

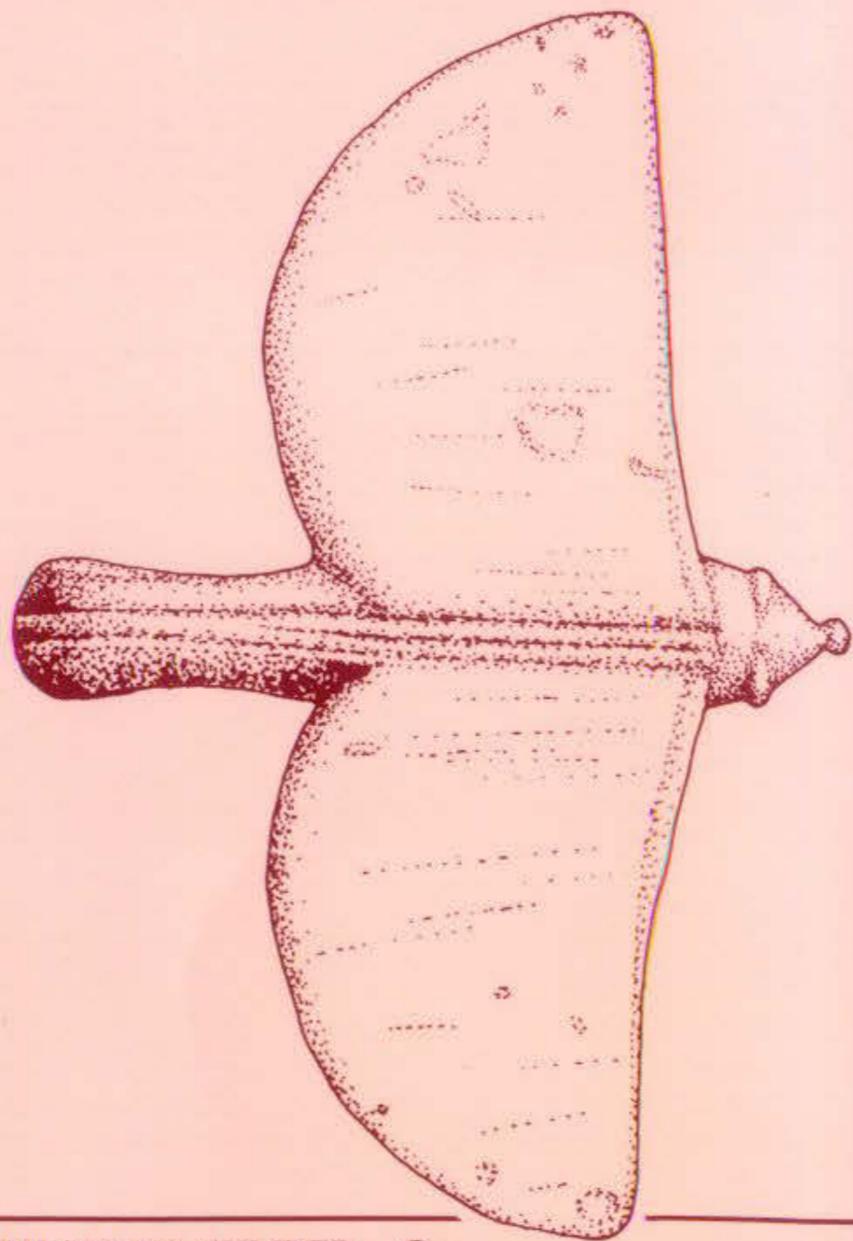
# Howe

four millennia of Orkney prehistory

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edited by BEVERLEY BALLIN SMITH

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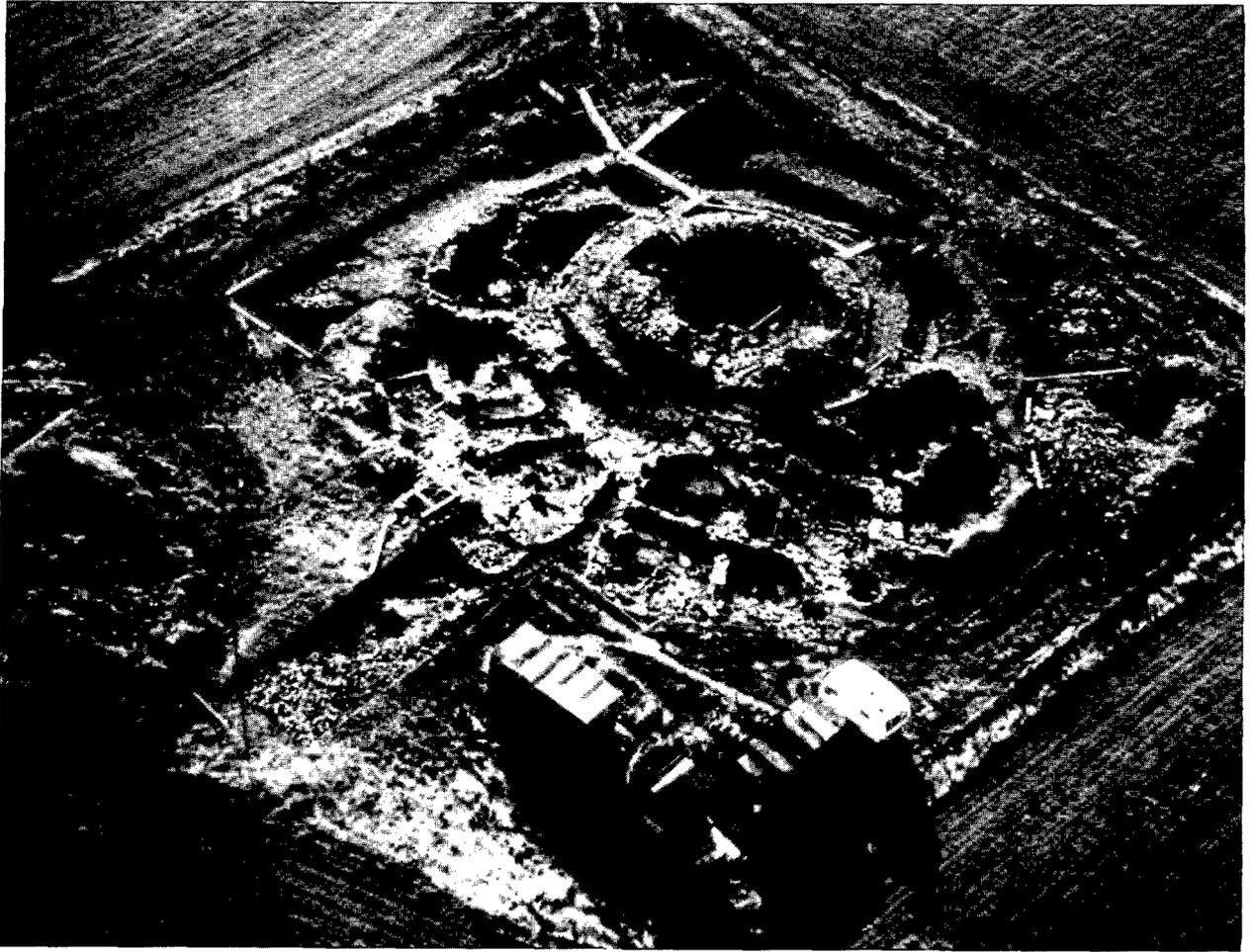
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**HOWE**

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BEVERLEY BALLIN SMITH (EDITOR)

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Frontispiece

Aerial view of the Phase 6 broch within the Phase 7 broch tower and village; from SE.

# HOWE

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FOUR MILLENNIA OF ORKNEY PREHISTORY  
EXCAVATIONS 1978–1982

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BEVERLEY BALLIN SMITH

Editor

WITH

STEPHEN CARTER, DAVID HAIGH & NIGEL NEIL

AND

D BRAMWELL, CAMILLA DICKSON, JULIAN HENDERSON, A KIMBLE  
HOWARD, ALISON LOCKER, DAPHNE HOME LORIMER, JG McDONNELL,  
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AND CONTRIBUTIONS BY

PL Armitage, Juliet Clutton-Brock, the late Geoffrey Collins, Josephine Constantine,  
GS Cowles, David M Ferguson, CJO Harrison, the late Richard Hattatt, Martin Henig,  
the late GWI Hodgson & Tim Holden

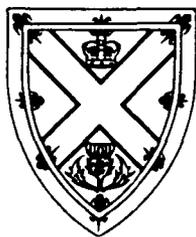
ILLUSTRATION AND PHOTOGRAPHY  
MICHAEL BROOKS, FRANK MORAN & ALEX RIGG

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SOCIETY OF ANTIQUARIES OF SCOTLAND  
EDINBURGH 1994

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MONOGRAPH SERIES NUMBER 9



SOCIETY OF ANTIQUARIES  
OF SCOTLAND

MONOGRAPH SERIES

EDITOR ALEXANDRA SHEPHERD

This volume is published with the aid of a generous grant  
from Historic Scotland and a grant from Orkney Islands Council

British Library Cataloguing-in-Publication Data.

A catalogue record for this book is available  
from the British Library.

ISBN 0 903903 09 1

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Produced by Alan Sutton Publishing Limited, Stroud, Glos

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Specialist sections by Beverley Ballin Smith (BBS) unless otherwise stated.

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## ACKNOWLEDGEMENTS

---

The scale of the excavation, the post-excavation work, the specialist reports and the writing and compilation of this publication, necessitate that the acknowledgements read like a list of credits for a major feature film. For this reason, the excavation staff and volunteers and the contributors to this volume are listed separately after the acknowledgements. To all of them, whose contributions are both great and small, grateful thanks are given.

Howe began in 1978 under the direction of JW Hedges and the first debt of gratitude is owed to him for beginning this most important excavation. Stephen Carter, David Haigh and Nigel Neil played major roles in shaping the results of the excavation and this publication. They helped sort out the many problems, and for their wisdom and insight, they are especially acknowledged and thanked.

Without the help and continued financial support of the Historic Buildings and Monuments Directorate, now Historic Scotland, this project and report would not have been possible; this monograph is published with the aid of a grant from Historic Scotland. Warm thanks are extended to members of its staff for their help and advice throughout the project: first and foremost to Patrick Ashmore, who saw the project through from the beginning to – almost – the end; to Noel Fojut and to Olwyn Owen, to whom fell the final responsibility for reaching the publication stage.

Other financial assistance was also generously given by the Manpower Services Commission and Orkney Islands Council, who kindly funded personnel for post-excavation work.

Specialist contributors to this volume are many and diverse, and gave their time and energies over a considerably long period. Catherine Smith, Andrewina Ross, Dr Gerry McDonnell, Daphne Home Lorimer, Alison Locker, Kimble Howard, Julian Henderson, Camilla Dickson and Dr D Bramwell are to be thanked for their specialist knowledge, hard work, patience and understanding. An additional list appears below, requested by the specialist contributors to this volume, of their own thanks for assistance and help, but Dr PL Armitage, the late Geoffrey Collins, Josephine Constantine, Mr GS Cowles, David Ferguson, Dr CJO Harrison, the late Richard Hattatt, Dr T Holden, the late Dr GWI Hodgson, and the late Dr RBK Stevenson deserve special mention.

Thanks must also be given to the photographer Mike Brooks and the artists/illustrators Frank Moran and Alex Rigg, who worked many long hours with difficult material to produce the results published in this volume.

Much useful advice, information and discussion have also come from the following: Ian Armit, Trevor Cowie, Barbara Crawford, James L Davidson, Steven Dockrill, Sally Foster, Andrew Foxon, Audrey S Henshall, John W Hedges, John Hunter, Raymond Lamb, Ewan MacKie, Graham Ritchie, Ian Ralston, Anna Ritchie, Niall Sharples, Ian Shepherd and Carol Swanson.

Mr Bertie Reid, the landowner, gave permission for the site to be excavated and gave considerable assistance during the excavation. Colonel Sir RAAS Macrae kindly allowed the use of Binscarth House, for the initial part of the project. Much of the post-excavation processing took place at the redundant South Sandwick School and Orkney Islands Council are to be thanked for the use of the property, and to Mr TW Eggeling for allowing the use of Orkney Islands Council facilities.

Much of the excavation and post excavation work would not have been possible except for the help of three organizations – the Orkney Ancient Monuments squad led by Mr John Drever, and his men, whose help was always willingly given, and invaluable; the Scottish Development Department – Vehicles Division led by Mr William Third, who very kindly supplied transport for the project; and Tankerness House Museum,

especially Bryce S Wilson, Anne Leith Brundle, Jim Park and Tom Muir, who provided much valuable help and assistance.

The post-excavation work would not have been completed without the assistance of Andrewina Ross and the facilities Dr Raymond Lamb made available. Daphne and Ian Lorimer gave every assistance, encouragement and hospitality possible to this author and thanks are very gratefully extended to them.

This author also wishes to express a very heartfelt gratitude, firstly to Mrs Alexandra (Lekky) Shepherd, the editor of the Monograph Series, whose great patience, expertise and advice have helped in the overall production of this volume and secondly to the Shepherd family of Lekky, Ian, Bryony and Sunniva, whose overwhelming generosity and kindness helped enormously during the final years of compilation and writing.

Lastly my thanks go to my husband Torben who gave me the encouragement to persevere to the end!

Beverley Ballin Smith  
Denmark  
September 1993

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---

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- Stephen Carter – Edinburgh  
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The late Geoffrey Collins – Edinburgh  
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Andrewina Ross – Orkney  
    Report and analysis of the pottery  
Alexandra Shepherd – Aberdeen  
    Discussion  
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    Report and identification of animal bone

## SPECIALISTS' ACKNOWLEDGEMENTS

---

Plant Remains: Dr JH Dickson, Mr TN Tait, Glasgow University Botany Department; Miss Elaine Bullard, Andrewina Ross and Richard Chancellor.

Animal Bone: the late Dr GWI Hodgson.

Duncan of Jordonstone College of Art for their facilities.

Also TD Oliver, Stefan Janik, RAD Markham (Ipswich Museum), Tom Muir, Allison Rooney, RW Youngson (Red Deer Commission), Dundee Museums and Art Galleries, MC Sheldrick, and Snicket.

Bird Bone: Eric Meek (RSPB)

Fish Bone: Dr Alwyne Wheeler (British Museum, Natural History)

Non-Marine Mollusca: Dr MP Kerney

Bone artefacts: James Rackham and Birthe Weber

Stone artefacts: Rory Gillies, the Institute of Geological Sciences, Edinburgh, Dr RA Nicholson (Analytical Chemistry Unit, British Geological Survey).

Flint and Chert: David M Ferguson

Metal artefacts: Dr JD Bateston (Hunterian Museum), Dr Sonia Butcher, Dr Mike Parker-Pearson, Valerie Rigby (British Museum), the late Dr RBK Stevenson, Dr JG McDonnell, the late Richard Hattatt, Dr Ian Stead

Slag: Department of Mechanical and Products Engineering, University of Aston, Birmingham

Glass: Research Laboratory for Archaeology and the History of Art, Oxford

Pottery: Susan Mills, Dr Ann MacSween, Peter Wardle, Dr Euan MacKie (Hunterian Museum, Glasgow), Ewan Campbell, the late Geoffrey Collins, and Dr Daffyd Griffiths (Institute of Archaeology, London)

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Others: Orkney County Library

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## EDITORIAL NOTE

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This work has been a long time in gestation; the problems generated by the complex nature of the original excavation have been compounded by the extenuated nature of the post-excavation process, a problem shared by other sites of similar size and complexity. While the efforts to bring this volume to fruition have been part of a co-operative venture, members of the original supervisory team were responsible for preparation of specific sections of the structural text: David Haigh – the Neolithic, Stephen Carter – the Early Iron Age, Nigel Neil – the Later Iron Age and Beverley Ballin Smith – in addition to amalgamating and editing the report – the Middle Iron Age. This volume consequently represents a compilation and the conclusions and opinions expressed are not solely those of the report editor. The Monograph Series editor has added a further assessment of the site which examines some of these opinions and adds further discussion points. It is hoped that in this way a site which has offered a challenge throughout its excavation and post-excavation will have received the full treatment which it deserves.

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## INTRODUCTION

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The excavation at Howe, by Stromness, in Orkney (NGR HY 276109), funded by the then Scottish Development Department (Historic Buildings and Monuments Directorate), now Historic Scotland, was one of the largest and most costly excavations to have been undertaken in Scotland at the time. It began with a short season in 1978 and was completed, after a further four six-month seasons, in 1982. It provided a hitherto unparalleled opportunity to fully excavate the extensive and complex remains of a broch settlement and thereby more fully examine and understand the stages of evolution from roundhouse to massive complex roundhouse, or broch. The ensuing discovery of the earlier Neolithic structures and enclosed early Iron Age settlements added further layers of importance to this rich and complex site.

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### 1.1 • THE HISTORY AND SETTING OF HOWE

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#### RECENT HISTORY OF THE SITE

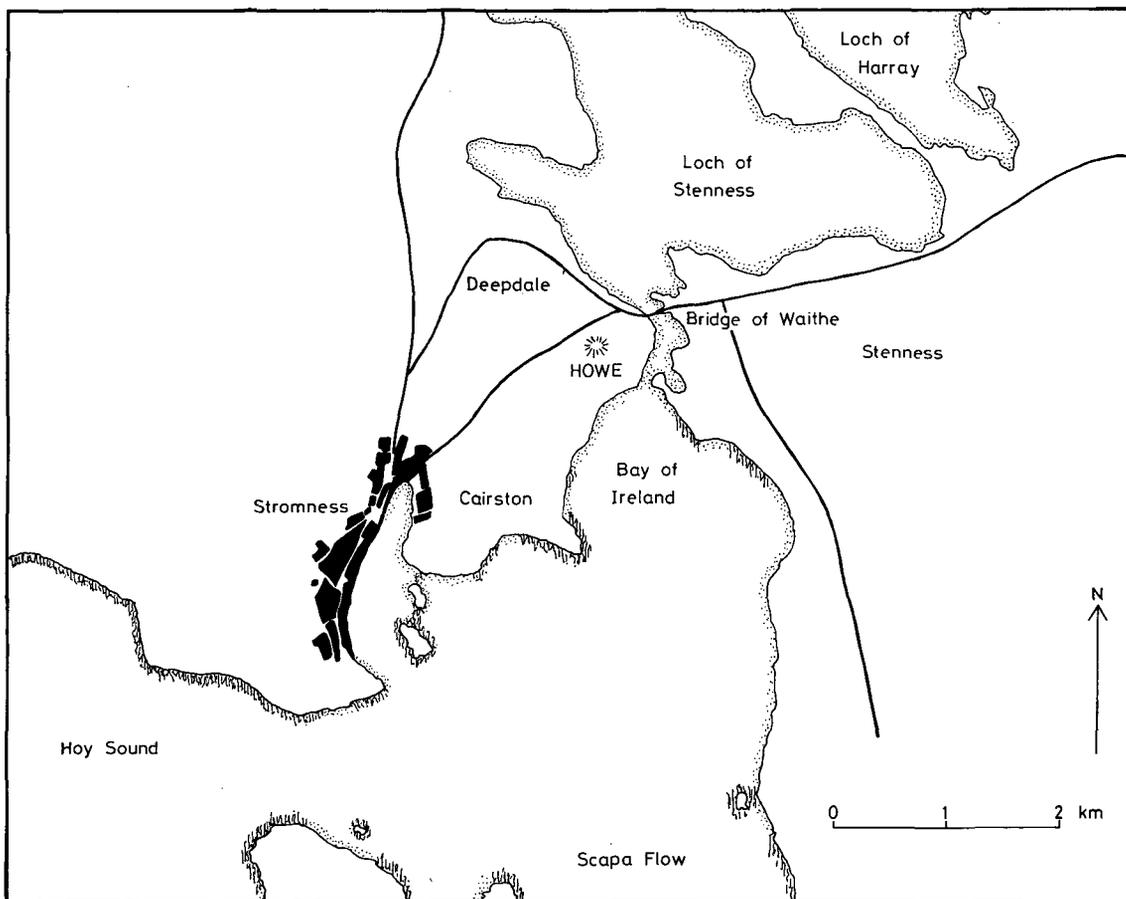
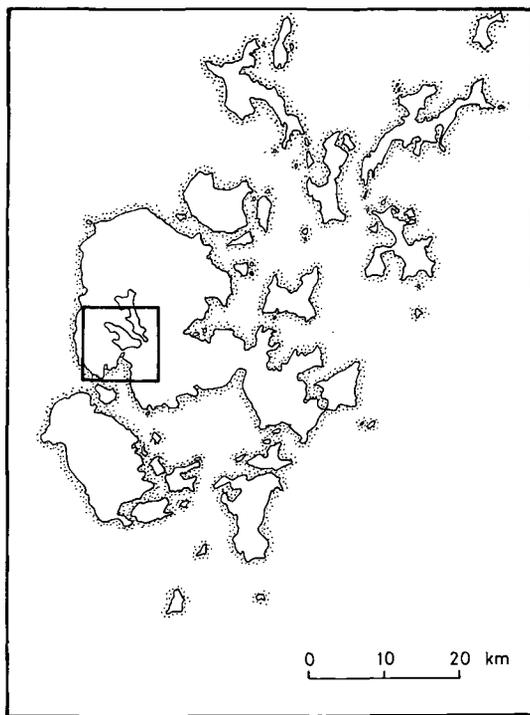
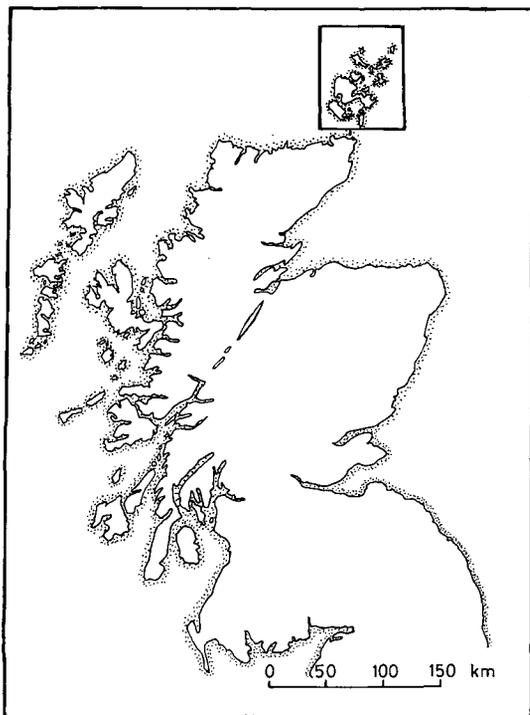
Prior to the beginning of the excavation in 1978, the site was identified as a probable broch in the parish of Stromness (RCAHMS 1946) (illus 1). It was known to have stone walls 'laid out on a definite plan' and had produced evidence of burnt material. Structural evidence from within the mound had been brought to light about the mid 19th century, when it is presumed that the then owner of the Cairston Estate, Dr or Reverend JH Pollexfen MA of Middleton Tyas, Richmond in Yorkshire, investigated the mound. Much of the disturbance of upper levels of the site (6: Phase 9 below) is attributed to him. In 1888, the Reverend Pollexfen donated the finds from the diggings to the Society of Antiquaries of Scotland (1889, 238); these are described in this volume as finds of the 19th Century (8.11 below).

In 1880 the Orkney Name Book (22, Stromness) described the Howe Brough as a 'supposed Picts House', but suggested there had not been a deep enough excavation to determine the exact nature of the site. Although evidence survived on the top of the site of 'diggings' earlier this century, the mound essentially remained untouched and indeterminate until the late 1970s when the present excavations were carried out.

#### HOWE IN ITS NATURAL SETTING

The hillock, or *howe*, of Howe was located in the SW of mainland Orkney (illus 1, 2), in pasture land belonging to the present day farm of Howe. It lies in the Cairston area, in the east part of Stromness parish. The mound was situated at approximately 28m OD on a hillside which gently sloped to the Bay of Ireland half a kilometre to the southeast, and to the Loch of Stenness, the same distance to the north. The Loch of Stenness flows into the Bay of Ireland via the Bridge of Waithe and The Bush and access is then made possible through Hoy Sound to the Atlantic in the west. Access is also possible to the North Sea to the southeast through Scapa Flow. West and northwest of the site, the hillside rises to between 54–65m, but open views are possible to the island of Hoy to the southwest and south, to the west entrance of Scapa Flow, the Orphir Hills to the southeast and east, and to the central, north and northeast areas of the Mainland of Orkney.

The solid geology of this part of Orkney is predominantly composed of the sedimentary derived Stromness Flags which form the lower group of the Middle Old Red Sandstone series. To the W, c 3km away, is a variation in the geology, where metamorphic rocks of the Basement Complex come to the surface as granite (Mykura 1976). An intrusive dyke of camptonite can also be found on the coast, to the immediate S of Howe (Inst Geol Sci map Kirkwall 119 D). The local geology can be seen as low cliffs to the S and SE of Howe bordering the Bay of Ireland, and exposed along the edges of the Loch of Stenness. The sandstones are covered with glacial drift, noticeably grey-brown boulder-clays in the vicinity of Howe, which form a deep till of 50–100cm.



Illus 1  
The location of Howe.

The soils formed on top of the till are part of the Thurso Association and are described as noncalcareous gleys, brown forest soils and brown rankers (Macaulay Institute for Soil Research, Soil Survey of Scotland 1982, Sheet 1). Their present day land capability for agriculture is described as primarily for grassland, with the possibility of occasional cereal crops, depending on the climate, especially the degree of moisture.

Climatic factors, in particular the wind and rain, continually dictate activities in Orkney. The area around Howe can receive 1000–1100mm of rain annually, and the yearly number of gales can average up to 30, mainly from the W through to the SW, and from easterly directions (Soil Survey of Scotland 1982, 9). The low temperatures with a mean annual average of 7.7°C, combined with the precipitation, produce high humidity and low evaporation rates. In the middle of winter, hours of sunshine rarely exceed six, but these negative aspects of the climate are offset by the prolonged daylight hours in the summer months, little variation in daily temperature, and few days of frost or prolonged snow. The maritime situation of Orkney dictates the climate, which has been described as ‘hyperoceanic’ (Berry 1985, 18).

The climate, including salt-laden winds from the Atlantic, has been of considerable influence in hindering the natural regeneration of trees since prehistoric times and none exist in the area around Howe. Natural vegetation is confined to the local cliffs, loch edges, and to the upper parts of neighbouring hills where maritime and heathland communities exist. The land immediately surrounding Howe is under grass with occasional barley in adjoining fields.

The land-based habitats surrounding Howe support very few varieties of terrestrial animals, and of these only mice, shrews, and possibly the Orkney Vole are considered native. The status of the latter is debatable as it may have been introduced into Orkney in the Neolithic period. Other animals have been introduced more recently into the island group and do not affect the Iron Age assemblages of mammal bone at Howe, unless as intrusive species. The grassland around Howe supports both dairy cattle and sheep, and the mound itself carried nesting starlings, Orkney Vole and field/wood mice and the occasional rabbit.

In contrast, the marine habitats of both salt and fresh water offer more varied species which would have been available to the inhabitants of Howe. These include otter, grey and common seals, fish, mollusca, and passing whales. Birds from a variety of environments, although some from habitats modified over the millennia, must also be considered as part of the natural setting, and as a resource available in the past.

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## 1.2 • THE EXCAVATION

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The history of the excavation began in 1978 when the present landowner and farmer, Mr Bertie Reid of Howe Farm, declared his intention, to the Inspectorate of Ancient Monuments, to level the mound, for reasons of agricultural improvement, in 1981. Consequently, in the late summer of 1978, not long after the completion his investigation of Bu Broch, John W Hedges began the first season of excavation at Howe.

### EXCAVATION METHODS

The rescue excavation undertaken at Howe, from the first investigation in 1978 to the final season of 1982, was funded almost entirely by Historic Scotland (then SDD – Historic Buildings and Monuments Directorate). Preliminary work on the site consisted of a contour survey of the mound (illus 3a), the laying out of a grid system along site N and initial photographic coverage. It was not possible for any prior field walking as the site and the field in which it lay were under grass, grazed by cattle (illus 2).

Four trenches, each 2m wide were laid out N–S in a line over the mound, to later form one of the main sections of the site (illus 3a; 164). The trenches were designated A to D, from S to N, and were later expanded to the E. It was at this point that areas of deep ploughing around the base of the mound were first noted. In 1979, the first of the six-month long seasons, the area opened on the mound was extended, with trenches E to H added to form an open excavation. Baulks between trenches were continuously dismantled during various stages of the first season of excavation. Trench A was excavated as a pilot trench to determine the type of features to be found on the mound, and as a guide to the excavation of the other trenches.



Illus 2

The mound at Howe before excavation; from W.

In 1980 trenches J and K were opened. During this middle season it became clear that the rigid trenches established from 1978 were not workable as the excavation progressed downwards and came in contact with buildings which crossed the trench boundaries. Firstly, Trenches B, C and D over the top of the broch tower were redefined as trench Z. This new trench took in not only the interior of the tower but also its walls. Trenches G, A and H across the front of the broch were amalgamated as the S Area, which later took in B, F and K, and the whole was excavated as an open area. This was also extended S, parallel to the old trench A as trench X. During 1980 the E area between trenches H and J was opened as trench M, and the N parts of the mound were excavated as trench R. During the final seasons of excavation up to and including 1982, small extensions were made to trenches to test the extent of various features, mainly defences, and these occurred in trenches J, X, K and R. The total area excavated was *c* 1436sq metres.

At the end of the 1981 season supplementary funding was requested to excavate fully the sequence of Neolithic remains which had become exposed with the removal of Iron Age features. Unfortunately, no further funding could be obtained as the original strategy of the excavation was concerned only with Iron Age structures. In the final excavation season, the Neolithic structures only were revealed and very few securely stratified contemporary deposits were completely excavated (2.1 below).

The major proportion of the site was excavated totally by hand; only in the opening up of trench R over the defences in the N part of the site was any mechanical help used. From 1981 onwards various elevated barrow runs of scaffolding and planks were used to aid the excavation of areas of the site where access was difficult because of depth. High-sided trailers were positioned at the end of the scaffolding runs, mainly for large stone, which was taken away by the farmer, for purposes of infilling. Otherwise, stone and small rubble were removed to a heap to the SW of the excavation.

## RECORDING SYSTEMS

The site code for Howe was HH, for *the Howe of Howe*, plus the year of excavation, and this is to be found not only in all the site registers but on all the artefacts and samples. The recording of the excavation was organized on the context basis within a given trench or area. The recording procedure was kept as simple but as thorough as possible. Registers with context sheet descriptions were kept for each trench or area and a separate register for the compilation of the total number of contexts and their descriptions was also kept, of which there were 2080.

Small finds, numbering 7882 (given their SF prefix in this text), including samples and individual artefacts, were recorded with all relevant details in a consecutive sequence of numbers in a small finds register. Every small find was also allocated a small find card, compiled from the register to allow for post-excavation data and analysis. Another register was used for soil samples; although initially recorded as small finds, the recording of their processing was kept separate. On average  $2 \times 2$ kg of sample was usually taken from non-stone contexts which was processed under laboratory conditions.

Another register was also kept for all plans and sections drawn on the site. This included a description of the drawing and its co-ordinates, and other relevant details. Plans were predominantly drawn at a scale of 1:20 with detailed drawings of features at 1:10. All sections were drawn at a scale of 1:10 including the main N-S and E-W ones (illus 164), which were recorded as running sections (dismantled with the procedure of the excavation). In all, there were 470 drawings.

At the start of the excavation in 1978, two separate registers were kept for the recording of black and white and colour photographs, but later these were amalgamated. Photographs were taken on two manual 35mm cameras and number *c* 7400. For the first two years of excavation photogrammetry was tried at the site, to help in the identification of walls and features in the difficult conditions of the upper levels. By 1980 photogrammetry was discontinued because it had become too dangerous due to the verticality of some parts of the excavation. Overall pictures of selected or large parts of the site were taken from the top of an *c* 5m high scaffolding tower which was usually kept beyond the trench edges.

At the end of the first two seasons of excavation detailed interim reports on the trenches dug were written and drawn up during the winter months. These also included detailed trench matrices and the beginnings of the phasing for the site. These reports were termed 'Blue Books' and form part of the site archive. In all, 6 were produced, for trenches A & H; D; G & F; Z; K; J, B & M. All except for D and Z were concerned with Phase 8 structures, especially those of later Phase 8 and Phase 9. This detailed information on the Phase 8 structures formed the basis for the understanding of their extremely complicated stratigraphy and phasing.

In a pre-computer age the recording methods developed and initiated by JW Hedges were adaptable, highly successful and efficient, and enabled sufficient cross-linking so that contexts and finds did not become lost in the system. All the site records, the archive, mentioned above are kept in the National Monuments Record (Scotland) in Edinburgh, with the exception of small finds records cards. These, together with with all the finds and some copies of the register and specialist archives, are held in Tankerness House Museum, Kirkwall in Orkney. Howe finds are accessioned from the number 1982.202 HH.

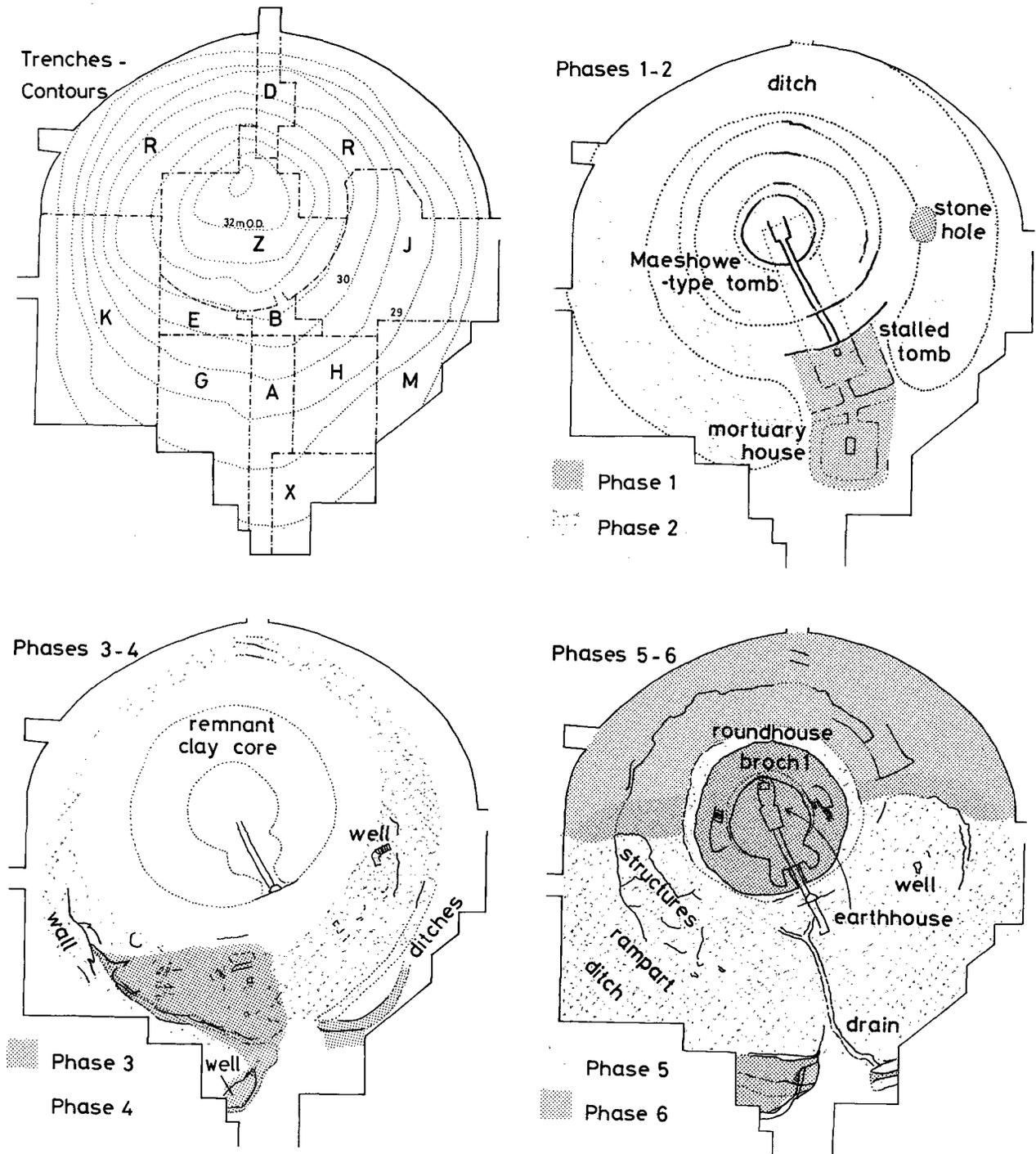
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## 1.3 • THE REPORT

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### THE CHRONOLOGICAL PHASING OF THE SITE

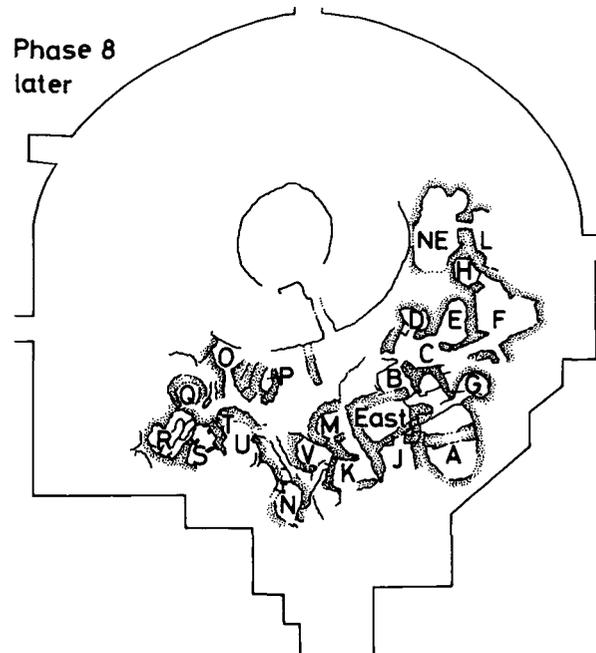
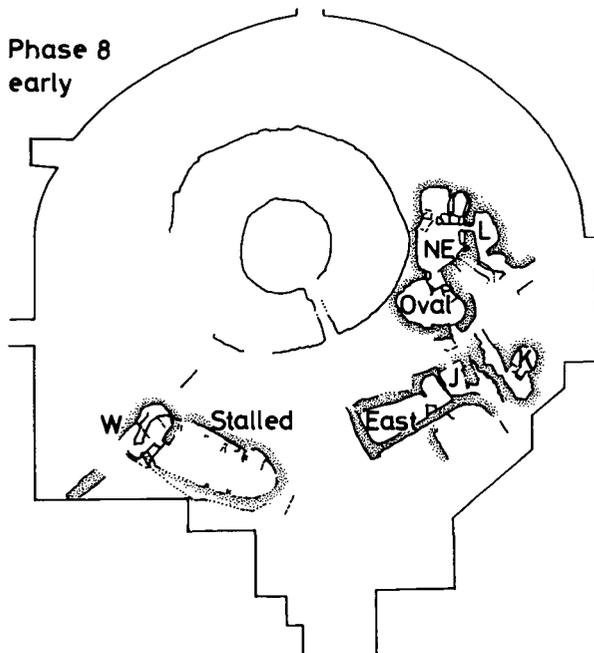
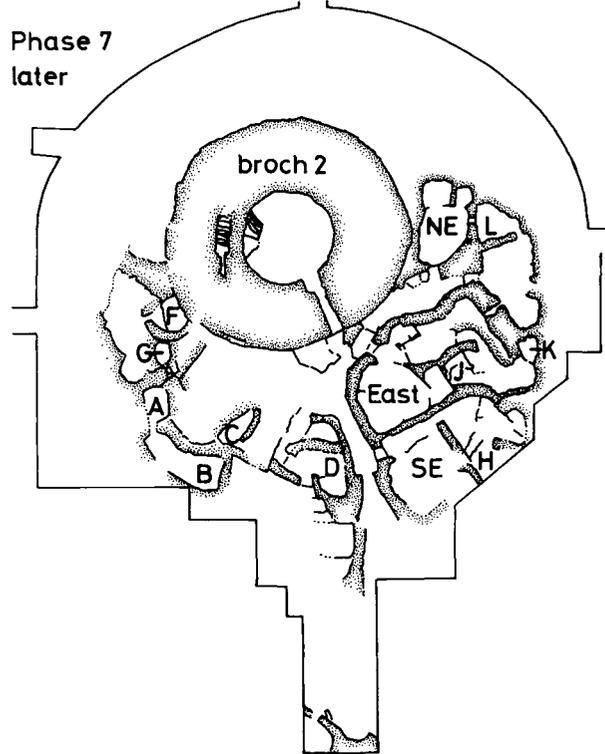
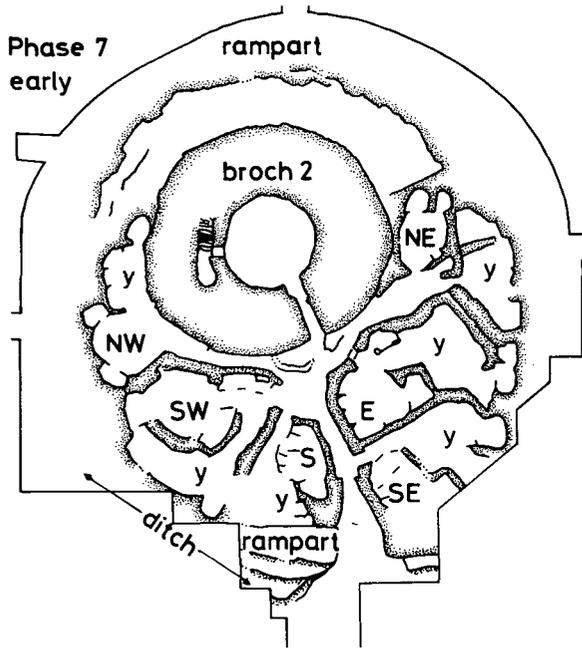
The site phasing, fully established during the post-excavation process, was based on the major building and destruction events of the site. Eight major phases were established with a ninth encompassing recent and unphaseable contexts. Where possible, the phases were ascribed chronological brackets derived from the calibrated series of radiocarbon dates produced for the site; these are discussed in detail in Chapter 10 (below). Throughout the body of this report the dates are quoted in the  $1\sigma$  68% level of confidence used in the processing of the dates. The discussion chapter (11 below) looks at some of the modification of the chronology that interim work has produced.



Illus 3

Site key logos showing a) trench layout and contours; b) Phases 1 and 2; c) Phases 3 and 4; d) Phases 5 and 6;

The report presents the phases in their chronological order rather than order of excavation. It begins with the earliest levels, a sequence of fragmentary Neolithic structures, Phases 1 and 2. (illus 3b). No radiocarbon dating was possible for these levels and their attribution to the Neolithic is based on the incorporation of material of Neolithic type and the nature of the structures indicating tomb types and ancillary structures which compare with others of the period on Orkney. These indicate that earliest occupation of the site must go back well into the 4th millennium BC (Davidson & Henshall 1989, 87-8). The existence of sherds of Beaker pottery suggest some activity, probably around the turn of the second millennium cal BC; but no Bronze Age phase as such



e) Early Phase 7; f) Later Phase 7; g) Early Phase 8; h) Later Phase 8.

could be identified. Occupation resumes in Phases 3 to 4 (illus 3c), attributed by radiocarbon dating to the Early Iron Age, 8th–4th centuries cal BC. Phase 5 (illus 3d) covers the period of the first of three major Iron Age structural complexes on the site, the roundhouse, which has been given brackets of occupation somewhere between the 4th and 3rd centuries cal BC. There was no direct radiocarbon dating evidence for the succeeding Phase 6, the period of the first broch which overlay the roundhouse (illus 3d); extrapolation from the putative end of Phase 5 and the earliest dates for the subsequent phase 7 broch put its construction and occupation somewhere in the 2nd and 1st centuries cal BC.

Phase 7 represents a major part of the information from the site as it was the most massive and best preserved of the structural complexes on the site, overlying, and partially destroying, the earlier period evidence. Again, brackets only can be given to the phase, 1st to 4th centuries cal AD, covering a number of periods of collapse and rebuilding. This major phase has consequently been divided into Early and Late (illus 3e–f), the earlier referring to the construction and use of the Phase 7 settlement and its subsequent levelling and the later to the continued use of some structures, and the building of new, up to the last major collapse of the broch tower.

The subsequent Phase 8, the period of the settlement characterised as the farmstead, covers a period of 4th to 7th or 8th, if not 9th, centuries cal AD. It is also sub-divided initially into Early and Late (illus 3g–h), and then into a further 12 Stages. Early Phase 8 covers stages 1 to 4, and later Phase 8 stages 5 to 12. These stages represent the finer distinctions between episodes of rebuilding and relocation amongst the complicated late Iron Age structures.

## THE STRUCTURE OF THE REPORT

Much of the detailed working out of the site story will not be found in this volume; original context numbers do not appear in the text or on the published plans but can be consulted in the archive if such detail is required. A phased layer list appears in microfiche (1:A3–B14), but the matrices have been archived because of their sheer volume and size. Detailed catalogues of finds or samples either appear in microfiche (see Microfiche contents list above) or are archived. ‘Key logo’ plans, simplified plans based on the phasing of the site as shown in illustration 3, have been included on the detailed site plans to direct the reader to the location of areas and buildings under discussion and show their relationship to the settlement mound. They also form introductory plans to the later complex phases of the site. The N arrow which appears on all plans, refers to site grid N which lay *c* WNW of Ordnance Survey Grid North.

