the results of fieldwalking.
- 37. Systematic underwater survey and evaluation of Harray and Stenness lochs, the results to be integrated with those of land-based survey.

### Orkney specific

- The petrological and macroscopic examination of stone tools from Orkney, along with a contextual analysis.
- 39. Analysis of the relationship between the sources of materials used for artefacts in Orkney and known sources further afield, such as the (Group XXII) axe production site at the Beorgs of Uyea on Mainland Shetland.
- 40. A detailed study of the bone, antler and shell tools of Neolithic Orkney, to include information on manufacture,

style, use and deposition.

- 41. An examination of the social meaning of specific artefact styles.
- 42. An examination of the meaning and function of Beaker pottery in Orkney.
- 43. An examination of individual artefacts and monuments as period specific indicators of social identity.
- 44. Intra- and inter-site studies of artefact manufacture, use and deposition.
- 45. The examination of the use of natural pigments, such as haematite, in prehistoric Orkney using experimental and other techniques.
- 46. Skeletal studies: Orkney holds an unparalleled skeletal record for some periods of prehistory and recent advances in techniques mean that this could be used to shed light on many different aspects of great relevance to the WHS, such as diet, illness, mobility and origins.
- 47. Investigation of the size of the population in Orkney through time, and the changing effects of population pressure.
- 48. Investigation of the evidence for, and date of, the initial post-glacial settlement of Orkney.
- 49. Investigation of the mobility and connections with the wider world among the first inhabitants of Orkney.
- 50. Investigation of the advent of farming and nature of transition from huntergatherers in Orkney – what were the relationships between the two groups?
- 51. Investigation of the nature of Bronze Age settlement in Orkney.
- 52. Investigation of the nature, date and function of burnt mound sites in Orkney.
- 53. Investigation of the nature, date and function of souterrains in Orkney.
- 54. Mapping and investigation of crannog sites in Orkney.
- 55. Investigation of archaeology as an educational tool in Orkney.
- 56. Investigation of the influences of archaeology on literature in Orkney.
- 57. Investigation of the influences of archaeology on art, both historical and modern, in Orkney.
- 58. An evaluation of existing research into the place-names of Orkney.

# The formation and utilisation of the landscape

#### Site specific

- 59. An examination of the pre-monument landscape: soil conditions immediately before monument construction.
- 60. An examination of the evidence for pre-monument construction activity: is there any evidence for activities prior to the construction of individual monuments, such as agriculture, funerary activity, the building of settlements, or the erection of stone settings?
- 61. Skara Brae: an examination of the sequences of sand accumulation and soil formation.
- 62. Skara Brae: Geophysics to assess the effects of coastal erosion by helping to define the extent of the site along the seashore and the limits inland.
- 63. An examination of local drainage: what changes in local drainage are associated with monument construction, within and around individual sites? What rôle did the construction of drains play in alleviating the potentially negative impacts of new drainage regimes? What effects did new drainage regimes have on soil stability and bearing strength of soil?

#### WHS specific

- 64. Compilation of an inventory of existing bio-archaeological data for the WHS.
- 65. An examination of agricultural history within the WHS: were materials imported to create cultivation beds?
- 66. Analyses of pre- and post-depositional taphonomic history for faunal assemblages in Neolithic cairns and settlement sites.

#### Zone specific

- 67. Production of an agricultural history of the WHS and buffer zones through related techniques such as detailed soil analyses and palaeo-environmental analysis.
- 68. Production of a detailed plan of land boundaries in and around the buffer zones and an examination of their

construction, morphology, functions and meaning.