During the twelve years of preparation of this report many of the specialist reports have been reorganized and rewritten. This was done not only to update information, but to standardize the use of the site phasing and its terminology, and the presentation of information in the light of this. The specialist reports have been divided primarily into two sections – the environmental evidence (Chapter 7) and the material culture (Chapter 8). Both sections are preceded by an introduction (7.1; 8.1) summarising the results of the specialist analysis. By this means, it is hoped that the important results gained from the site, will be both accessible and clearly demonstrable.

Within this publication, all small finds (SF) or samples are referred to by their original numbers; finds illustrations have not been given a separate numerical sequence. The retention of the original SF numbers throughout is intended to avoid complications and ambiguities when dealing with such a large mass of material: the archive, finds catalogues, this report and the finds themselves, thereby retain their unbroken connections.

## TERMINOLOGY

Some stratigraphy lay between two phases or covered a time scale of more than one phase, and these have been referred to respectively in the following way: Phase 5/6 or Phase 4–6. However, these complications only cover either single or small groups of contexts.

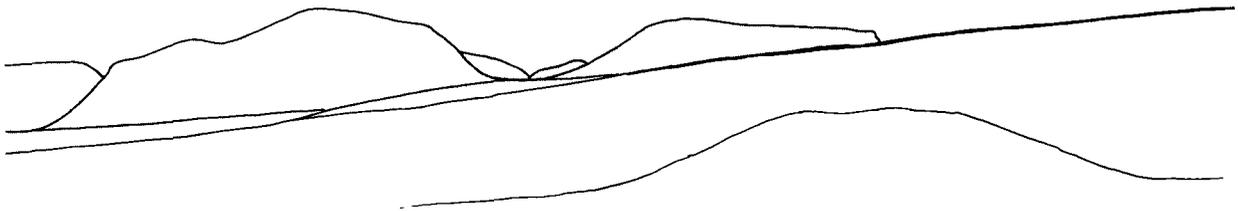
During the excavation many of the early Phase 7 buildings were referred to by a letter denoting their direction, for example the ‘**SW** building’, or later by an adjective such as ‘**oval**’ or ‘**stalled**’. This method of reference has been maintained in the structures reports and extended where possible. From late Phase 7 and to the end of early Phase 8, buildings or single rooms within buildings, have been described using the letters **A** to **L**. This type of nomenclature was repeated from stage 5 of late Phase 8 because of the number of units, with the letters **A** to **V**. The late unphased structures of Phase 9 are similarly, but separately from the previous phases, accorded the letters **A** to **J**.

More generally, the terminology for the developmental stages of the substantial Iron Age structures is expressed in the form used throughout the excavation and post-excavation work: roundhouse (Phase 5), Broch 1 (Phase 6) and Broch 2 (Phase 7). The need to redefine terms to avoid the historical inferences

which the use of *broch* implies are noted in the discussion (11.1) below, but a substitution of newly established categories at this stage was felt to further complicate rather than aid understanding of the sequence.

The term 'Pictish', as belonging to the historical Pictish kingdom is not used in the main body of this report, neither is the word 'pictish' as denoting any cultural similarities with the Pictish kingdom. All Phase 8 occupation, ie that occurring from approximately the 4th century AD, is described as late Iron Age, thus stressing the similarities of, and gradual change in, structural and cultural attributes from the preceding Iron Age Phases. The wider picture of the place of Orkney within the Pictish Kingdom has been discussed by Ritchie (1985) and Thomson (1987).

Every attempt has been made to avoid confusion in site and placenames. The form of names used follows current usage where possible thus Maeshowe (not Maes Howe) Borwick (not Borthwick) but Skara Brae is retained in its most recognisable form although the single form Skarabrae is the preferred Orkney usage. Likewise 'earthhouse' is employed rather than 'souterrain'. Although Howe itself can be found referred to as 'The Howe' (Davidson and Henshall 1989, 176–7), following the original site name of 'The Howe of Howe', the short version 'Howe' is now most commonly employed and is used throughout this volume.



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## THE NEOLITHIC

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The final season of excavation in 1982 encompassed excavation of the earliest deposits on the site covering two phases (1 and 2) of Neolithic activity. The earliest phase of activity was represented by a pit/setting for a standing stone, a building described as a 'mortuary house' and the partial remains of a structure identified as a stalled tomb; the stone setting lay to the NE of and either predated, or was contemporary with, the mortuary house. This latter structure was remodelled to serve as a forecourt structure at the entrance to the stalled tomb. Both stalled tomb and forecourt structure were levelled prior to the subsequent construction, in Phase 2, of a chambered tomb of Maeshowe type. With the time and resources available, it was not possible to fully investigate all these features or to ascertain whether the standing stone was solitary or formed part of a stone circle.

Little material culture and no human bone were recovered (8.1 and 9 below) from these levels to confirm the function of the structures. Two stone axes and other possible Neolithic stone types were found over the levelled remains of the Phase 1 forecourt structure. Pollen and plant analyses (7.2 below) give some indication of the landscape into which these structures were set; it seems reasonably certain that, by the time the chambered tomb was built, woodland was largely cleared and some pastoral activity established in the area.

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### 2.1 • THE STRUCTURAL EVIDENCE • PHASES 1 AND 2

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#### 2.1.1 • PHASE 1 (illus 4)

A pit setting for a standing stone is possibly the earliest remnant of activity on the site. The first evidence of occupation, to the SW of the standing stone, consisted of a sub-rectangular stone building, identified as a mortuary house, which was partly remodelled to act as a forecourt structure when a stalled building, interpreted as a tomb of the Orkney-Cromarty type, was built to the N. Tomb and forecourt structure were separated from each other by a passage; both contained a stone-lined hearth or cist, but neither was excavated. Further modifications to both structures occurred before they were levelled prior to the construction of the subsequent Maeshowe-type tomb (2.1.2 below).

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### THE EARLIEST EVIDENCE

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#### THE STONE SETTING

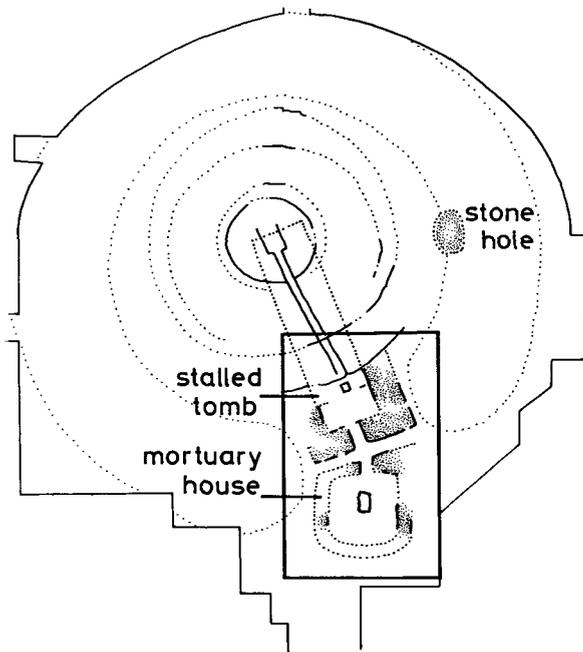
Excavation of the Iron Age levelling deposits below the Phase 7 settlement, revealed a single, large flat-bottomed oval pit (illus 4), filled with stone rubble, chippings and clay. This was a massive pit, 3 × 2m, surviving to a depth of c 1 m. At the N end was a shallow sub-rectangular depression c 1m across containing a single horizontal slab that must have served as a post pad. The size of the pit setting indicated that it must once have contained a substantial standing stone which rested on the horizontal slab. The oval shape suggested that the standing stone had a rectangular cross section and that the shape of the pit therefore provided some indication of its alignment.

The stone may have survived until the early Iron Age when it was removed completely, and the pit filled with rubble. It is also possible that the stone was removed and the pit filled prior to the construction of the Phase 2 tomb. The damage caused to the top of this pit by the construction of the Phase 7 village meant that the date of its destruction must remain unclear.

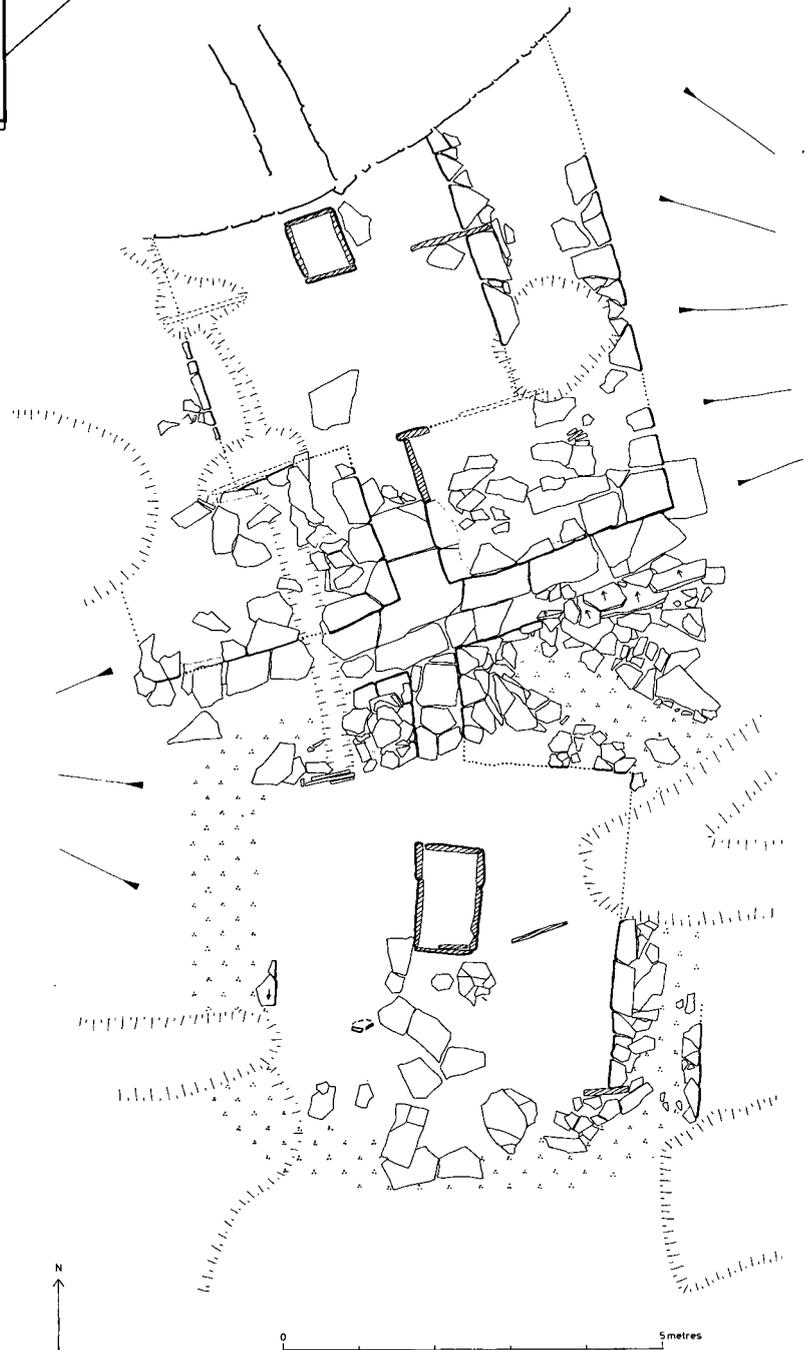
#### THE SUB-RECTANGULAR STRUCTURE

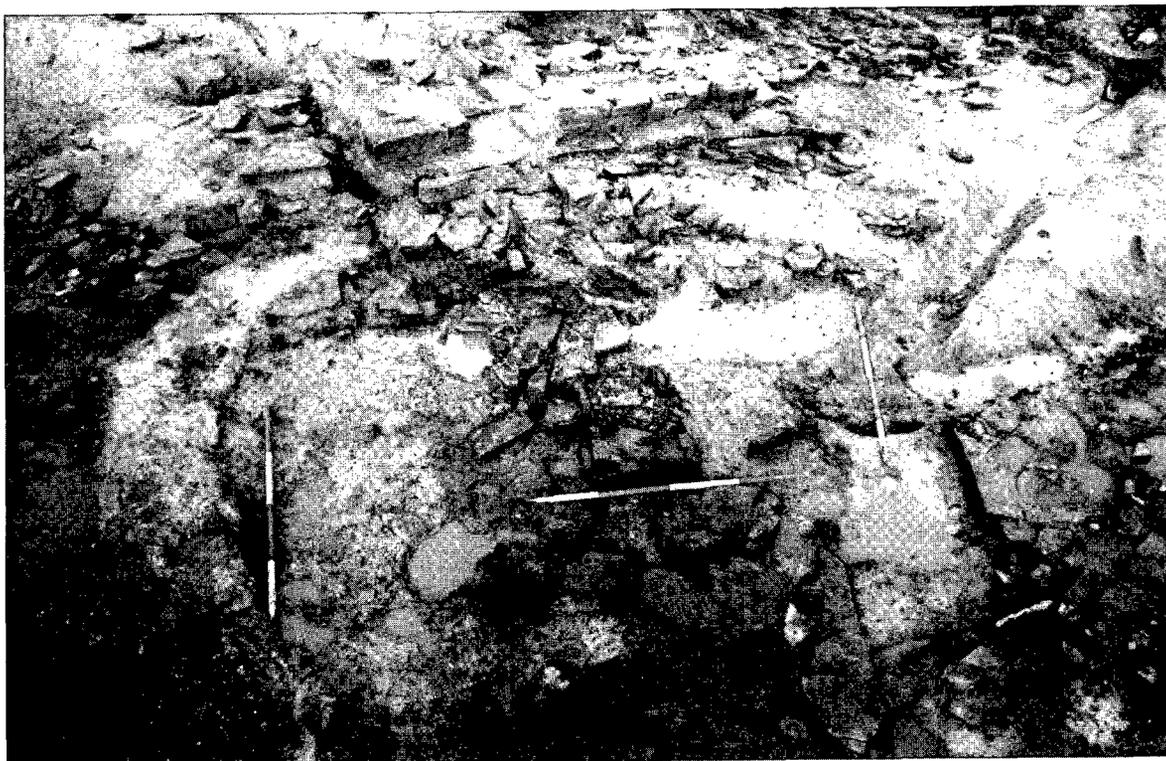
The first substantial building on the site was a sub-rectangular or pentagonal structure (illus 4, 5a) enclosing an area c 4.5 × 5.4m. The walls were 1.8m wide and survived to a height of c 0.25m and consisted of a specially deposited layer of clay, 0.15–0.20m, thick with facing stones on either side. These stones were roughly dressed flagstones cut from the underlying bedrock. It was assumed that the clay was only used to provide a flat, firm foundation layer for a conventional drystone wall above. The layer of clay forming the core of these walls clearly overlay, and was different from, the boulder clay found over the rest of the site, being both paler in colour and also virtually stone free. This paler clay only occurred in this structure and it is suggested that it was obtained from one location and only used during this period of the site's history.

The foundations of the N and E walls survived reasonably completely, but little of the W wall and only the corners of the S wall survived. There was no sign of a doorway although it is



Illus 4  
Phase 1: detail of earliest structural remains; key logo shows position of stone hole.





Illus 5

- a) Phase 1 structure with central hearth and the clay of its wall alignments (revealed but not removed); scales – 2m; from S.
- b) Phase 1 stalled tomb with its hearth, showing the relationship to the Maeshowe-type tomb in the upper part of the picture; scales – 50cm & 1m; from S.



assumed to have been in the S wall because of the orientation of the subsequent tomb doorways. The N wall was particularly interesting; it provided the only clear evidence for the two different phases of this building. Initially the N side of the building was defined by two walls running at 45° from the E and W walls to meet at right-angles at the mid point. Unfortunately the actual junction between the walls was subsequently destroyed during the construction of a new entrance passage during the later alterations. These two walls were identical in construction to the rest of the building as described above. Some of the blocks remained in situ whilst the impressions of others survived where the stones themselves had been removed (illus 5a).

The disturbed nature of the interior made it impossible to be certain of the original internal plan. Traces of the pale clay found within the building suggested that originally it had a clay floor, but the central area showed no trace of it. It is assumed that the original surface was replaced during the alterations to the building when a hearth was either added or rebuilt. Evidence for possible roof supports was limited to the identification of a single stone-lined post-hole, SW of the hearth (illus 4). Others may have existed if the surface had been excavated, and it was unclear to which phase of the building the posthole belonged.

This structure was interpreted as a mortuary structure.

## MODIFICATIONS AND A NEW BUILDING

### FORECOURT STRUCTURE (illus 4)

In the succeeding period the mortuary house was remodelled; this modification took place at the same time as a new structure, identified as a stalled tomb (see below), was being erected; the close association of the remodelling of the mortuary house with the construction of the tomb suggested that the function of the former building had changed to that of a forecourt structure.

The two walls which formed the V-shaped N end of the building were now rebuilt as a single wall on a different alignment, to include a paved passage that led directly to the entrance of the new stalled tomb. Presumably the rest of this structure was also modified at this time although the other walls were retained and possibly repaired as there was no evidence for their replacement.

The new N wall was wedge-shaped to adapt it to the change in alignment of the new tomb. It was 1.8m wide at the W end and 3.15m wide at the E. In the centre was a new paved entrance passage which ran through the wall, almost at right angles to the inner face, but obliquely to its outer face and opened directly onto the entrance of the stalled tomb. The quality of the masonry was equal to that of the stalled tomb, and the outer face rose from a carefully laid plinth of thin paving slabs which abutted those of the adjacent building. The two stone plinths formed the floor of a narrow NE/SW cross passage, c 0.8m wide, which separated the two structures and which helped support the weight of the walls above. However, it was unclear whether this passage was roofed.

The inner face of the N wall within the building was lined with orthostats set vertically into a shallow foundation trench and packed with smaller stones as a decorative feature. Following the remodelling of the N wall, the forecourt structure consisted of a rectangular enclosed area, 4.5 × 4m, with a centrally placed hearth aligned on the new entrance passage to the stalled tomb, and presumably with the original entrance to the S still being in use. The hearth was 1.2 × 0.7m, and consisted of upright slabs laid end to end, set into the clay floor. There was, however, no sign of ash or burnt debris round the hearth and it is possible, although unlikely, that it had a different function – perhaps as a cist. Neither this feature nor the area around it were excavated beyond partial cleaning, and no evidence of burnt or unburnt bone was recovered. Although the hearth could have been installed during the remodelling, it is also suggested that it represents part of the elaborate final process which marked the end of this phase of use of the site.

The single identified stone setting mentioned above, may have also belonged to this stage of the building.

### STALLED TOMB (illus 4 & 5b)

Only a portion of the structure, subsequently identified as a stalled tomb, was exposed. It measured 7.85m wide at its S end, and had slightly bowed walls, almost 2m thick. The S wall was the best preserved and contained the entrance passage, 0.75m wide and

2.2m long, that opened into the main chamber which was 4m wide. The walls were similar in construction to the forecourt structure, and consisted of a layer of clay 0.15–0.20m deep, faced on either side with dressed stone blocks. With rare exceptions, only a single course of the stonework survived, and as with the mortuary house, this was assumed to be the prepared foundation for a drystone wall above.

Only the lowest course of the entrance facade survived, consisting of a row of slightly larger dressed stones resting partly on the clay foundation and partly on a plinth of paving stones; these formed part of a narrow paved path between the tomb and the forecourt structure. The same detail was found on either side of the tomb entrance passage. The opposing wall of the adjacent forecourt structure was now rebuilt (see above) almost parallel to the tomb wall and was of identical construction, so that its plinth abutted that of the stalled tomb. Although both walls converged slightly at the E end, this still left a cross-passage some 0.8m wide at the narrowest point, that ran the full width of the two structures and appeared to have been open at both ends. Part of a cup-marked stone (SF 7309) was reused to form part of the tomb facade on the S side of the entrance passage, and this would have been clearly visible within the cross passage. A number of pecked hollows on the face of this stone ran off its edges showing that it had been repositioned here. It is probable that it was originally located within the N end of the mortuary structure and was reused in the adjacent wall during the rebuilding.

The only stall to survive *in situ* within the tomb chamber was embedded in the E wall of the chamber, 2.8m from the entrance, and although it had been broken off at ground level, part of the stone and its packing remained. The remains of the opposing slab, which would also have been broken off at ground level when the tomb was levelled, were finally removed during the early Iron Age, when the drain from the Phase 5 roundhouse was laid across this part of the site, leaving only a clay-filled socket which was not excavated.

On either side of the entrance were traces of two further orthostats, set against, rather than flush with, the horizontally bedded wall face. The orthostat to the W of the entrance passage had been removed during the construction of the Phase 5 Iron Age drain, leaving only the stone-lined socket, the S side of which consisted of several courses of dressed stone blocks forming a single-faced wall. This wall was in line with the inner face of the tomb wall and appeared to be part of the same construction, but the top of the setting had been cut away during the Iron Age and so there was no direct relationship with the rest of the tomb wall face. It appeared that these additional courses formed an especially deep wall foundation restricted to this setting and designed to provide support for it.

The orthostat to the E of the entrance had been destroyed when a Phase 7 stone-lined tank was built on the site. When this was excavated the sides consisted of redeposited clay rather than the undisturbed subsoil and it was assumed that this was a clay filling put into the stone setting of the opposing stall following its removal during the construction of the Phase 2 tomb.

It was not possible to excavate the original floor within this tomb, which must, given the level of the paving within the entrance passage, have been some 0.07m below. Only 4m of the interior projected beyond the later Phase 2 tomb. It was assumed that the tomb had a clay floor and that only the entrance passage was paved.

Although the full length of the stalled tomb cannot be conclusively

demonstrated, evidence revealed in the main N-S section of the site (illus 164) suggests that it was *c* 15m long. The section had been cut down to bedrock in a number of places and this showed that extensive levelling of the hillside must have taken place prior to the construction of the Phase 2 tomb. It is suggested that initially the site was cleared for the construction of the stalled tomb and that the bedrock was levelled at that time.

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## FINAL ALTERATIONS

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### STALLED TOMB (illus 4; 5a; 5b)

After some time, both entrance passages, the cross passage, and the floor of the stalled tomb were resurfaced with a thin layer of clay. A single new flagstone was incorporated into the new floor of the tomb entrance passage, and a second survived amidst later disturbed deposits in the entrance to the forecourt structure. As with the earlier floors, neither entrance passage seems to have been completely paved. Midway between the E and W walls of the stalled tomb chamber, 2m from the entrance, was a small rectangular hearth, 0.8 × 0.6m. It was located precisely at the entrance to the subsequent Phase 2 tomb entrance passage, suggesting that its position had been marked throughout the demolition process (illus 4; 5b). The hearth was formed from four lengths of thin flagstone set on edge in the clay floor, apparently without a stone base. The sides of the hearth were flush with the new floor and in view of the very limited evidence for burning, the hearth can scarcely have been used before the tomb was demolished. It contained a layer of unburnt clay that sealed the remains of the last fire, which consisted of a thin deposit of burnt material lying *in situ* on the clay floor. Neither the stone sides of the hearth nor its clay floor appeared to be heavily burnt, which suggests that the final fire had not produced intense heat and had been rather small. The construction of this hearth is seen as part

of the final deconsecration process prior to the abandonment and careful demolition of the tomb and forecourt structure, and it was possible that the hearth was only used once before being sealed below the clay that covered the levelled remains.

Loose ash and unburnt debris had been cleared from the hearth before it was filled up with fresh clay, and this may have been the source of a thin deposit of ash, burnt bone and clay that lay on the new floor to the S of the hearth. These deposits could not be considered securely stratified as they were directly overlain by disturbed Iron Age deposits containing burnt material. Part at least of these deposits appeared to have been covered by a further layer of clay no more than *c* 0.1m thick within the chamber, which was part of the final sealing of the tomb remains prior to its demolition.

### FORECOURT STRUCTURE

At the same time, the entrance passage to the forecourt structure was resurfaced with a layer of clay and a number of paving slabs. It was unclear what happened within the interior besides the hearth being sealed by flat slabs prior to the demolition of the building.

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## ABANDONMENT OF PHASE 1 TOMB

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There was no clear evidence for the length of use of either building. However, the end of this phase of activity seems to have been triggered by the settling and partial collapse of the E wall of the entrance passage through the N wall of the forecourt structure. This partly blocked the passage and debris had spread across part of the interior. The wall at the SE corner of the passage collapsed onto the resurfaced clay floor, and the lowest courses of this wall remained tilted at the angle from which they had fallen onto the floor of the passage. If the wall had been deliberately demolished these courses would have remained horizontal, and the angle of tipping from ground level implies settling took place over inadequate foundations perhaps on ground

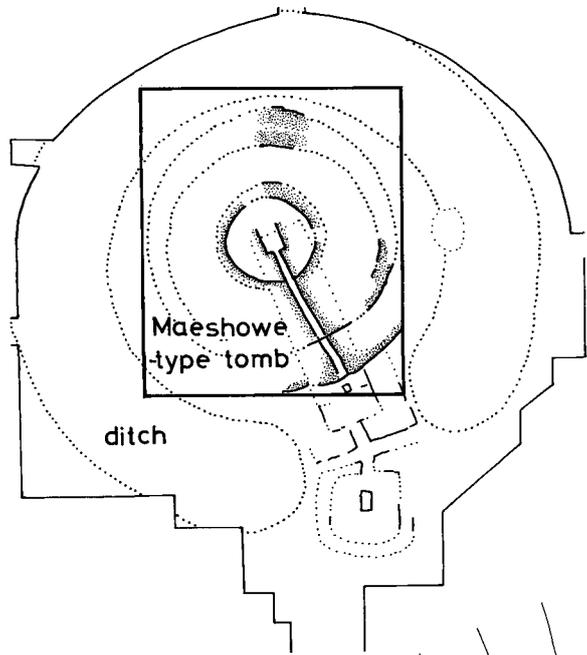
already disturbed by the replacement of the earlier V-shaped wall. Whatever the cause, the complex was abandoned as a result of this collapse and the final levelling of the site left the lowest courses of this wall *in situ* and sealed the rest of the interior to a depth of *c* 0.2m above the original floor level.

This collapse, combined with the relaying of the floor within both buildings, suggests that both structures had already been in use for some considerable time before being replaced. It is suggested that the whole tomb and forecourt were only levelled and replaced by the Phase 2 tomb, when the forecourt structure, at least, was in need of major repairs.

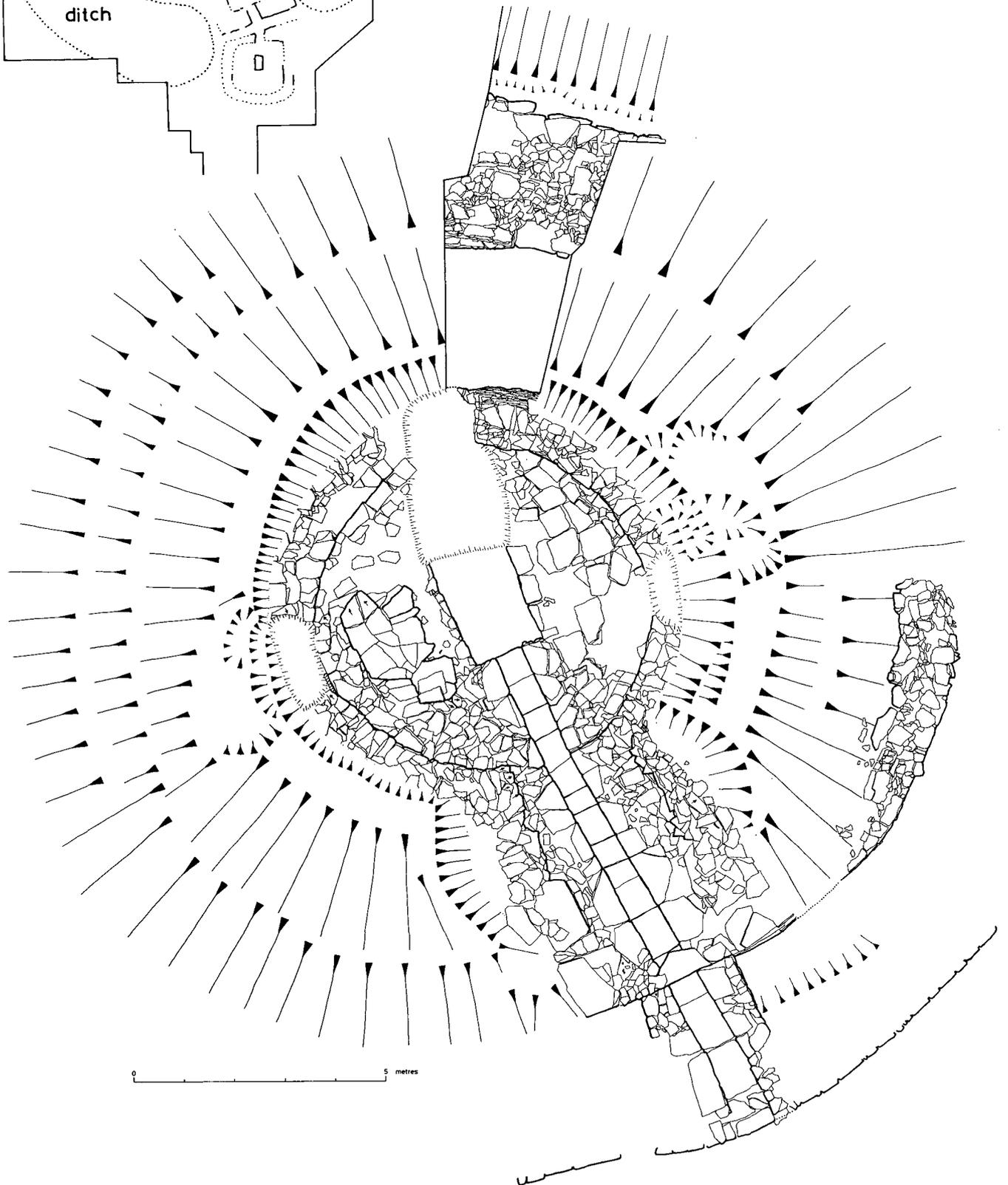
### 2.1.2 • PHASE 2 (illus 6)

The Phase 1 structures were levelled and covered with a layer of clay prior to the construction of the Phase 2 tomb. The design for the new tomb consisted of a round, vertical sided, drystone cairn, with a central chamber, three side cells, an underground cell and an entrance passage. A freestanding retaining wall was constructed around the cairn, for the reception of a clay mound which covered the structure. A stone facade was also constructed either side of the tomb's entrance. The internal features of the tomb survived in a fragmentary state due to subsequent demolition and quarrying in later phases.

The tomb was surrounded by a shallow ditch which left, as a causeway, the demolished remains of the Phase 1 forecourt structure. The post pit, described above, originally lay to the E of this tomb, on the inner edge of the ditch. No Neolithic artefacts were found *in situ*; later activity is assumed to have removed any tomb contents, if indeed there were any.



Illus 6  
Details of Phase 2 Maeshowe-type chambered tomb; key logo shows position of ditch.





Illus 7

a) The Phase 2 Maeshowe-type chambered tomb (top right), showing midden infilling the Neolithic ditch and the remains of the Iron Age defences to the left; scales – 2m; from SE;

b) view along the entrance passage into the Phase 2 chambered tomb; scales – 50cm; from S.



## THE MAESHOWE-TYPE TOMB

### CONSTRUCTION

This structure was built partially overlying the area of the Phase 1 stalled tomb. Its construction necessitated the demolition of the remains of that tomb and the deposition of a substantial clay levelling layer, *c.* 0.1m thick, on which it was placed.

The construction of the tomb comprised a central cairn, covered by a massive clay mound, 19m in diameter, which rested asymmetrically on the N edge of a circular platform, *c.* 25m in diameter, surrounded by a 7m wide and 1m deep shallow ditch (illus 6; 7a). The S side of the platform projected a maximum of 3m beyond the edge of the tomb where it formed part of the entrance facade.

A massive well-built drystone wall formed a double circle at ground level, the inner one around the central cairn and the outer one round the mound itself, linked by the entrance passage and all of one build (illus 7b). The stone cairn was 6.5m in diameter and was not bonded into the inner retaining wall, but appears to have been constructed first, containing the central cells and the start of the 2.5m long entrance passage. The retaining walls, and the rest of the entrance passage of 5m in length, were added, abutting the sides of the cairn, after the sides had risen to a height of at least 0.5m (illus 8a). Only after the central cairn and the retaining wall were completed, was the clay mound built up in the 4m wide gap between the finished cairn and the outer retaining wall, and then raised over the central cairn itself. The outer face of the retaining wall would have been visible at the base of the mound, rising from the ditch that surrounded the tomb, except behind the low stone-faced facade which projected 3.5m beyond the tomb. In appearance the tomb would have been very similar to the neighbouring Maeshowe.

### THE CENTRAL CAIRN, CHAMBER AND CELLS

The central cairn contained a chamber at the end of the entrance passage that was approximately square with a small cell below the floor and three raised side cells. Much of the tomb was destroyed during the early Iron Age, when the Phase 5 roundhouse was built into the centre of the clay mound. The central chamber and the N cell were completely destroyed during the construction of an earthhouse below the roundhouse floor, and only the small underground cell survived. However the masonry core of the central cairn survived up to 0.5m high in places, including the raised floor of the W cell and part of the foundations for the E one.

The floor of the W cell consisted of a single carefully dressed massive flagstone (illus 6; 8b). This was approximately hexagonal and would have been 2.0 × 1.5m. It was 0.12m thick and had bevelled edges. The rest of this chamber had been destroyed, although some of the drystone rubble packing round the cells still survived. By comparison with Maeshowe, the side cells are likely to have been rectangular and about 1.5 × 1.0 × 1.0m and were 0.42m above the floor of the main chamber – assuming that this was at the same height as the entrance passage. The central chamber would have been *c.* 2.5m square.

Below the floor of the central chamber was a small cell 2.0 × 1.2 and *c.* 1.1m high (illus 8b; 8c). Its N wall was destroyed when the cell was enlarged to form an earthhouse during Phase 5, and the S wall lay directly below the end of the tomb entrance passage. The walls on either side were single-faced and of drystone construction built against clay. Each wall incorporated an opening which revealed the 1m thick layer of redeposited clay below the tomb mound. These openings appeared to be deliberately placed directly below the entrances to the side cells above, perhaps to mirror the entrances to these cells. They were 0.6m wide and rose the full height of the walls, and were initially believed to indicate a

lower level of chambers within the tomb, similar to those found at Huntersquoy and Taversoe Tuick (Davidson & Henshall 1989, 123–4, 160–3). It was not possible to remove the overlying tomb cairn material, and therefore each opening was examined with an auger to a depth of 2m beyond the opening. No variation in the clay was found and the idea that these spaces were blocked openings to a lower level of side cells, was discarded.

The inner retaining wall was built against the walls of the cairn with gaps in its inner face to accommodate stones projecting from the sides of the cairn. Although this wall was a uniform 1m in height, and had a width of 1.2m, where it ran round the outside of the mound both varied. On either side of the entrance passage and behind the facade, the outer retaining wall remained 1.2m wide, but elsewhere, where there was no facade to provide additional support, the mound rose directly above the edge of the ditch, and the retaining wall gradually thickened to 2.7m wide on the N side. It would have been at least 1.45m high. Except around the cairn and along the entrance passage where the inner face was vertical, both faces of the retaining wall had a slight batter. Finally the clay mound was added, parts of which survived to a height of 4.5m until 1983.

The entrance passage projected beyond the outer retaining wall through a low clay platform with a dressed stone face (illus 6; 8a–c). This facade was 3m wide at its widest point and narrowed down on either side of the entrance until it ran into the tomb walls. It consisted of a level clay platform that would originally have been *c.* 1m high with a vertical face of dressed stone blocks. Although it had been partly destroyed during the Iron Age, sufficient remained to show that the outer retaining wall of the tomb rested in a shallow foundation trench cut into this clay, demonstrating that the platform had been part of the initial construction of the tomb. The facade, which rose from the edge of the surrounding ditch, was an integral part of the original design of the tomb. This was confirmed by the absence of a break in the sides of the entrance passage where it crossed the outer wall of the central cairn into the platform beyond. The masonry of this outer stretch of the entrance appeared to be of slightly poorer quality, but this was likely to be due to the effects of its exposure during the Iron Age (illus 7b). The surviving slope of the sides of the entrance passage also reflected the shape of the tomb mound after the Iron Age rather than its original slope.

Set into the mound immediately above the retaining wall were the remains of a single-faced wall. It is not possible to be certain that this was of Neolithic date, representing a second stepped support for the mound; it could equally be of early Iron Age date when the tomb mound was altered for a roundhouse.

It was considered essential to examine the clay mound of the tomb and a section was cut through on the N side down to bedrock (illus 6). This provided soil and C14 samples as well as confirming the relationship between the inner and outer retaining walls and the tomb mound and ditch. The inner retaining wall at this point had a vertical inner face which survived to a height of 1m on the W side. This however could not have been the full height of the central cairn walls, which would have supported a corbelled roof over the central chamber and its cells. The total height of this cairn was at least 4m above ground level, and the clay mound would have added at least another 1m to this.

Viewed from the SE, the low facade with the retaining wall rising behind, and the clay capping above, would have given the tomb a high, impressive stepped appearance as it rose above the encircling ditch (illus 7a). From the quality of the masonry that survived it is clear that this tomb would have been one of the finest Orkney Neolithic tombs yet discovered, possibly the equal of Maeshowe in its quality and constructional details.

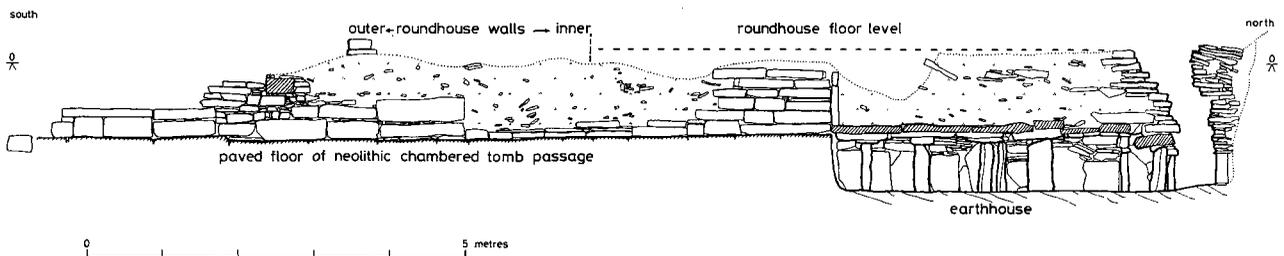


Illus 8  
 a) Entrance passage and surrounding stonework of the Phase 2 Maeshowe-type chambered tomb; scales – 2m; from E;



b) the tomb entrance, cell pavings and underground structure; the Phase 5 earthhouse shaft is to the left; scales – 50cm & 2m; from W;

c) profile of Phase 2 chambered tomb passage showing relationship with subsequent roundhouse and earthhouse.



## MATERIAL FROM NEOLITHIC LEVELS

There is no firm evidence for the dating of either of the tombs; the production of an absolute date from material beneath the Maeshowe-type tomb proved impossible. Few finds were recovered from the Neolithic contexts except for a fragment of a wooden scoop from below the clay of the Phase 2 tomb. However, two stone axes (illus 109), a 'Skail' knife (all of Neolithic type), a pounder, pounder-polisher, 4 flint scrapers, 1 struck flake, 1 flint arrowhead, 4 pumice pebbles and 11 pieces of pottery, were found over the levelled remains of the Phase 1 forecourt structure. These 26 objects represent less than 0.15% of the total artefacts recovered from the site. Environmental evidence in the form of pollen from the pre-Neolithic land surface suggests (Table 1mf, 1:C5) that at the time of construction of the Phase 2 tomb, the landscape was relatively open and some pastoral farming was practised.

There was no artefactual evidence to support the suggestion that the site had been used over a considerable length of time. It was unclear whether this was due to a real absence of artefacts, to later disturbance, to incomplete excavation, or to the scrupulous cleaning of the tombs and forecourt structure prior to each phase of abandonment.

As with the Phase 1 stalled tomb, there was no direct evidence to indicate that the Phase 2 tomb had ever been used as a burial place. The virtual absence of bone and domestic rubbish from the site until the Iron Age was striking, although it is possible that some of the random scatter of human bone from the Iron Age deposits was in fact redeposited Neolithic bone. Alternatively, the absence of human debris from these levels may result from the careful cleaning out of the tombs prior to abandonment and the disposal of their contents in an unexcavated part of the site. Given the obvious care shown over the demolition of the stalled cairn and forecourt structure prior to the erection of the Phase 2 tomb, a careful deconsecration of the site is suggested. It may be possible to link this with the Bronze Age beaker vessel fragments found outside the entrance to the Phase 2 tomb in disturbed deposits. These sherds do not appear to have been associated with any domestic settlement on the site, which is next occupied during the early Iron Age.

Without the firm evidence of radiocarbon dates, it can only be established that the mortuary house predated the stalled cairn, and that both were superseded by the Maeshowe-type tomb. The relationship of these structures to the standing stone suggests that it belonged to the earliest phase of the site. The overall time span for this phase must remain unclear, but it would be expected to fit the estimated parameters for developments of stalled and Maeshowe-type tombs of the 4th to 3rd millennia cal BC.

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## 2.2 • THE NEOLITHIC STRUCTURES • DISCUSSION

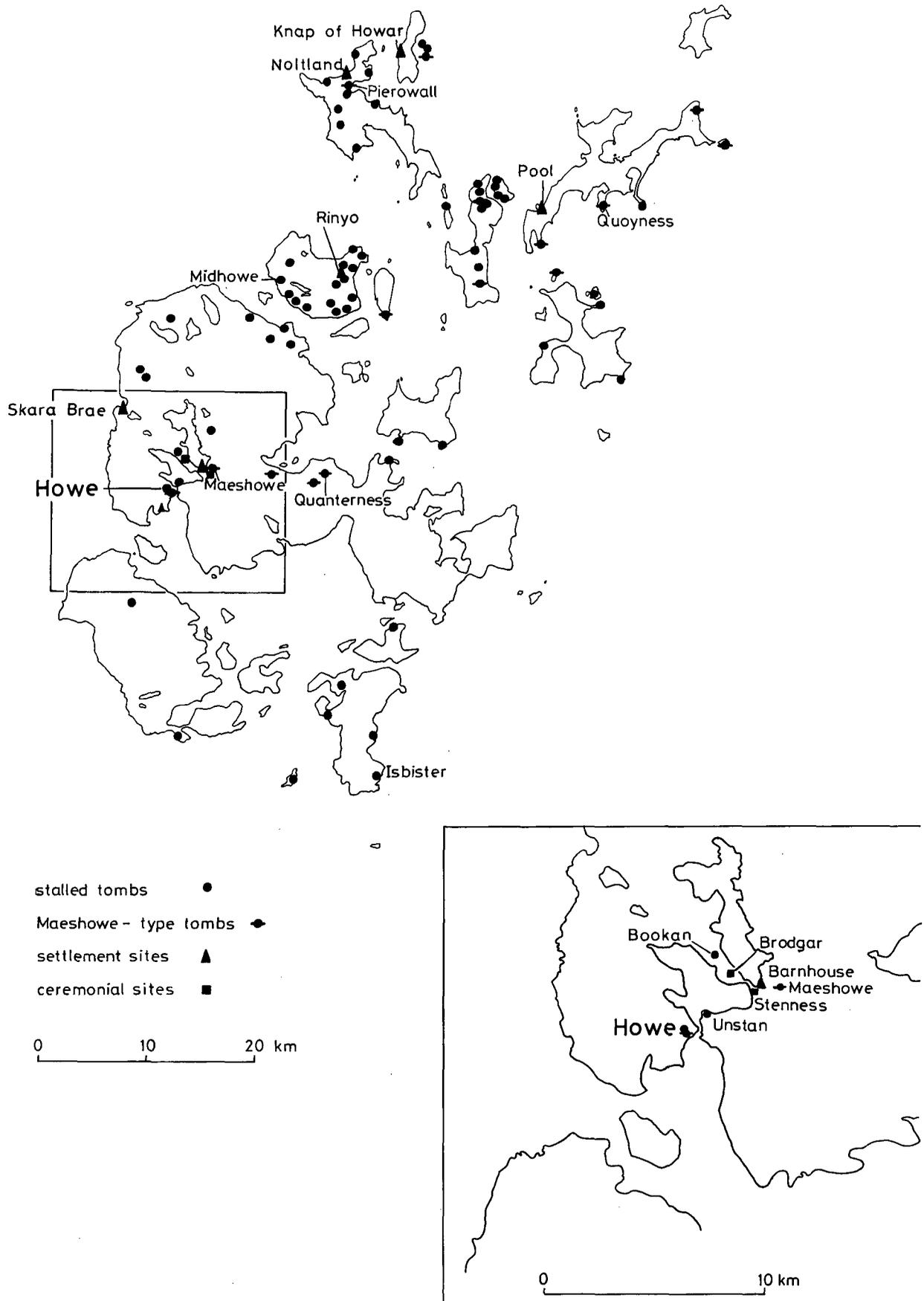
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### HOWE IN ITS NEOLITHIC SETTING

The heavy, fairly wet soil, more suitable for grazing than arable cultivation, may have influenced the original location of the site. It is also likely that the site was chosen because of its prominence within the landscape. Indeed a 19th century navigation cairn on top of the settlement mound remained an important landmark for ships approaching Stromness from Scapa Flow and negotiating Cairston Roads, right up to the middle of this century. The site was clearly visible from all directions except where the hill rose behind it to the NW.

Its location on the hill slope did however mean that, although the closer of the two nearby standing stones (removed in the mid 1970's), at Deepdale, Stromness (Burton 1978), would have been visible, the further stone which still survives, would not.

Prior to the excavation of Howe, the only known Neolithic remains in the vicinity (illus 9) were the chambered tombs of Unstan and Maeshowe, respectively *c* 1km and 4.7km to the NE and the two stone circles with henges, the Stones of Stenness and the Ring of Brodgar, 3–3.5km also to the NE. All these monuments are easily seen from Howe on clear days. More recently, fragments of pottery discovered in the cliff section 1.9km to the S of Howe, at Garson (Lynn & Bell 1985, 1986 & 1988), may indicate that other settlements existed nearby. Other recent fieldwork from 1984, and excavation at Barnhouse in the vicinity of the Stones of Stenness, has revealed a complex of both domestic and ritual structures of the Neolithic period (Richards 1986, 1987, 1989). Richards' field work also produced evidence of further Neolithic settlement close to the shore of the Loch of Stenness 2.5km to the NNE of the site.



Illus 9  
Howe in its Neolithic setting.

These alone are unlikely to indicate the true pattern of settlement during the Neolithic, nor the relationship of funerary monuments to domestic settlement. However, it can be seen that the potential for future discoveries, especially around the shoreline of the Loch of Stenness is quite high (Richards pers comm).

During the earliest period of Neolithic activity at Howe, which consisted of a standing stone and a mortuary house, the site seems to have been a small and relatively open affair, and it is presumed that the location and alignment of the two features were in some way crucial to the activities that took place there. The site's most obvious links are astrological ones, and it is therefore important to view the site as part of a series of related monuments set within the whole landscape, rather than as a single site in isolation.

From the depth of its setting, it is inferred that the standing stone would have been at least as tall as the largest of those at the Stones of Stenness or the Ring of Brodgar, and therefore may have been expected to have stood to a height of *c* 3–4m above the ground. Before the construction of the Phase 1 tomb, the standing stone and the mortuary structure would both have been clearly seen from Stenness, silhouetted on the hill slope, with the deep cleft of the valley of Trowie Glen on Hoy in the distance. The low angle of the midwinter sun would have meant that it would briefly but clearly illuminate the stone above the hill side as it sank below the hills of Hoy. This would have been visible from several kilometres beyond Stenness in clear weather.

The standing stone was probably earlier than the mortuary structure as its prior existence would provide an explanation for the change in alignment of the construction of the succeeding stalled cairn. This early date for its erection is confirmed by the equally awkward juxtaposition of the stone and the Phase 2 Maeshowe-type tomb, which strongly suggests that it was already in existence when the tomb was built.

With the construction of the Phase 1 stalled tomb on a new alignment to the preceding structure, and the remodelling of the mortuary house as a forecourt structure on its existing foundations, the whole emphasis of the site changed. This suggests that the view southwards from the mortuary house through Cairston Roads towards Flotta, was still an important one, even though a new alignment was considered necessary for the stalled tomb. There were two reasons why the new alignment took place: firstly because of the need to avoid the standing stone, and secondly, because for the first time the view over Ward Hill, Orphir, seems to have been considered a vital one.

The cross passage lying between the two buildings may have been important, as it was aligned towards the valley of Trowie Glen on N Hoy, the Harray Hills and the saddle between Ward Hill and Mid Hill, Orphir. Viewed from Stenness, the two buildings would have shown up as low mounds, and perhaps even the cross passage itself would have been visible under exceptionally clear conditions. Given the alignment of this cross passage, it was clear that as at Maeshowe, the setting sun at the midwinter solstice could have shone down it.

The alignment of the Phase 2 tomb faced the saddle between Ward Hill and Mid Hill in Orphir. Toward the *beginning of spring* (observed February 22nd, 1982), the sun rising between these two hills, shone down the tomb entrance passage. The alignment was not quite exact as the entrance passage was slightly to the S of the sun's rise. Had the tomb entrance been complete, it would have confirmed that this allowed only a narrow band of light to penetrate to the central chamber.

It can be argued that these sites were part of a complex of religious monuments that all linked together in the Neolithic landscape: the stone circles of Stenness and Brodgar, with their henge monuments, the tombs of Maeshowe and Howe, the cairn at Bookan and the complex of structures at Barnhouse, Stenness; the standing stones at Howe and Deepdale, and the astrological events recorded from these sites over the horizons defined by the hills and valleys of Hoy, Orphir and the Cairston hills. No other area of Orkney has such a well preserved Neolithic ritual landscape which carefully integrated the religious needs with the natural features. Whatever the reason for the distribution and sighting of these sites, their careful choice of location and alignments was not wholly coincidental. In a landscape where so many different monuments were linked together, these tombs should be looked at, not just as burial places but rather as centres of ritual and religious activity.

## FUNCTION OF THE STRUCTURES

Although referred to as 'the stalled tomb, the mortuary house and the forecourt structure', there was no direct evidence for the function of the earliest phase of buildings at Howe. However, the absence of domestic debris and the implied presence of at least one standing stone, have been taken to suggest that from the first

the site had a religious or funerary rather than domestic function. Parallels to the sequence of early structures at Howe are, however, hard to find. A number of the Orkney tomb sites including Bigland Round, Calf of Eday Long and Holm of Papa Westray North (Davidson & Henshall 1989), have produced evidence of earlier phases of tomb. Beyond Orkney, the closest parallels to the first building at Howe would appear to be with the mortuary houses associated with the earliest of the Neolithic tombs, the earthen long barrows.

Davidson & Henshall, in their recent revision of Henshall's catalogue of chambered tombs (*ibid*, 52), intimated that the first building at Howe was not a tomb and suggested that its closest parallels lay with the sub-rectangular domestic buildings at the Knap of Howar. David Haigh considers that unlikely, not only because of the absence of domestic refuse, but also because of the nature of the link between this building and the subsequent tombs. When the presence of the standing stone setting is also considered, it seems unlikely that the Neolithic phases of the site were ever purely domestic ones.

The relative chronology of the standing stone remains unclear, although it almost certainly predated the stalled tomb, as it provides an explanation for the change in alignment between the tomb and the mortuary house (illus 4). There would have been insufficient room to construct the new tomb on the same alignment as the existing mortuary house if the stone was still *in situ*. A further argument for an early date for the stone, is that once the cairn mound was constructed, the standing stone would no longer have stood out on the hill slope, which is assumed to have been an important factor in its original location here. If its prominent location on the skyline was important, there would be little sense in erecting the stone once the stalled cairn was built.

It was impossible to carry out a geophysical survey of the surrounding area, and the limited extent of excavation of the Neolithic levels prevented confirmation of whether other stone settings existed. However, the arguments in favour of an early date for the standing stone make it more likely that this stone was an isolated one, possibly a landmark, rather than forming part of a stone circle, such as the ones at Brodgar and Stenness, which seem to be late Neolithic features. In 1991 a single large stone socket with its intact packing was found to the rear of Maeshowe. It was a socket for a large upright stone, which has been interpreted as forming part of a stone circle around the tomb (Richards 1991, 73). A drain and paving earlier than the tomb were also found, suggesting the possibility of at least one earlier phase, paralleling some of the complexities found at Howe.

## THE CONSTRUCTION OF THE NEOLITHIC BUILDINGS

Evidence for the constructional techniques used in the erection of the chambered tombs at Howe has added considerable light to the development of chambered tombs in Orkney. Henshall's (1968) classification of Orkney-Cromarty tombs, followed by Fraser (1983), still remains the standard and, whilst recognizing its limitations, was retained by her in the most recent update (Davidson & Henshall 1989, 19–51). The evidence from Howe, however, highlights some of the problems with this classification.

The Phase 2 tomb at Howe clearly fits within the Maeshowe group, which is defined as tombs with a square or rectangular central chamber with side cells, within a cairn with revetments. Included in this group are the tombs of Quoyness, Quanterness, Cuween, Wideford Hill, Vinguoy, Holm of Papa Westray South, ?Pierowall as well as Maeshowe itself. Hedges (1983a) and Renfrew (1979) proposed that tombs like Isbister and Unstan fall within a composite group between Henshall's stalled cairns and the Maeshowe-type tombs, on the grounds that they have both side cells and stalls.

The tomb typology has however, been based mainly on the plan of the central chamber and its side cells, and less attention has been given to the relationship of the ground plan to the covering mound or to the development of each tomb as an entity. This approach was acceptable when few tombs seemed to have had major alterations such as the addition of new chambers, but has become less satisfactory in the face of evidence from a growing number of excavated tombs, which suggests that tombs may have evolved rather than been replaced. Notable examples are the Knowe of Laird, where there was clear evidence of secondary walling within the main chamber, at Wideford and now Howe itself. It was probable that in the former cases these alterations were of Neolithic rather than Iron Age date.

The problem of the use and age of the various outer skins of masonry added to the majority of these tombs is one which has caused considerable controversy. Two recent writers, Hedges (1983a) and Sharples (1984), deny that walls were added as revetments and see these as primarily for emphasizing the massiveness of the tomb as a monument. Childe (1952) and Sharples argued that there was an inherent instability in the original

conception of these tombs – almost vertical-sided towers rising 3–4m within their outer stone rubble cairns. If one looks at the excavated tombs, it can be seen that most of them show signs of severe structural problems, largely the result of the weight of the central core pushing out the vertical sides of the tomb cairn. The most usual method of repair appears to have been the addition of an external masonry skin to the cairn, which often changed the shape and size of the original design, by making the tomb wider, and giving a lower pitch to the top of the whole mound. Tombs which have had revetting added to them include Midhowe, Quoyness, Isbister, Quanterness, the Knowes of Ramsay and Rowiegar (Davidson & Henshall 1989, 30–32). The situation was unclear at Pierowall, where only part of the inner cairn and outer revetment survived. At Isbister coastal erosion may have led to a major redefining of the forecourt area of the tomb within hornworks, changing what was an oval tomb into a crescent-shaped one. Davidson and Henshall claim that the outer skin was part of the original design at Bigland Round, but suggest that at other sites similar wall faces within the cairn reflect pauses in the building process, supporting Hedges' argument at Isbister.

Excavations at three of Henshall's Quanterness/Quoyness tombs revealed a common design of a central stalled chamber with side cells, enclosed within a stone mound consisting of the central cairn with a series of retaining walls. At Quanterness, Renfrew (1979) argued that these walls were contemporary although there were clear breaks in the masonry where they joined the entrance passage. At Isbister, Hedges argued that whilst the revetments were subsequent additions, they only marked pauses in the construction of the tomb. Smith (1989) confirmed by excavation that the outer retaining walls of the Isbister cairn, were double faced, as was the outer revetment of the monument, suggesting, as at Howe, that they were contemporary with the main period of construction (Hedges 1983a, frontispiece & addendum). Clearly the proof for contemporaneity of revetments would have been provided by the junction with the entrance passage, as at Howe, where the revetment and passage were linked without a break to the inner cairn, as a single phase monument. If however, as at Midhowe or Quanterness, there was a clear break, it was a reasonable indication that the outer wall was a later revetment. The state of the cairn behind the revetments would also show whether they had been added as a structural necessity or an architectural nicety. Unfortunately the entrance details at both Isbister and Pierowall, have not survived, but indications at the former site suggest the outer retaining wall to the cairn was part of the initial design (Smith 1989).

Sharples (1984, 115) noted that 'the cairn at Pierowall was intended to be constructed with two revetments and that the outer was slightly different in construction because it was primarily a facade for display'. He explained this by arguing that the tombs had changed function and that a different architectural style was in order, the crucial change being in the monumentality of these tombs. He argued that at 'monumental sites' like Pierowall, the outer revetment would have risen to the full height of the central cairn, as typified by Childe's excavations at Quoyness on Sanday, where both the cairn and its retaining wall stood over 3m high.

At Howe, there is no evidence to show that the outer retaining wall ever rose beyond its surviving height of 1.5m; similarly at Maeshowe, the wall appears to have been buried. From this evidence, it is clear that these later tombs did not regard the outer wall as important. This is not to say that Sharples was wrong to argue that the ideal for the stalled and composite cairns was of a tall straight-sided monument with a low curving roof over the central chamber. However, the evidence of structural weakness provided by the fully exposed examples of these tombs convincingly shows that the additional masonry skins appear to be in most cases later revetments added to buttress walls which were bulging under the weight of the roof. Thus the final form of most of these monuments reflects architectural expediency more than the original architectural intention.

The analysis of tomb construction was clearly in need of revision given the results of the major excavations of the last few years. Barber's work (1992), based on his excavations at Point of Cott, has more recently helped to remedy this lack. At Howe, the stalled cairn, rather than being repaired, was replaced by a new tomb which was so close in style to that at Maeshowe that it was probable that the same builders were involved. Although only two-thirds of the size, it was clear that the problems of mound instability had been seriously examined and that careful attention had been paid to the revetting of the mound from the start. Particularly important here was the evidence that the external retaining wall was contemporary with the initial phase of construction and was conceived as part of the original design.

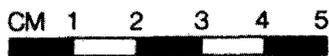
The construction of the Maeshowe mound is uncertain, but given the limited evidence from Childe's (1956) excavations, it appears that there was a different and less stable series of single-faced revetments to the clay mound over the central stone cairn. As at Howe, it was clear that the Maeshowe-type cairn was always

intended to have a covering mound, as can be seen from the construction of the entrance passage, where no break in the masonry was visible at the edge of the central stone cairn until the outer revetment was reached. From the slope of the walls it was clear that they must have been added at the same time that the clay mound was built over the central cairn, as they could not have been freestanding as at Howe. It might be assumed that this outer wall was meant to be exposed, and was only buried following slippage from the mound over the subsequent millennia. However, Childe (*ibid*) showed that the outer limit of the mound was defined by a turf bank and ditch, suggesting that the present diameter was deliberate. It was possible that the mound was raised in two stages, and that the outer retaining wall was only buried when the mound was enlarged. If this was the case one would have expected Childe to have noticed a turf line at the point where the original mound stopped. He did not, and one can only assume that the mound was all of one build.

If it is accepted that the material from the ditch at Maeshowe was used to create the mound, it suggests that the idea of a later date for the ditch at Maeshowe was unlikely. The radiocarbon dates from the ditch were later than those from the other tombs included in Henshall's Maeshowe type, and this has been used to argue that the ditch was a later addition. This seems implausible. It is possible that the ditch was re-cleaned during its use, and that the C14 dates do not reflect the date of its initial construction. However, a far more likely explanation was that this tomb was later than the others in the group.

It is assumed that Howe is later than Maeshowe, because it appears to be a more advanced form of tomb, with the sunken chamber with its blank openings mirroring the cells above, and its altogether more sophisticated construction. No other tombs have the same rectangular central chamber, the original designed long entrance passage, the same exceptional standard of dressed stonework, the raised side cells, and the same use of a clay mound. The enclosing ditch at Howe, an integral part of the design, was excavated partly to provide material for the covering mound, and partly to enhance the tomb itself. The entrance between the ditch terminals would have served as a forecourt enhancing the grandeur of the tomb.

It seems clear that Howe was a more advanced version of the Maeshowe-type tomb, with the errors learnt, rather than a small scale prototype. Given the clear differences between these two tombs and all the others in Henshall's Maeshowe type, it has been proposed that Maeshowe and Howe do not belong there (Renfrew



Illus 10  
Beaker sherd (SF 7377) from the area in front of the  
Maeshowe-type tomb.

1979). Rather than have a Maeshowe class without a Maeshowe, it is suggested that the other tombs which were basically stalled cairns with side cells, Renfrew's Quanterness/Quoyness type, should be added to Henshall's Bookan tombs to form a group of Composite tombs, midway between the Maeshowe type and the stalled cairns. Maeshowe and Howe stand alone as a culmination of chambered tomb design in the Scottish Neolithic, and the late C14 date for Maeshowe supports this.

### USE AND ABANDONMENT OF THE TOMBS

The change in tomb design at Howe from the stalled to the Maeshowe-type reflects changing religious needs, and the design of the Phase 2 tomb indicates that an even more restricted group of people was being served. Certainly the tomb was designed for maximum effect and the forecourt area between the ditch terminals may have now served the same function as the replaced Phase 1 forecourt structure, although no evidence survived of any activity here.

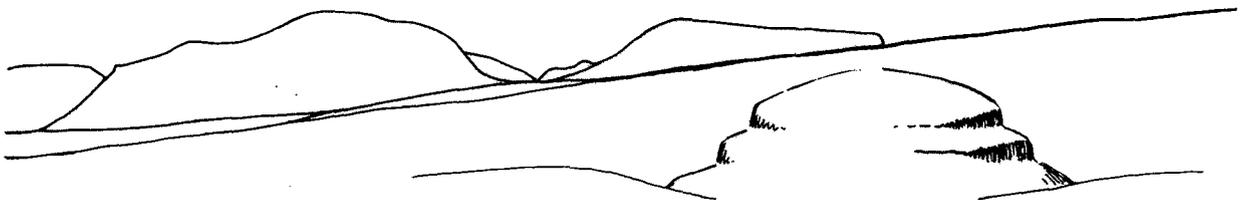
As at other tombs, the absence of human bone has attracted considerable speculation. Only at Quanterness and Isbister have substantial numbers of burials been recovered suggesting that a tradition of selected burial, frequently of already disarticulated skeletons, was the norm. This has been used to suggest that the tombs served a small, select group of the local population. However, given that some tombs appear to have been cleared in antiquity, or were never used as burial places, it is not surprising that the number of burials within a tomb must bear little relation to local population densities. This would suggest that tombs were primarily important as religious foci, and, given the quality of the tombs at Maeshowe and Howe, as status symbols, rather than burial places.

Both Hedges (1983a) and Sharples (1984) have argued that there was sufficient evidence to show that tombs were deliberately sealed, filled in or slighted. Deliberate infilling of chambered tombs has been noted at Midhowe, Wideford Hill, Cuween, Quoyness, Holm of Papa Westray North and Isbister. Sharples pointed to the partial demolition and deliberate levelling of the cairn at Pierowall paralleled at Quoyness, and suggested that this was associated with a general abandonment of chambered tombs as collective burial places. At Pierowall the outermost revetment to the tomb was apparently added to the partly demolished and levelled structure to form a flat platform on which a late Neolithic building was constructed. At Quoyness, Childe (1952) showed that the latest of the retaining walls apparently blocked the entrance to the tomb, and Sharples suggests it was constructed during a partial levelling of the site. It is clear that the Phase 1 structures at Howe were deliberately demolished, and almost certainly this was associated with an elaborate deconsecration process – as the Phase 1 hearths indicate.

There is no evidence for the use of the Phase 2 tomb, none to suggest why it went out of use, nor any to indicate it was slighted prior to the end of its period of use. Was this a tomb which was never used, as has been suggested at Maeshowe, or was this a tomb which was carefully emptied before abandonment? Was this tomb deconsecrated during the Neolithic period as the Phase 1 tomb? The fragments of two Beaker vessels found outside its entrance (illus 10) may mark the end of its importance and the final completion of activities associated with it, as has been noted at Neolithic sites in the NE of Scotland (Shepherd 1986) and elsewhere on Orkney.

### AFTERMATH • THE BRONZE AGE AT HOWE

Given the paucity of evidence, it is very difficult to fit Howe into a Bronze Age setting. Primarily, apart from the fragments of Beaker vessels, there were no other indications of Bronze Age activity on the site. The evidence for continued links between the Neolithic and the Bronze Age are lost, if indeed they ever existed. The preservation of Iron Age material was such that if the site had been settled in the Bronze Age, some evidence would have survived. The amount of modern comprehensive information on other Bronze Age monuments such as settlement sites, cists and burnt mounds in the nearby landscape is sadly lacking. Only the continued use of the Stones of Stenness and the Ring of Brodgar discussed above, is well documented (Ritchie 1976). The Bronze Age setting in Orkney is less clear than that of the Neolithic, and Howe's part in it would appear to be extremely small.



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## THE EARLY IRON AGE SETTLEMENT DEVELOPMENT TO ROUNDHOUSE AND BROCH

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The earliest Iron Age phases on the site (Phases 3–6, illus 3c–d) follow a chronological break after the Neolithic (Phase 2), bridged only by the deposition of fragments of two Beaker vessels. Activities on the site over this period, from the 6th century BC to the start of the first century cal AD, cover the two main areas of the original tomb mound and the outlying ditch. Three main events took place in the area of the tomb mound: stone was robbed from the central cairn and entrance passage of the Phase 2 tomb; a roundhouse was constructed over the remains of this tomb and, finally, the collapse and demolition of the roundhouse was followed by the construction of a broch, Broch 1. Within the area of the Phase 2 tomb ditch, four main events could be recognized: an enclosure gully was dug into the upper fills of the ditch which were Iron Age in date; this gully was then replaced by another similar gully backed by a stone wall; partial replacement of the second gully and wall by a clay-cored rampart and rock-cut ditch was followed by numerous modifications to this rampart and ditch.

Between these two main groups of contexts lay the scattered and fragmentary remains of successive contemporary settlements. Most of the Iron Age structures occurred to the S of the old tomb mound. There is no evidence for major breaks in the occupation sequence of the settlement between Phases 3–6 and it has therefore been assumed that these phases represent stages in the development of a single Iron Age settlement whose plan remained consistent through to Phase 7.

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### 3.1 • THE STRUCTURAL EVIDENCE • PHASES 3–6

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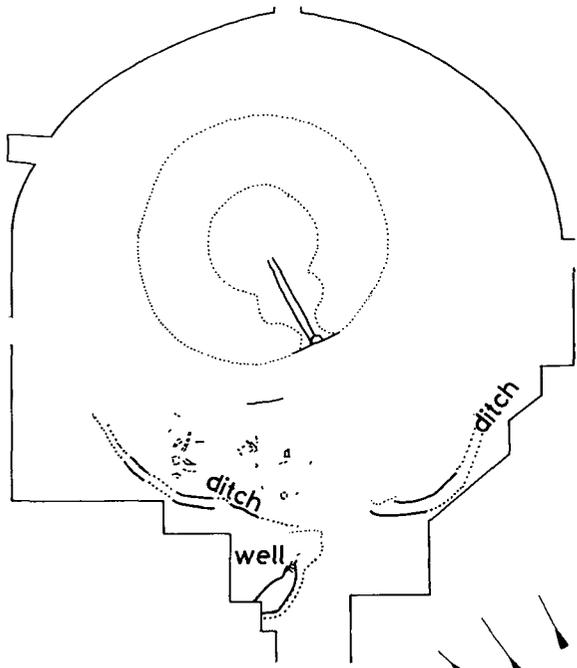
Those contexts that can be assigned to Phases 3–6 fall into two main groups which were rarely linked stratigraphically: the tomb mound and the defences. These deposits and structures, which precede the well-preserved Phase 7 settlement, are difficult to organize into clear constructional phases. This was due to repeated levelling which had destroyed most of the structures and removed the stratigraphic links, and incomplete excavation of the ramparts which made it difficult to correlate information from the excavated sections. The organization of Phases 3–4 was based therefore on a number of key sequences and stratigraphic links. Phases 5 and 6 cover the two superimposed, similar massive circular structures, the roundhouse (Phase 5) and Broch 1 (Phase 6), set into the centre of the Phase 2 tomb which had been destroyed preparatory to the construction of the roundhouse.

#### 3.1.1 • PHASE 3 • THE EARLIEST IRON AGE EVIDENCE

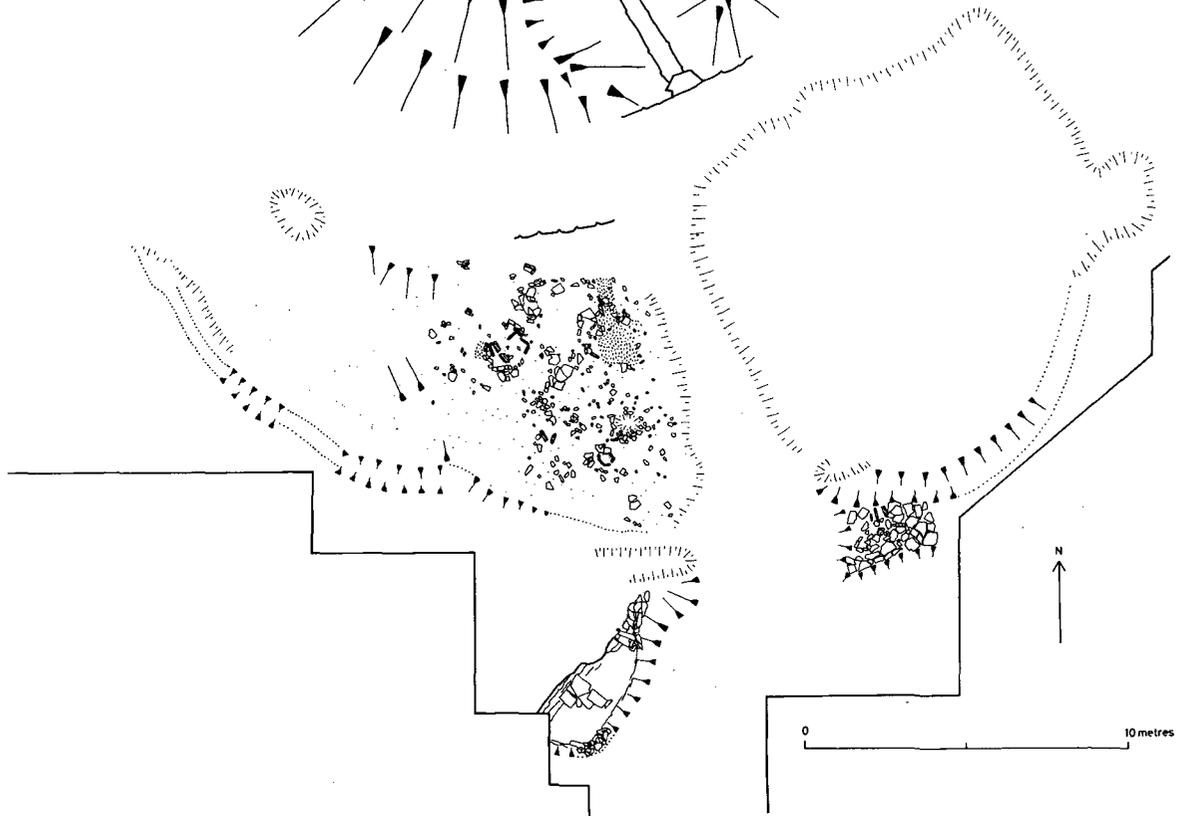
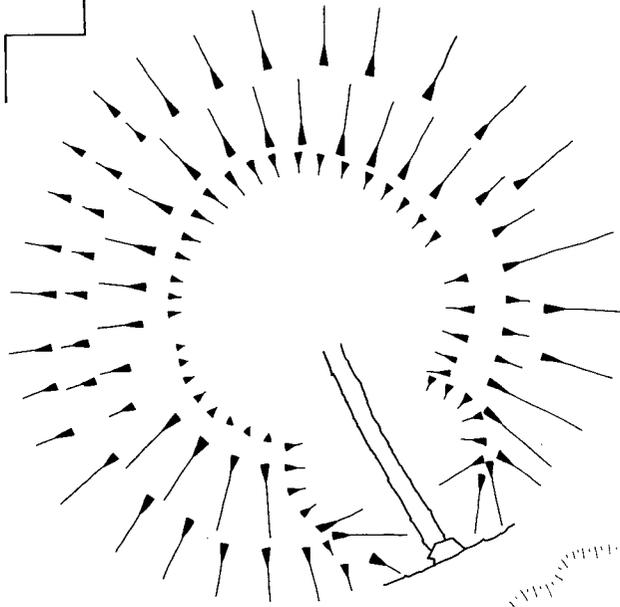
Phase 3 (illus 11) is characterized by the filling in of the Phase 2 ditch and the partial demolition of the Phase 2 tomb. A small ditch or gully was dug which encircled the tomb mound and contained an entrance or causeway to the S. Beyond this enclosure, a rock-cut well was dug also to the S. There is evidence of contemporary structures within the enclosure, but the remains were slight.

In the silts and midden debris which developed over the filled in Neolithic ditch, was found evidence of the domestic activity on the site including the first incidence of a rotary quern, and bones from domestic cattle, sheep/goat, pig and also from red deer and whale. The midden also produced the earliest evidence for the cultivation of barley.

This earliest phase of the Iron Age is dated to within the 6th and 5th centuries BC.



Illus 11  
Plan of the Phase 3 enclosure gully and internal remains.



## STRUCTURES

Phase 3 includes all the Iron Age contexts that predated the construction of the enclosure wall and second gully of Phase 4. It may therefore cover a long timespan for which we have very little information.

The earliest Iron Age deposits were the upper fills of the Phase 2 tomb ditch on either side of its entrance. They consisted of rubble overlain by clays and silts as well as some silts which were notably rich in midden material. The rubble within the ditch had presumably derived from the Phase 2 tomb and appeared to have been tipped in from both the outer and inner sides. This suggests that it had been deliberately tipped rather than being the debris from the collapse of the adjacent tomb facade. Further evidence suggesting that stone had been robbed from the tomb came from sections cut through the tomb ditch on the N and NW. These failed to show any rubble from the adjacent tomb outer revetment wall, of which only a few courses survived. Had the revetment collapsed into it the ditch should have contained a mass of clay and rubble. As it was, the ditch contained layers of silt which had built up until the start of Phase 3 when the rubble was dumped into it. This suggested that the tomb remained largely intact at the start of Phase 3, and this was supported by the fact that most of the ditch fills at the tomb entrance were Iron Age, showing that little material had come from the tomb before this time. The removal of at least the upper courses of the outer revetment wall would have exposed a vertical face of the boulder fill of the clay mound which would then have rapidly eroded, contributing to the clay and silt layers that filled the tomb ditch during Phase 3.

By the start of Phase 5 most of the tomb stonework had been removed leaving only the lowest courses of the revetment walls, the entrance passage and the central cairn, however one piece of

evidence suggests that the central cairn was not robbed until Phase 5. The inner end of the entrance passage within the central cairn was left intact although all the stone was removed from around it. This was unlikely to have been accidental and suggests that the Phase 5 plan to reuse the passage (see below) had been decided before stone was robbed from this part of the tomb. If this argument is correct, the Phase 3 and 4 robbing must have been limited to the outer walls and the outer section of the entrance passage, which unlike the inner end had been much reduced. It was however impossible to separate those parts of the tomb that had been robbed in Phase 3 from those in robbed in Phase 4.

Building stone was clearly in demand at the start of Phase 3 but evidence of structures was minimal. The presence of midden rich silts in the ditch overlying rubble indicated the existence of a settlement, yet no structures had survived unless the well was contemporary (see below). A pit cut into, and filled by these early midden layers, was found over the W ditch terminal. The only surviving Phase 3 structures were a well, an enclosure gully cut through the midden deposits, and fragments of house floors overlying them.

### THE WELL

The well had been largely destroyed by Phase 5 ditch digging, but the rock cut base, access steps and some side walling survived (illus 12a). It had been dug through a ground surface containing Iron Age material but it cannot be linked stratigraphically to other Phase 3 features; however, the existence of another well by the start of Phase 4 implies that it had a Phase 3 date. The base of this well was filled with silts overlain by rubble (illus 12b).



Illus 12

- a) The Phase 3 southern well steps outside the enclosure; scale – 50cm; from S;  
b) the Phase 3 rock-cut well under the later defences; scales – 1m & 2m; from E.

## THE GULLY

The gully was revealed only to the S of the mound due to the partial excavation of later ramparts. It appeared to enclose the mound, 7.5m-9.5m from its base and probably did so, as did its Phase 4 replacement. It survived up to 1m deep and included a 4.5m wide entrance gap. The position of this entrance was maintained throughout Phases 4, 5, 6 and 7 and was evidence of some continuity in the layout of the settlement. There was no evidence for a contemporary wall inside the gully as there was with the similar Phase 4 gully but one may have been completely removed.

## THE REMNANT HOUSES

The surviving fragments of houses all lie within the enclosure gully and included a tank and two successive hearths but the extent of the settlement was not known. It was reasonable to suggest that the settlement that developed in Phase 3 was reorganized within the enclosure gully later in that phase forming the earliest version of the enclosed settlement of Phases 4-7. The internal arrangement of the settlement in Phase 3 was unknown.

### 3.1.2 • PHASE 4 • DEVELOPMENT OF THE ENCLOSED SETTLEMENT

The Phase 3 settlement was reorganized in Phase 4 (illus 13) and the encircling ditch was recut. In addition, it now supported a stone wall on its inner edge which entirely encircled the Phase 2 tomb mound, but the causeway position was retained. The Phase 3 well had collapsed or been destroyed, causing the construction of a new well or cistern within the E half of the enclosure, possibly at the end of Phase 3 or the very beginning of Phase 4. At least three houses were constructed within the defences during this phase.

Artefactual evidence produced a range of stone and bone tools and the first incidence of dog and horse on the site. From C14 dates the phase lies within the 5th to 4th centuries BC.

## STRUCTURES

### THE GULLY AND ENCLOSURE WALL

The start of Phase 4 was marked by the levelling of the Phase 3 settlement and the replacement of the Phase 3 gully by another similar gully on approximately the same alignment. This new gully was backed by a stone wall which encircled the tomb mound. This enclosure wall had survived under later ramparts up to 1.1m high, but was reduced to fragments of foundations elsewhere, when the settlement was cleared at the start of Phase 5. Those sections buried under later ramparts on the N and W sides appeared to be of one build but on the S and E where it had been abutted by contemporary structures, the surviving fragments had been rebuilt on more than one occasion. The wall was not concentric with the tomb mound, lying up to 8.4m from it in the S but only 4.8m on the NW. The entrance gap in the gully matched that in Phase 3 but the wall had not survived at this point so there were no details of the actual gateway.

Two of these lay to the W of the entrance gap and the third was on the E side next to the Phase 4 well.

Only two walls belonging to buildings within this settlement had survived, making the remains of the floor plans difficult to interpret (illus 14). The floors included hearths, small tanks, areas of flags, packing probably for orthostat screens and a soakaway.

### THE PHASE 4 WELL

The well on the E side of the settlement had survived intact with a complete corbelled roof. The fill of the pit dug for the well chamber was overlain by the Phase 4 enclosure wall. This well must therefore have been built either at the start of Phase 4 or late in Phase 3 (possibly to replace the earlier well after the digging of the Phase 3 gully). This second well was accessible until the end of Phase 6 and as no other wells have been found on the site it was probably in use until that time. The finds recovered from its silt included the substantial remains of four red deer skeletons (7.3 Animal bone report below). These are unlikely to have been placed in the well until it went out of use and have therefore been considered as Phase 4-6 material.

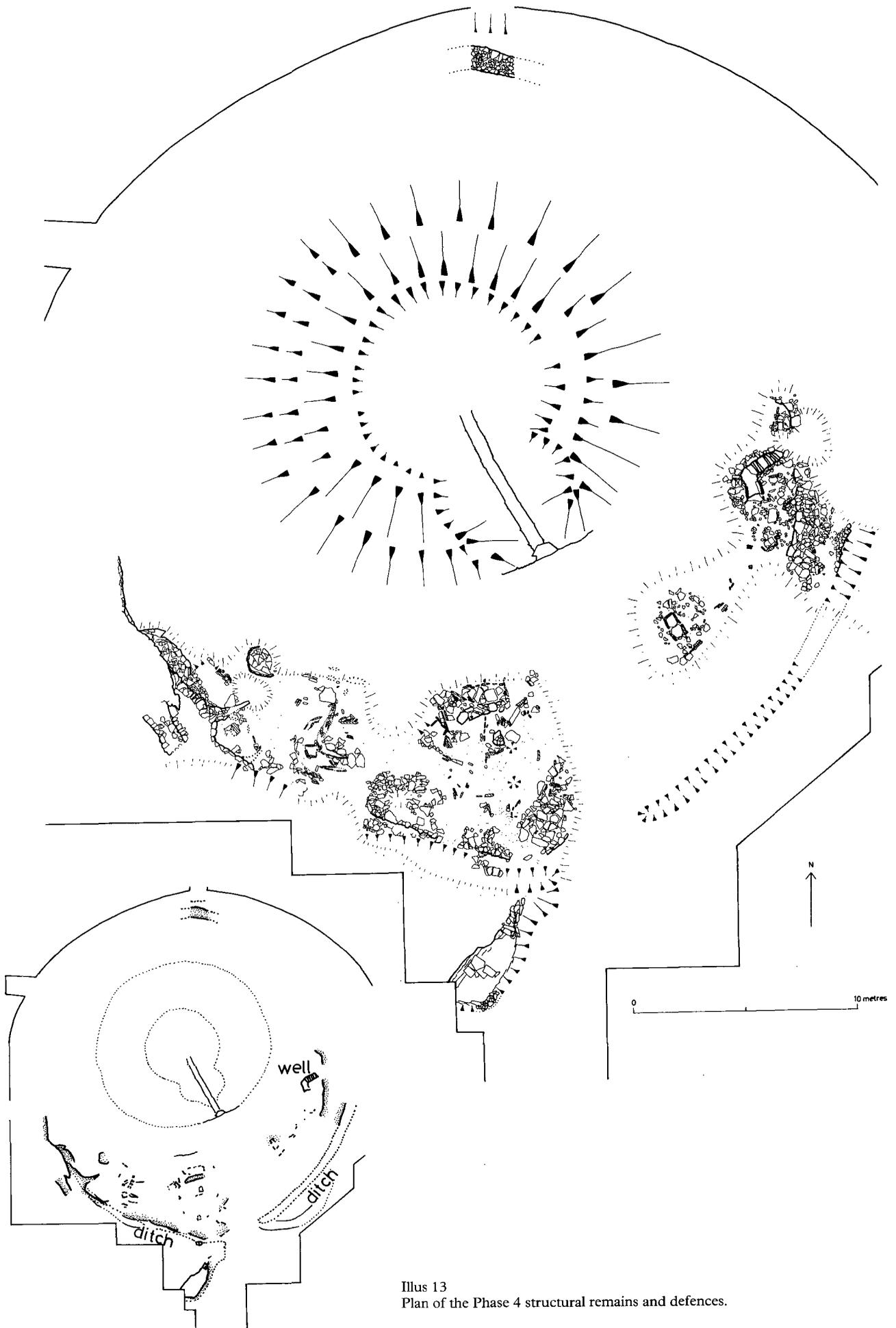
### REMNANT HOUSES

Within this wall were the levelled remains of at least three houses.

### 3.1.3 • PHASE 5 • THE ROUNDHOUSE SETTLEMENT

The start of Phase 5 was defined by a major reconstruction of the settlement (illus 15) that had developed during Phases 3 and 4. This involved the levelling of both the houses and the adjacent sections of enclosure wall to the S and E of the mound. These were replaced by a large clay-cored, stone-faced rampart and rock-cut ditch which abutted the Phase 2 tomb mound and enclosed a thick-walled roundhouse, built into the tomb mound. Other than the roundhouse itself, no remains of houses could be definitely ascribed to Phase 5, although fragments structures from contexts placed within Phase 5/6 (see below) were located in the SW of the settlement.

The position of the causewayed entrance was maintained and formalized with a gate. The interior of the tomb was cleared out, and an earthhouse with an entrance shaft was built into the underground Neolithic cell (illus 8c). A drain was constructed from the roundhouse entrance, across the enclosure to exit at the E ditch terminal.



Illus 13  
Plan of the Phase 4 structural remains and defences.



Illus 14  
The Phase 4 building foundations within  
the enclosure; scales – 2m; from S.

The new design of settlement and defences was to be modified on many occasions before the major reconstruction at the start of Phase 7. Features assigned to Phase 5 were only those considered to have been part of the original design of the Phase 5 settlement.

Radiocarbon dates suggest that the roundhouse was built some time within the 4th to 3rd centuries BC.

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## STRUCTURES

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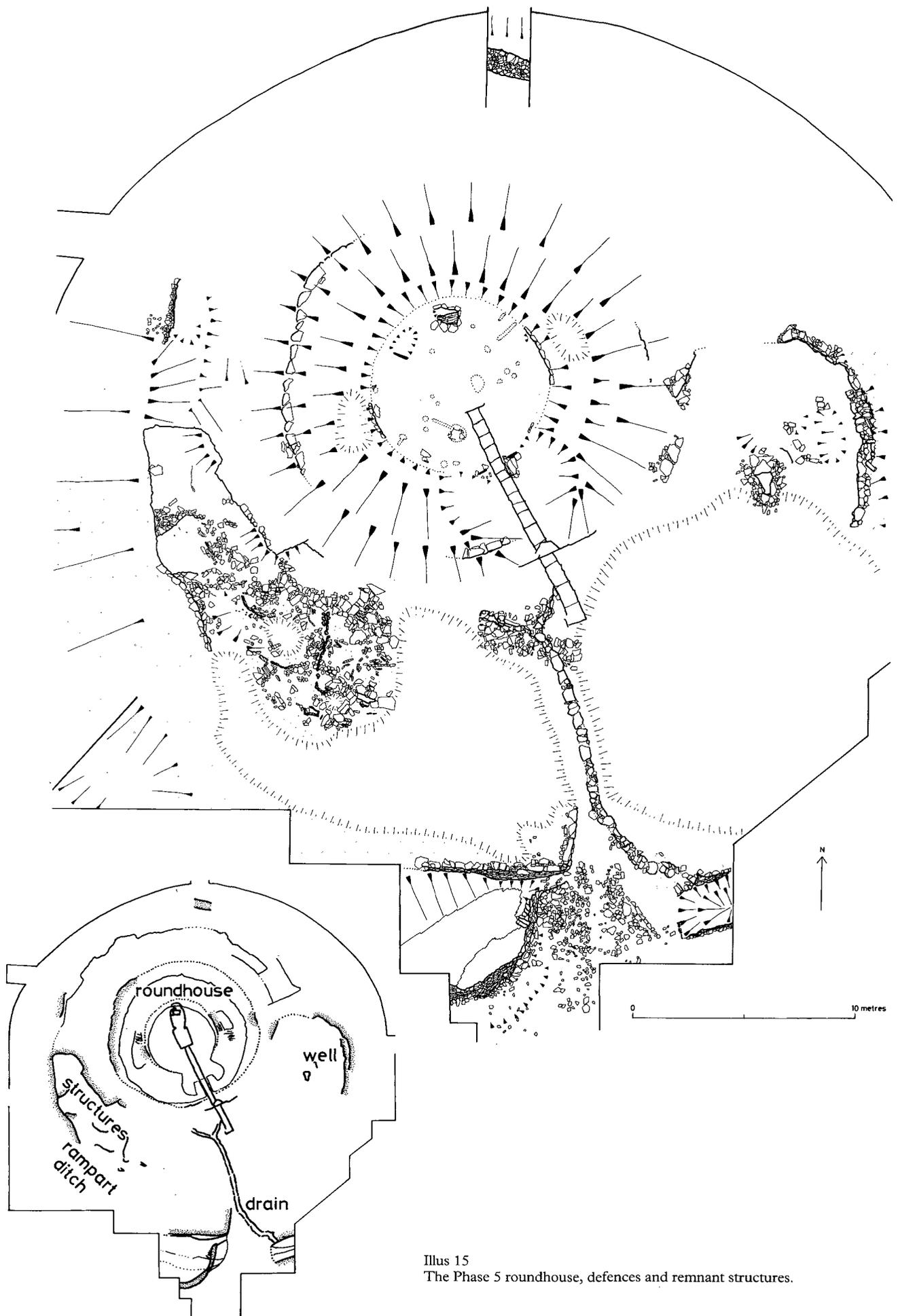
### THE ROUNDHOUSE (illus 15)

The roundhouse was constructed over the remains of the Phase 2 tomb after the interior of the mound had been levelled with clay. Its walls were built on the tomb mound with its entrance aligned over the Phase 2 tomb passage. The robbing of the central cairn of the tomb was completed at this time, leaving the partially destroyed entrance passage and an 8m diameter quarry hole where the cairn had been.

Little remained of the roundhouse itself (illus 16), only fragments of the outer and inner wall faces, approximately 4m apart. The

interior was subsequently cleared in Phase 6; some floor deposits survived under clay slips beside the inner wall face but most were mixed with the Phase 6 floor. The bases of two pots were found *in situ* set into the floor clay; other features survived only as cuts in this clay. These included one large rectangular pit (1.5 × 1.0m) which was apparently originally stone-lined and extended down into the remains of the tomb masonry. Other cuts appeared to be post holes and slots for stone partitions.

Nothing remained of the roundhouse entrance passage except for parts of its junction with the inner wall face. Two thin uprights, 1.1m apart, were set in position to form door jambs at the inner



Illus 15  
The Phase 5 roundhouse, defences and remnant structures.