#### Orkney specific

- 69. The construction of a detailed history of field management strategies in Orkney through hand-auger survey of known deep topsoil areas within West Mainland, in order to provide depth distributions of these cultural soils which can then be related to settlement sites. This should be combined with survey to identify new areas of deep topsoil.
- 70. The location of buried, fossil, plaggentype soils of prehistoric age, as at Tofts Ness, Sanday could be undertaken and related to soil development in the WHS, for example in the wind-blown sand areas of Sandwick.
- 71. The recovery of palaeo-botanical data and an examination of the rôle of plants in prehistoric Orkney.
- 72. Investigation of the date and nature of the deglaciation of Orkney.
- 73. A programme of palaeo-environmental work across Orkney to investigate the environmental history of the Holocene.
- 74. Investigation of sea-level change in Orkney through the Holocene, including information on submerged landscapes.
- 75. The survey of submerged areas to recover information on archaeological preservation.
- 76. Investigation of the faunal history of Orkney with reference to both wild and domestic species.
- 77. Investigation of woodland usage and management during the Holocene.
- 78. The colonisation of Orkney by its mammalian fauna, especially in relation to human migration.

### **Cross-theme**

#### WHS specific

- 79. The production of an enhanced SMR specific to the WHS. This should be on-line and designed for maximum public accessibility.
- 80. Compilation of a database of all existing geophysics work in the WHS. This should be held centrally and

suitable for the addition of new work.

- 81. Compilation of a database of aerial records relating to the WHS in particular.
- 82. The analysis and publication of backlogged research, particularly regarding unfinished excavation projects in the WHS.
- A season of concentrated aerial reconnaissance in Orkney targeting the WHS.

#### Zone specific

- 84. Compilation of a GIS system relating to the WHS and the buffer zones to combine information on field survey, topographical history, monument location.
- 85. Desk-based assessment of the archaeological value of the current aerial records, including both vertical and oblique photographs.

#### Orkney specific

- 86. Establish a research centre for archaeology in Orkney, under the auspices of an Archaeology Institute for the Highlands and Islands: to act as an umbrella organisation for research on the WHS.
- 87. Establishment of a post of community archaeologist.
- 88. Compilation of a database of aerial records relating to Orkney in general.
- The analysis and publication of backlogged research, particularly regarding unfinished excavation projects in Orkney.
- 90. Study of history of archaeological research on Iron Age onwards in Orkney.
- 91. A review of existing evidence relating to the Late Neolithic - early Bronze Age in Orkney, together with targeted fieldwork/artefact-based research in order to investigate this poorly understood period.

### Prioritisation of research

Julie Gibson

This volume has not tried to prioritise research either by theme or topic, or on a

project by project basis. Instead, we have devised a mechanism that takes account of a variety of archaeological, historical and related projects. This mechanism may be used to assess, prioritise and further research. In this way, all types of project can be considered and relevance given to changing priorities. This method accepts that priorities change so that it is not possible to set out here a list of priorities that will last into the long-term future. Instead, the table below outlines a scoring system based on a series of *Threats and Opportunities* which can be tailored to meet the needs of future management.

This strategy assumes that a basic check on sustainability will be considered first. This check should take account of the following factors:

- Is the proposer competent and is the project adequately resourced?
- Does the project offer an enhancement of knowledge and understanding?
- Does the project lead to the destruction of the resource and if so is the destruction necessary, acceptable and inevitable?
- If it is a destructive project, should it be done within the WHS and buffer zones?
- What mitigation strategies are in place to ensure that damage is limited?
- What are the sustainable outcomes of the project?

After this has been done, the following table functions as a mechanism to enable the factoring in of the many elements in order to assist in the validation of a

Threats and opportunities Low – high	Range of options:	Score 1-10
Threats		
- timescale of loss of information	slow/chronic – rapid/catastrophic	
- extent of loss of information	slight – total	
- amount of damage anticipated if no action taken	very little – total destruction	
<b>Opportunities</b> Management Opportunities		
- securing preservation for some time	less than 10 years - perceived as permanent	
- methodological application	limited – wider	
Importance of site/landscape		
- scale of importance	very local – international	
Funding opportunity		
- type	partial – total	
- value for money	bad – good	
Educational opportunities and community access		
- academic quality	poor – excellent	
- academic publication	local – international	
- range of inclusion	community excluded – community participation	
- applicability to WHS interpretation	poor – good	
- range of dissemination	narrow – wide	
Developing understanding (range and depth of applicability)		
- theoretical approaches	poor – good	
- methodological development	poor – good	
- conservation issues and techniques	poor – good	

particular project, or to prioritise competing designs for a project. This table is intended as a guide for those who are working on the development of research projects and also as a guide for those who fund them. It is not a dogma. Using this table to prioritise projects, a project to record folklore in and relating to the WHS might currently score very highly in this table, especially if local volunteers were used, and if the results were sustainable and accessible through the local archives and an internet resource. Where invasive archaeology is involved this system of prioritisation, working together with the sustainable approach, encourages the development of high quality projects offering value for money. Furthermore, it emphasises community participation and the need for widespread access.