Illus 16  
Phase 5 roundhouse clay floor; the earthhouse shaft is in the bottom right corner, with remains of the roundhouse walls to the top right and bottom left; scales – 2m; from E.

end of the entrance passage. On the E side, the upright was abutted by a wall face which formed the side of the drain (tomb passage) at this point. This presumably supported the roundhouse wall above it.

### THE EARTHHOUSE, CIST AND DRAIN

#### THE EARTHHOUSE

The lower central chamber of the Phase 2 tomb was exposed and then doubled in size, by the addition of an extension on the N side to form a rectangular earthhouse (illus 8c; 17; 18). This was roofed with large flags supported on stone pillars which were covered with some sort of skin (7.2 Plant Report below).

A shaft with steps connected the earthhouse to the floor level on the N side of the roundhouse interior (illus 16). Although the earthhouse had survived intact until its excavation in 1982, it was found to be empty and clean; it was reused in Phases 6 and 7, and therefore its condition on excavation reflects its use in Phase 7 and not Phases 5 or 6.

#### THE CIST

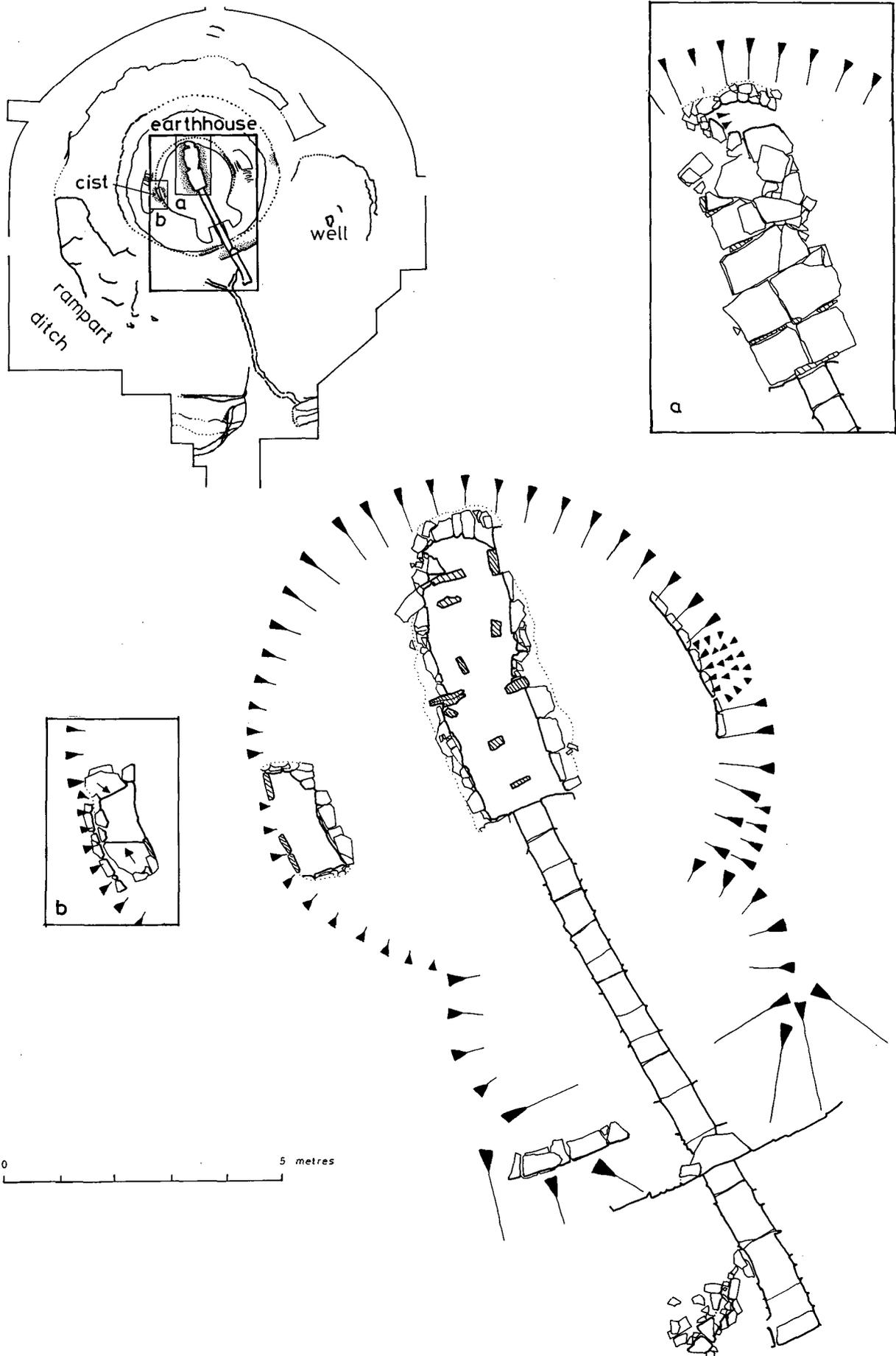
At the same time as the construction of the earthhouse, a cist-like structure (illus 17b) was cut into the remains of the tomb inner revetment wall on the W side of the quarry hole. It measured 2.0 × 0.8m and was 0.4m deep with a flag lid which was found collapsed into it. Nothing was found in the cist which underlay the

inner wall face of the roundhouse; it may have been a foundation burial but if the cist originally contained anything it had completely disappeared. At the time of excavation this feature was thought to be the collapsed roof of a chamber to the Phase 2 tomb and therefore samples of the cist fill were not collected from the uniform clay fill. A high phosphate concentration could have demonstrated the former presence of a body. Opposite the cist, on the E side of the quarry hole, was a similar gap in the Neolithic inner revetment wall but it contained no evidence of an inserted cist. This may be the site of a planned second cist that was never completed or one that was subsequently emptied and backfilled to provide a better foundation. The cist and earthhouse were buried under 1m of clay which formed the floor of the roundhouse interior. This yellow clay could have been reused from the tomb mound or come from the newly dug Phase 5 ditch (see below).

#### THE DRAIN

The entrance passage of the roundhouse incorporated the tomb passage as a drain beneath it, with clay replacing those sections of passage wall that had been removed in Phases 3 and 4.

The drain was extended beyond the tomb passage S through the settlement (illus 15), and into the E terminal of the ditch at the rampart entrance. Where the extension crossed the outer tomb facade, it divided and a branch led W but only the first 2.25m of this had survived. This could be an alteration to the original drain which had a negligible gradient from this junction out to the ditch and therefore could have silted up easily. However, the W branch must have drained away within the settlement but no soakaway had survived.



Illus 17  
The Phase 5 earthhouse; a) details of roofing; b) details of cist.



Illus 18

a) The Phase 5 earthhouse inserted into the Phase 2 tomb shown after its roof had been removed; scales – 1m & 2m; from N;



b) view inside the Phase 5 earthhouse with the pillars supporting its roof; scales – 50cm & 1m; from N.

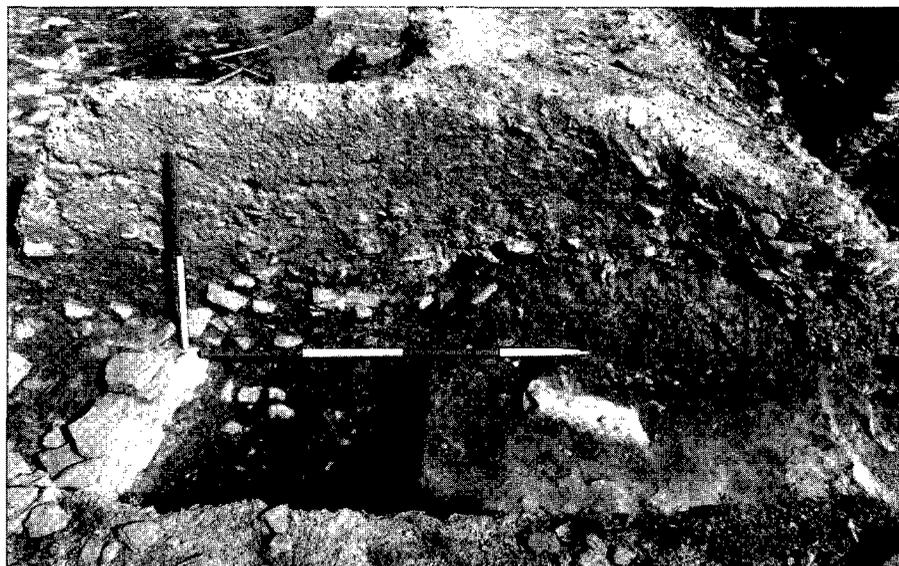
#### THE DEFENCES (illus 15; 19a-c)

The rampart and ditch constructed at the start of Phase 5 are only partially understood because of subsequent rebuilding and also because of the limited excavation. On the S side, where the defences were most extensively excavated, the Phase 5 rampart had been largely destroyed and the main ditch excavation (the W terminal at the entrance) was complicated by the presence of the Phase 3 well. From the available evidence, the original Phase 5

rampart was stone-faced with a clay core; the clay was presumably obtained from the ditch which cut through yellow boulder clay into the flagstone bedrock beneath. It appeared that this rampart did not extend right round the mound, but instead turned in to meet the mound on the E and W. The evidence for this came from the W side where the rampart (formed here from a dump of shillet, capped with clay) ran over the top of the Phase 4 wall (which formed its inner face up to that point) and turned E to meet the mound.

#### 3.1.4 • PHASE 5/6

Phase 5/6 was used to include contexts not specifically attributable to either Phase 5 or 6 but to activities overlapping these two periods, in particular remnant buildings within the defences and modifications to the ramparts.



Illus 19

a) The stone facing to the clay rampart of the ditch and defences in the SW; scales – 1m & 2m; from SW; b) Phase 5 stone ramparts and ditch SW of the entrance; scales – 1m & 2m; from SW;

c) Phase 5: section across rampart/defences in the SW; scales – 1m & 2m.

## STRUCTURES

### REMNANT HOUSES

Fragments of a number of structures were located in the SW of the settlement. These included a wall, hearths, kerbing and a possible tank. The demolition of the roundhouse and the building of the replacement broch in the centre of the settlement must have required widespread clearance, and any surviving structures would then have been removed before the replanning of the Phase 7 settlement.

### RAMPART MODIFICATIONS

The Phase 5 rampart and ditch were extensively modified before reaching their final forms at the beginning of the Phase 7 settlement, and very little rampart work in fact belongs to that Phase. Two

separate areas of the defences were excavated at the entrance and the N side of the rampart, which showed a sequence of alterations throughout phases 5/6. The entrance sequence was straight forward and represents successive shifts of the rampart outwards. Therefore no inner faces of the rampart survived but four outer ones did on the W side and two on the E side of the entrance.

The rampart on the N side was only partially excavated and was therefore not fully understood. It was fully sectioned by a 2m wide test trench in 1978–79 but this unfortunately revealed a complex junction of rebuilds. Most of the rampart inner face as revealed on the N side was Phase 5/6 in date but not all of one build. The outer face was only revealed in the test trench where it was formed by the Phase 4 wall. The earliest identified alteration to the rampart involved the junction of the rampart with the mound on the E side. This was cut

away and the rampart extended round the N of the mound over the remains of the Phase 4 wall. The original inner face on the E side was replaced by one with an orthostatic bottom course; this face was not followed as far as the test trench in which it was absent.

Subsequently, the destroyed junction of rampart and mound was replaced by a c 3m thick cross wall which butted the mound and rampart face. The slope of the mound was then revetted to the N of this cross wall by a stone facing presumably as part of a support for either the roundhouse or Broch 1. This was followed by a refacing of the rampart N of the cross wall masking the inner face and doubling the width of the cross wall as the new inner face turned to the mound 3.7m short of the N face of the cross wall. This inner face was partially buried by up to 1m of small rubble before the construction of Broch 2 in Phase 7. The rubble may

have come from the collapse and demolition of Broch 1 at the end of Phase 6. The building of the cross wall and rampart face involved a large volume of rubble also.

The quantity of rubble available could be connected with the demolition and construction work at the start of Phase 6. It may be noted that the rampart rebuilds at the entrance all used small rubble mixed with much midden material, probably derived from the demolition of the adjacent houses. Whilst the rebuilds at the rampart entrance are clearly associated with extending the settlement outwards, the functions of the extensive alterations on the N side are not clear. However, they do indicate that the Phase 5 and 6 settlements continued for a considerable time, providing evidence which was lacking from the settlement itself.

### 3.1.5 • PHASE 6 • THE EARLY BROCH

After the collapse of the Phase 5 roundhouse, another roundhouse or broch was built on the same alignment, with internal staircases, entrance cells and a partitioned interior surrounding a central hearth.

The pattern of defences and settlement constructed in Phase 5 was modified during Phase 6. The rampart was extended to include the Phase 2 tomb mound, with the Phase 5 roundhouse, and was rebuilt several times. At the entrance to the site, the defences were modified, with a new rampart built into the ditch, probably to enlarge the enclosed area. The settlement was rebuilt, although little survived the subsequent Phase 7 constructions.

The surviving artefacts were undiagnostic, but both rotary and non-rotary querns appeared together, naked six-row barley was cultivated and iron and copper artefacts were present including a simple ring-headed pin of Early Iron Age type.

No radiocarbon dates relate directly to this phase, but by extrapolation from the preceding and subsequent phases it is estimated to lie within the 2nd and 1st centuries BC.

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## BROCH 1 (illus 20)

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### CONSTRUCTION

The roundhouse collapsed almost certainly because of the failure of its inadequate foundations. The outer wall face was built on the clay slope of the mound and slipped down slope under the weight of the wall. In the interior, the floor clay had settled leaving the inner wall face unsupported. Both faces collapsed and the wall was thoroughly demolished leaving only fragments of wall faces set in clay. It was replaced by a structure of similar size and complexity which because of its better state of preservation can be referred to as a broch (Broch 1).

Broch 1 had survived with an almost complete ground plan (illus 20; 21) including floor layout, despite levelling in Phase 7 and wall faces were found up to 1.6m high. The wall of Broch 1 was 3.5m thick with a projecting foundation course under the outer face. The entrance followed the alignment of the earlier roundhouse and tomb in the SE (illus 22a). The passage was 0.8m wide but only 11.1m long because of the curious arrangement of the cells on either side of it. These cells opened directly off the interior of the broch without a restricted doorway and are therefore unlike any style of entrance cell previously published. The novelty of this cell arrangement was recognized at the time of excavation and therefore a careful search was made for a conventional closed cell. However, the inner wall face clearly turned directly into the cell with no evidence of a restricted entrance passage.

The broch wall also contained two staircases with associated cells (illus 22b). These were located opposite each other on a line perpendicular to the entrance passage. The E staircase was better preserved and consisted of a short flight of six steps rising c 1m from the broch floor to an intramural cell. Then the main stairs ran clockwise round the wall from this cell, however only seven steps had survived rising a further 0.7m. On the W side, the lower

short flight had been destroyed, but the cell and the first five steps of the clockwise main flight were present. The design of these stairs, and the height of the cells, was controlled by the presence of the clay mound in the core of the broch wall.

### THE INTERIOR

The interior of the broch was divided into compartments by flagstone partitions of which only the stone packing and slots survived (illus 20; 21). The main elements of the floor plan were a large subrectangular room, 3 × 5m on the N side and a central square room 3 × 3m, with smaller radially divided compartments occupying the remaining space. The central room was partially destroyed by later cuts, but there were fragments of a large kerbed hearth and an earth floor with much ash and charcoal. S and W of this room were four smaller compartments; starting beside the W entrance cell and working clockwise, the first three appeared to be small storage spaces opening off the central room of which the first was flagged. The fourth was a small unflagged compartment at the foot of the W staircase with access to both the central and N rooms.

The main N room was flagged and included the earthhouse access shaft. A gap in the partition at the room's E end led to a small flagged compartment at the foot of the E staircase (mirroring the arrangement on the W side). This in turn gave access to another flagged compartment which opened on to the E entrance cell and the entrance passage itself. The layout of the area at the inner end of the entrance passage was confused and partially destroyed by later disturbances. There may have been access directly from the entrance passage to the central room or possibly via the first flagged compartment E of the entrance. The surviving partition slots and packing allow for either or both routes.

In addition to the ground floor layout of rooms there were post-holes and packing associated with roofing or an upper floor. Five post-holes and one post setting were located 1.5–2.0m from the inner wall face in two rough lines of three. They did not form a ring concentric with the broch wall face. The open area behind the short entrance passage contained two large groups of stone packing for

uprights one of which was still present. These uprights were more heavily packed than any of the partition slabs and they were positioned across the gap in the inner wall face created by the open entrance cells. They may therefore have been the bases of supports for a structure (roof, floor or wall) spanning this gap at a higher level. The reconstruction of Broch 1 is discussed (3.2) below.

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### 3.2 • THE EARLY IRON AGE SETTLEMENT • DISCUSSION

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As described above, following the Neolithic phases at Howe, there was a break when the site was no longer used, and the Neolithic ditch silted up. The only evidence of any intermediate activity was the occurrence of fragments of beaker pottery around the entrance to the Phase 2 tomb. It is possible that the tomb itself continued to be used at this period, but there is no other evidence for this. The earliest evidence for Iron Age activity comes with the deliberate destruction of the centre of the tomb when the central chamber was completely removed, the side cells were levelled and the stone cairn was reduced to the level of the entrance passage. The stone was deliberately dumped within the encircling Neolithic ditch and when this rubble had silted over, only a shallow depression marked the remains of the ditch terminals. The N–S and E–W sections (illus 164) across the site failed to reveal any evidence of revetment collapse from the tomb. This implies that either the sides of the tomb mound were still intact, or that they had already been carefully demolished.

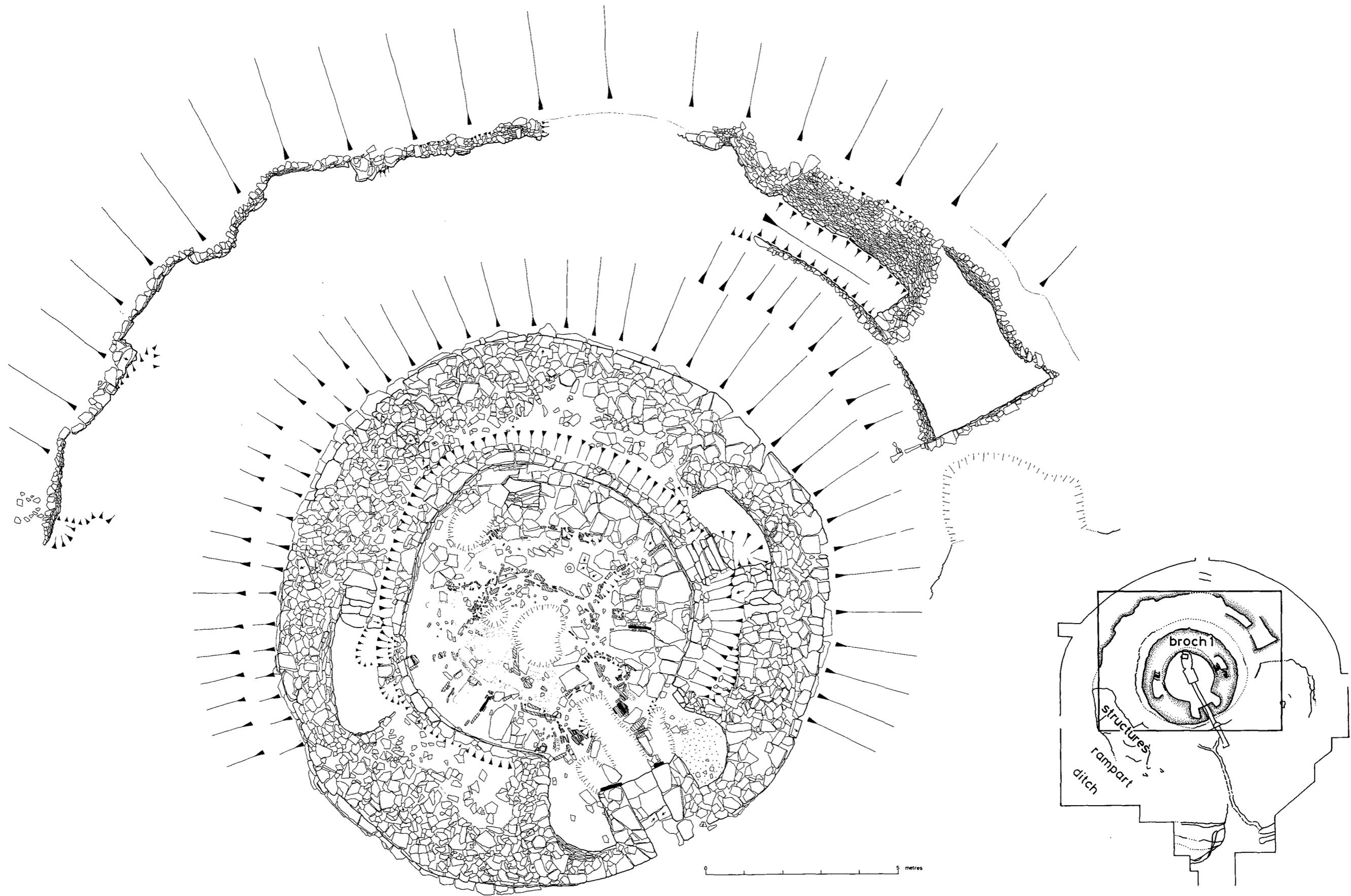
The fragmentary remains of sub-circular houses which survived, built over the Neolithic ditch silts, were typical of Orkney house types, which endured from the Neolithic to the Late Iron Age, constructed with dry-stone walls, orthostat partitions, flagged floors and internal features including hearths and tanks.

With the construction of the Phase 5 settlement, at some point after the end of the 5th century cal BC, the site assumed a character it was to retain for almost 500 years. For the first time, there is evidence that the Phase 2 tomb mound was reused, rather than just being robbed. The tomb was carefully levelled, the cell below the central chamber of the tomb was extended to form an earthhouse, and the inner end of the tomb entrance passage was blocked by a single flagstone. The centre of the tomb was then filled with clay leaving only a narrow shaft leading via steep steps to the earthhouse below. This clay was c 1.2m thick and rose to the top of the surviving Neolithic entrance passage sides. New flagstones were added to cap this passage and these formed the floor of the roundhouse entrance. The empty tomb entrance passage was now used as a drain, with an overflow at the outer end, which led out across the site and into the encircling ditch by the entrance to the site. This soon proved ineffective, no doubt because it was virtually horizontal, and a new outlet branched away from the drain at the mouth of the tomb and ran into a pit on the S side of the settlement. A new rock-cut ditch encircled the settlement completely surrounding the tomb mound for the first time, with a stone faced earth and rubble rampart behind. The importance of the drain is that for the first time there is unequivocal evidence that the surrounding settlement and its defences were constructed contemporaneously with the central building. It would have been impossible to add either of these as an afterthought. Phase 5, like the later stages of the settlement (Phases 6 and 7), was constructed as a single planned uniform entity, and initiated a major reorganization of the site.

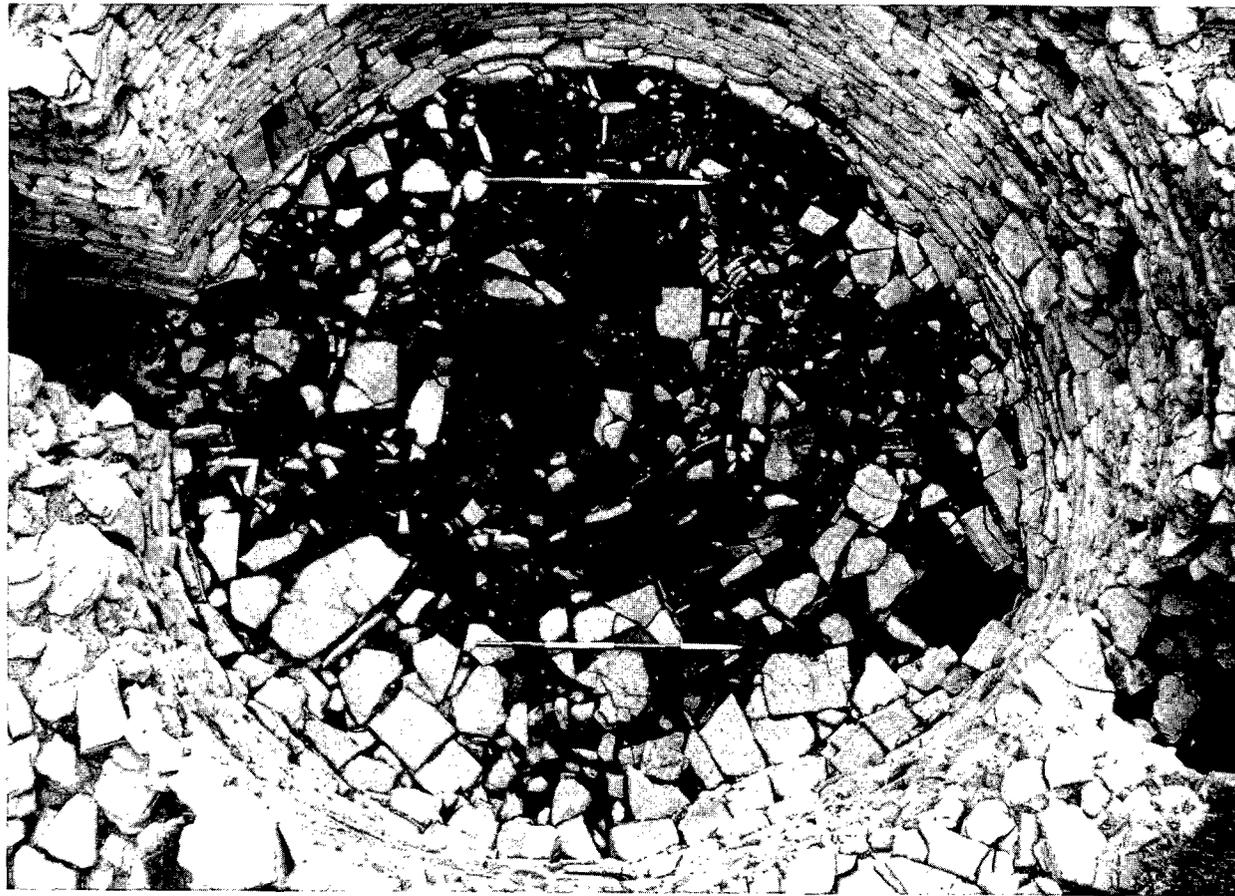
The roundhouse incorporated the clay core of the Phase 2 Neolithic tomb within its walls, and its stone facings survived on both the inner and outer faces. It is assumed that there would have been a central hearth with orthostat partitions, a flagged floor and timber uprights supporting a roof or an upper gallery. Unfortunately so little remained of this structure that it was impossible to confirm this, or ascertain the height of the building or how it was roofed.

The fact that the builders had gone to great lengths to construct a drain from the interior meant that drainage presumably of rain water was considered a problem, and rainwater which collected in the roof may have been channelled down into the building with the drain carrying the surplus away. Perhaps the entrance passage of the Neolithic tomb acted as a water tank, which was kept sweet by the flow of rainwater through it. This is paralleled at Dun Mor Vaul, where a similar arrangement of drain and tank was found.

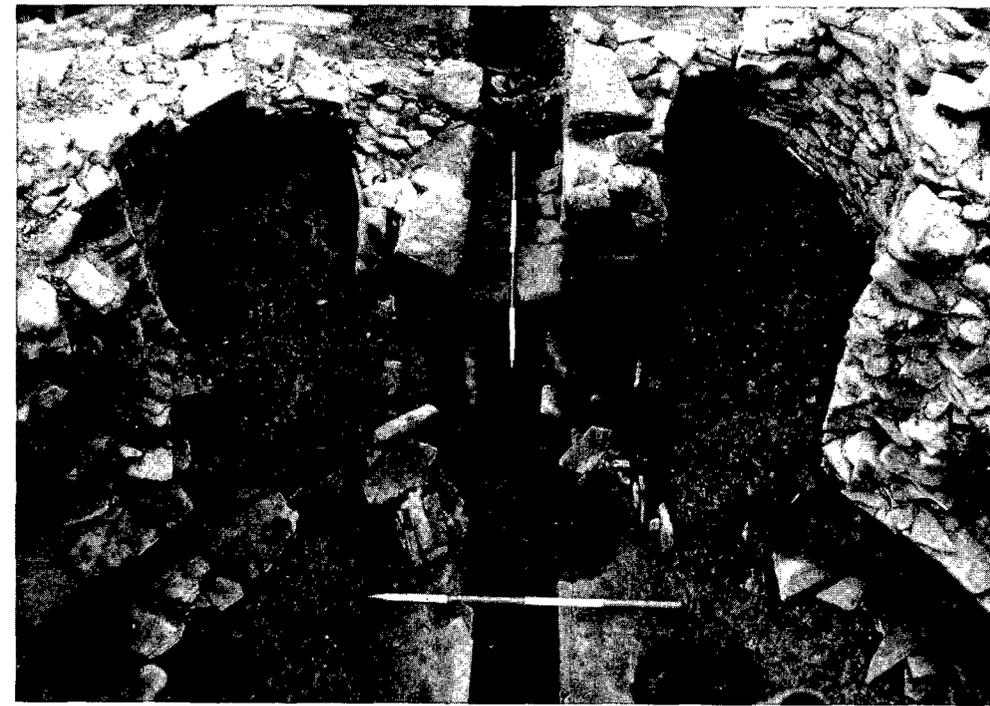
The sides of the roundhouse entrance collapsed into the drain, crushing what was thought to be one, now (9 Human remains below) established as two young persons. An original theory, that the remains were of someone who had gone down to unblock the drain, dislodging the masonry and burying themselves in the process, is now not considered plausible. The outer walls may have fallen outwards onto the surrounding buildings, but for the



Illus 20  
The Phase 6 broch tower and N defences.



Illus 21  
The Phase 6 broch floor revealed during the excavation of the Phase 7 broch tower; scales – 2m; from E.



Illus 22  
a) The Phase 6 broch entrance, with entrance cells, over the Neolithic passage; scales – 2m; from N;  
b) the staircase and intramural landing and stairs on the E side of the Phase 6 broch; scales – 2m; from W.

most part these would appear to have simply been demolished. Unlike the later buildings, there was no other evidence for a complete collapse, although this may merely reflect the surviving evidence.

The subsequent replacement of the roundhouse, and the surrounding settlement seems to have been precipitated by the collapse of this building. The dangers of building a substantial drystone walled structure half way up a clay mound were illustrated again and again during the life of this settlement. On this occasion, the walls of the central building collapsed off the clay mound, and the outer face of the replacement building (the Phase 6 Broch 1), was constructed on a ledge cut into the mound, above the remains of the roundhouse wall, so that the new wall was thinner than the old one.

The new building was called Broch 1, simply because it underlay the Phase 7 Broch 2 and it was not realized that an earlier broch-like building (the Phase 5 roundhouse) existed.

The replacement building, the Phase 6 Broch 1, was distinguished by having guard cells opening off the entrance passage, and two intramural staircases rising above the level of the Neolithic clay mound. Unlike other brochs, it was impossible to have intramural passages at ground level because of the clay core to the wall. As a result these started at first floor level and were reached by steps cut into the edge of the clay core from the E and W sides of the broch interior. The earthhouse remained in use, and the internal plan of the building resembled that of the earlier roundhouse. Post holes and radial orthostats divided the interior and suggested either a timber framed roof above, or an upper storey or gallery, presumably with a roof above. A central opening would have allowed smoke to leave, and the intramural stairs ran from the two side cells up to either this upper level or up to what must have been a walkway round the roof. The walkway presumably had a parapet which would have helped to trap rainwater within the building, rather than allowing it to drain outwards, unless the roof fitted over the walls and walkway.

Unlike all the other known broch tower guard cells, these opened directly off the entrance passage and were open to the interior of the building, thus giving a more open plan to the structure. However, they also considerably weakened the wall at this point and the presence of such weakly built cells and of two intramural staircase cells are powerful arguments to suggest that this was a relatively low structure.

The full history of this period of occupation, like that of the preceding phase, must remain unclear. This was due to the almost complete destruction of both Broch 1 and the surrounding settlement in preparation for the construction of the third and final phase of broch (Broch 2) on the site. The end of the Phase 6 settlement was signalled by what appeared to have been virtually a total collapse of the building. Apart from a few small sections of wall standing a single course high and part of the wall in the W surviving to c 1m in height, the only trace of the outer wall is the foundation ledge cut into the tomb mound. The rest of the wall survived only as rubble under the Broch 2 outer wall on the N side of the site. The inner face and core survived to a height of several courses, but even so the collapse must have been spectacular, destroying the surrounding buildings and leaving little of the settlement within the ramparts intact.

The major reorganization of the site which began in Phase 5 with the design of a large roundhouse/broch with a defended settlement, lasted from perhaps as early as the 4th century BC until the start of the 1st century cal AD. Although relatively little of the Phase 5 and 6 settlements survived, it appeared that in both cases, major reorganization was prompted by the collapse of buildings rather than a change of function of the settlement.



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## THE MIDDLE IRON AGE BROCH AND SETTLEMENT

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This period, Phase 7 of the site's occupation, was one of the best preserved on site representing a major percentage of the artefactual and environmental evidence from the site. At the start of this new phase, the previous plan of a defended settlement with broch tower was maintained (illus 23), but the broch tower was cleared out to be rebuilt as a bigger structure (illus 24) and the Phase 6 buildings were levelled for the construction of a new village of six houses. The good preservation of environmental material provided information on the roofing and fuel used in the houses. Of the artefactual evidence from this period, the metalwork, both iron and copper-alloy, survived particularly well.

Construction of the broch, together with the use and subsequent levelling of the new settlement, is described as the earlier Phase 7 (4.1.1); Later Phase 7 (4.1.2) covers the continued use of some of these structures, their replacement with new buildings and the last major collapse of the broch tower. The earlier and later phases were divided by apparently contemporary fires in broch and settlement.

Chronological brackets of the 1st to 4th centuries cal AD have been ascribed to this phase from the radiocarbon determinations.

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### 4.1 • THE STRUCTURAL EVIDENCE

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#### 4.1.1 • EARLY PHASE 7

The Phase 5/6 settlement within the defences was completely levelled at the start of Phase 7, and a layer of rubble, 0.1–0.2m deep, sealed most of the site, except in the E and NE where Neolithic material was exposed.

This levelling was followed by the construction of six new houses (illus 23). The broch tower was cleared out for rebuilding, with walls over 5m thick (illus 25). The entrance alignment was maintained but the intramural cell and the W staircase were rebuilt (illus 26). During its construction, the broch collapsed on the W which led to alterations of the W staircase.

The interior of the tower comprised a central area with hearth, bound by a circle of upright stones, with 3 bays to the S and W (two of which had lids), and with a curved passage on the E which gave access to the earthhouse. Problems of instability of the walls led to the blocking of the W landing and staircase, and the construction of an internal stair at the end of the curved passage.

The Phase 5/6 defences were on the whole maintained (illus 26), but the inner face of the defences was cut back during the construction of the new houses within the enclosure. Three houses were built either side of a pathway from the gateway to the broch's entrance. All the houses were given similar plans of an internal domestic area with hearth, oven, tank and two cells, and an external yard with a single cell. An external door was also added to the broch tower. The houses continued in use with little alteration, except for the addition of new hearths and tanks.

The following detailed description looks at the settlement in terms of the defences, the entrance, the tower and the settlement.

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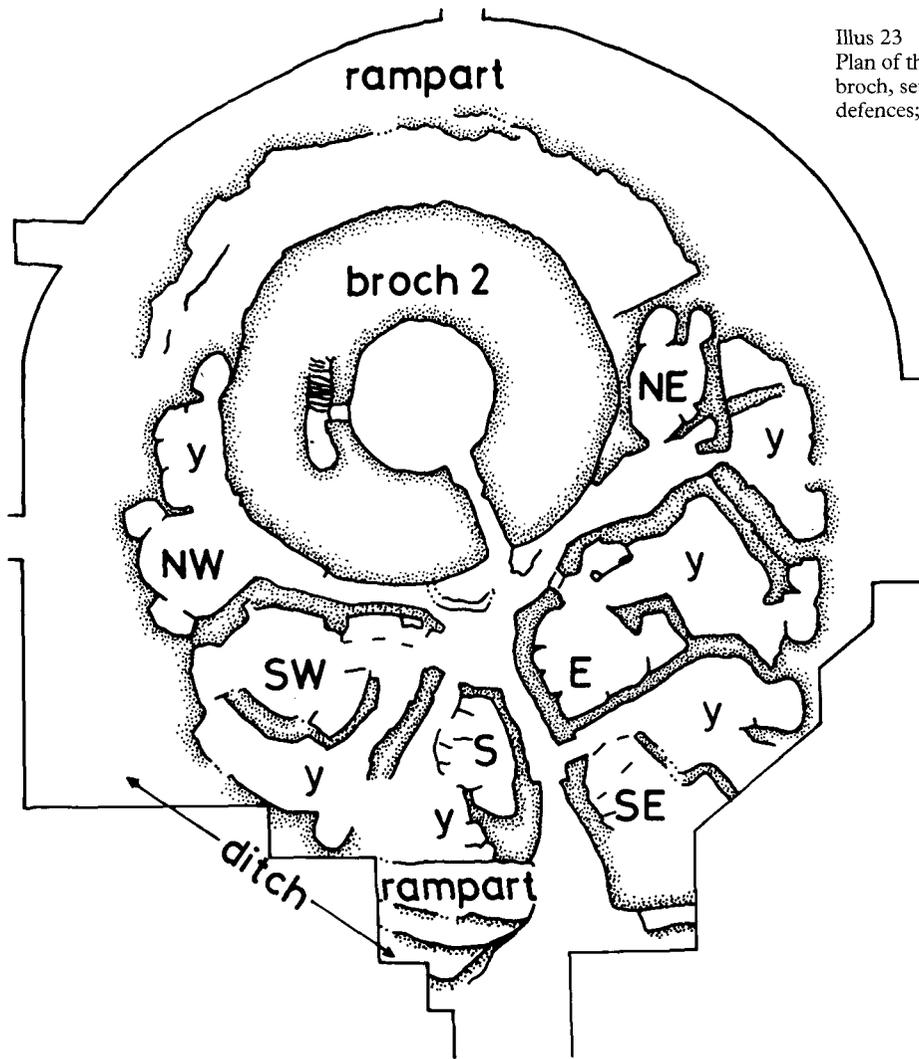
#### THE DEFENCES (illus 26)

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The Phase 5/6 defences were largely maintained at the start of Phase 7, but with minor alterations. The area between the base of the broch and the Phase 6 rampart in the N was infilled with rubble which had accumulated following the collapse and

demolition of the Phase 6 broch and the construction of Broch 2. The NW side of the tower was repaired after the early failure of the foundations during the rebuilding. A foundation trench, 9m long, was traced through the Phase 6 rubble, and the wall was

Illus 23  
Plan of the Early Phase 7  
broch, settlement and  
defences; y indicates yard.



Illus 24  
The Early Phase 7 broch tower during excavation; from SW.

rebuilt with large blocks of stone. In the NW, where the rampart had been damaged by the tower collapse, a 6m length of new wall was built as a repair. This wall was dug into rubble and lay 2m E of the old rampart face. It also faced the remains of the Phase 5/6 cross wall in the W; this was built at the start of Phase 7, probably to provide access to the broch tower during its construction. The cross wall and rampart face on the NE were maintained, although the S half of the cross wall was cut away for the insertion of the cells of the **NE** building. The W end of the cross wall was also truncated by the construction of the new foundation for the broch wall.

In the trial trench N of the tower, the development of a ground surface in the inner ditch between the broch and the rampart was interrupted by a collapse of the inner face of the Phase 6 rampart and its core. The collapsed section was not replaced, but a foundation trench, 1.2m wide, was dug 0.3m deep through rubble to natural clay. Foundation stones were laid in the trench and a sloping wall-face was built on top with a core of small rubble. The wall was built to a height level with the remaining collapsed Phase 6 rampart. A 0.4m depth of large rubble was laid down over the Phase 6 rampart to butt the Phase 4 rampart and was faced by a continuation of the new wall. A new inner wall of large stone blocks with a solid clay core was constructed onto a 3.4m wide foundation. The outer face which retained the clay core did not survive, but the inner one stood to a height of 1m. The lower face continued up beside the higher one for at least 0.6m with a fill of small rubble between.

Following this rampart rebuilding, occupation continued for sufficient time for 0.05–0.1m of material to accumulate in the inner ditch. This suggests that the rebuild was late in Phase 7. To the W and S of this trench, the Phase 5/6 ramparts were modified on their inner faces with the clay core cut back and new retaining walls built to allow more building space. This is discussed below with the appropriate building.

At the outer gate to the village a flag path continued S from the village entranceway paving, along the W edge of the gap through

the defences. A rubble and clay surface survived at the E end of the path, but both path and surface were truncated by ploughing at their S extremities. A new ditch revetment was constructed W from the entrance against the last Phase 5/6 rampart face. The ditch was cleared of most of its Phase 5 and 6 deposits and the new wall was built partly on bedrock and on some Phase 5 rubble in the bottom of the ditch. The corresponding Phase 5 S ditch revetment survived to 1.6m high and was not replaced. The new revetment was 2.6m high as excavated and formed the N side of a V-shaped ditch, 0.7m wide at its base. How far the new revetment continued to the W is unknown, but in the SW corner of the site, only one wall was visible, and this was probably of Phase 7 date.

During Phase 7, the ditch W of the entrance was filled with rubble, burnt stone and midden material. This debris was probably derived from one or more of the building levellings on the W side of the site, at a time when the ditch and rampart were no longer required. When the ditch was full, a collapse of stone from the Phase 7 ditch revetment was noted and an extensive ground surface developed which levelled up the ditch fill. In the SW of the site, the fill was slightly different, in that silt and rubble were found in the base of the ditch, followed by large rubble and clay and small rubble, probably from building levelling and rampart weathering. A lens of shell midden, then earth and small stone, filled the ditch and represented *dumping*, weathering and ground surface development.

The defences on the E side of the entrance were only partly excavated. The Phase 5/6 inner ditch revetment was still in use, but was then replaced by a double-faced wall, built into the middle of the ditch, dividing it into two. The S ditch face continued in use from Phase 5/6. After this the ditch was infilled with rubble behind the new revetment and its outer wall continued up as single-faced with a rubble core. This, formed a wide inner revetment, which joined the W wall of the **SE** building by the entrance. The ditch which survived was now only 0.8m wide at its E terminal, and was later infilled with rubble and midden upon which developed a ground surface.

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## THE ENTRANCE (illus 27)

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The village was entered by a path through the S defences which led to a narrow doorway 0.9m wide. This was set back within a splayed entrance formed by the curving walls of the **S** and **SE** buildings. These walls had been rebuilt on Phase 5/6 foundations and the doorway had a worn, but well-packed, sill-stone between two uprights and a pivot-stone on its E side which may also be of Phase 5/6 date. Immediately inside the doorway, the passage widened out and led through the village towards the broch entrance.

The entrance passage was c 1.6m wide and divided the village into two halves as it curved gently towards the broch doorway. There may have been a second doorway, 4.5m further on, between the **E**

and **S** buildings, where three stones set on edge divided the pavement. Beyond this, the passage opened onto an area c 3.5 × 3.0m from which doorways led to five of the buildings and the broch tower.

The paving in the entrance passage was very irregular and roughly laid, resting directly onto the underlying rubble rather than a properly prepared surface. Part of the paving at the base of the W wall of the **E** building and the N wall of the **S** building was covered by deposits of yellow clay which also overlay the lower courses of the walls. What appeared to be the packing for a stone upright was found in the passage at the N end of the **S** building, although it could have belonged to a previous phase.

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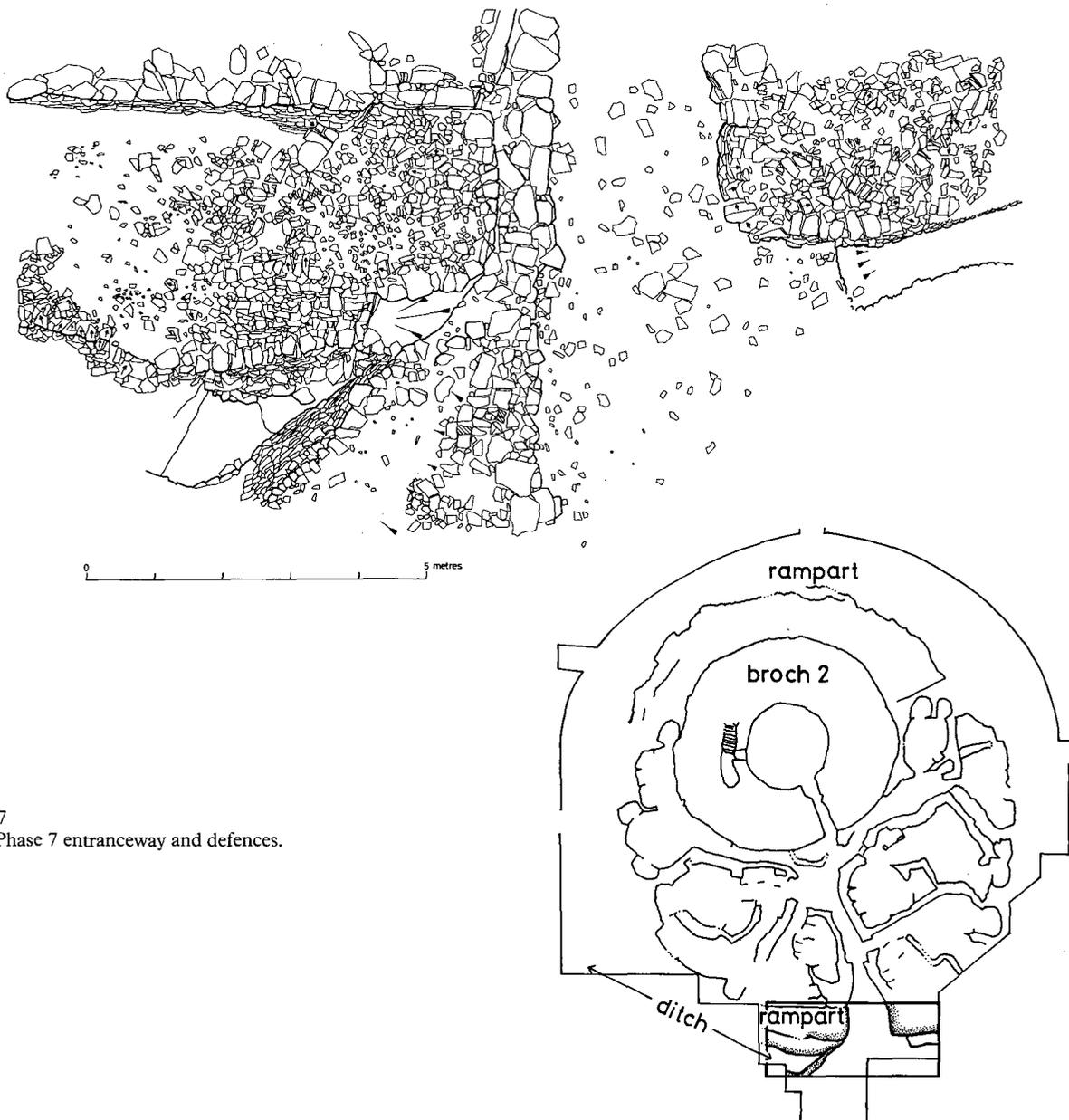
## THE BROCH TOWER (illus 25; 26)

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During the construction of the broch, the tower partly collapsed. This seems to have occurred after the Broch 1 W staircase had been rebuilt and when the walls had reached a height of c 4m high. A large section of wall face and core on the W and NW sides fell outwards, probably due to inadequate foundations, where the wall had been constructed on the loose rubble remaining after the collapse of Broch 1. Evidence for this collapse was seen on the W side of the broch, where the foundation of the original Broch 2 outer face survived. The collapse became more severe to the N as the wall slipped progressively further off the Neolithic mound until it was lost entirely.

Afterwards, the collapsed debris on the W was removed, and new foundations were excavated along the base of the mound. On the

N side, large stone slabs were laid onto the rubble which filled the space between the mound and the ramparts, to provide support for the outer wall-face, and the new wall-face, completely masked the remains of the original slumped version. All these events occurred before the construction of the house and yard in the NW. Following the rebuilding of the broch wall, repairs were made to the rampart inner face (see below), and rubble from the collapse of the broch was cleared away to the W of the broch before the **NW** yard was built. During the subsequent rebuilding of the settlement, the broch tower was probably completed first, for the practical and logistic reasons of bringing stone onto the site. The Phase 5/6 defensive cross walls to the NW and NE of the tower seem to have remained *in situ* and would have provided a



Illus 27  
Early Phase 7 entranceway and defences.

means of getting stone across the ramparts direct to the broch tower.

The main features of the rebuilt broch were the increase in the wall thickness from 3.5m to 5.5m, the redesigned entrance and the complete rebuilding of the interior. The increase in wall thickness was due to the construction of the external wall-face around the foot of the clay mound, beyond the Broch 1 outer face. Where the new outer face reached the Phase 6 entrance it rose to the old entrance level which had been retained in order to keep a roughly horizontal passage. The entrance itself was completely rebuilt with a 0.9m wide and 4.0m long outer passage, leading through the new wall to a doorway marked by stone door-jambs and a sill (illus 28a). Beyond this, the slightly wider inner passage 1.5m long and 1.3m wide led to the interior. The walls of the outer passage rested on the surviving flagstones of the Broch 1 passage, and close to the outer end of this passage was a small setting which had no known function. Beyond the broch entrance was an outer doorway marked by a sill- and pivot-stone, between a small chamber on the

W and a wall on the E (see below). To the W of the sill was a space for a pivot-stone.

The inner face of the tower was completely rebuilt, and it seems to have escaped damage in the initial collapse of Broch 2. It incorporated the remnant walling of Broch 1 and partly rested on Broch 1 paving which acted as a foundation. Within the N wall of the tower was a small square cell 1.6m sq, reached by a 0.8m wide entrance, 1.3m above the broch floor. It had a corbelled roof and walls surviving 1.7m high, and a small cupboard built into its N wall (illus 28b). The entrance lintel was found collapsed but had originally been one large stone, 1.32m long by 0.92m wide. The Broch 1 staircase and intramural cell on the W, were rebuilt to serve the new building (illus 28c), but the remains of the E staircase were completely filled in with masonry. Access to the W staircase cell was from an opening in the inner wall of the broch, 1.3m above the floor, which led to a paved landing. On the S side of this landing was an oval cell 3.0 × 1.5m wide, and on the N, the staircase, 1.0m wide, rose clockwise within the tower walls.



Illus 28

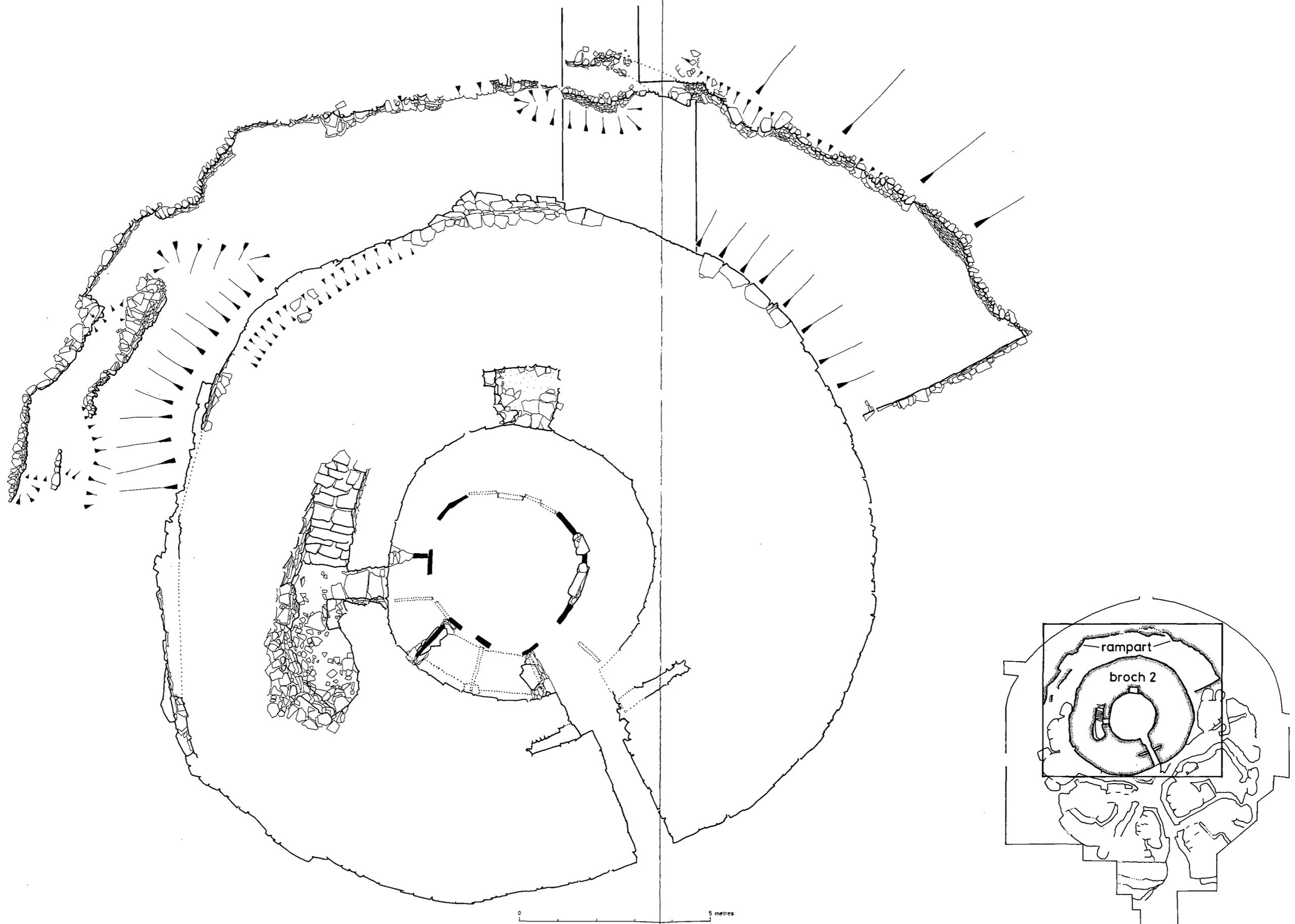
a) The entrance passage and doorway of the Early Phase 7 broch tower (from within the broch); scales – 1m & 2m; from N; b) N cell within the Early Phase 7 broch wall; scale – 1m; from S;

c) staircase and landing cell within the W wall of the Early Phase 7 broch tower; scale 2m; from W.

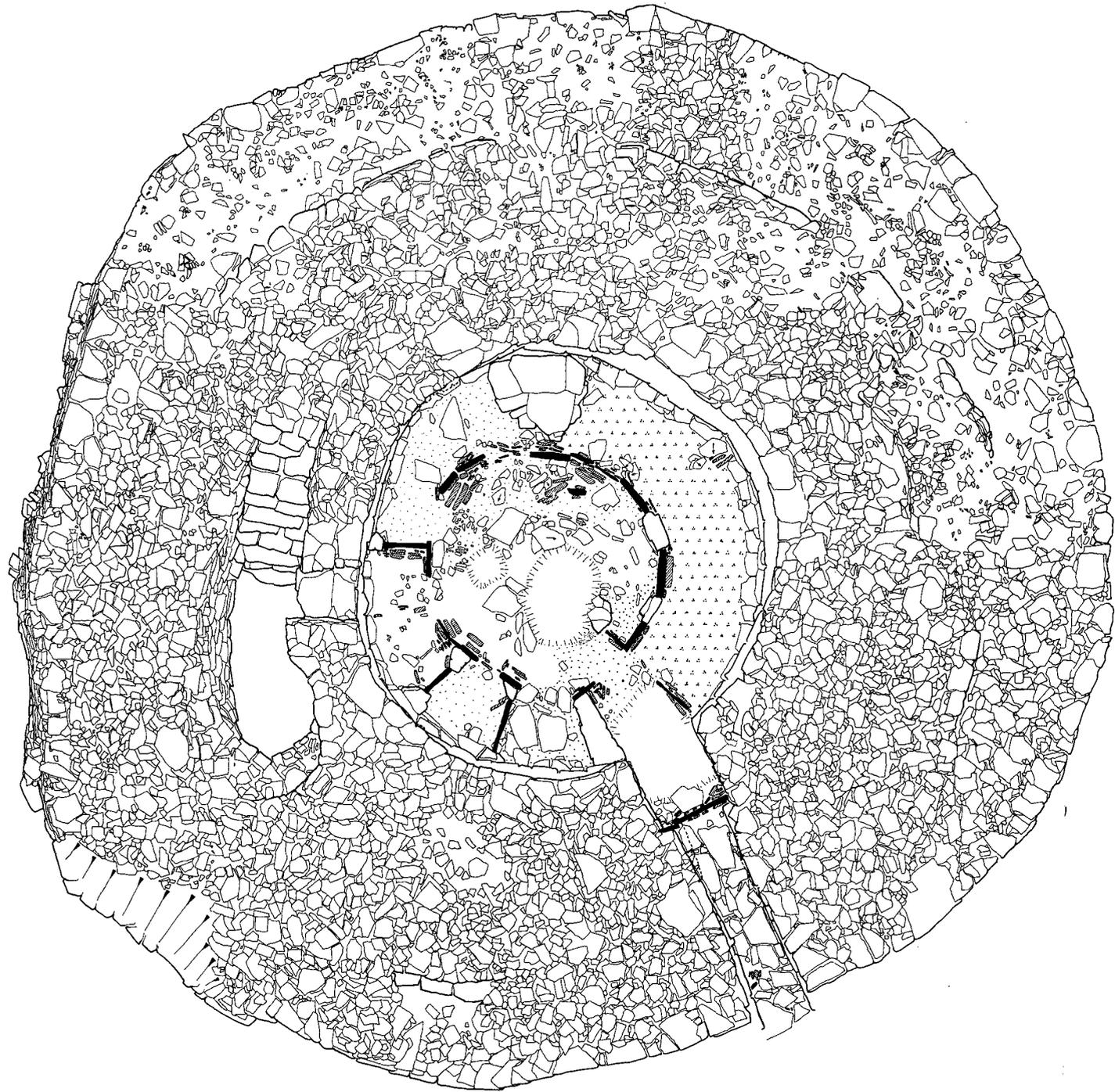
The W wall of this cell slumped outwards during the initial collapse of the Broch 2 wall, but it was refaced during the rebuilding of the cell when the entrance was buttressed on either side and narrowed down to 0.7m (illus 26). A solid base of rubble levelling and a layer of stony floor material were spread on the cell floor as its new surface, and the rest of the cell was rebuilt.

The interior of the tower was laid out with a new arrangement of furnishings built over the levelled remains of the Broch 1 floor. All

the Broch 1 uprights had been either withdrawn or broken off, and the only one remaining to any height was reused as packing. The only early feature to show through the Broch 2 floor was the earth house shaft, although this was partly obscured by the new inner wall-face. The new internal design was simpler than in Broch 1, being divided into three main areas (illus 25; 29). These comprised: a central inner circle 4m in diameter, two lidded bays on the S side, and a 2m wide passage running from the entrance around the E and N sides as far as the landing of the W cell. The

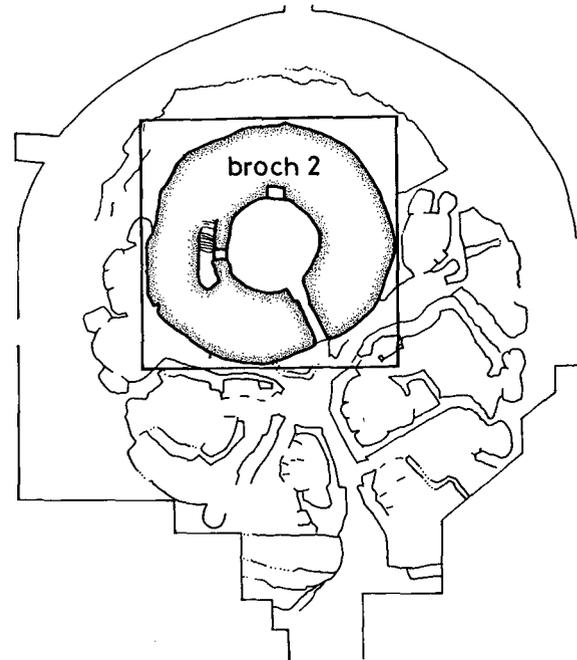


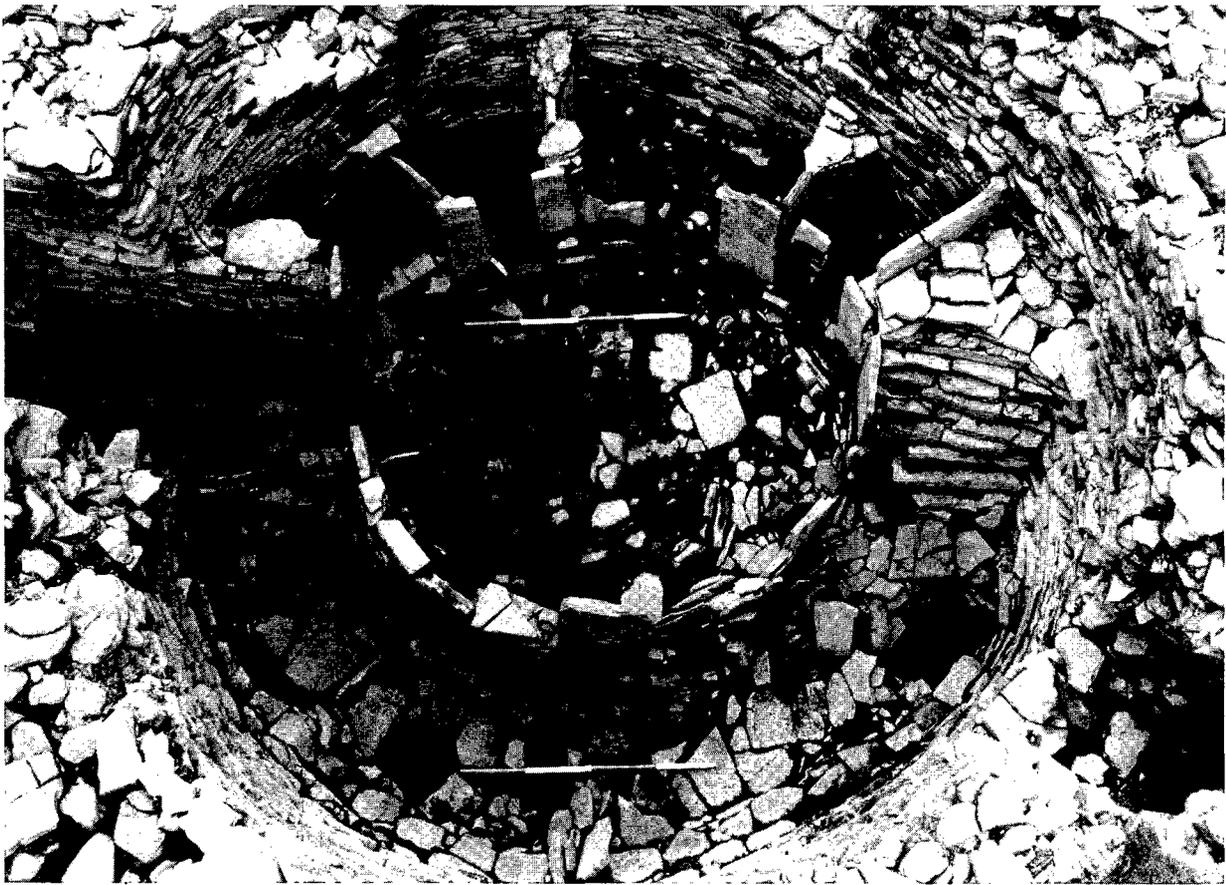
Illus 26  
Details of the Early Phase 7 broch tower (W intramural landing, staircase and bar-hole) and its N defences.



0 5 metres

Illus 25  
The Early Phase 7 broch tower: wallhead and floor plan.





Illus 29

The primary floor of the Early Phase 7 broch tower, with the Phase 5 earthhouse shaft visible and the replacement staircase beyond it; scales 2m; from E.

two bays were entered from the central area and a third, open bay, gave access to the W staircase, presumably via a ladder. The curved passage on the E could be entered either at its W end through a 0.8m wide gap in the central partition, or round a flagstone partition on the E side of the broch entrance. This passage extended around 200° of the inner face and was separated from the rest of the interior by a screen of uprights up to 1.6m high.

This screen was composed of four load-bearing uprights with thin slabs between. The space between the easternmost uprights was filled by a thick, short upright stone abutted and overlain by horizontal masonry. The passage floor was of clean clay and contained a single partition, which cut into the wall plinth. The earthhouse shaft opened into this passage and was presumably lidded. The floor within the central circle had been severely damaged by Later Phase 7 levelling and cuttings so that its layout was unclear. The surviving remnants of the floor were a few scattered flags, a fragment of hearth slab, a narrow partition between the hearth and an upright, and an area of packing around another upright on the N side. The bays on the S and W were divided by similar radial partitions, each with an upright set at its inner end and a single large slab, about 1.05m high, with horizontal masonry filling the gaps. The entrance partition was of solid masonry walling, 1.05m high. A single flagstone formed the lid to these two bays, and rested on the partitions (illus 30a). Between the first and second partition, it was a wider but only 0.03m thick, and between the second and third partitions it was narrower but 0.05m thick. Only fragments of these lids survived *in situ*: most were found in rubble in the bays.

Topping all four partitions were large thin slabs fitted against the broch wall with horizontal packing, which survived *in situ* only on the third partition. On the first partition, the packing remained, with the broken slab lying in the rubble below, but the slabs over the second and fourth partitions were removed during Phase 7. These top slabs could not have taken any great weight, although horizontal packing extended over the third slab, suggesting that an upper lid may have existed. The lower lid extended 0.6m to the N of the third partition, supported on its inner edge by a thin upright. This would have formed a small cupboard, 0.6m by 1.2m, in the S end of the open bay but would have allowed access to the intramural W cell from between the third and fourth central uprights. The first bay had a flagstone floor, whilst the second had a layer of fine gravel, and the floor did not survive in the open bay. There was also the packing for a small sill between the second bay uprights. Although these fittings were exceptionally well preserved, the function of each of these separate areas must remain open to speculation. No evidence existed for an actual higher floor level on the interior and the wall-face had no sign of a scarcement, even though it survived about 3m high.

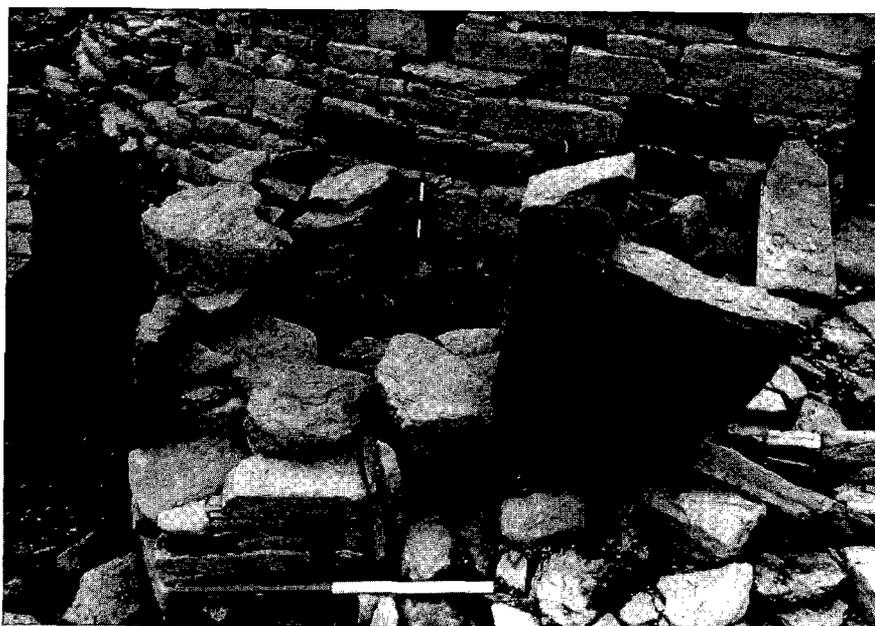
#### EXTERNAL CELL AND DOORWAYS TO THE BROCH TOWER

After the broch tower had been started, an outer door cell was built onto the W side of its entrance. The cell abutted the broch at ground level, but higher up it was bonded into the tower wall. The cell wall curved E about 1.5m from the tower producing an open cell, c 1.8m long. At the E end was a projecting stone upright that



Illus 30

a) A bay partition in the Early Phase 7 broch tower; scales - 1m; from E;



b) Early Phase 7 outer doors and cell to the broch tower; scales - 50cm & 1m; from S.

formed one side of the outer door to the broch. It was matched on the opposite side of the entrance by a pivot-stone and some packing projecting out of the W wall of the *E* building. This doorway, 1.0m wide, was originally designed as the outer door to the broch tower, but it also provided access to both the *E* and *NE* buildings (illus 32). Several thick paving slabs formed a floor within the cell resting directly onto the Neolithic clay mound. At the E end, the slabs formed a step about 0.14m high, but elsewhere, this paving acted partly as a foundation for the cell wall.

During Phase 7, the cell and doorway were redesigned as a massive outer doorway (illus 30b). A large hole,  $2.8 \times 1.6\text{m}$ , was dug into the clay of the Neolithic mound, immediately E of the broch tower entrance, and was filled with rubble in order to provide a strong foundation. Silt and clay formed a thin layer in the bottom of the hole, and filled the spaces in the rubble before it was sealed with large flagstones. A solid block of masonry was built onto this flagstone foundation which was  $c 2.05 \times 1.4\text{m}$  and

survived to a height of 0.76m. It abutted the tower wall and contained a large boulder, 1.1m high, as the E jamb to a new external door. The door to the *NE* building was incorporated into it, cutting through the broch tower plinth and abutting the S wall of the passage.

Another door was constructed against the W wall of the *E* building, immediately to the SE of the broch outer door. Two upright stones formed its sill-stone, giving a doorway 1.1m wide, and a pivot-stone was found at its N end. This door may have been seen as a replacement for the original outer door to the tower, but it was found to be unnecessary and was dismantled. Between it and the door to the *NE* building was a passage  $2 \times 1\text{m}$ , paved with stones, from which opened the door to the *E* building. The entrance cell was eventually partly demolished and rebuilt over the levelled remains. The new cell, was roughly built and had a large upright, 1.5m high, at the E end that formed the W door jamb of a doorway. The new door was 0.90m wide and had a sill-stone 0.22m high between two uprights. Paving was laid

between the sill and the tower entrance passage, which contained a pivot-stone for the door. At about the same time, the entrance into the cell from the passage was defined by a doorway between two upright stones, with a pivot-stone and a central sill-stone.

This cell was altered once more, by the addition of an internal buttress against its W wall, which had slumped and may have partly collapsed before the buttress was added. The new buttress was  $1.0 \times 0.4 \times 0.46\text{m}$  high. As a result of these changes, the cell and doorways survived in use until the W half of the settlement was levelled later in Phase 7.

## LATER MODIFICATIONS TO THE BROCH TOWER

Several structural alterations were noted during Phase 7. The inner section of the broch entrance passage E wall collapsed as far as the central door-jamb. This collapse was caused by the passage

walls settling into the silts filling the underlying Phase 5 drain, and may have led to the temporary abandonment of the broch tower which occurred shortly afterwards. During the repairs, the drain was partly cleared of silt, before being filled with large rubble that abutted the surviving W wall of the entrance passage. The E wall was then rebuilt but the bar-hole was not replaced suggesting that the inner door was no longer considered necessary, and the pivot-stone was not replaced when the floor was repaved.

At some time during Phase 7 there was a large fire in the curved passage within the broch tower which scorched the broch wall to its full surviving height. On the floor was a layer of charred straw, suggesting that straw may have been used as a floor covering or was perhaps being stored here. After the fire a new flagstone lid was laid over the earthhouse shaft, as the previous lid must have been destroyed by the intense heat. The surviving lid may however have been a replacement put in when a new staircase was built adjacent to it (see below).

## THE SETTLEMENT

As with the Phase 5/6 settlement, the houses of the Phase 7 occupation were grouped within the line of the earlier defences on the S side of the broch. From the layout and construction of these houses it is clear that they formed a homogeneous planned settlement, designed to fully utilize the available space (illus 23). The broch tower sat close to the encircling Phase 5/6 defences in the N, with the six houses arranged to the S, cutting into the rampart of the earlier defences to gain more space. Three houses with their adjoining yards lay on the W of the settlement entrance, the other three houses and yards lay to the E (illus 31; 32). The entrance to the SE house was from the entrance passage, whilst the doorways to the E and NE buildings led from in front of the broch tower entrance. Immediately in front of the broch tower was a small additional structure housing the two outer doors.

Most of the houses and yards shared common walls, confirming that they were built together. The following stratigraphic account deals therefore with each house in turn, starting with the NE and working in a clockwise direction.

### THE NE BUILDING AND YARD

#### ORIGINAL FEATURES (illus 32; 33)

This house and its adjoining yard were cut into the rampart on the E, the Phase 5/6 defensive cross-wall to the N and was built against the broch tower on the W. The E face of this cross-wall survived below the foundations of the W wall of the this building. The Phase 5/6 rampart on the E was still maintained and formed a boundary for the house yard.

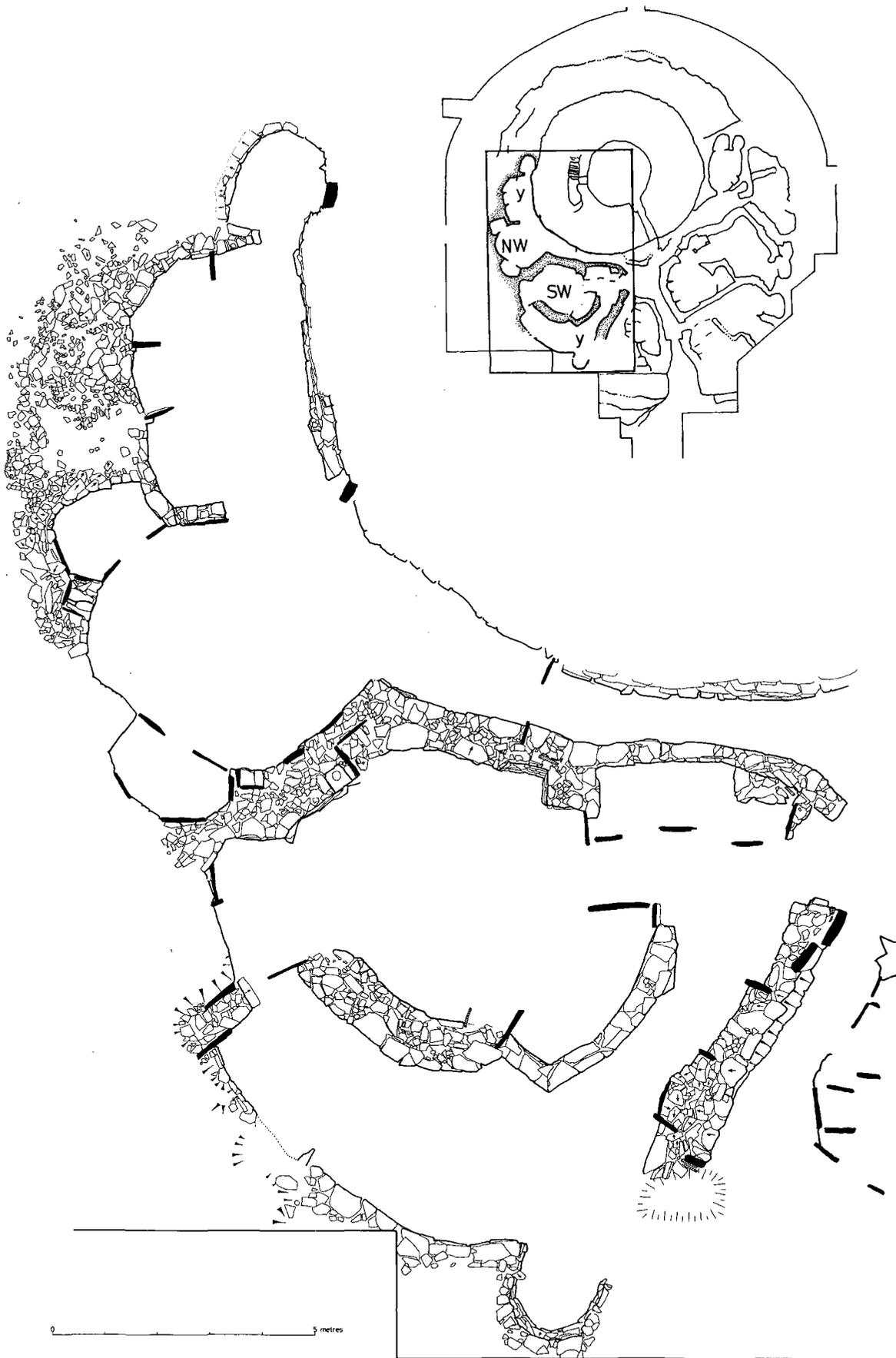
Prior to construction, this area was cleaned down to Neolithic levels, leaving a clay surface, and to Phase 5/6 rubbles. A doorway with a pivot-stone and raised sill in front of the entrance to the broch tower opened onto a paved 8m long passage leading E to the yard and the house beyond.

The S wall of this passage was shared with the E building, and its E end divided the NE and E yards before abutting the E rampart. The broch tower formed the N wall of the passage until it was replaced half way along by a new facing wall (illus 32). This wall was 0.5m thick and continued N as the W wall of the building. It neatly abutted the broch and was thicker towards the top to compensate for the batter of the tower wall. At the E end of the passage, between the building and yard entrance, was a small corbelled cell,  $1.0 \times 1.3\text{m}$ , entered from the passage between two upright flagstones. Its coursed masonry walls rose to a height of 0.60m, before they began to corbel in to form the roof; this had not survived, although the surrounding walls stood to a maximum height of 1.76m.

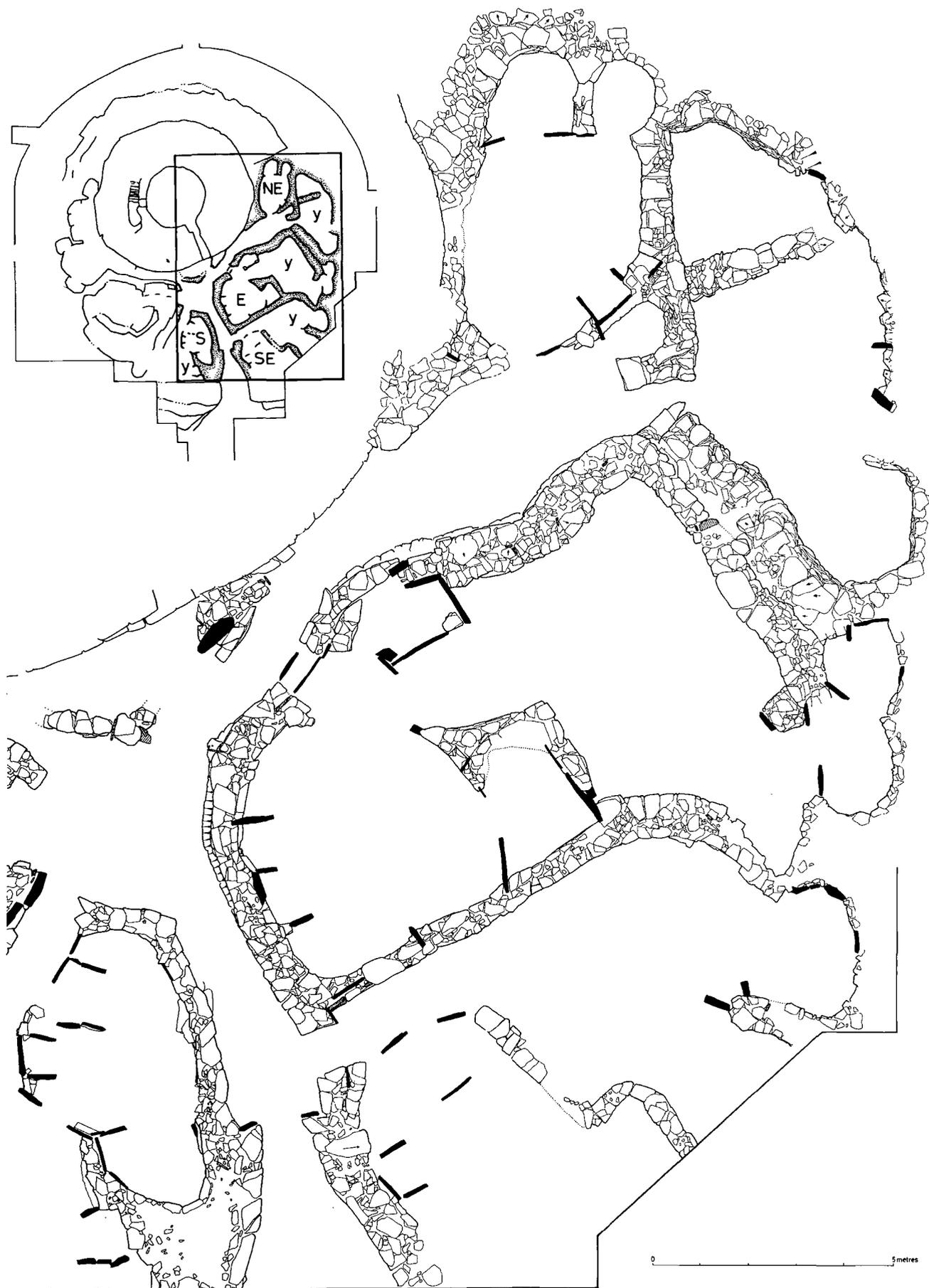
The cell rested on a clean clay foundation cut by a single stake hole below a thin layer of pea gravel. A layer of rubble, ash and silt over this gravel, formed the floor of the cell and the passage outside. At sometime during this phase, the cell roof collapsed completely, filling it, and the cell was abandoned. The doorway to the NE building lay immediately E of this cell and consisted of a raised sill between an upright flagstone, bonded into the passage wall, and walling on the E. A flagged and raised recess was built immediately W of the doorway, in the angle of the W wall. This could have been the remains of a double cupboard  $0.8 \times 0.66\text{m}$ . E of the doorway were the remains of a possible oven, which was open to the NW and partly recessed into the wall which formed one side of the external cell described above. This oven was 0.8m square and contained a small quantity of ash and stone.

Immediately NE of the oven was a small cupboard,  $0.32 \times 0.44\text{m}$ , which may originally have had a central shelf, set into the freestanding E wall of the building. The N end of this wall abutted the Phase 5/6 rampart before cutting into it to become part of the single-faced wall where it formed two N cells to the house. These two cells filled the gap between the W and E walls of the building. The E cell was divided from the W cell by a masonry partition which supported the corbelled roofs of both cells. Corbelling for the roof of the E cell began 1.8m above its floor, but the roof was found incomplete. An open entrance led into this cell from the S which had floor dimensions of  $1.5 \times 1.3\text{m}$ . Entry to the W cell was through a screen of upright flagstones over a central sill. Both ends of the screen were bonded into the cell wall and the uprights were chocked by smaller stones. The cell had floor dimensions of  $2.2 \times 1.4\text{m}$  and its corbelled walls survived to a height of 3.0m, even though the roof did not survive complete. The clay surface below the E cell was initially covered by a thick layer of pea gravel and silt, on top of which lay a floor of narrow paving slabs. The clay layer below the W cell was cut by twenty, small, randomly distributed peg holes, filled with a mixture of pea gravel and silt from the floor. The pea gravel was capped by a flagstone floor of which only part remained.

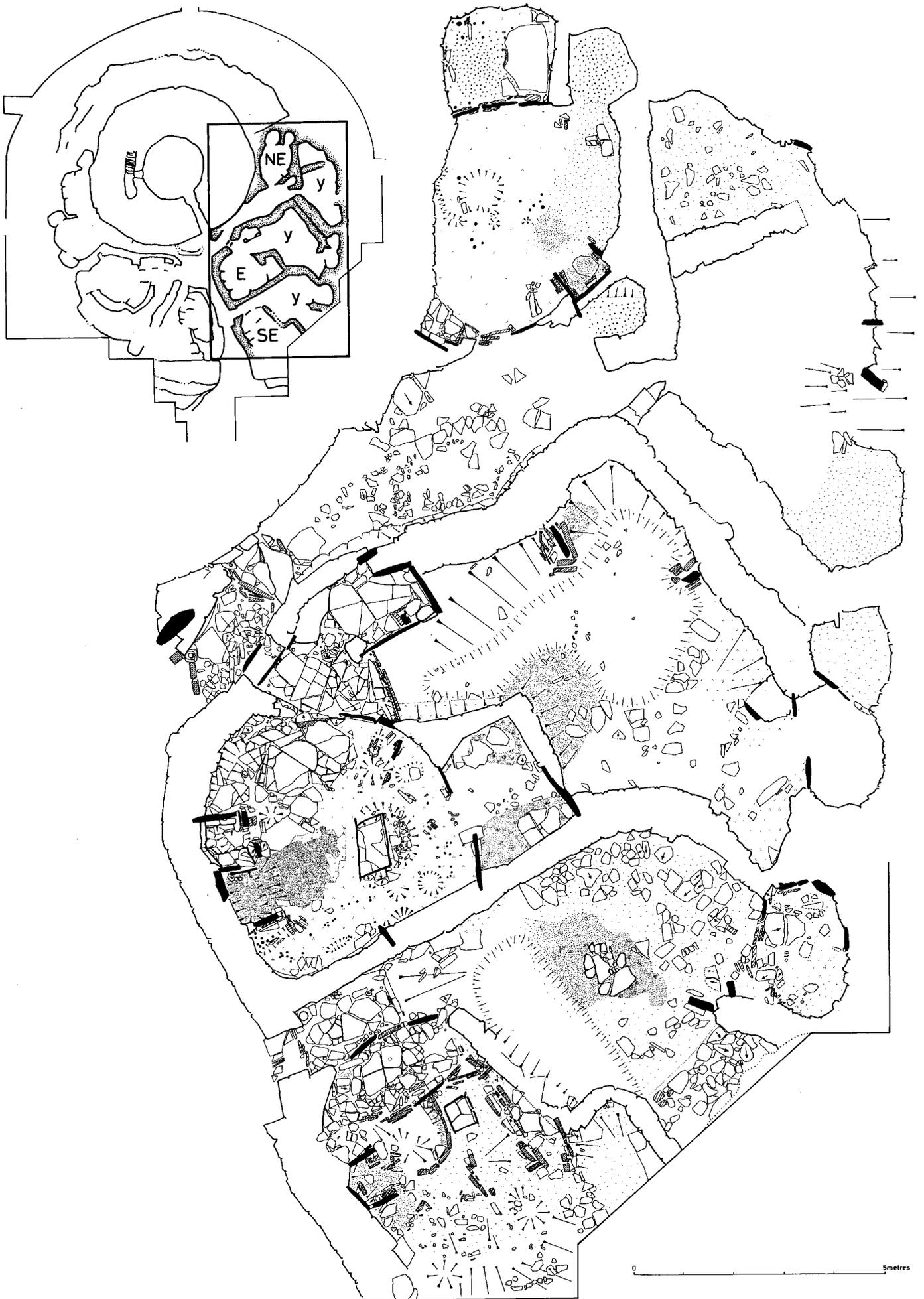
The central area of the house was  $4.5 \times 3.7\text{m}$ , and evidence for some of the original fittings survived in the clay surface, although subsequent cleaning had largely removed the initial floor. Fifteen peg holes were found in the centre of the area below the earth floor material, and some were close to a patch of burnt clay which probably indicated where the original Phase 7 hearth lay. W of this burnt clay were several other features dug into the clay and surrounded by peg holes, including a small circular depression, 0.23m in diameter, which was linked by another shallow depression and a linear gully to a deeper pit,  $0.21 \times 0.84 \times 0.9\text{m}$ . All were filled by charcoal, ash and earth floor material, and some slag was found close to the circular depression. These may have been the remains of an iron smelting furnace and a slag tapping hollow. These features, together with the sparse remnants



Illus 31  
Early Phase 7 settlement: wallheads of *NW* and *SW* buildings.



Illus 32  
Early Phase 7 settlement: wallheads of *S*, *SE*, *E* and *NE* buildings.



Illus 33  
Early Phase 7 settlement: original features of the *NE*, *E* & *SE* buildings.

of paved and earth flooring, are all that remains of the earliest recorded floor for this building. They may not all be of the same date, but they predate subsequent Phase 7 floors in the house. The yard was reached through a 0.9m gap at the E end of the entrance passage, between the external cell and the dividing wall between the **E** and **NE** buildings. The yard surface was disturbed, and contained levelled rubble and midden material from both the earlier and later phases. It was divided at the N end by a freestanding wall aligned roughly W–E, which ran from the E wall of the building towards the rampart, leaving an entrance 0.6m wide against the rampart wall. It enclosed an area,  $2.8 \times 3.8\text{m}$ , of levelled rubble, which might if roofed, have formed a small shed.

### NE BUILDING: MODIFICATIONS

A reorganization of the interior of the building took place early in Phase 7, with an almost complete clearance of the primary floor(s). Prior to this, or at the same time, the oven was partly filled with rubble, the exterior cell roof collapsed, and mixed layers of midden, ash, earth and rubble partly filled the entrance passage. This collapse may have prompted the subsequent cleaning and rebuilding of the house.

Also undatable, but prior to this reorganization, was the addition of a linear buttress, 1.0m wide, against the full length of the dividing wall between the **NE** and **E** yards, narrowing the entrance by about 0.4m. This buttress may have been necessary due to settling over the entrance into the underlying Phase 4 well. A roughly levelled area of rubble, clay and midden, in the angle between this new dividing wall and the rampart wall, may have been the remains of a small shed or cell which was later cleared away.