### Communication and dissemination

C R Wickham-Jones

Research will inevitably lead to the collection of new data regarding the WHS, but this is of limited value if it never reaches the public arena. Data has to be communicated to be useful. Communication is an integral part of any research project. There are many methods for data communication: publications; lectures: electronic dissemination: use of the media such as radio and television. All have a respectable history regarding information relating to Orkney. Two levels of dissemination are relevant: academic and public. Academic communication comprises more attention to the details of the data themselves; public communication comprises more attention to interpretation. Both may be used by people as they see fit and both are clearly necessary if knowledge and management of the WHS is to advance. Public communication has a clear rôle in education, itself a vital aspect of the archaeological approaches to the WHS.

World Heritage Sites are designated to the benefit of all, including the varied audiences of the future. Given that most people do not have the specialised knowledge of the researchers who work within the WHS, interpretation is crucial to any WHS. This is not the place for a detailed discussion of interpretative techniques, but for the purposes of this document all interpretation can be regarded as education, thus bringing together two powerful tools of communication. As such, interpretation takes place in different places (on-site and off-site) and it takes place on different levels (from the activity group of the primary school pupil, to the tour of specialists).

Archaeologists working in Orkney are generally well aware of the value of public communication and education. Orkney in the 21st century is a society highly aware of the rôle of the past, and most archaeologists who work here have spent time on public lectures, open days, seminars and demonstrations. This is of particular importance in an area such as Orkney where many finds are still made each year by members of the public, particularly within the farming community. This should not be allowed to drop and it could be developed further to include systematic work within the education system, if support be found. At the moment archaeological contributions to schooling are given on *an ad* hoc basis but it is clear that there would be considerable benefit were it to be developed. In this respect, the development of a Young Archaeologists Club in Orkney, which has been given limited support by the Orkney Islands Council, is an important step forward, as are Historic Scotland's proposals for a WHS Ranger Service.

Professional communication is important if we are to make the most of our research opportunities. This includes not only preproject communication but also postproject work. The archaeological sites of Orkney (and indeed elsewhere) have been dogged by the failure of many excavators to process and publish their results. Yet, if results are not made available to the wider world, the site is lost. It is not uncommon in the early 21st century to meet professional archaeologists who know nothing of the rich midden and artefactual remains of Neolithic Orkney, simply because of the failure to publish a few key sites. As we have seen, the Heart of Neolithic Orkney plays a crucial rôle in our understanding of its times and this is a situation that must be rectified. It is, at the time of writing, approaching solution with the publication of the Barnhouse volume, and work on the 1970s excavations at Skara Brae is once again underway, but there are still other sites to be published and professional archaeologists must be careful to ensure that this state of affairs does not happen again.

Interpretation relies on research to provide the data which it will work into information. It is fluid, constantly changing as new research gives precedence to new ideas. Interpretation is nothing without research, but it will stagnate if not fuelled by criticism and questioning, both of which rely on access. There is thus a vicious circle in that a key contribution to research comes from its very audience. When research is placed in the public arena, the enhanced levels of criticism and questioning that result themselves play vital rôles to ensure that interpretation remains meaningful and moves forward. For interpretation to be of maximum benefit it is thus essential that it can take account of change: whether this is in the renewal of text on interpretation boards; the regular updating of guidebooks; new lectures; ongoing training of interpreters; or the devising of new workshops. These are all vital to the success of the WHS in Orkney.