## THE **E** BUILDING AND YARD

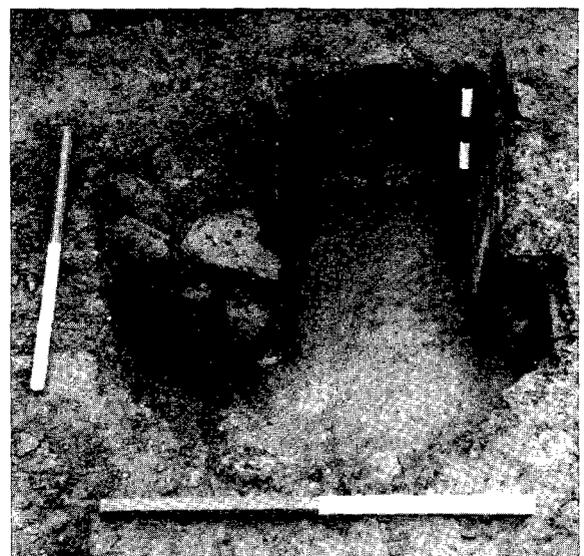
### ORIGINAL FEATURES (illus 32; 33)

The **E** building and its yard lay between the E rampart and the **NE** and **SE** buildings. It was built over early Phase 7 levelling rubbles and into Phase 5/6 deposits and Neolithic levels. Its double-silled entrance lay within freestanding masonry walls immediately to the E of the external doorway to the broch tower. To the E, was the dividing wall between the **E** and **NE** houses,

and a partly curved wall, to the SW, formed one side of the entrance passage into the village. At the S end it was shared with the **SE** building, and it also formed the S wall for the **E** yard before abutting the E rampart (illus 32).

The house was separated from the yard by an angular wall of both coursed masonry and large upright flagstones, which incorporated an E cell to the building and joined the S wall. Built into the W face of this wall, about 0.9m above the floor, was a double cupboard made of vertical and horizontal flagstones, with recesses of  $c 0.44 \times 0.3\text{m}$  separated by a horizontal slab (illus 34a). In the curved corner of the W and NE walls was another cupboard,  $0.58 \times 0.4 \times 0.46\text{m}$  deep, of similar construction. The top of the wall above this cupboard was rebuilt in Phase 8 and it is uncertain whether it was originally a single or double one. Set into the wall to the E of this cupboard were the remains of an upright flagstone, and N of the cupboard was a narrow flagstone and masonry partition which marked the position of the hearth (illus 35a). 1.5m further N was an oven formed from two upright stones, about 1.3m high, that projected 0.8m into the room from the wall and were about 0.9m apart. The wall face between them was slightly bowed and had a narrow projection, 0.9m above the floor, running the width of the feature. Two packed, upright slabs on the E side formed its entrance, and other uprights, set about 0.1m away from the side, supported coursed masonry rising to the level of the wall projection. This has been interpreted as a flue system with upper shelf supports within the oven. Other structural features include the N cell, set against the N dividing wall of the building E of the entrance, which was entered from the S through an open doorway, marked by an upright pillar of masonry at its SW corner. An adjacent long thin, upright flagstone formed the S wall, ending in another small masonry pillar. A further upright slab filled the gap between this stone block and the N dividing wall. The walls survived to a height of 0.84m and enclosed an area  $1.9 \times 1.10\text{--}1.5\text{m}$ ; inside was a packed stone upright, set at right angles against the S wall. The cell was constructed on Neolithic clay, and heavy paving, resting directly on the clay, formed the floor.

Between the doorway into the building and the entrance into the yard was a passage,  $2.4 \times 1.2\text{m}$ , which was originally paved. This paving survived only as a fragment at the E end as it was replaced later, but sufficient remained to show that it was set on a levelling layer of yellow clay, and it may also have held a pivot-stone at the entrance. The entrance to the building was marked by a sill-stone which lay between the broken upright flagstones forming the S

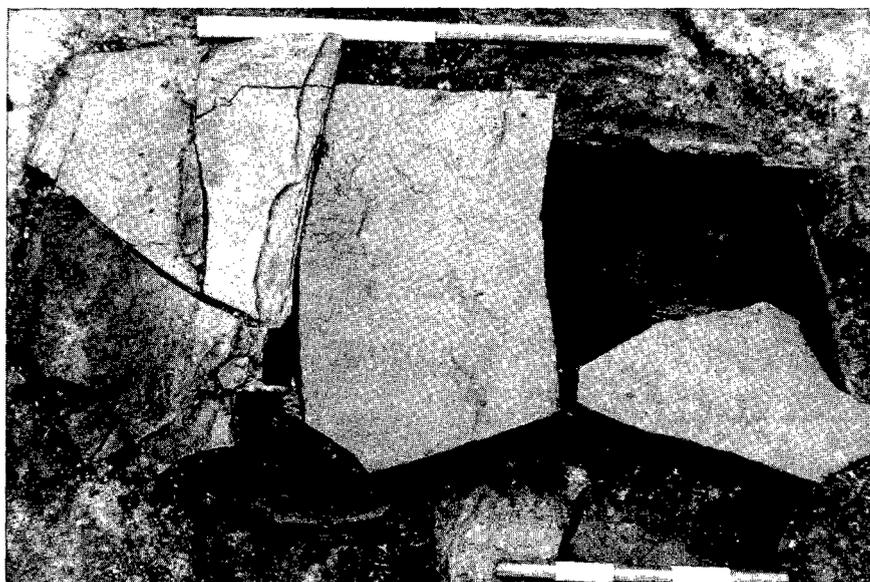


Illus 34

Early Phase 7 settlement: a) double cupboard in the **E** building; scales – 1m; from SE; b) tank in the **E** building, half-sectioned showing side slabs resting on a basal stone, with clay and rubble packing; scales – 50cm & 1m; from N.



Illus 35  
Early Phase 7 settlement: a) E building, interior wall face, between the cupboard (left) and the oven (right), showing its construction; scales – 1 & 2m; from E;



b) tank of the E building with lid; scales – 50cm & 1m; from E.

wall of the passage, and linked the internal wall to the NW wall of the building. The sill was packed by stones and yellow clay and allowed a drop of about 0.4m to the interior of the house from the passage.

A large hole by the S wall of the house contained a tank,  $1.2 \times 0.55 \times 0.6\text{m}$  deep, with chipped flagstone sides set on a base slab packed round with clay and rubble (illus 34b). Underlying the base slab, and packing the sides and the corners, was yellow clay which made it watertight. The tank sides projected about 0.15m above the floor, and during its use the base slab had been cracked and was repaired by a patch of yellow clay. Other original features include two adjoining upright packings, one still containing part of an upright, built into the underlying rubble E of the internal doorway, and close to the internal wall of the house.

There was a  $2.6 \times 2.0\text{m}$  cell formed by an internal wall between the house and the yard, which was entered through a gap 0.8m wide between two upright stones. It had a complete corbelled roof rising to about 2.5m above the floor, and a succession of fragmentary floors were laid down within it although only one floor survived in the main area of the house. This was because the cell floor had settled into the underlying Neolithic ditch and was at

a lower level than the house floor. Surviving around the walls on the inside of the cell was a mixture of charcoal, clay and paving, and in the SW corner a pot (SF 7114) was set into the floor. This floor was completely replaced by a 0.36m thick layer of yellow clay with some stone and charcoal lenses which had settled slightly as an earth floor containing some pottery and bone accumulated in the centre. The earth floor was subsequently levelled and covered by well-fitted paving that gradually settled along the S wall of the cell and was levelled up with a clay patch about 0.1m thick. While this activity was happening in the E cell, the main area of the house, which was about  $5 \times 5\text{m}$ , was almost completely floored by a layer of yellow clay up to 0.3m thick. At the N end of the floor, between the doorway, the W wall of the house and the oven, a 0.1m thick layer of paving was laid on the clay. Within the clay floor, towards the SE corner, were the levelled remains of a circular, clay-lined depression, filled with fine charcoal overlain by a mixture of grey/yellow clay and stone. This feature probably represents the base of an iron-working furnace, and reddened, burnt clay around the lip of the depression and an associated arc of four stake holes emphasize this interpretation.

In all, 12 groups of stake holes, representing 47 holes, were found in the clay floor. These holes were either arranged singly, or

grouped in pairs, fives or nines and one had 11 holes. Their diameters lay within a range of 0.02–0.065m and the depth of the holes was from 0.02–0.17m. The holes were filled with earth floor material and some were clearly angled into the clay where pegs or stakes had been pushed in. Other surviving evidence for activities within the house at this period were small packing stones and shallow linear depressions noticed in the clay floor. Cut into the S edge of the N paving was a small circular pit, 0.4m in diameter and 0.2m deep, which also belonged to this phase. A large amount of earth and clay between the oven and the partition slab to the S, showed that the hearth was situated close to the W wall. Ash deposits spread from the wall towards the tank and contained small fragments of stone interpreted as burnt pieces of hearth slab. Though some clearing of occupation debris and levelling of the hearth took place towards the end of this phase, it was sufficiently patchy to leave the structural fittings and other shallow features which have just been described.

Other alterations belonging to this initial phase of activity include the repairing of the entrance passage wall, the raising or inserting of a new pivot-stone, and its repaving with new flagstones set into a thin clay levelling layer on top of the old paving. A triangular masonry buttress was added between the doorways to the E building and the small N cell, where the wall was weakest. This wall may already have slumped before the reinforcing buttress, 0.6m high, was added.

At the E end of the entrance passage, between the N and E cells, was the doorway with a step leading down into the yard. The floor here consisted of the levelled remains of Phase 5/6 debris. Two large stone packings, containing fragmentary uprights, were built into this levelling against the NW and NE walls of the yard. These would have formed partitions, until they were broken off during a later occupation of the yard. The rampart was partly cut away at the SE end of the NE wall and two small cells were formed backing into the rampart. They were faced by a curved wall.

Further S, this wall became the S wall of the building, although it had lost its face at this point. A sill-stone between two upright flags formed the entrance of the N cell, while the S cell had an open entrance again set between two flagstones, and the N cell could only be reached from this cell. It seems that the N cell was not part of the original design, but was formed when the buttressing wall was built against the NE wall. Part of the earth floor survived in this cell but the S one had been cleaned down to underlying rubble. The yard wall to the W of the S cell may have settled slightly, probably because it overlay the Phase 4 well, and was reinforced by a square buttress of coursed masonry.

Against the outside wall of the E cell were two deliberately laid clay patches  $c 2.0 \times 0.3 \times 0.2$ m deep. The clay was clean, compact and sloped from the walls into the yard and functioned as a draught/waterproof layer. Later, a large spread of ash,  $2.6 \times 1.6$ m, was dumped against the cell wall over this clay. A small patch of ash and clay found by the E face of the N partition, and another dump of yellow clay surrounded the buttress at the end of the NW wall, are all that remained of the early Phase 7 deposits in the yard. All these clay dumps sloped towards the centre of the yard which had been repeatedly cleaned down, cutting into Phase 5/6 deposits.

### **E BUILDING: LATER MODIFICATIONS (illus 36)**

Both the house and yard received new floors which appear to have been used for a long time. In the house, an earth floor with some paving was laid over the levelled clay floor. Clay and much charcoal had accumulated on it before a new hearth slab, set into a layer of yellow clay, replaced the earlier one. This clay had been burnt red through prolonged use and the hearth slab was largely burnt away. A series of ash lenses and clay patches around and over this hearth seem to be the remains of subsequent clay levellings and burnt-out replacement hearth stones, emphasizing the long duration of this floor. Between the hearth and the W wall was an ash-filled hollow, which was probably the ash pit for this hearth.

Finally, a levelled 1.5m square patch of yellow clay was laid over the hearth, and a new 1.2m square hearth was formed from two slabs with small stones pushed into the clay to fill the gabs between them. The hearth was found badly cracked, reddened and partly containing a 2m square spread of grey and pink ash and charcoal. While this hearth was being constructed, some small repairs were made to the room's N paving by the addition of a thin linear yellow clay patch. The tank, which contained only a thin layer of silt and two large stones, appears to have gone out of use and had been covered by three slabs which were partly hidden by the earth floor material (illus 35b).

The E cell entrance was rebuilt before the next sequence of floors were laid. First the N entrance upright was removed and a grey clay levelling layer was laid in the cell, then a new 1m long, low sill-stone was set into this clay. A triangular masonry buttress was built against the N wall between the double cupboard and the cell to reinforce the cell wall, and an upright, projecting S from this buttress, now formed the N side of the new entrance. The cell may well have been re-roofed at this time.

Further modifications included the laying of a new clay floor with some paving, and the addition of some loose stone to the sill in order to heighten it. The surface of this clay floor sloped to the centre of the cell, indicating that it had been worn down by repeated clearing. A furnace, about 0.9m in diameter, had been built in the N half of the floor, and the base survived as a charcoal-filled hollow with paving to the S and E. Between it and the cell was a 0.45m diameter hole,  $c 0.12$ m deep, filled with brown ash and charcoal, which was either a slag tapping pit or a post-hole. Meanwhile, a silty occupation layer built up on the paved floor of the N cell.

### **E YARD: MODIFICATIONS (illus 32; 36)**

The yard was remodelled following the partial collapse of the W end of N wall after it was partly undermined by repeated clearing of the yard floor. Rubble from this collapse was levelled to form a layer in the yard. The collapsed section of the N wall was rebuilt, abutting the surviving E end, and a small upright stone was put in front of a small gap left between the two sections.

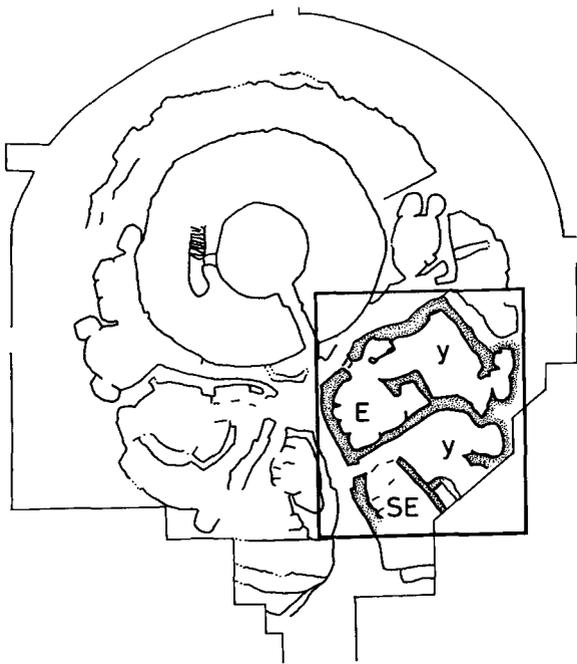
An earth and clay surface was put down in the N part of the yard, but a layer of debris from the buttressing and re-roofing of the cell was left in front of the entrance at the W end. This rubble was used as a rough flagged path into the S part of the yard. A roughly built freestanding cross-wall ran S from the NE wall to within 1m of the house, dividing the yard into two unequal parts. This wall survived only as a low feature and both ends were unclear; however, a small upright stone and packing, survived between it and the S buttress to the NE wall.

An earth and flagstone floor containing ash and clay, was put down and extended into the S rampart cell, where two small stone settings close to the cell wall, formed low partitions. A fragmentary partly kerbed hearth was laid on the earth floor in the centre of the S part of the yard, and may have been unused. The presence of the hearth, earth floor and dividing wall suggest that this part of the yard may now have been roofed over. Finally, an earthy layer was spread across the floor of the N rampart cell and a layer of closely fitting flagstones was laid on top.

### **E HOUSE AND YARD: LAST REPAIRS AND ABANDONMENT (illus 37)**

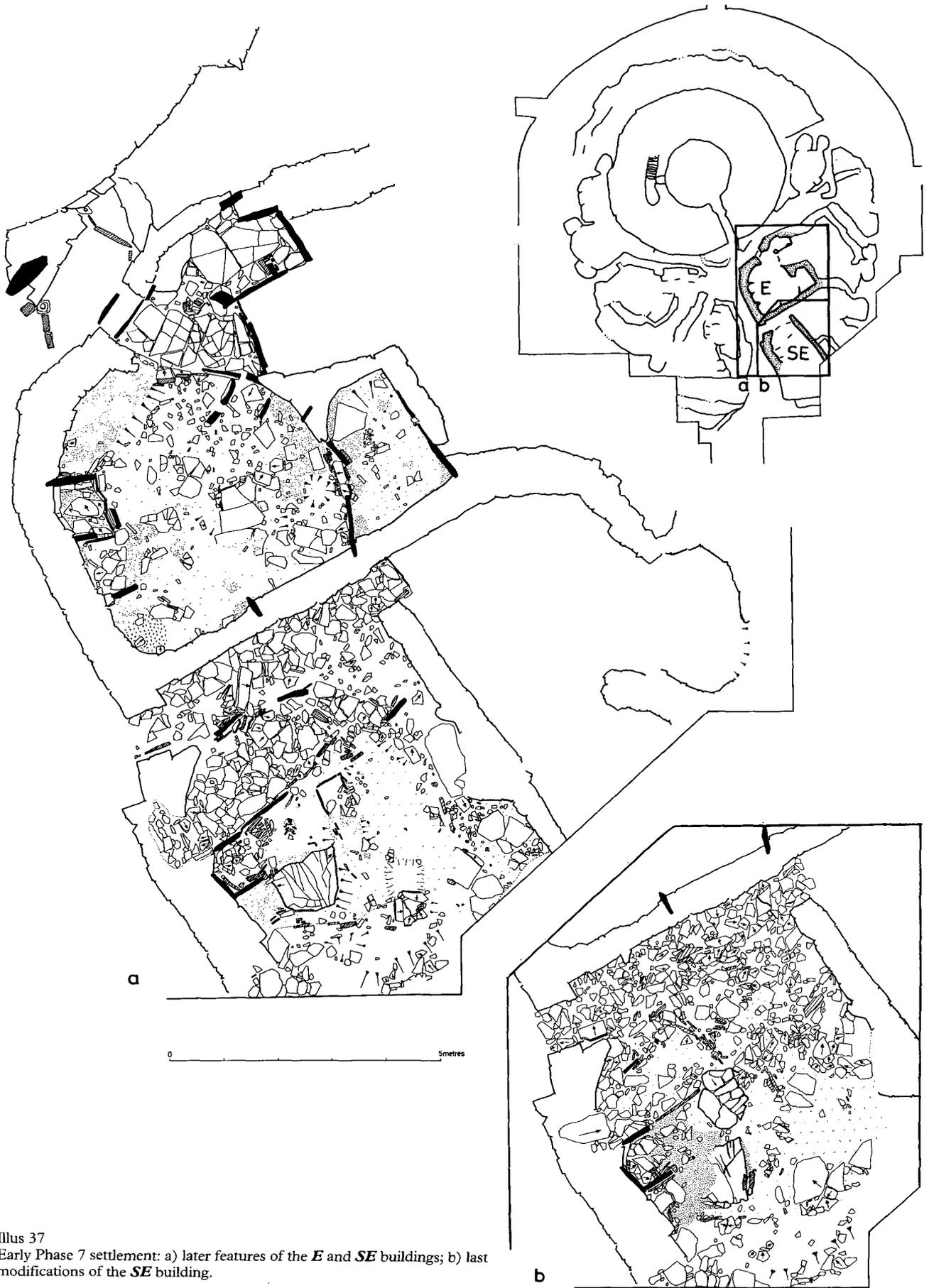
A final series of changes took place in the house. Three small uprights were set into the bottom of the oven and a series of clay, charcoal and ash lenses accumulated within it. Capping them was an ash layer with reddened stones which appeared to be the remains of collapsed shelving, which marked the final use of the oven. A series of dumps and collapses now brought the use of the house to a temporary end.

In the E cell, ash, probably from the oven, was dumped into the pit beside the N entrance upright, and spread across the cell to



Illus 36

Early Phase 7 settlement: later features of the *E* & *SE* buildings and yards. Inset: Early Phase 7 *E* building during excavation with its yard to the right and the *SE* building and yard to the bottom right. The village entranceway is on the left; scales – 2m; from S.



Illus 37  
Early Phase 7 settlement: a) later features of the *E* and *SE* buildings; b) last modifications of the *SE* building.

became intermixed with the shallow earth floor. In the SW corner of the house was a dump of shells which had not been cleared away before clay and rubble from the W wall fell on to it and the adjacent earth floor. In the N part of the room, the wall collapsed again, depositing a further layer of rubble onto the floor intermixed with ash below. More ash was dumped on top before a further collapse took place and finally, yet more ash, probably from the oven, covered this, before the house was abandoned. The change between the cleanliness of the earlier floors and the accumulations of the final phase of this building seems clearly to be significant. Occupation in the yard continued until the E end of the S wall fell off the rampart onto the earth floor, bringing with it clay and stone from the rampart which slumped over the rubble. At the N end of the yard, rubble accumulated from the decaying N wall, prohibiting use, and the yard was then abandoned.

### SE BUILDING AND YARD

#### SE HOUSE: ORIGINAL FEATURES (illus 32; 33)

The **SE** building was constructed against the S rampart, over the levelled remains of Neolithic and Phase 5/6 deposits. Its W wall incorporated the wall foundations of Phase 5/6 date to form one side of the entrance passage across the defences into the village. The silled entrance into the settlement was retained and rebuilt. The doorway into the house lay immediately E of the entrance passage, and the N side of this doorway, and the NE wall of the house and yard was shared with the **E** building (see above). Dividing the house from the yard was a freestanding wall of coursed masonry which incorporated a partially excavated cell, belonging to the house, at its SE end. The stratigraphic relationship between this wall and the Phase 5/6 rampart was unclear and the S wall of the house was lost due to deep ploughing over this part of the rampart.

The paved entrance passage rested on clay levelling and a sill with a pivot-stone formed a low step *c* 0.15m high at its inner end. A partition of upright flagstones, with a sill-stone marking the doorway, separated this passage from the house, and another entrance led from the E side of the passage into the yard. The base of the N wall of the house was partly packed with clay, and the S partition wall and sill led into an oval, paved anteroom, 3.0

$\times 1.5$ m. A stone partition on the SE side of this room had an entrance gap at the E end which opened onto the living area of the house. S of the partition was an oven,  $0.80 \times 1.00$ m, composed of three thick upright stones, one set against the W wall and two at right angles to it. A large hearth,  $1.2 \times 1.2$ m, was built against the partition to the E of the oven, with a curved kerbed edge to the S and E; it was badly burnt through. Two further stone settings lay to the S of the hearth, and the E one formed a partition.

At the SE end of the house/yard dividing wall was a cell with an entrance screen of upright stones. Its E wall was freestanding and curved, but its S end was not excavated. The outer face of this wall stepped down *c* 0.4m into the yard surface beyond. The cell was *c*  $2.5 \times 1.8$ m, and had a partly paved earth floor, which was later replaced by a thicker yellow clay floor. The house had an earth floor covered with accumulated ash and charcoal lenses from the hearth, and there was ash in the base of the oven (illus 38).

The house seems to have been remodelled early in its history. The NE dividing wall was buttressed or refaced with substantial upright stones of which only the packing remained. These partly obscured the entrance to the rampart cell, and a new entrance was made into the main room. The E end of the screen to the S of the anteroom was reinforced by further packing and two stones at its W end were realigned to leave a gap for an entrance past the hearth. A slab-lined tank was then set into the floor on the E side of the hearth. It was  $0.6 \times 0.54 \times c 0.45$ m deep, with thin slabs and it was packed round with rubble and clay. The hearth slab was replaced by a new one which lay on a 0.09m thick deposit of clay levelling, and a layer of red ash built up over it. To complete this initial remodelling, an extensive clay patch was laid in the E half of the room to level up the floor deposits.

#### SE YARD: ORIGINAL FEATURES (illus 32; 33)

At the E end of the N wall of the yard was a cell, built partly into the remains of the Phase 5/6 rampart. It was *c*  $2.6 \times 1.6$ m and had a 1.4m wide entrance set between two stone uprights, with a central sill. The N jamb was built into the NE wall of the yard, and the S jamb into a 1.8m length of freestanding wall which formed the S wall of the cell. This wall cut into the back of the Phase 5/6 rampart, and led to another cell in the SE corner of the yard, at the junction with the house/yard dividing wall. The



Illus 38  
The Early Phase 7 **SE** building during excavation showing entrance, cell, tank, hearth and oven; scales – 2m; from SE.

deposits within this cell were not fully excavated, but it had an entrance 2m wide between the two wall faces. At the W end of the dividing wall, between the two cells, was an adjoining upright stone. The E cell had a clay and earth floor over a layer of pea gravel which was identical to the floor in the yard. In the middle of the yard floor was an unkerbed hearth, 1.1 × 0.9m, set directly onto the earth surface, and ash and charcoal from this badly cracked hearth were spread across the floor. This suggests that the yard was roofed over at this time. Occupation in the **SE** building was dramatically brought to a close by the collapse of the NE wall into the yard, leaving a heap of rubble. The roofs of both the house and yard would have been brought down by this collapse.

### **SE BUILDING: LATER MODIFICATIONS AND FLOORS** (illus 36)

The SE cell seems to have been rebuilt first, as it was now roofed independently from the rest of the house. First, a new reinforcing wall or buttress was added to the remains of the cell E wall, and a new dividing wall was built between the house and the yard, almost 2m away from the previous wall alignment. A sill at its NW end marked the doorway into the yard, and the collapsed part of the dividing wall was retained as a levelled rubble floor in the house. The NW end of the wall now became the E wall of the oval anteroom and also served as a roof support.

A large pit, 1.0 × 1.0 × 0.6m deep, was dug into the floor of the SE cell, and its original function remains unknown. It was later filled with rubble and sealed by a clay and earth floor. A central shallow stone packing, with a small, earth-filled scoop or pit beside it, were the only features associated with this floor. The house continued to have a hearth, tank and earth floor which were kept in good repair, although the ash deposits in the oven were not completely cleared away. The collapse of a large part of the NW wall seems to have brought down the roof and led to changes in both the house and the yard. This collapse does not seem to have affected the **E** building (illus 36). The entrance passage was cleared of rubble, but only larger rubble was removed from in front of the yard doorway, and some rubble and silt remained on the slope leading up to it. Domestic rubbish, ash and clay was dumped over this rubble in an attempt to level it up. Some rubble was removed from the anteroom, but the lowest stones were kept as rough paving, on which both ash and yellow clay accumulated. The S partition of the anteroom may have been damaged, as a new upright stone was added at the W end and packed with yellow clay. The tank was now deliberately filled with stone and roughly capped with earth, and a new earth floor was laid across the room up to the yellow clay patch in the E. Access to the cell was now gained through the partition from the anteroom and across or around the buried tank.

Prior to this collapse a double-faced wall had been built across the entrance to the SE rampart cell, to close it off from the yard. Following the collapse of the NE wall of the yard, or possibly as an independent event, the dividing wall between the two rampart cells collapsed into the blocked cell, and rubble fell from the NE wall into the yard. Some of this was cleared away, but the rest was left piled up against the yard wall. At about the same time a semi-circular porch, 1.1 × 1.2m, defined by a line of stones round an area of roughly laid paving, was added to the door into the yard.

At the same time a new hearth was constructed on top of the old. It was a c 1m square, kerbed on three sides and open to the W. Ash and charcoal from the hearth were found on the earth floor. At a later date the hearth was provided with a new slab, perhaps because the hearth had settled into the underlying stratigraphy. The E rampart cell seems to have continued in use unaltered, and like the yard, appeared to have remained roofed.

### **SE BUILDING: LATER ALTERATIONS** (illus 37)

Further modifications were then carried out within the house. The E cell was partly re-floored with large flagstones set into an layer of earthy clay loam that completely sealed the earlier floor. A pit,

0.54 × 0.44 × 0.13m deep, was dug through the earth floor, on the SW of the cell entrance, and although it was loosely filled with black soil its purpose remains obscure. A tank, 0.61 × 0.7 × 0.26m deep, was dug through the S edge of this pit, and part of the Phase 5/6 rampart. It was poorly constructed of upright stones set on a base slab and was not luted. The sides gradually settled into the adjacent pit, and it was then abandoned and filled with domestic debris. A line of small stones which ran from the S edge of the tank to the E wall of the building may have indicated the position of a former partition or the S wall of the room. The rest of the cell was covered by a compact yellow clay floor which only survived along the N and E sides, as repeated clearing in the centre of the room had exposed the previous earth floor.

Later, a large new hearth slab was laid towards the SW corner of the room. It was unkerbed but was replaced during its use, and ash from it was spread in patches as far as the W wall. A small stone-lined pit, c 0.2m diameter and 0.08m deep, was dug into the clay floor to the N of the hearth. It was filled with black earth and may have been associated with it.

The house entrance collapsed at some point during this phase of its occupation, blocking the passage and anteroom. The rubble was levelled rather than cleared away, and access was maintained through the entrance and passage to the yard. The N partition of the anteroom was completely destroyed, but the rubble was largely contained by the S partition. In the house, the inner face of the E wall collapsed by the oven and the rubble was not removed, suggesting that it was no longer required. As this collapse was localized, it did not bring to an end the occupation of this house, although it was part of the same sequence of collapses which led to the abandonment of the **E** building.

Following the collapse an earth floor containing organic debris developed within the house and spread over the rubble in the anteroom. The S partition was dismantled and a new hearth, 1.1 × 0.9m, constructed over the remains, even though the SW hearth was still in use. It was gradually covered by pink ash, which spread across the W part of the floor, and contained much charcoal and pottery. A stone, c 1m square and 0.02–0.04m thick, was laid over the tank, flush with the new floor level, but the yellow clay floor at the E end of the house was retained and the E cell, which was now disused, was gradually filled with rubble.

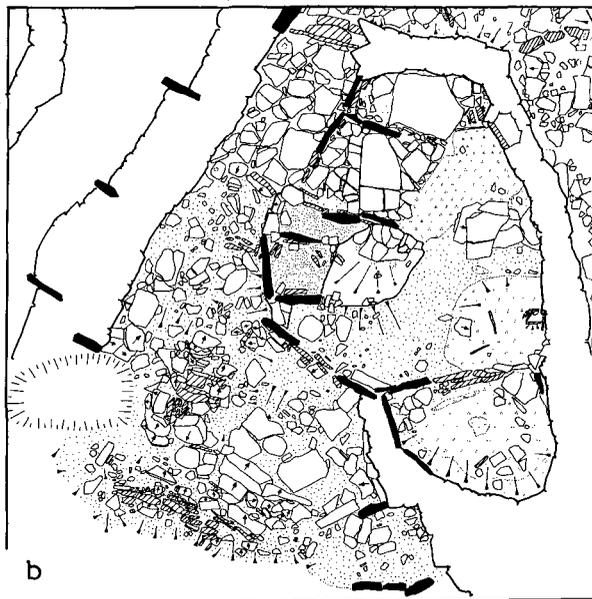
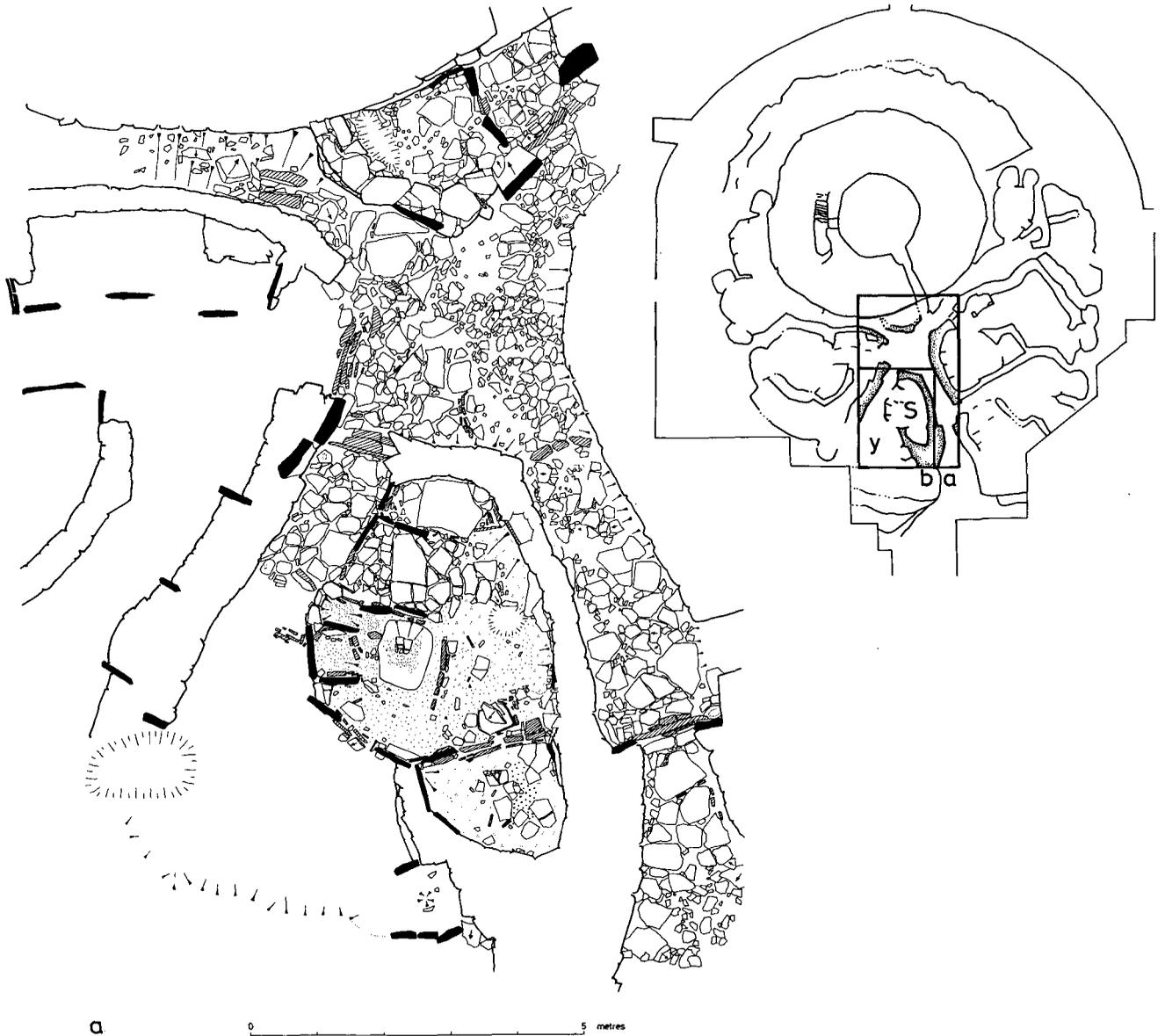
Following another small collapse of part of the E wall, and with the threat of further collapses from the other walls, the house was finally abandoned. But not before occupation in this building had persisted longer than in either of the other buildings on the E side of the village.

## THE **S** BUILDING AND YARD

### ORIGINAL FEATURES (illus 32; 39)

This building formed the W side of the entrance passage into the village and was the smallest house in the settlement. It was built over levelling rubbles, and, like the **SE** house, it reused the Phase 5/6 foundations of the village entrance and its E wall contained the W jamb of the entrance door. The E wall was freestanding and its N end formed one side of the house doorway. This door lay about 5m from the broch tower and led from the entrance passage where it widened out in front of the tower.

The W wall was also freestanding and was shared with the **SW** building. At the N end were two upright stones with a well-packed sill-stone between them, that formed the other side of the entrance. The junction with the rampart had been destroyed by a recent cow burial (Phase 9), but the W wall presumably turned E to form the single-faced S wall of the yard which revetted the Phase 5/6 clay rampart. The E end abutted the surviving Phase 5/6 settlement wall where the rampart was cut away and faced with new masonry to form a small cell. This facing continued N for 1.6m as a double-faced wall to join the curved partition between the house and the yard. Another cell was created on the E side of the wall, within the clay of the Phase 5/6 rampart.



Illus 39  
Early Phase 7 settlement: a) alterations to the **S** building;  
b) final alterations to the **S** building.

The building entrance led to a paved passage,  $1.8 \times 1.0\text{m}$ , laid on yellow clay levelling, which ended with a step into the yard. The E wall of the passage consisted of two upright flagstones and the silled doorway into the house. Beyond this it continued S as a curve of both upright flagstones and short lengths of coursed masonry, ending in another silled doorway where it joined the yard and rampart wall. This second doorway between two upright flagstones provided direct access between the house and the yard. An oven was constructed in the partition to the N of this door, with flagstone sides that projected into the room. It was  $c 0.8 \times 1.0\text{m}$  and had been broken off at  $c 0.5\text{m}$  above the floor, so that its full height is unknown.

The doorway from the passage opened into a room  $1.4 \times 1.30\text{m}$ , with well laid but worn paving which had slumped to the S. It overlay yellow clay levelling which extended to the E wall of the house. A dark almost black, clayey earth floor, rich in organic material, ash and charcoal, accumulated in the rest of the room, covering an area of  $2.0 \times 3.0\text{m}$ . Immediately N of the paving was a small cell,  $1.0 \times 1.8\text{m}$ , set against the N wall. It was entered from the S through a gap between two flanking partition stones, and had a paved floor over clay levelling.

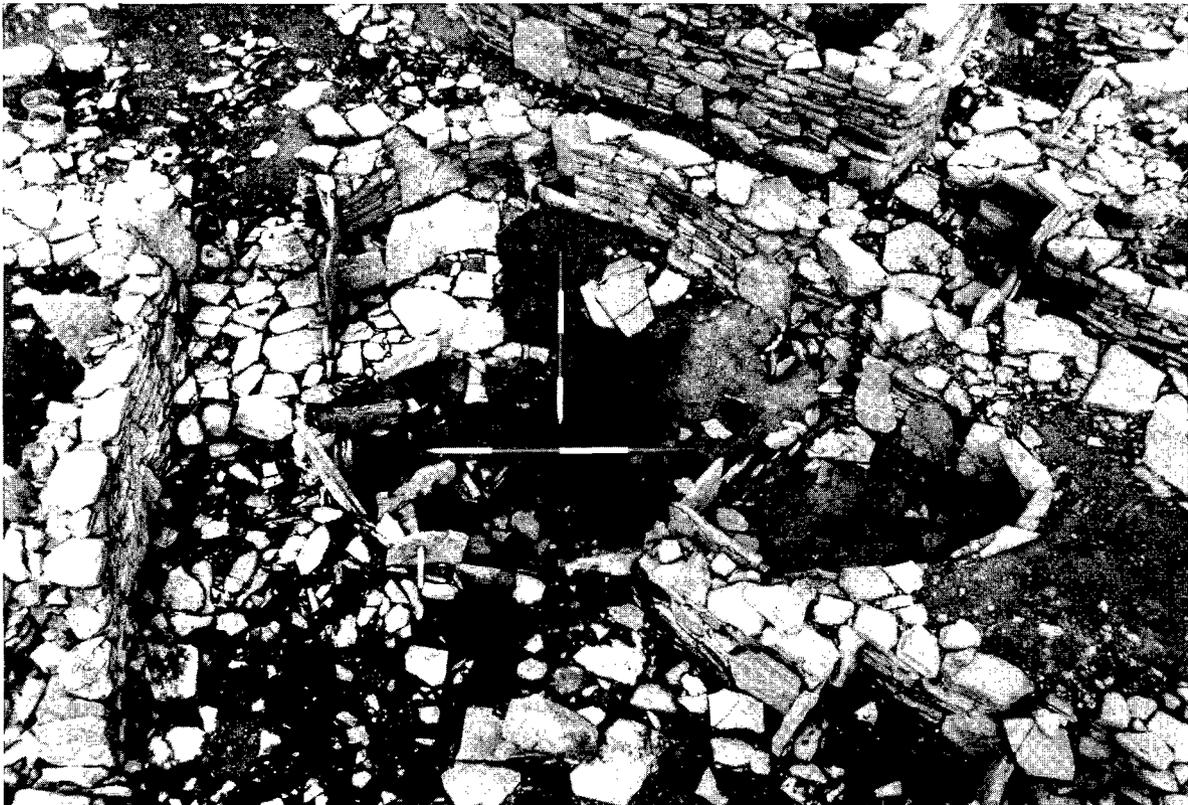
The paving comprised one large stone about  $0.1\text{m}$  thick which was infilled around the edges by smaller stones which were badly disturbed. There was a cupboard,  $0.4 \times 0.25 \times 0.68\text{m}$ , high in the E wall adjacent to this cell, with an upright sill-stone,  $0.14\text{m}$  high at its mouth. Although it had been badly damaged when its roof collapsed, it still had traces of clay luting in its corners. A hearth  $0.7 \times 0.6\text{m}$  was laid on the clay levelling towards the centre of the room near the oven. It lay in front of a screen of three upright stones which formed a S edge to the entrance paving, and ash from it accumulated to the W. A slab-sided tank  $c 0.4 \times 0.5 \times 0.32\text{m}$  deep had been set into the floor in the S of the room. Its N side was badly collapsed and appeared never to have had clay luting. It was built close to a slab-built partition wall which separated the rampart cell from the rest of the room. The

cell enclosed an area of  $c 2.0 \times 1.6\text{m}$  and had a levelling layer of clay as its floor, which had been worn away in the middle. The yard, which was entered from the passage, was  $4.6 \times 4.0\text{m}$ . It contained two sets of packings for stone uprights, situated behind the oven, which may have held buttresses for the oven. In the SE corner were other uprights forming two sides of a small cell, about  $1\text{m}$  square, which lay against the rampart. The cell was entered from the W through an open doorway, and had an earth floor, like the rest of the yard. In the centre of the cell was a post hole which may have housed a wooden roof support. The post hole was lined with stones and pea gravel, and was filled with earth and charcoal. It was capped by pea gravel.

### S BUILDING: LATER MODIFICATIONS (illus 39a; 39b)

Several alterations took place during the life of this building, including the repaving of the entrance passage with a  $0.05\text{m}$  thick layer of compact clay into which the new slabs were laid. This new paving was close packed and incorporated some worn out quernstones, and had new pivot-stones set at either end of the passage. The S doorway had a new sill-stone in the entrance to the yard (illus 40).

The clay floor of the S cell of the house was levelled with pea gravel onto which was laid a new clay floor and some paving. The old hearth in the centre of the room was replaced by a new slab, edged on the E by a curved kerb about  $1\text{m}$  long, made from four stones. Black occupation material continued to develop but was separated from the earlier floor by intermittent clay patches, and ash accumulated in a hollow in the floor between the oven and the N partition. Where the floor was thin, it had been patched by yellow clay. The tank set into this floor collapsed and was deliberately filled in with large stones, including a fragment of rotary quern, and clayey earth.



Illus 40  
The Early Phase 7 S building and yard during excavation; scales – 2m; from SW.

Further alterations within the house (illus 39b) include the replacement of the hearth by a new slab laid onto a thin layer of clay levelling, and only small fragments of the hearth stone survived. Further deposits of organic debris occurred on the earth floor, but these were only separated from the earlier layers around the hearth where they covered the kerbing of the earlier hearth.

A small stone setting was placed against the inside face of the E wall, near the S cell, replacing the facing slab which had been removed. The stone setting may have been for a supporting post, 0.21m square and 0.17m deep, set against this weak point in the wall. A hole, 1.0 × 0.8 × 0.35m deep, dug against the E wall to E of the hearth, may have been a soakaway to replace the collapsed tank to the S. The new hearth stone was also replaced by a larger stone, which, when excavated, had burnt through to the intervening clay levelling. The new hearth was 1.0 × 1.2m and abutted the oven. Ash from it filled the bottom of the oven, as well as the ash hole to the N of it.

A new floor, which partly overlay the entrance paving, was laid in the NE of the room. It consisted of mottled red clay and red sandstone chips, and edged both the hearth and the soakaway, and may have been laid in an attempt to level up this area as the entrance paving had slumped E. On top of the clay was the flagstone lid to the soakaway, resting on smaller flat stones round the soakaway rim. The lid had cracked, and had slumped into the hole. In the SE corner of the room, a mottled yellow clay patch, about 0.15m deep, was laid. It neatly edged the small post setting against the wall and covered the earlier tank. Between these clay patches were further deposits of mixed earth floor and organic material. This floor partly overlay the hearth, soakaway cover and the clay patches.

Yellow clay luting was found on the clay floor of the rampart cell and may have been deliberately added at the base of the wall, backing into the rampart. However, its uneven and incomplete deposition may suggest that it had fallen off the face of the wall onto the floor. The cell seems to have had a new floor laid in the centre of the room, which did not totally cover the clay luting and contained some ash and charcoal.

The yard must have been regularly cleaned out, as its thin surface only represented its final use. Charcoal and ash deposits on the brown-grey clayey earth floor had spilled through the partition from the house, over a fallen stone setting at the back of the disused oven. On the floor was some discontinuous paving, and more importantly, two rubble collapses in the middle and E end of the yard. This rubble had fallen from the W wall of the yard and from the rampart. The yard and house must then have been abandoned as the rubble was not removed, although unlike the E and SE buildings, the walls seemed to be quite stable, (see below). After it had been abandoned, rubble fell into the rampart cell and a large patch of yellow clay slipped from the N wall over the floor of the N cell and into the house. The house remained like this until the walls were deliberately levelled at the start of the next phase.

## SW BUILDING AND YARD

### ORIGINAL FEATURES (illus 31; 41)

The SW building lay between the broch tower and the Phase 5/6 rampart on Phase 7 levelling rubbles. It had two cells, one for the house and one for the yard, which were partly cut into the rear of the rampart. It was separated from the broch tower by a narrow passage which provided access to the NW building. Forming the S side of the passage was the freestanding N wall of the house. At its E end was one entrance, while halfway along was another doorway to the house and an adjacent stone oven. Further W it became the dividing wall between this and the NW house and contained two recesses. It then turned to the SW as a single-faced wall and formed the back wall of the cell dug into the rampart, before joining the surviving Phase 5/6 rampart walls.

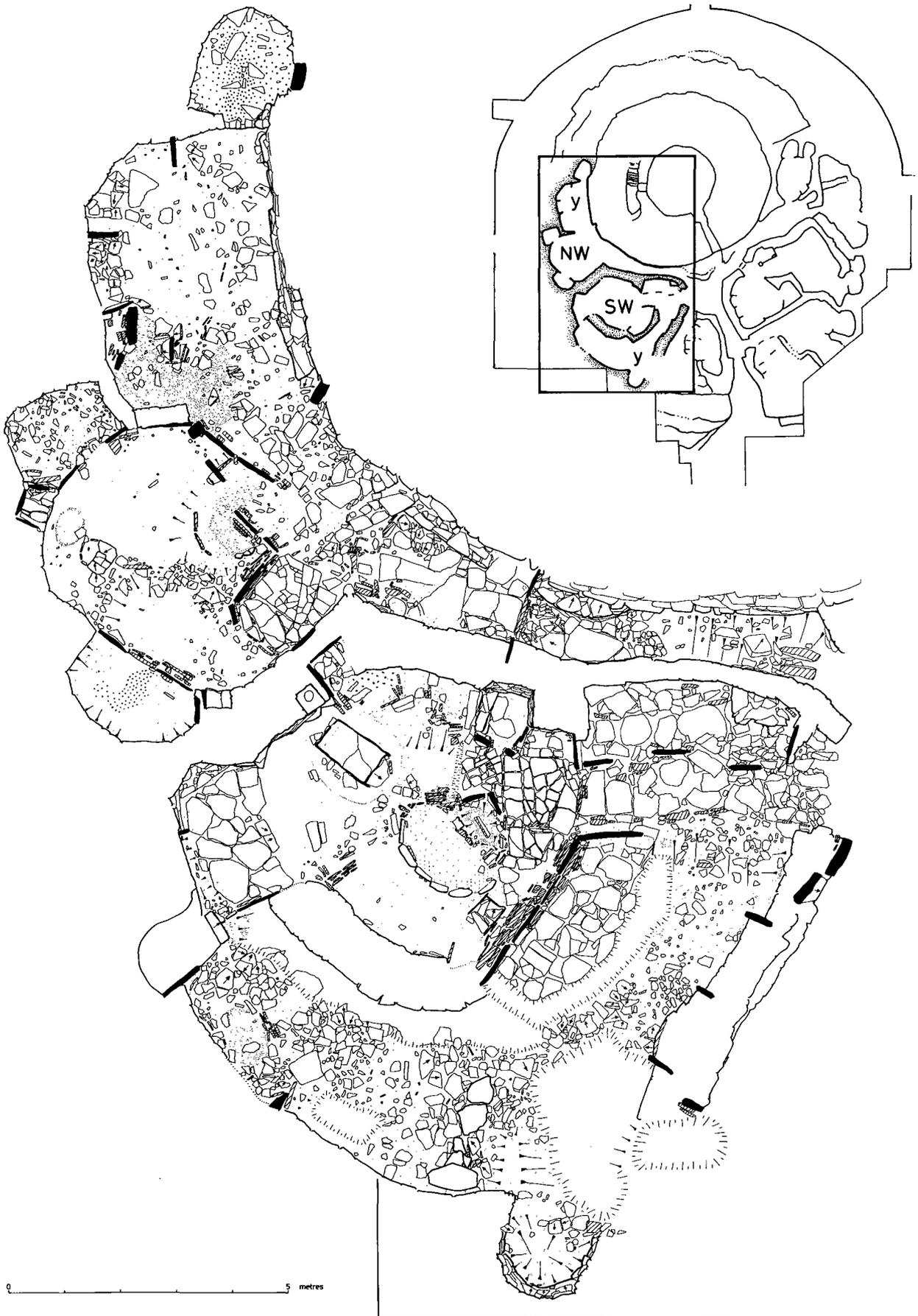
A small adjacent stone-lined recess in the rampart may have been blocked off during the building of this house. Beyond this lay the cell built of single-faced masonry into the S rampart wall of the yard. Its E wall joined with the freestanding E dividing wall between the SW and S buildings, but the junction was destroyed by a recent cow burial. The E wall of the yard contained three upright stones which projected out from the wall face, and its N end formed one side of the 2m wide entrance into the house.

This entrance originally had a sill-stone, but the N side of the door is unclear as the N wall stopped 0.6m short of the sill. An orthostat may have joined the two, but no packing was found. It is possible that when the outer door cell of the broch tower was rebuilt (see below), this entrance was destroyed and the door was removed.

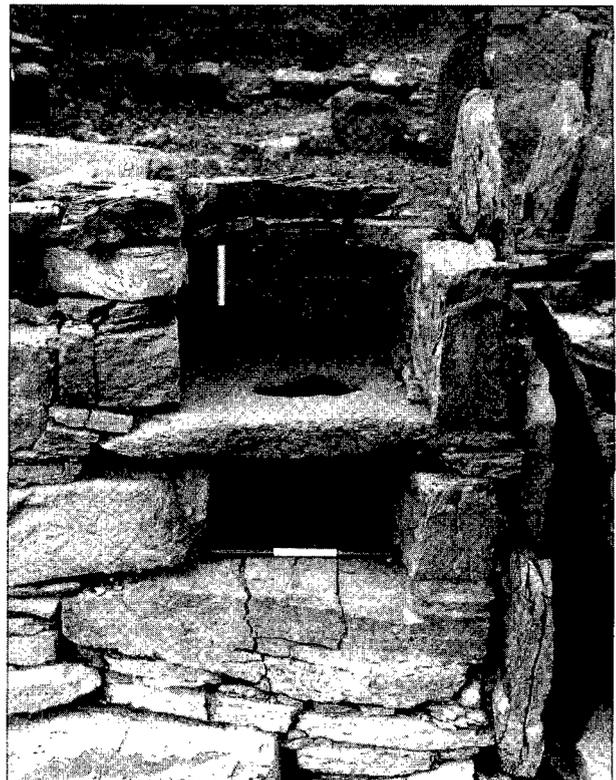
A roughly paved 4.5m long passage led to the house doorway, kerbed on the S with small upright stones set into the yellow clay and underlying levelling material. A 2m opening led from the passage to the yard between the E dividing wall and the E cell of the building. On the N side of the passage were three upright stones, with 0.7m gaps between, forming a partition wall which enclosed a separate paved room to the N. The E end of this room was blocked by another upright stone set in a short length of coursed masonry which jutted S from the N building wall. The paving in this room was very heavy, with stones up to 0.2m thick, and may have served as a secure foundation, for the N building wall which partly overlay it. Against this wall and also resting on the paving was an unfaced masonry block, 1.1 × 0.65 × 0.16–0.4m high, which may have been intended as a buttress. A silled door, 1.0m wide between two upright flagstones, led into the house, from the W end of the paved passage. It opened onto a well-paved area c 3 × 2m, laid over a levelling layer of yellow clay. The paving was partly enclosed to the N by upright stones forming an opening to the oven, to the S by the backing stones of the hearth and ash scoop, while the W side was open to allow access into the rest of the room. At the S end of the paving was a small tank, set into the floor.

The oven was of coursed masonry and was larger and more substantial than the other ovens at Howe (illus 42a). A 0.8m length of coursed freestanding masonry, 1.34m high, abutted the N wall of the building and enclosed an area of 0.8 × 0.9m. Two well-packed upright stones formed the entrance, and other uprights formed the E wall. The floor was packed with yellow clay and a base slab was laid over this, and it is possible that a flat slab was laid on top of the oven to form a shelf. Immediately to the W was a fragmentary burnt recess which appeared to be an earlier oven. Two upright stones at right angles formed one side and the back wall, but the NE side was missing. It is suggested from the stone packing in front of it and its size, 0.7 × 0.7 × 0.91m high, that this was the original oven. Following its partial collapse it was filled with loose rubble, and replaced by the adjacent oven which was more conveniently situated near the hearth. Adjoining the burnt recess was a closet, built of coursed masonry within the wall. It was situated c 0.7m above the floor and was c 0.36 × 0.4m and comprised an upper and lower recess with a central horizontal shelf. The lower area was 0.2m high and the shelf had a central hole about 0.18m in diameter. Because of the central hole this is assumed to be a commode rather than a double cupboard (illus 42b). To the SW of this feature was an open cell, 2.6 × 1.5m, backed into the Phase 5/6 rampart with a tightly paved floor over a 0.15m thick layer of yellow clay levelling. There was no sill or partition at the entrance which was 2.2m wide, and the SE wall consisted of a single upright stone with some masonry infill which was bonded into the curved freestanding S wall of the building.

The S wall divided the house from the yard and had packing for an upright stone partition at either end. The E end narrowed slightly and contained one end of a heavily packed partition for the E cell. Originally this wall would have continued round the back of the cell, but it had been replaced by a new wall at a later date. This partition was 3.1m long, and contained a silled entrance to the cell. The N end formed the S jamb to the house door. The original cell paving lay on yellow clay.



Illus 41  
Early Phase 7 settlement: original features of the *SW* and *NW* buildings.



Illus 42

a) The oven of the Early Phase 7 **SW** building; scales – 30cm & 50cm; from S; b) double cupboard or commode within a wall of the Early Phase 7 **SW** building; scales – 30cm; from E.

Within the house was a small tank,  $0.6 \times 0.5 \times 0.35\text{m}$  deep, composed of upright stones, which lay adjacent to the E partition at the S end of the entrance paving. It was set into the underlying levelling layers, and both its base and side slabs were packed with clay and rubble. Its sides were very thin and the SW stone had broken and collapsed inwards during its use. It was then abandoned and filled with rubble and a new, larger tank was built in front of the commode.

The new tank was set into a  $2.0 \times 1.5\text{m}$  hole dug through the floor. It was  $1.1 \times 0.65 \times 0.69\text{m}$  deep, and its sides projected  $c$  0.1m above the floor. The base slab was 0.06m thick and the sides rested on it; the cut was packed by clay and stones, and the floor was levelled with clay. The whole tank was made water tight with yellow clay and a shallow semi-circular notch was cut in the edge of the two end slabs.

S of the entrance paving was a hearth,  $2.0 \times 1.0\text{m}$  consisting of six large stones dug into the floor. Packing stones within the kerbing suggested that two early hearth slabs had been burnt through to the clay levelling below and had been replaced. Adjacent to the hearth, was a scoop filled with grey ash. The hearth formed two sides of it and two upright flagstones formed the other sides of the feature, which was  $0.35 \times 0.5\text{m}$ .

The floor of the house was predominantly a dark earth containing ash and charcoal which lay between the hearth and the S wall, except where yellow clay packed the E partition screen and both tanks at ground level. Rubble, red clay and low partition stones from the underlying stratigraphy were revealed around the new large tank, due to excessive cleaning after the collapse of the original oven and the subsequent replacement of both the tank and the oven.

A long curved yard surrounded the house to the E and S (illus 43 inset), and varied in width from 1.1 to 3.5m. The yard ran S from the entrance passage, between the E cell and the E dividing

wall, past the curved rampart cell which was  $1.5 \times 1.5\text{m}$  and open to the N. The W side of the yard abutted against the W cell of the house and the rampart. The rampart wall here was probably of Phase 5/6 date, and incorporated a single upright stone that projected into the yard. A soakaway or drain was built of coursed and upright slabs from close to the S rampart cell, leading out underneath the rampart wall. It was  $c$   $2.2 \times 0.3 \times 0.4\text{m}$  deep, and was capped by three large slabs and three smaller stones. The earliest surviving surface in the yard was a mixture of earth, stone chips and rough paving. Between the E cell and E wall was some rubble which may have been collapsed stonework from the cell.

#### **SW BUILDING: LATER MODIFICATIONS** (illus 43)

Several major alterations took place to the house following slumping of the walls into the underlying Neolithic ditch, including the replacement of the S and E walls and the roof. The E cell wall was removed and replaced by a freestanding wall on the same alignment. The new wall abutted the cell partition to the S but stopped short of the house doorway to the N. A small upright stone may have bridged the gap between the two, but the junction seemed incomplete. The S wall was then levelled and a new curved wall was built, using the old wall as a foundation on the inside of the house, but on the outside it was dug into the yard. It formed the S wall of the W cell and refaced the Phase 5/6 rampart, whilst its E end abutted the new E cell. The paving in the entrance passage, between the outer and inner doors, was replaced by heavy flagstones resting on earth and a 0.05m layer of levelling clay, spread over the old paving. The paving at the N end of the passage remained unaltered. Movement within the house was also affected. A screen of three upright stones was built in the N end, between the oven and hearth, preventing entry from the W. At the same time the small S tank was filled in and capped with a stone slab, to allow access between the hearth and the E cell.



Illus 43  
 Early Phase 7 settlement: alterations to the **SW** and **NW** buildings; inset shows the **SW** yard with rough paving, hearth and soakaway; scales – 2m; from SE.

The hearth was also rebuilt on the first of three occasions. The first rebuilding only survived as burnt clay with a few remnant bits of the hearth slab  $c 1.3 \times 1.45\text{m}$ . The earlier kerbing was covered over as it was no longer required. The second hearth slab lay on a 0.07m thick layer of clay levelling and ash, over the first, and, like its predecessors, it was highly burnt and fragmentary. It was originally  $c 1.3 \times 1.1\text{m}$  and contained a single hearth socket to the SW. The final hearth in the sequence was separated from it by a mixed earth and clay layer. It was  $c 1.4 \times 1.7\text{m}$ , and rested by this time on a large mound of hearths in the centre of the room, and the earth floors surrounding these hearths were largely indistinguishable from one another (illus 44 inset).

The lowest surface, which was quite sooty in appearance appeared to be associated with the lowest hearth of this sequence. Over this was a greyer earth floor, which only survived around the hearth slabs. On top, contemporary with the last hearth, was another earth floor which contained charcoal, ash and soot and was  $c 0.15\text{m}$  deep beside the hearth. These earth floors merged away from the hearth mound and became intermittent towards the walls of the house largely as a result of cleaning, and the entrance paving was largely buried by the final earth floor, mixed with ash and charcoal. The ash scoop to the NE of the hearth complex became filled with mottled buff ash which was not cleared away when the last hearth was laid. It, too, was gradually covered by the final earth floor.

The partly exposed foundations of the old S wall were infilled with a 0.14m thick layer of yellow clay and compacted pink ash and stone. The clay was confined to the E, but the ash was also used to level up the earth floor and was found between the hearth and tank as well as in front of the new S wall, and partly over the yellow clay. A thin flagstone,  $0.74 \times 0.6\text{m}$ , with carefully chipped edges, lay on the ash by the W cell. Although it was broken in antiquity, it may have formed part of a cover slab for the tank.

The W cell had been slightly modified, presumably during the rebuilding of the house walls, by the removal of the single-faced W wall which consisted of upright flagstones built against the rampart. A narrow robber trench with a line of yellow clay in front, marked the position of this wall, before being covered by an earth floor with ash, clay and charcoal debris which accumulated in the cell on top of the paving slabs. Central to, and just outside, the entrance to this cell was a square socket of upright stones,  $0.25 \times 0.22 \times 0.1\text{m}$ , which may have contained a post to support the cell roof.

The E side of the oven was strengthened, before a mixture of soil and ash built up within it. Above this was a 0.09m thick deposit of pale orange ash with burnt bone which probably resulted from its last use.

The E cell wall was rebuilt and a new paved floor was laid over a clay levelling layer. The SE end of the paving later subsided and was patched with yellow clay, which contained a small dump of shells and ash. A deposit of clay luting was found where it fell on the floor from the walls of the cell.

Alterations to the yard included the insertion of an oblong kerbed hearth against the S rampart wall. It was  $1.2 \times 0.6\text{m}$ , open to the SE, and had two stones set side by side as its base. Although the hearth did not seem to have been well used, some ash and charcoal were found among its stones, and ash and charcoal lenses were found between the drain and W rampart cell (illus 43). Rubble found in this area was probably building debris which had not been cleared away.

Towards the end of its life the yard was partly blocked by the collapse of the inner face of the E dividing wall. The heap of fallen rubble,  $3.0 \times 4.0\text{m}$ , in the yard was not cleared away, although it was levelled, and some of the debris which had fallen into the S cell was also left. Possibly at the same time, the retaining wall fell off the rampart into the yard of the S Building. Although this resulted in the yard being largely abandoned, the SW building continued to be occupied.

## SW BUILDING: END OF OCCUPATION (illus 44)

The building continued to be used until it was burnt in a fire which also affected the NW and S buildings. All three buildings were then abandoned although the E side of the settlement continued to be used.

During the fire, the roof collapsed inwards, bringing some stones from the wall tops with it, but leaving the yard largely unaffected. The heat reddened the walls of the building, and the burnt roof fell on to the floor below as a charcoal layer with soot and ash. Analysis of this showed that it had a framework of willow (*Salix*) timber, covered by both barley and oat straw (7.2 Plant Report below). On top of the charcoal and soot in the S end of the building were patches of pink-buff to orange ash. This ash has been identified as mainly barley straw with some heather suggesting that this part of the roof had a slightly different thatch. The W side of this ash layer was overlain by pale buff ash and charcoal which may have come from a patch of grass on the roof.

Stone rubble and silt from the walls gradually accumulated on these ash layers throughout the house, with the exception of the W cell which may have had a stone corbelled roof. After the fire, a small pile of shells were dumped against the E wall of the E cell. The fragmentary nature of the burnt rubble in the tank may indicate that the tank contained liquid which shattered the hot stones as they fell in. Beneath the rubble was a thin layer of orange silt from the decaying burnt stone and clay luting.

## NW BUILDING AND YARD

### ORIGINAL FEATURES (illus 31; 41)

The NW building lay between the rampart and the broch tower, to the N of the SW building. It was built over Phase 7 levelling of Phase 5 and Phase 6 material, after the collapsed W wall of the broch had been rebuilt.

The broch tower formed the N and NE boundary of the entrance passage to the house and yard, which was  $c 6.0 \times 1.0\text{m}$  long and ran from the main entrance passage in front of the tower. The N wall of the SW building formed the S side of the passage which had a paved floor, resting on levelled rubble. The E end had been damaged during the reconstruction of the outer entrance to the broch. The width of the W end was restricted by a curved block of masonry, 0.2–0.4m high and 2.5m long, which acted as underpinning and buttressing for the tower. Additional buttressing and refacing was added to the outer wall following the initial collapse.

A step at the W end of the passage led to the sill of the outer door of the building between two opposing upright stones. The N one was inserted through the broch, providing underpinning when the doorway was created, and the S jamb formed part of the passage wall. A pivot-stone lay in a paved floor to the W of the door. The end of the passage opened into the yard on the N with the house to the S.

The N wall of the SW house formed the dividing wall between the two buildings where it turned SW to join the rampart. A cupboard of upright stones and coursed masonry, opened into the NW house near the S end of the wall. It was  $0.6 \times 0.4 \times 0.5\text{m}$  high and was 0.23m above the floor level. Where this wall met the Phase 5/6 rampart, it formed the single-faced rear wall of a cell, partly dug into the rampart clay before becoming the inside wall of the house. At the N end was another cupboard  $c 0.5\text{m}$  square, built about 0.5m above the floor, which opened to the E. It was found collapsed and had lost its N side by the junction with an adjacent cell.

The wall continued as a single-faced wall round the back of this cell which was also built into Phase 5/6 rampart material. A freestanding section of the wall formed the E side of the cell, before it continued N as the single-faced revetment to the



Illus 44  
Early Phase 7 settlement: later modifications to the **SW** and **NW** buildings; inset shows the **SW** building with the central mound of hearths before excavation; scales – 2m; from S.

rampart, and as the W wall of the yard. For most of this length it had been built over the foundations of the Phase 5/6 rampart-facing that it replaced. At the N end, the wall curved E towards the broch tower, before forming a cell which was cut into the rubble of the Phase 6 cross wall and abutted the broch wall.

The entrance passage paving, between the door and the house, was patched with yellow clay and an upright stone screen was inserted into the angle of the S wall. The stone had subsequently been removed but the packing remained to mark its position.

The closely fitted paving continued to the house, 1.6m to the SW, and, unlike the paving in the passage, rested on a layer of yellow clay rather than rubble. It was bordered on the S by the dividing wall and on the NW by a partition of well-packed upright slabs. A row of small upright stones marked the opening into the house, but no formal doorway was found.

Opposite this paving was a  $2.4 \times 1.4$ m cell, cut into the rampart, backed by three large upright slabs between coursed masonry. The entrance was 2m wide and contained a central sill-stone 0.6m long, between two upright stones which butted the cell masonry. They may have been slightly later additions to the original design, but were well supported by small stones on edge and packed with clay. Over the levelling rubble within the cell was a 0.08m deep layer of brown/yellow clay which formed the foundation for a 0.10m thick yellow clay floor. After this had become worn, a layer of pea gravel was laid to level up the floor. A fragmentary partition wall of six upright flagstones separated the house from the yard. Two stones formed the back of the hearth, and a missing stone, 0.7m long, with two others which survived, formed the sides and back of an adjacent oven. Beyond this was an upright block and another upright that was bonded into the E wall of the NW cell which was buttressed at this point by a 0.9m long freestanding wall.

Close to the W wall of the house was a tank,  $0.65 \times 0.47 \times 0.36$ m deep, with an almost circular base slab with thin upright slabs resting on it which had been chipped along their bottom edges. Small stones were set on top of the slabs to build up the sides but no clay luting was found, suggesting that this tank may have been used as a soakaway rather than for holding water. On the N side of this tank was the other rampart cell,  $1.6 \times 2.0$ m, with a 0.6m wide entrance between two upright stones. The sill stone was found collapsed, and the floor was a poorly laid mixture of clay and earth, which had been burnt near the cell entrance.

The floor within the house (illus 45) consisted of a carefully prepared surface of yellow clay and stones which was loose in texture, unlike in the other buildings. It was almost complete

within the room and covered an area  $c 3.8 \times 4.7$ m, but was lost in places due to subsidence into underlying rubbles. A hearth,  $1.0 \times 0.7$ m, was built onto this floor against the E end of the partition screen. Small upright stones formed a curved kerb to the W and S, and the floor slab had been burnt through. Some of the earth floor survived in the depression around the hearth, which was black and sticky and continued to accumulate after the hearth was re-slabbed. The new hearth stone was laid on top of the old, with an intervening layer of yellow clay, part of which had slumped through the partition screen. Ash overlay this hearth and collected in the base of an adjacent oven. This oven was  $c 0.7 \times 0.4 \times 0.7$ m high and opened to the SW through a gap 0.6m wide.

The yard which filled the rest of the area between the broch and the rampart was reached from the paved area by the house entrance. Two upright slabs projected into the yard from the wall on the W of this entrance, with a third in the curve of the wall to the N. Three other packed uprights survived beside the first of these. The yard had an earth, rubble and clay floor with a step 0.4m high at the N end leading to an entrance, 0.5–0.8m wide, into a curved cell. This cell may have been a later addition to the yard, but the evidence is inconclusive. It certainly post-dated the rebuilding after the initial collapse of the broch tower, and had a single-faced wall of upright slabs backed by rampart material, set onto a paved surface. This paving was laid over a layer of pea gravel that levelled up the underlying rubble. During the use of the yard, ash and clay with some charcoal was dumped against the W wall and the short dividing wall by the partition of the house.

Within the house, rubble, burnt stones and earth were dumped into the disused tank, which was then sealed with a stone slab, and both cells collapsed. Rubble from this collapse accumulated on the floor of the NW cell, whilst clay luting fell from the walls of the SW cell to form two heaps on its floor which were not cleared away.

#### NW BUILDING: LATER USE AND ABANDONMENT (illus 44)

Some minor alterations took place in the building before it was abandoned. A new earth floor was laid throughout the house, with the exception of the cells, completely covering the disused tank. Organic debris, ash, charcoal and some clay accumulated on this, despite later cleaning which exposed the earlier clay floor round the edges of the room. A new  $1.2 \times 1.8$ m hearth slab was laid on clay levelling, completely concealing the previous hearth. The disused oven was now used as an ash pit for the hearth, and a 0.23m thick deposit of different types of ash within it suggested that a variety of materials were being burnt here. Eventually a new



Illus 45  
The floor and cells of the Early Phase 7 NW building; scales – 2m; from E.

1.0 × 1.2m hearth slab was laid on a layer of clay levelling clay over its predecessor, and orange-grey ash and charcoal built up over it and the adjoining ash pit. A dump of brown-pink ash was found in the corner between the W wall and the NW partition, which contained charcoal, bone and pottery and was similar to the material in the yard.

Burnt deposits in both the rampart cells suggest that their roofs were burnt and collapsed on to the floors. It is unclear whether this was due to a series of isolated fires or whether they were burnt at the same time as the **SW** building. Whatever the case, the fires seem to have been prevented from spreading to the main part of the building. Within the SW cell was a thin layer of pink ash and charcoal which overlay a layer of charcoal or carbonised peat. The two deposits were clearly differentiated around the cell edges.

Although disturbed by later collapses, the deposits in the NW cell were clearly only slightly different from those in the SW cell, in that a similar brown/pink ash layer overlay a layer of clay, earth and charcoal layer. Both cells were abandoned after being burnt. Domestic debris, including ash and clay with burnt bone and pottery, was dumped against the W wall of the yard, spreading over an area of *c* 4.6 × 1.3m. This dump was not cleared away and an earth floor with some shells developed adjacent to it, covering an area of *c* 4 × 1.6m in the middle of the yard.

The rubbish in the yard suggests that it was already abandoned, but it is unclear whether the house also was abandoned

immediately after the fires or whether part of it continued to be used for a short period. Both cells had lost their roofs, and soil containing some stone chips and clay patches developed inside. The remaining corbelled roof in the NW cell collapsed as large rubble, breaking off part of the entrance partition as it fell. Unlike the **SW** building, no evidence of the roof remained; this suggested that it had been removed, probably during the fire to prevent it spreading, leaving only a scatter of burnt stone which had fallen from the walls of the house and mixed with ash and charcoal on the floor.

Small stones and rubble chips formed an intermittent surface in the yard which became compacted through use before two dumps of midden were deposited onto it. These dumps which contained a lot of shells – mainly mussels, cockles and whelks – confirmed that the yard had been abandoned by this time to become no more than a rubbish dump. The remains of a young child (SF 5445) were buried in the dump of ash in the NW corner of the yard between the NW Rampart cell and the W wall.

Domestic rubbish, including shells, ash and fish bone, were now being dumped on the paving of the inner entrance passage, the S cupboard and at the entrance to the NW rampart cell. Most of the shells were mussels, with some whelks and cockles, and these deposits seem to indicate that some activity was still taking place in the ruins of the building. Rubble began to accumulate in the yard and its cells, mainly from the broch tower, and the threat of further collapse of the broch tower as well as fire damage may have been responsible for the abandonment of the three houses on the W.

#### 4.1.2 • LATER PHASE 7

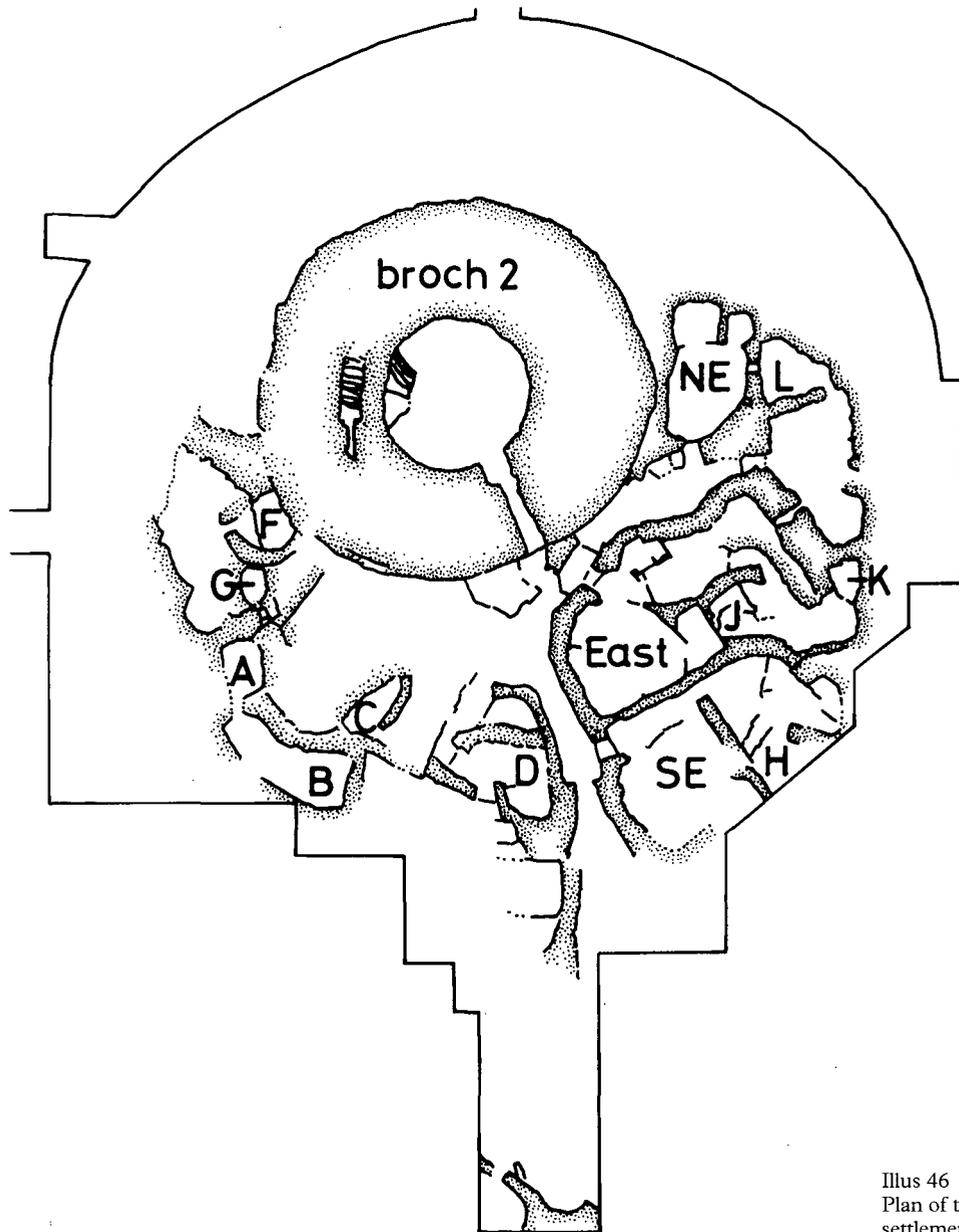
A threatened collapse of the broch tower, precipitated by its inherent instability, together with fires both there and in the surrounding buildings, marks a change between Early and Later Phase 7, with corresponding new developments on the site. The buildings on the W side of the settlement were levelled, with a view to moving them further away, on to the Phase 5/6 clay rampart. After the broch collapsed on the W, the houses there were rebuilt and used as workshops, whilst a buttress and retaining wall were constructed against the W side of the broch tower. Later an earthhouse was built into the rubble of the broch collapse, prior to a further levelling of the W buildings.

Collapses of the outer wall of the broch affected its interior, and the building may have been abandoned for a while. Its reoccupation was marked by a clearing out of debris, which was dumped into the ditch terminals and on to the levelled area in front of the broch. The broch was now used as a pottery workshop and for stone tool manufacture.

The **E** buildings continued largely in use, with some periodic abandonment horizons and alterations, and with access to them now being made across the infilled defences in the E. There was also a change of emphasis, especially in the **NE** building where a series of iron-working hearths were constructed.

Although it could not be stratigraphically verified, the fires in the broch and village were probably contemporary. Whatever the relative chronology, they had a dramatic effect on the whole settlement (illus 46). The whole of the W side of the village was levelled to form a rubble surface which also included the main entrance passage, the passage to the **NW** building and the outer cell of the broch tower.

New buildings were erected on the levelled rubble, away from the tower and abutting or overlying the Phase 5/6 rampart. Rebuilding did not take place beside the broch because the wall on the W and SW side of the tower had slipped outwards and was in danger of collapse. Despite its parlous state, the tower remained in use as did the **NE** building and the yards of the **SE** and **E** buildings although the two buildings themselves seem to have been abandoned. Traces of buildings beyond the defences to the S suggested that the defences were no longer considered important. These developments will be looked at in detail beginning with the SW part of the site, then examining the E area, the broch tower and areas beyond the defences.



Illus 46  
Plan of the Later Phase 7  
settlement.

### THE SW AREA OF THE SITE

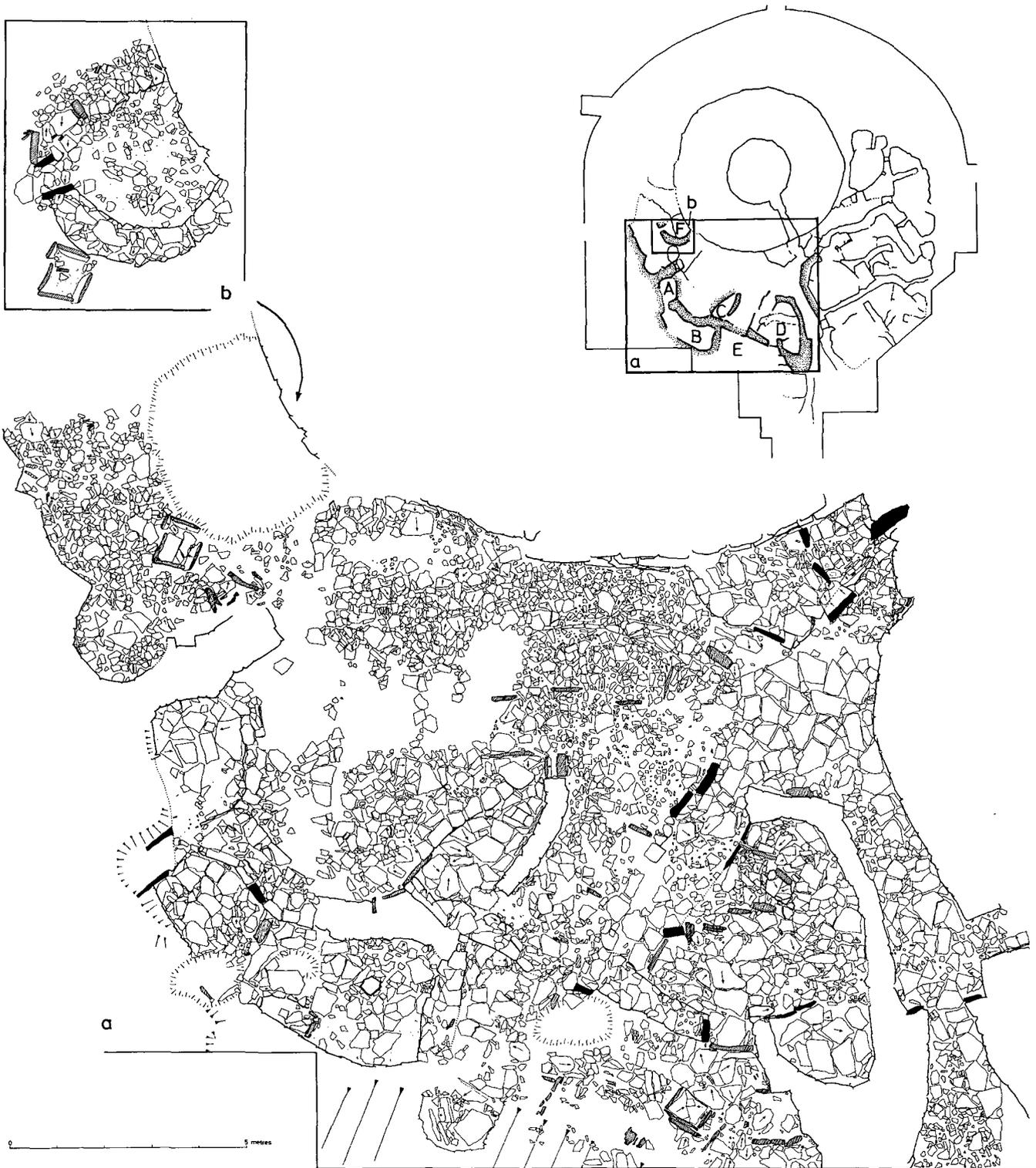
#### REBUILDING: CELLS/ROOMS A-E (illus 47a)

Some of the levelled walls of the **S** and **SW** buildings were reused in the new buildings which included three adjoining cells or sheds **A**, **B** and **C**, created from the cells of the old **SW** building. A rounded cell, **A**,  $2 \times 2.6\text{m}$ , was built in the remains of the **W** rampart cell reusing its **W** and **N** walls, but with a new, single-faced, **E** wall. This wall joined the **S** wall of the old **SW** building, which was now rebuilt, as a freestanding wall that contained the entrance that was about  $0.5\text{m}$  wide at its **W** end. This room had an earth floor with a single layer of large paving stones.

A second room, **B**, opened off to the **S**, between the levelled remains of the rampart wall and the wall of the old **S** building. This curved room was about  $6.5\text{m}$  long and  $1.75\text{--}2.5\text{m}$  wide, and had an earth floor set with large flagstones. Built into the **E** end of

the floor, beside the early Phase 7 drain, was a soakaway with a lid, which measured  $0.7 \times 0.6\text{m}$ . The freestanding **E** wall was  $c. 2.8\text{m}$  long and was poorly built on a foundation of paving slabs. It was the collapse of parts of this wall that led to the abandonment of this cell.

There was a rectangular stone setting cut into the underlying rubble against the rampart. It was  $1.4 \times 0.8 \times 0.06\text{m}$  deep and had paving to the **N** and **W** and a kerb of two small uprights to the **E**. It contained flagstones and ash, and extensive ash and charcoal deposits were found around it, suggesting its use as a hearth. The **NW** part of this room was repaved with flagstones set onto an earth levelling layer. Access into this series of rooms may have been from the **SW** across the rampart, but the stratigraphy at this point had been destroyed by a recent cow burial.



Illus 47  
a) Later Phase 7 buildings in the SW; b) alterations to buildings in the W.

NE of the curved room was a triangular cell, **C**, built into the remains of the E cell of the **SW** building. It reused part of the old E cell with a new W wall of large stone blocks set into rubble which partly rested on the paved floor of the room. A new freestanding wall to the SW stopped short of the E wall to create an entrance 0.6m wide. This had a raised stone sill 0.66m long set into yellow clay, on the carefully paved shed floor. In the NE corner of the room was a square recess 0.25 × 0.3 × 0.14m deep set into the paving, that was similar to those in room **B** and may also have been a soakaway. A badly damaged freestanding wall, 2.4m in length, linked the S wall to the remains of the dividing wall between the early Phase 7 **S** and **SW** buildings. This wall may have been a later addition, and formed part of the N wall of a rectangular room, **E**, partly built over the Phase 5/6 rampart (see below).

The full length of the entrance passage through the village was repaved now. The paving began outside the ramparts, where large flagstones ran through the E side of the entrance as far as the mouth of the broch. The outer door by the ramparts was abandoned and the sill-stone was not replaced, however the broch outer door probably remained in use despite the demolition of the outer entrance cell. The paving continued intermittently for 4.5m, ending at the door, marked by a sill-stone, of a new paved cell, **D**, built into the old **S** building (illus 48).

A screen of upright flagstones ran E from this door across this cell, reusing part of a partition from the old building. Immediately NE of this partition was a slabbed hearth, 0.5 × 0.54m, resting on the paved floor but with no deposits on or around it. A freestanding wall built on paving and rubble, ran W from this cell,



Illus 48  
Later Phase 7 settlement: southern buildings and refurbishment of the old **S** building and village entranceway; scales – 2m; from S.

forming its S wall and the wall of the adjacent passage. It was 2.6m long and about 1.0m wide and ran as far as the remains of the dividing wall between the old **S** and **SW** buildings. It included a doorway 1.04m wide at the W end of the rampart cell. The doorway contained a sill-stone, and led into a linear room, **E**, which was partly built over the Phase 5/6 rampart. A small buttress 0.56 × 0.3m was added at the N end of the W wall by the entrance.

The new room, **E**, c 7.5 × 3m, was built on rubble within the yards of the old **S** and **SW** buildings and separated from room **B** by a freestanding wall. Adjacent to this were the remains of the former rampart cell off the **SW** yard which was filled with rubble probably from its collapsed roof. The new room had a partly paved earth floor which extended over the yellow clay of the rampart. At the S end were two groups of upright stones and packing, set into the rampart about 2.0m apart, that may mark the site of the destroyed S wall. Set into the paving on the E side of the room was a kerbed hearth, 1.3 × 0.9m, which was open to the N, and had another stone partition about 0.3m to the E. The hearth was composed of two large stones which had cracked and like the surrounding paving, slumped into the underlying rubble and off the rampart. Pink ash overlaid the hearth, and a burnt slab immediately to the W, suggesting that the hearth area extended beyond the kerbing.

#### LATER ALTERATIONS IN THE SW (illus 47b)

New floors were laid in the W rooms consisting of levelling layers of earth and ash, with either paving or earth floors laid on top. In room **A**, well-fitting flags with patches of ash were bordered in the SW by a row of small stones set on edge. In room **B**, roughly laid paving covered an area 1.2m square which was raised about 0.1m above the rest of the room which had an earth floor.

Room **D**, was now divided by a curved wall (illus 48), aligned E–W, built directly on the paved floor over the hearth, forming a smaller paved room without a hearth to the S, and a small cell or shed to the N. New earth and clay floors were put down in this shed and the S rampart cell which contained much ash and charcoal. The other rooms remained in use and were unaltered.

Sometime during the rebuilding, the rubble in the old Phase 7 **NW** building was levelled to form a roughly paved surface and a hearth, 1.0 × 0.8m, with kerbs 0.2m high, was built on top. It was probably built in the open as there was no evidence of any surrounding walls, and had been re-slabbed after the original base had slumped into the underlying rubble and paving. Both slabs survived, and ash and charcoal on the upper hearth slab indicated that both had been used.

Subsequently a curved, freestanding wall was built over it to form the S wall of a new cell, **F** (illus 47b), 3.7 × 2.8m, built against the broch tower. Only a single course of its N wall and part of the S wall survived the later collapse of the broch wall here. The cell had a paved floor with some occupation debris, which was entered from the W, through an entrance, 0.8m wide, between two uprights.

Shed **F** was the only building constructed against the broch tower during this phase, suggesting that any possible collapse of the tower was assumed to be likely on the S, rather than the W, side. There is no evidence of any buttressing of the tower and access to the sheds **C** and **F** must have been across the levelled rubble in front of the tower.

In general all the rebuilding during this phase was of poorer quality than the earlier buildings, with a predominance of badly built, single-faced walls set into rubble. The deposits within these rooms and sheds all suggest that their occupation was short-lived. Contemporary with this rebuilding on the W side of the site was the reoccupation of the **E** and **SE** buildings.

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## THE E AREA OF THE SITE (illus 49)

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### THE *SE* BUILDING

Access to the *SE* building was still possible from the village entrance passage. Within the building, a further layer of stone fragments and rubble had accumulated on the early Phase 7 floor deposits, and a 0.2m thick layer of yellow-orange ash had been dumped on top. A new single-faced wall was constructed on the S side of the dividing wall between the *E* and *SE* buildings, against rubble which had probably fallen from it. This wall, and its rubble, blocked the former doorway into the *SE* yard which was now reached from over the rampart (see below).

A small buttress was added to the S wall by the building's entrance to create a new doorway, 0.8m wide. Several small stones on edge lay on either side of this entrance, and a third set of stones formed a partition immediately to the E. Broken-off uprights from the early Phase 7 oven were also used as part of this arrangement, and an earth floor was laid, comprising small stone chips, charcoal and clay with a central hearth within a ring of stone settings. The hearth was 1.35 × 0.95m wide and had a cracked bare slab with kerb stones on three sides. Ash from the hearth spilled out to the NW and some charcoal survived against its SE corner. All these stone settings were dug into the underlying rubble and ash around the hearth. Traces of paving survived although ploughing had removed the S edge of the floor. Resting on this floor to the S of the hearth was a layer of red-orange ash up to 0.06m deep, which had been dumped against a stone setting and presumably came from this hearth.

After this building had gone out of use, the doorway from the village entrance passage was deliberately blocked by large rubble, which was roughly faced to E and W. This building was then abandoned and was not used again until Stage 5 of Phase 8.

### THE *E* BUILDING (illus 49)

The *E* building was temporarily abandoned at the end of early Phase 7. Although some attempt may have been made to level the

dividing wall with the *NE* building, all the walls except the collapsed S wall remained to a good height. The N cell of the building was levelled (see below), and rubble and silt formed within it. Access was still possible through the entrance of the building, despite an accumulation of rubble on the passage floor which had probably come from the levelling of the N cell. Rubble 0.3m deep mixed with organic debris within the main area of the house suggests that dumping took place here.