### Logistics and funding

C R Wickham-Jones and Jane Downes

Previous research agendas for other areas (eg Brown and Glazebrook 2000) have emphasised the necessity for research initiatives to work together. Isolated research projects can lead to duplication and redundancy, or limited information. Research in Orkney is generally strong on cross-institution and cross-discipline

collaboration. The Mine Howe excavation project, for example, makes use of specialists from Orkney College and Orkney Archaeological Trust, the University of Bradford, and the National Museums of Scotland as well as various individual consultant archaeologists. Funding for projects such as this is drawn from a complex suite of grants including research grants, local authority money and national funding from bodies such as Historic Scotland. Projects like this are not unusual in Orkney and they have an enhanced value. One aim of this Research Agenda is to promote the continuation and further development of that ethos by bringing together scholars of different disciplines from a variety of institutions as well as independent researchers.

Careful project design is obviously central to the success of any research. No matter what the scale of a project, precise questions and targeted work are essential in order to base it on a sound design. This extends to the actual undertaking of the project. Vigilant project management and monitoring are vital parts of any project whether it be a student thesis or a large scale excavation and interpretation exercise. It is also important that the initial design includes all stages of research - for instance, an archaeological project runs from desk-based research, through field investigation and post-excavation to publication, artefact conservation, the formation and storage of an archive and the deposition of material in a museum. The construction of comprehensive project archives and their deposition in a central point, such as the Orkney Museum, or the NMRS, provides a vital source of data for future generations. Once destructive excavation has taken place archives provide the only means for testing or enhancing interpretation; they should thus incorporate access to more recent work.

Financially, past archaeology has been both rescue- and research-led. Both the impetus for projects and the sources of funding have been divided. Rescue work took place because a resource was under threat, whether by developers or nature,

and it was funded either by the developer or by national bodies such as Historic Scotland. Research work, on the other hand, was driven by the desire to fill perceived gaps in archaeological knowledge and usually funded by money from a variety of places including national and local research bodies, as well as national and local authorities. In reality, the perceived importance of Orkney as an archaeological resource has been such that research has always played an important rôle even where considerations of destruction were the main stimulus for work. Today, the concept of sustainability and the requirement to make best use of scarce resources render such a distinction unhelpful and it is likely that future projects will make use of funds drawn from a wide and varied field.

Funding is one of the most obvious logistical factors to affect research in the WHS. Quite apart from the various potential sources of funding for archaeology, an important concept here is the oft quoted 'value for money' that is so important to agencies such as Historic Scotland. It makes sense to ensure that funds are used carefully so that both data and interpretation can be maximised. Nevertheless, it can be difficult to define what, precisely, individual agencies mean by 'value for money'. Indeed, different funding bodies may well judge it in contrasting ways. Historic Scotland note that post-project review should be an integral element of any value for money assessment, and have set out the following criteria for any one project (Historic Scotland 1996): it must be necessary; it must be done at an appropriate scale; it must be well planned; it must be efficiently executed; it must be well and promptly reported; it should not be overly complex; it should not be overly intensive.

Larger archaeological projects can sometimes involve single organisation funding, such as the contract work funded by Historic Scotland which covers the investigation of findings of human remains by a commercial archaeology unit (at the time of writing, AOC (Scotland) Ltd). Developer funding is another example of single-organisation funding for an archaeological project. It is, however, an infrequent source of major funding in Orkney. Commercial pressures here, as elsewhere in Britain, tend to make it hard to maximise the potential of such work. Many projects, however, work to a package of funding including money from Historic Scotland, Orkney Islands Council, and research funds. Work such as this currently includes both university projects and projects run by commercial units.

The smallest scale of project might comprise an individual research student, working on a closely defined project for a student thesis. In some cases students work with minimal funding - just enough to finance travel and accommodation; other students use money from one or other of the research bodies, whether they be university specific funds (eg the Munro Fund of the University of Edinburgh) or medium research bodies (eg the Society of Antiquaries of Scotland), or larger Councils (eg the British Academy). Some students gain partnership funding, such as a University grant plus money from Historic Scotland, and this is especially useful for wider projects such as PhD theses. Other students come to work on training excavations such as Mine Howe. Excavations like this (funded by a wide package, see above) provide important teaching opportunities not only for young professionals but also for volunteers who, while they do not intend to draw a living from archaeology, wish to develop their skills in it. There is an active body of archaeological volunteers in Orkney, coordinated under the aegis of the Friends of Orkney Archaeological Trust. Volunteer work does not just include excavation: post-excavation work is equally important and takes place throughout the year, whether in Orkney Archaeological Trust, the Orkney Museum or for commercial archaeological contractors.

As has been emphasised throughout, research into the WHS includes many disciplines and these can each open doors to different sources of funding. Some projects, as noted above, combine disciplines and thus call on an even broader base of funding. Some of the larger funding bodies, such as the Leverhulme Trust, positively encourage inter-disciplinary work, thus opening the way for more projects of significant international value. There are plans in Orkney for the creation of a research centre for archaeology in Orkney, under the auspices of an Archaeology Institute for the Highlands and Islands. When this comes into existence it will be a useful umbrella body to help co-ordinate funding bids and house information.

It is important that individual research projects do not take place in isolation but rather add to the collective whole. In that way the limited resources that are available for archaeological and historical research can be maximised, and the finite resource that is archaeology can be carefully managed (see p 35). Furthermore, the importance of making findings accessible and publishing results cannot be overstated for it is by this means that a wide research community centred around the Orkney WHS can be maintained and sustained.

### Management

Jane Downes and C R Wickham-Jones

The well-being of the archaeological resource is of paramount importance and to this end Historic Scotland has already produced a Management Plan (Historic Scotland 2001). This Research Agenda has been produced to be used hand in hand with the Management Plan. Research projects such as those outlined above provide two sorts of information: they provide information that contributes to our understanding of the rôle of the monuments at various times in the past; and they provide information on the physical make-up and current conditions of the monuments as well as on any changes that have taken place with time. Both types of information can be played into the management practices in use at the WHS in order to benefit that management. In this way good management can be built up on a broad

foundation of information to assist the well-being of the monuments, as recognised in the Management Plan.

At this point the importance of communication becomes apparent as this can be where the interests of different groups diverge. The formation of the AHRCC was designed to take account of the views of all parties and this has been played into the writing of the Research Agenda. As noted above, Orkney has an active tradition of inter-communication between interest groups and it is important to continue this. The existence of the AHRCC as the most appropriate umbrella under which individual projects can thrive is vital, and it is recommended that this Committee continues to function both as a body which can facilitate communication about projects as well as advise on projects and research directions, and can review and update the Research Agenda.

The quality of individual research projects is of central importance - the highest standards and all relevant techniques have to be employed right through to publication and archiving. This is not to say that all projects should emanate from within the Committee, just the opposite. Outside projects and ideas are necessary to keep up the stimulus that enables management and interpretation to move forwards. The rôle of the Committee is to maximise the context and implementation of any research project. In this context the possible development of a new Institute of Archaeology is exciting, with its potential rôle as a co-ordinator for bodies such as the AHRCC and as a centre for the exchange of information and ideas. While the physical facilities of an Institute would offer important benefits for the storage, processing and analysis of materials, the virtual facilities of a talking-shop are just as important.

Orkney is a relatively isolated northern archipelago and it has both a perceived and a real geographic isolation, which can act as a drawback for researchers from elsewhere. This adds to the value and importance of effective communication. In

this respect an Institute, with a dedicated web of electronic communications, could be a vital lynchpin for the way forward for research in the WHS. Not only might it provide basic information on the locations of information, artefacts, or archives; it could also help to co-ordinate research and avoid repetition and redundancy; and at the same time help with centralised equipment and facilities as well as financial and project development advice. The vision is one where local expertise is tied into outside specialisations, and collaboration between residents and visitors is encouraged to thrive. In this way the shared sense of ownership that lies at the heart of the World Heritage concept can truly flourish.

### Concluding comments

Research is vital to the well-being and development of The Heart of Neolithic Orkney WHS. It may seem from this document that there are many gaps indeed in our knowledge of the WHS, and this is so, but we do know much: otherwise The Heart of Neolithic Orkney would not exist as a WHS. This section has tried to look at some of the realities behind research in the WHS and to set out possible directions forward. It is not intended to be prescriptive, but rather to inform those who have an interest in the area of ways they might undertake research. Only time will tell whether our deliberations of the early 21st century were running in the right direction.