The E cell was largely unaffected by the temporary abandonment. It still retained its corbelled roof and any debris which had accumulated was cleared out before a new earth and flag floor was laid. An earth floor with ash and charcoal developed on top of the rubble within the central area of the house. The floor deposits were shallow and seemed to have been pressed into the underlying rubble, and were deepest where it accumulated around a badly cracked hearth. The hearth was 1.06 × 0.9m and had been repaved as its earlier slab had subsided into rubble. It was partly kerbed to the SE and W, and ash from the hearth was dumped in the SW corner of the room and intermingled with the floor deposits.

In front of the silled entrance to the E cell was a bowl-shaped depression, about 0.9m diameter and 0.3m deep, edged by small upright stones with a single stone slab loosely packed with yellow clay within it. This seems to have been the pad for an upright wooden post, perhaps to support the roof of the E cell. However it effectively blocked the entrance to the cell and access would only have been possible over a broken partition slab to the S. Occupation here was short-lived, and the building was abandoned allowing rubble, stone chips and yellow clay to develop across the passage and into the building.

The slight and transitory nature of the occupation of the *SE* and *E* buildings differs from the contemporary use of their yards and of the *NE* building, which seem to have formed a unified whole and will be discussed below. At the same time, further activities took place in the W which are discussed here as they do not affect the *NE* buildings and *E* yards and cannot be linked to them.

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## THE BROCH TOWER COLLAPSE AND W SETTLEMENT ALTERATIONS

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A series of collapses in the NW corner of the settlement were probably all the result of the collapse of the SW wall of the broch tower. Part of the Phase 7 rampart retaining wall collapsed into the yard, destroying the adjacent cell *F* whose NW wall fell over to the S, leaving a rubble layer about 0.4m deep.

The outer face of the tower collapsed to the SW spreading rubble up to 1m deep to the W and S, but did not entirely cover the new buildings further to the S. The main part of this collapse was composed of large masonry blocks with smaller stones towards the edges, and was severe enough to reduce the broch wall-face almost to its foundations on the SW. Room *A* was destroyed completely, or left so badly damaged that it had to be demolished. The other rooms, *B*, *D* and *E* to the S, were abandoned and a thin layer of rubble was found in each.

Remedial measures must have started instantly to prevent further collapses on the W. A massive curving buttress up to 2m wide was built over the rubble, using very large blocks of stone from the SW collapse. It stretched in an arc for about 8m from the tower wall to, and over, the rampart.

### THE BROCH TOWER

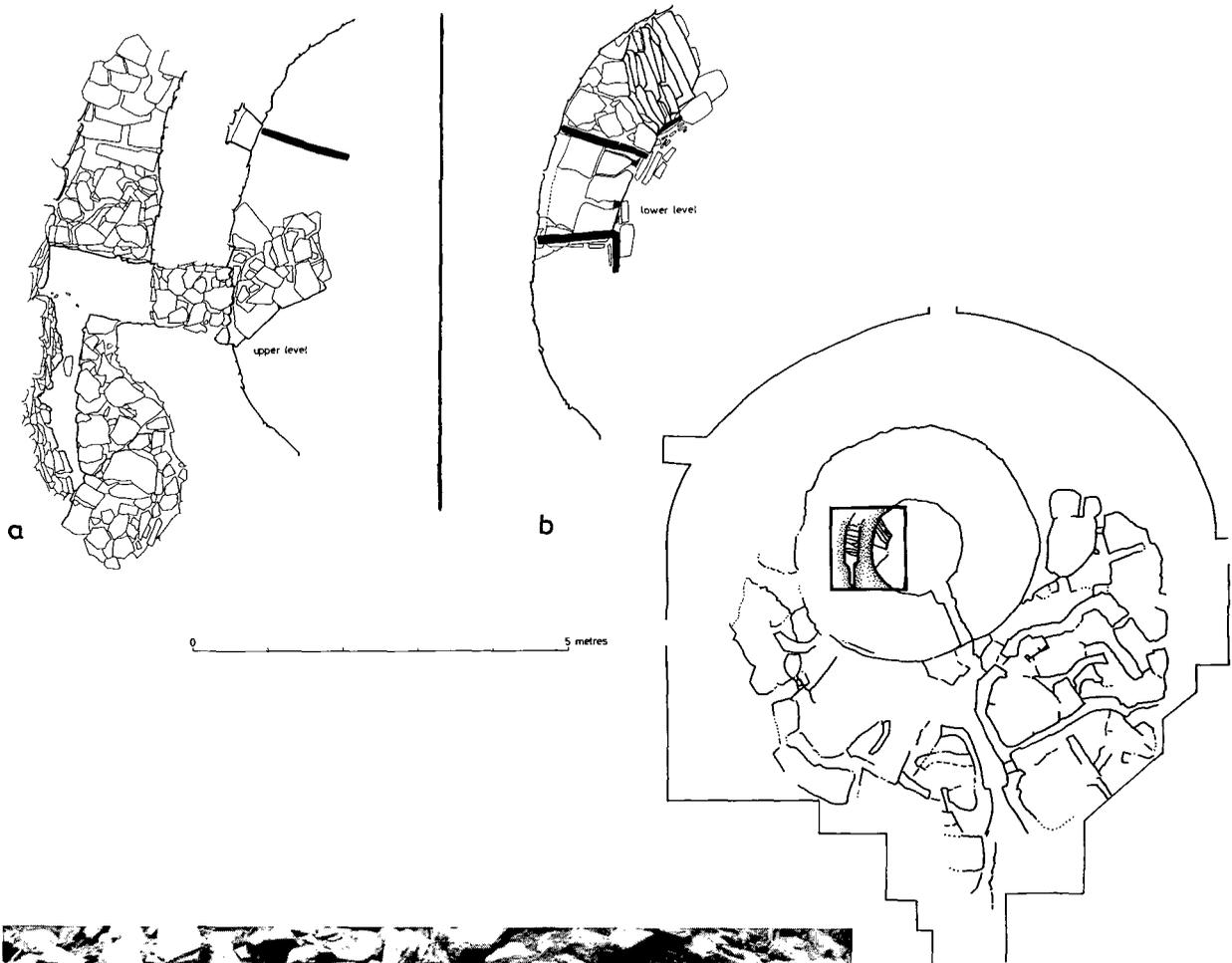
The early rebuilding of the W side of the broch tower and the W staircase cell survived until this collapse. As the collapse was

outwards, the interior of the tower remained undamaged, but the roof of the staircase cell and the staircase rising from it were destroyed. The inner face of the broch wall was only 1m thick at this point, and in order to strengthen the face, two buttresses were inserted into the cell almost completely filling it (illus 50). These buttresses were probably built within a short space of time, and the S one overlay the remains of the outer wall. Subsequently a new earth floor was laid over the remaining floor.

Sometime afterwards, new stairs were built from the broch interior replacing the intramural stairs which had either cracked in half at this point or during a previous collapse, prohibiting access to the wall top. A replacement staircase was therefore built up to the surviving section of the intramural stairs, and the damaged lower section of the stairs and the cell landing were blocked with masonry. The new staircase was built within the broch interior starting just W of the earthhouse shaft and rising steeply to meet the wallhead immediately to the N of the blocked landing. The bottom treads were found intact as they were built of solid stone but the higher section was supported by an arched piece of corbelled masonry which rested on the old fourth partition and a new one, 1.4m to the N. In order to build this arch, the original top slab of the fourth partition was removed and replaced by a much shorter thicker slab, overlain by horizontal masonry which was built around a support stone



Illus 49  
Later Phase 7 buildings in the E.



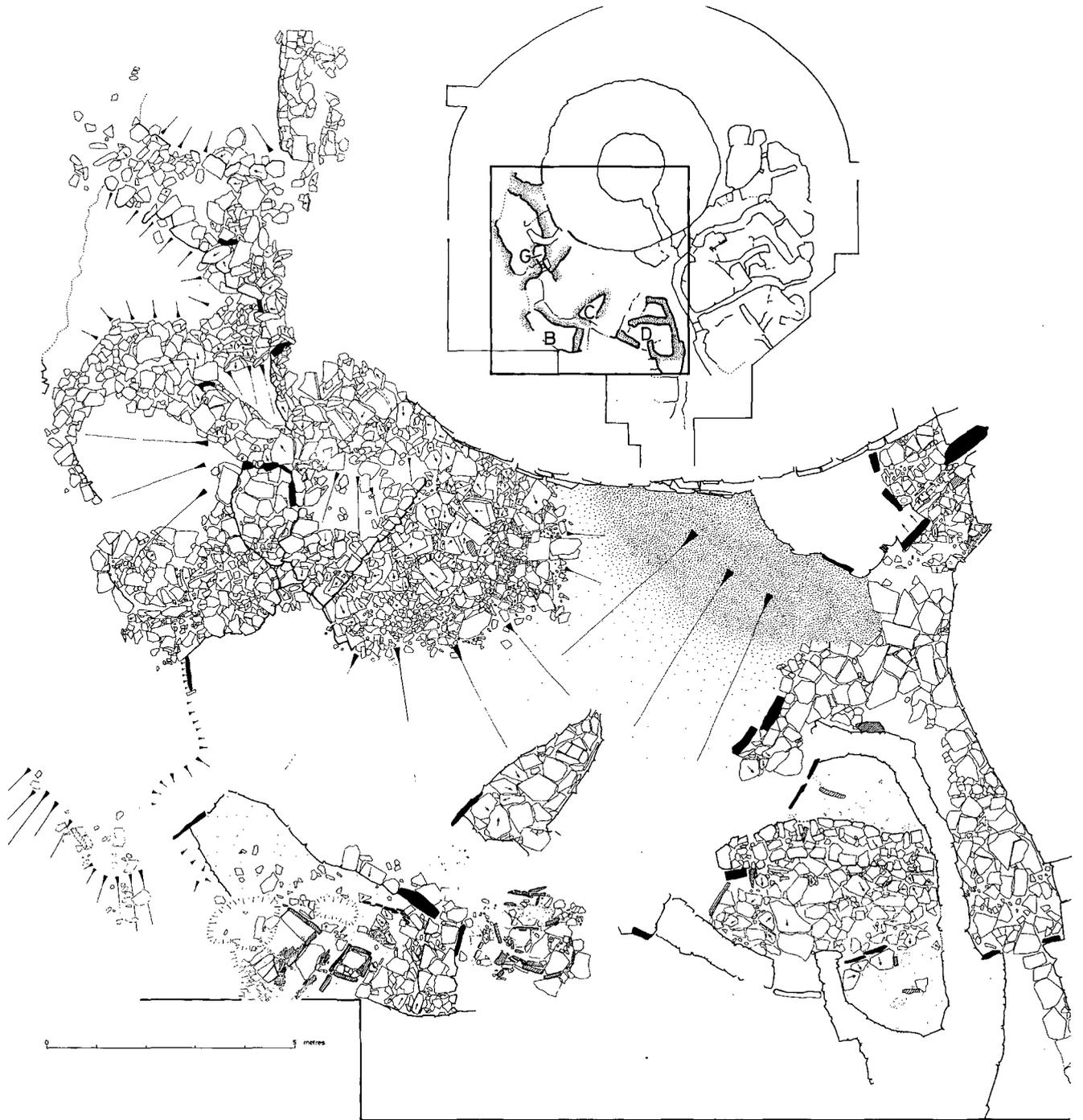
Illus 50

Later Phase 7 alterations to the broch tower W staircase. a) upper level; b) lower level; c) upper storeys of the cupboards in the broch tower with their lidded bays beneath (right) and remains of the replacement staircase and its corbelled arch; scales – 1m & 2m; from SE.

inserted into and projecting from the broch wall. The actual corbelling rested on the horizontal masonry and extended N in order to step down on to the new partition. The corbelling also projected S presumably as a counterbalance and was bonded into the landing blocking (illus 50c).

Between the fourth partition and the new ones was a large slab at a similar height to the S bay lid which presumably also acted as a

lid, although it may have braced the partitions as well. It was supported by the insertion of an additional upright to the inner circle forming an enclosed cupboard beneath with an open closet above, that had a corbelled roof. There was a small wall cupboard at this height that was probably contemporary with this new bay. It is assumed that access to the higher levels was gained by ascending the new stairs to the wallhead before doubling back over the blocked staircase towards the surviving section of the



Illus 51  
 Later Phase 7 settlement: final alterations to buildings in the SW with the earthhouse, **G**, built into the rubble of the SW collapse of the broch tower. Inset shows close-up of the earthhouse; scales – 30cm, 50cm & 1m; from S.

staircase somewhere on the N side. Direct access from the centre of the broch interior to the stairs was made by removing an upright from the inner circle at the foot of the stairs. This also gave access to the reduced passage whose original W entrance was now blocked by the staircase. As soon as the landing and stairs were blocked, the remaining open parts of the cell and landing began to fill with rubble.

### THE SW AREA OF THE SETTLEMENT

It is assumed that the broch continued to be used in this state until it was abandoned later in Phase 7 following the collapse of the N side of the tower. Further activity continued outside the tower with a series of new buildings being constructed over the rubble from the SW collapse, (illus 51). After this rubble had stabilized, a small ovoid earthhouse, **G**, 2.8 × c 2.0m wide was built into it. It was approached from the S over the levelled remains of the W rampart room, **A**, and had a splayed entrance which faced E (illus 51 inset). A retaining wall ran from it over the rubble to the broch tower. It was of squared stone, was partly dug into the rubble and survived to a maximum height of 0.75m. The entrance narrowed to a passage, 0.4m wide, which sloped up into the chamber. At the narrowest part of this passage two capping lintels survived at a height of 0.5m above the floor. The curved wall of the earthhouse was built of upright stones, with horizontal stones on top, resting on the paved floor of the chamber which was made of large flagstones. No deposits were found within it and it is not known how long it was used before being filled with rubble when its roof collapsed.

Room **B** was reoccupied at this point, and room **C** may also have been used, but the adjoining rooms **E** & **D** remained abandoned. The SW collapse seems to have severely affected these southern buildings as both the E wall and part of the N wall of room **B** needed to be rebuilt. The new wall was freestanding and was poorly constructed from large facing stones with a rubble fill. Only a couple of courses of this wall survived, and at its N end it joined four large boulders which were dug into rubble to form the N wall of room **B**.

A new earth floor with some paving stones was laid in the room, and a well-built hearth, 2.0 × 0.8m, added. A raised kerb survived on the N side but the W and S sides had been destroyed by a recent Phase 9 cow burial and by ploughing. Its base stones survived under an intermittent deposit of ash and charcoal. About 0.6m to the E lay a 0.75m square, kerbed feature containing some ash which lay parallel with the hearth but separated from it by a row of upright stones, possibly a partition. It had a cracked base slab and a stone on edge which projected from its SW corner. E of this may have been a store of peat with some charcoal which lay in a hollow within the earth floor.

Overlying, but intermixed with it, were the fragmentary remains of a hearth, about 0.9 × 0.7m, with the remains of kerbing along the N edge. The rest of room **B** lay outside the excavation and its full extent is unknown. E of this room was an irregularly shaped kerbed hearth, about 1.20 × 0.80m, built on the rubble surface. It is assumed that the hearth was either outside or in a lean-to against the E wall of the room **B**.

### FURTHER OCCUPATION OF THE BROCH TOWER

A layer of small rubble 0.3–0.4m thick mixed with silt and midden material 0.3–0.4m thick gradually built up within the broch tower. The only large rubble was a heap in front of the N cell composed of thin slabs from the collapse of the corbelled cell roof. It is clear that the tower was abandoned for a time after the N side had collapsed and the ruins were used for rubbish dumping. A large deposit of stone and rubbish against the broch wall immediately W of the entrance and formed a mound 0.6m high and included burnt and cracked stone, stone artefacts, shell, bone and organic debris. From its location, this appears to have come from a partial clearing of the rubbish from the broch interior at the end of the

phase of disuse. The only other alternative is that it was brought here from the **NE** building which had been cleared out earlier in Phase 7 and which was the only other building now in continuous occupation.

### SECONDARY FLOOR 1

Within the tower, the rubble and rubbish were cleared out of the entrance passage, the central area and the bays to the W, down to the earliest Phase 7 floor which was now levelled to create a clear space in which to rebuild. The E and N sides were not cleared although some rubble may have been removed from in front of the collapsed N cell in order to block it up with facing masonry. All the W bays, the orthostat screen and the internal staircase were still intact.

Within this basic design, a floor, 1, consisting of a layer of mixed earth 0.15–0.2m deep, was spread over the inner circle (illus 52). A door sill was placed between two uprights of the inner circle probably replacing the tower's inner door. Although later reset, the door originally had an internal pivot-stone (SF 2399) at its E end. Within the inner circle a square feature of uprights and masonry was set against the E side. This is interpreted as a kiln by its later association with spreads of broken pot and lack of connection with any sort of slag. It survived as an open deep hearth but probably originally had a lid.

On the W side of the inner circle, a square tank, 0.5 × 0.5 × 0.4m, sealed with yellow clay was dug into the floor. It had a flag cover, resting on the sides which projected 0.05m above the floor level. Another sill, placed across the gap between the uprights to the W, suggested that this bay was being used as a room, although the extension of the flag lid roofing this bay was missing. The only other new feature was a short line of small packing stones forming a temporary partition to the SW of the tank (illus 53).

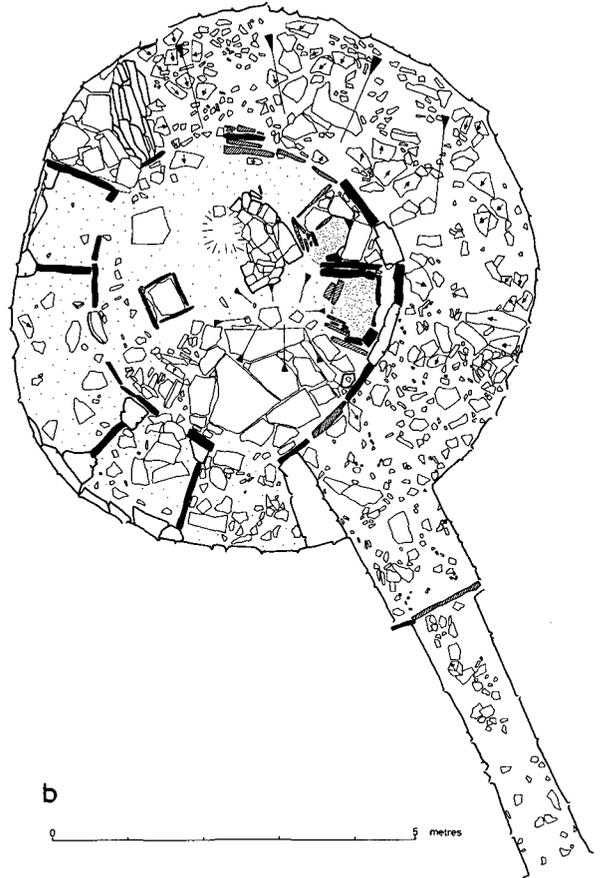
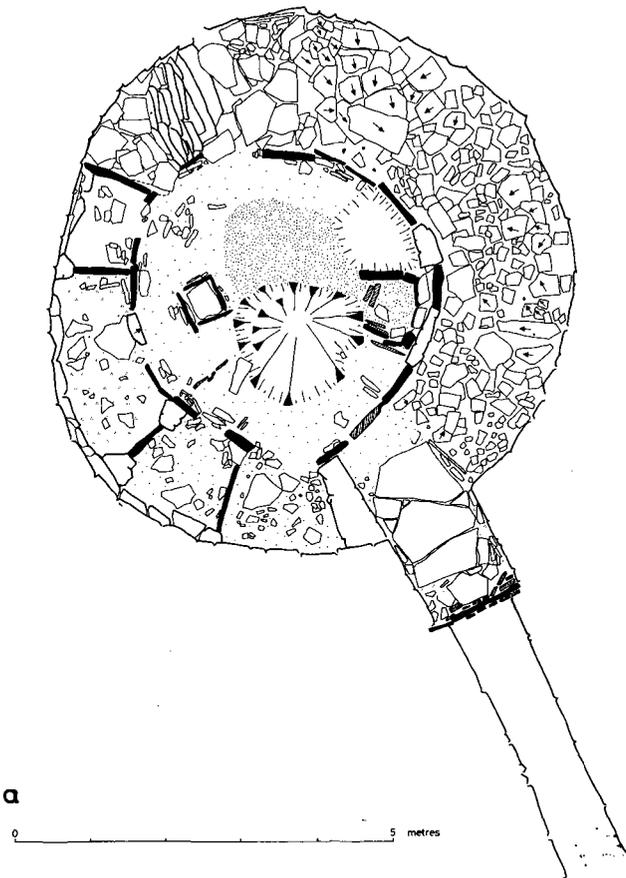
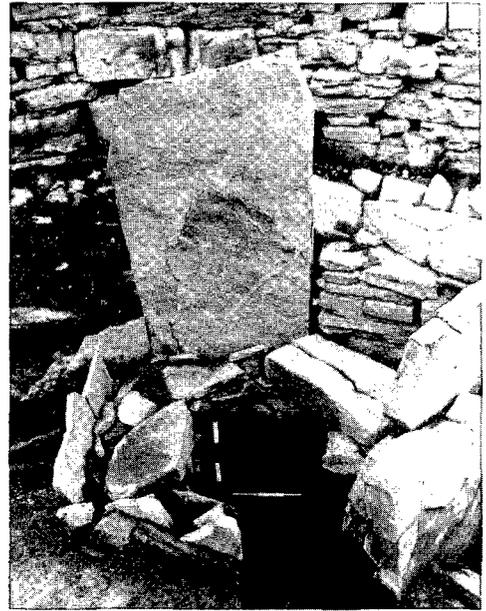
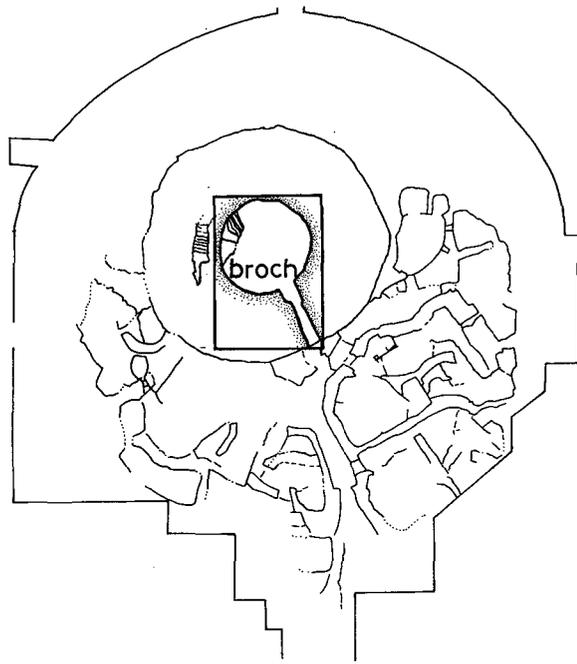
This workshop floor remained in use for a considerable period, during which the floor levels built up and a large heap of ash 0.4m deep formed as successive fires were raked out of the kiln. Numerous lenses of red, orange and yellow ash indicate the prolonged use of the floor and kiln. At the same time the entrance passage and rubble on the E side gradually became covered in a layer of small rubble and earth. This was a natural accumulation of material that began to form, as soon as the interior was cleared, by stone flaking off the walls and being trampled down. This stone debris was found spread out from the broch entrance over the levelling rubble to the S and SW of the tower. The presence of this layer within the tower, combined with the internal sill and pivot, suggest that only the central area and W bays of the broch interior were roofed.

### SECONDARY FLOOR 2

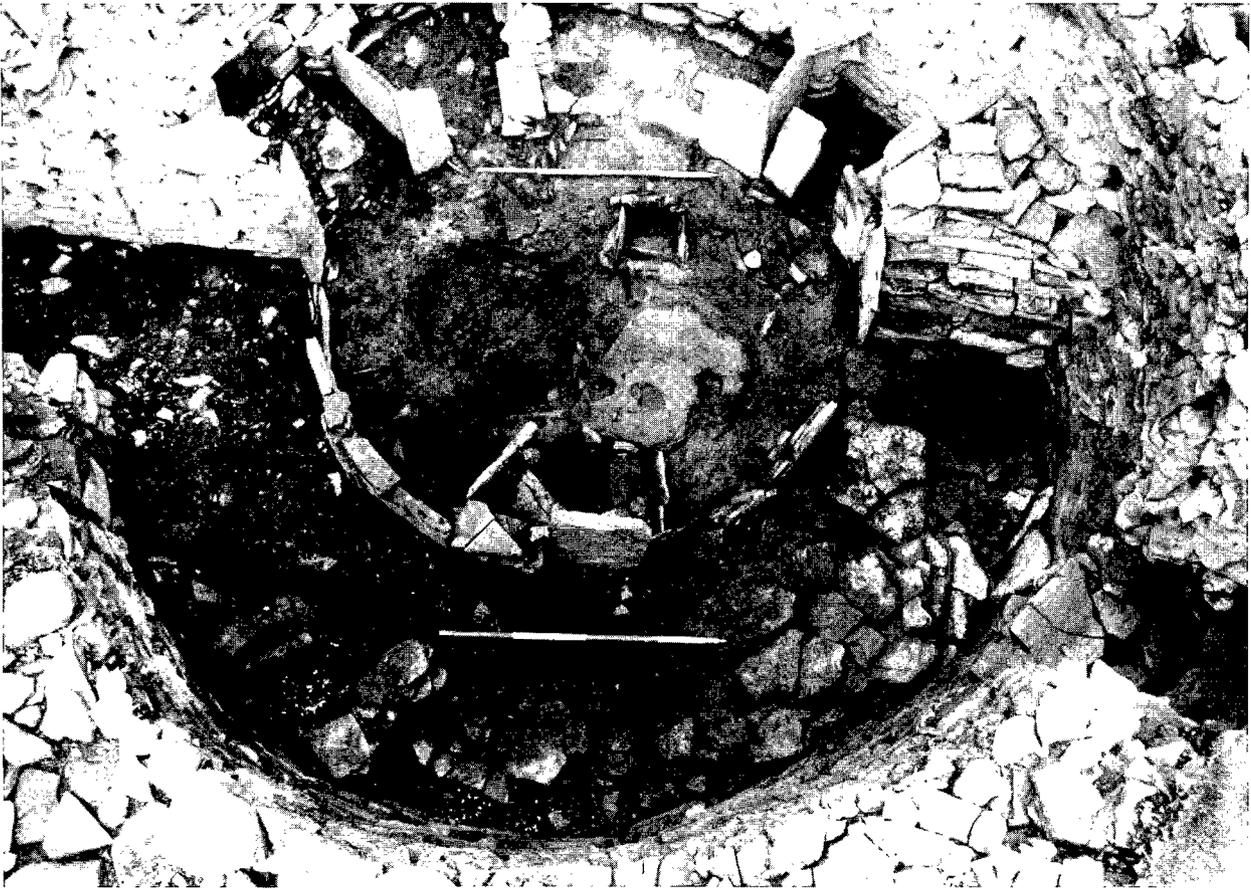
A series of repairs and improvements followed, including the laying of a new floor, 2 (illus 52). The major improvement was the digging of a large circular soakaway, 0.95m deep, through the centre of the floor into the clay below the Phase 6 and 7 floors. It was filled with large rubble and then capped with a triple layer layer of flagging, which was set in yellow clay. The careful repair of an inner circle upright, with a new slab set against it, supports the idea that these uprights were used as roof supports.

A second roughly pentagonal kiln with a corbelled lid and a chimney gap was built immediately N of the first one (illus 52 inset). It was loaded from the side and was more convincing as a kiln than the earlier one. At the same time, a new floor was laid over the ash heap, the interior circle and the two W bays, and a large rectangular hearth slab was laid on the floor next to the new kiln.

These improvements should be seen as a continuation of the original activities within the broch tower, which appear to be



Illus 52  
Later Phase 7 floors, a) 1 and b) 2, of the broch tower. Inset shows floor 2 kiln in the broch tower; scales – 30cm & 50cm; from SW.



Illus 53  
Later Phase 7 floor 1 within the broch tower; scales – 2m; from E.

the manufacture of pottery and stone tools. Evidence for the stone-working came from over 60 hammerstones, pounders and grinders and numerous pot lids, flagstone shovels and querns, either finished, half finished or broken. Whilst the spreads of smashed and unused pottery suggest firing took place in the kilns, the tank may have held water for pot making.

Evidence for an abrupt end to this activity comes from a thick layer of orange ash overlaying a continuous layer of charred unthreshed barley within the central circular area. Those ears which survived intact, were apparently spread on the floor to dry, covering the tank lid and the hearth, and suggesting that they were drying in the heat from the kilns. The barley must have accidentally caught alight setting the whole inner circle on fire. The presence of large pieces of charred wood and much

matted straw among the barley suggests that the roof also burnt. After the fire, much of the burnt material was cleared away and some trampled out of the entrance, and a shallow deposit of rubble built up over it, showing that the area was still used, although only for a short time. Shortly after the fire, the whole of the S wall of the broch collapsed outwards, creating a bank of rubble which blocked access to the entrance passage. A second collapse, of the E corner of the entrance passage, filled the inner entrance and triggered further collapses into the three S bays, smashing their flagged lids, the capping of the W room partition and breaking an adjacent upright. These collapses are all approximately contemporary although the sterile rubble layer suggests that the entrance passage was open but unused for a time which would be consistent with the southern collapse preceding the inner one.

## CONTINUED USE OF THE E SIDE OF THE SETTLEMENT

### NE BUILDING

During Later Phase 7, the **NE** building was re-occupied and remained in use until the southern collapse of the broch tower. This occupation cannot be linked with any other contemporary activity on the site.

The entrance passage to the building was roughly paved with flagstone over earth and ash levelling. The passage extension which led to the yard was now blocked with stone which was faced to the W and also stabilized the SE corner of the building and the

collapsed S cell. Two buttresses were added to form a short corridor,  $c 0.8\text{m} \times 1.0\text{m}$  long, to the house door. The W buttress was freestanding and butted the N wall of the entrance passage, while the E buttress was single-faced and backed into the rubble fill of the S cell.

### SECONDARY FLOOR 1 (illus 49)

The interior of the house was also redesigned: although both cupboards and cells were kept, the NE cell was repaved and the N cell was given a new earth floor. The original Phase 7 oven was

rebuilt with the addition of two upright flagstones forming a triangular support on its NE side, and the basal slab was luted with yellow clay to form a watertight tank.

Lying almost centrally within the floor was a rectangular hearth, 1.5 × 0.6m, kerbed with upright stones but partly open to the S. The hearth slab was in two large pieces. The W end was repaved, but the E slab had collapsed into the rubble filled Phase 1–2 post pit below. These repairs may have taken place when a new, smaller, kerbed hearth was built immediately to the S. This new hearth was open to the SE and may have had a socket recess in the N. Well-fitting paving was laid S of this but the rest of the floor was a mixture of earth and rough paving.

Access to the yard was via a gap cut through the *E/NE* dividing wall from the *E* yard (see below). The shed, *L*, in the N part of the yard remained in use, but was given a new earth and stone floor, while the yard itself was largely unaltered, apart from the build-up of an earth and rubble surface.

#### THE *E* BUILDING YARD (illus 49)

A reorganization of the *E* yard now took place, with new walls and paving being laid down over the levelled rubble of the early Phase 7 yard. A partly curved wall of rubble, faced on the S with large uprights, was built on to the E cell of the *E* building, aligned E–W. This wall formed the N side of a new, paved, slightly curved passage. A second wall built against the yard dividing wall, and infilling to its S buttress, formed the other side of this passage and contained a 1m wide doorway with sill-stone. The N end of this wall was crudely altered when an access gap was made through it into the *NE* yard. This gap was about 0.5m wide × 0.7m long and only roughly faced with stone.

Access into the N part of this yard was from the original Phase 7 house door, via its entrance passage and the old *NE* yard door. A new path, 3.4m long and about 1.0m wide, was laid on the

underlying rubble linking the early Phase 7 yard door to the new silled doorway and curved passage. No division of the path was found at its E end to lead to the *NE* yard access, and presumably entry was only gained over rubble.

The curved passage opened into an irregular shaped room, 5.0 × 2.4m in the S part of the yard which had a close-set flag floor but no hearth. The SE corner of the room and S portion of the rampart cell was rebuilt with the addition of a 2.5m length of wall. This wall replaced the collapsed portion of the *SE/E* dividing wall, and may have originally been double faced. Its S face was however lost, probably by ploughing. These new walls indicate that the S half of the yard was probably roofed over.

#### THE *SE* YARD (illus 49)

There was little evidence for any demolition in the yard since its last occupation. However a shallow earth and stony abandonment surface was found in the NE part of the yard and in the rampart cell, indicating that these areas now remained open and were only used for access.

A single-faced wall was now built against the W edge of this yard, running N–S, which butted its N wall. This wall continued S as a double-faced wall, which had been badly damaged by later disturbance. It is not known if there was originally a doorway here. The original doorway from the *SE* building was now blocked and access into the new room would have been from the E or possibly the S. This new W room, c 4.3 × 2.8m, was paved with close-set stone slabs laid on a silty-clay foundation layer. The room sloped to the S and E and no domestic or industrial refuse was found on the floor.

Another room, *H*, was created in the S part of the yard by the construction of the double-faced wall incorporating a doorway with a sill and reusing the surviving Phase 7 masonry against the Phase 5/6 rampart. This room was 3.0 × 2.0m, irregular in shape, with a clay loam floor set with some flagstones.

### FURTHER ACTIVITY IN THE E OF THE SITE

The next stage of activity on the E side of the site continued without a break.

#### THE *NE* BUILDING

##### SECONDARY FLOOR 2 (illus 54)

This stage of activity was marked by a major refurbishment of this building following the gradual build up of 0.1–0.2m of earth floor and rubble. This rising floor level seems to have necessitated the insertion of a new entrance in the E wall and a complete or partial reroofing of the building, as well as numerous minor alterations. A new flagged surface, 2, was laid over the debris within the entrance passage; the buttress W of the entrance was demolished and replaced by paving along the N wall of the passage, ending with a small upright to form a rectangular porch about 2.2 × 0.9m which was later repaved.

Within the building, the cupboard W of the doorway was filled in and faced with stone as the floor levels within the house had reached the base of the cupboard. The earlier hearth was replaced by a larger kerbed hearth 1.5 × 0.7m, with three stone-built sockets. Surrounding the hearth to the N was a kerbed area which contained the remains of iron-working debris which was capped by a 0.09m thick layer of pink-orange ash. The W part of the hearth was re-slabbled during its use, and the surrounding earth floor contained some flagstones to the S. Between the hearth and the SE wall a linear socket may have contained an upright flagstone, and deposits of pink-orange ash on the floor suggest that material from the hearth was spread around the building.

The NE cell was repaved with flagstones; the N cell was given a new earth floor and the existing partition was raised or rebuilt. At the same time, a new entrance was put into the E wall, allowing access to the shed, *L*, and the yard beyond, away from the broch tower. The shed remained unaltered but a surface of rubble, slag and furnace material developed across the yard, as long as the access between the *E* and *NE* yards remained.

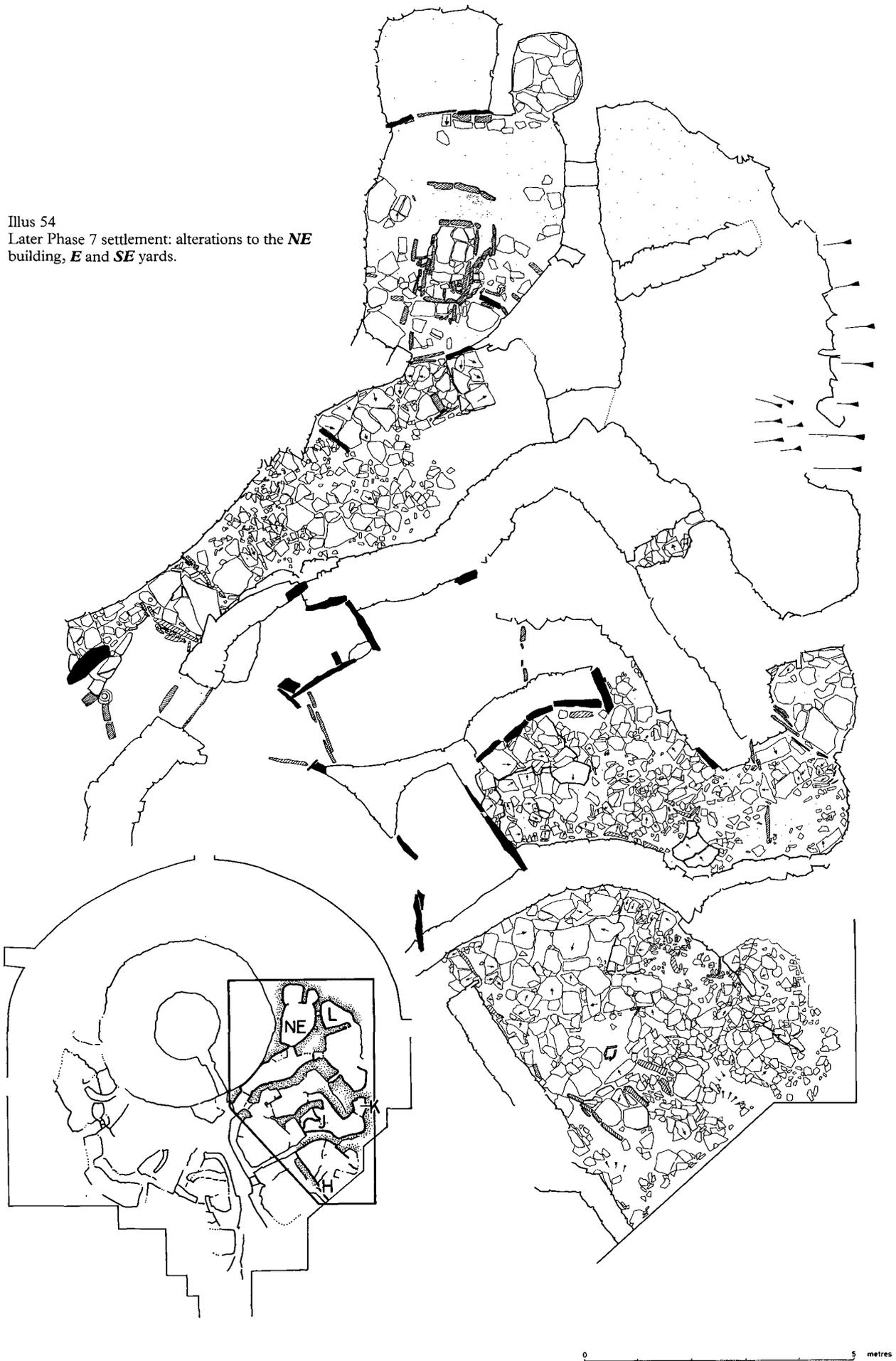
#### THE *E* YARD (illus 54)

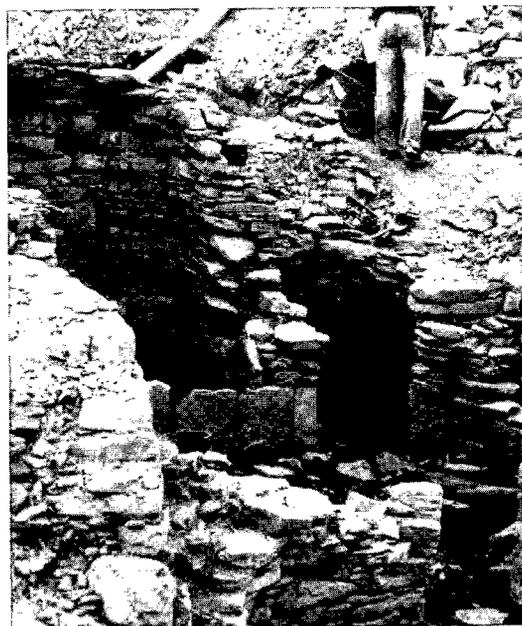
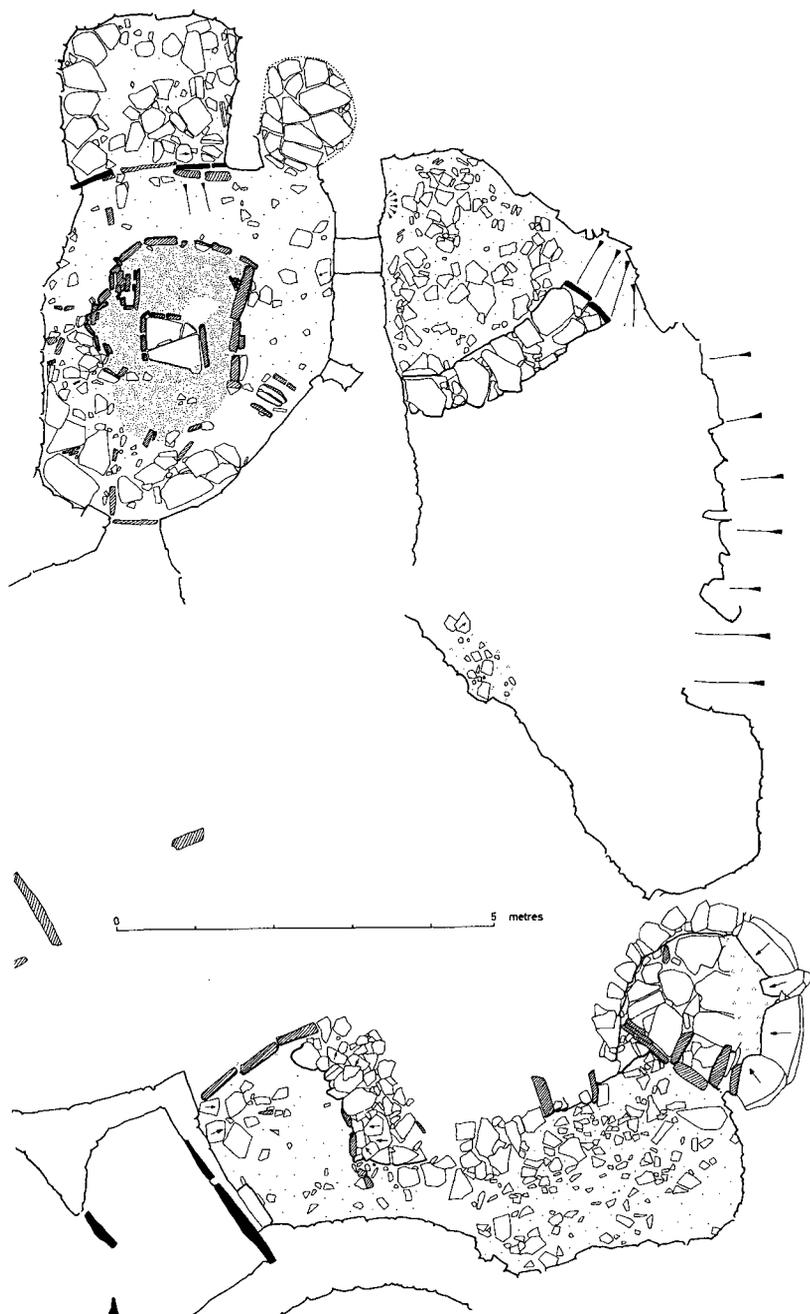
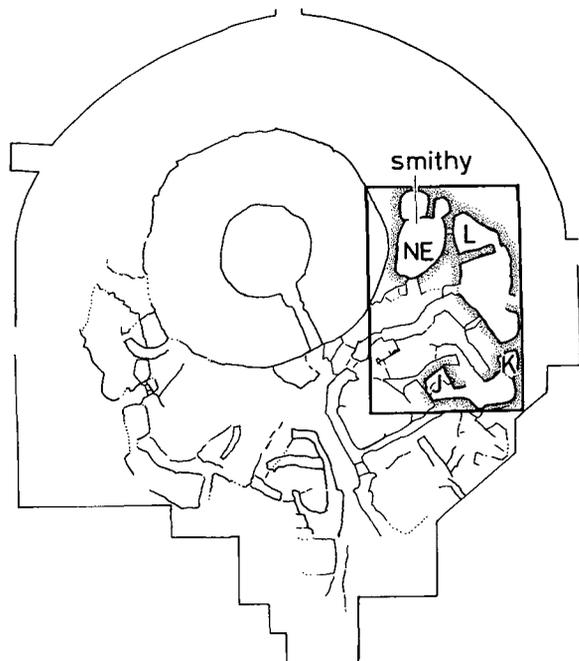
Further modifications took place in the *E* yard with the addition of two single-faced buttresses in the S room where the uprights of the new NW wall, by the Phase 7 *E* building cell, may have become unstable. A collapsed pile of stone by these buttresses may have originally been a roof support. A new earth floor was then laid in the room and an unkerbed hearth built against the new S wall. This hearth was composed of a single large slab, about 0.7m square, which was found cracked and burnt and had settled into the underlying stratigraphy.

#### THE *SE* YARD (illus 54)

Although the W and S rooms of the *SE* yard remained unaltered, a new path, 3.5m long, was constructed from the rampart over the rubble surface, entering the W room at the junction of the single- and double-faced walls. The single-faced wall was partly rebuilt and faced to the W and S at the new entrance; the path was defined on the N side by a single-faced wall of which two small fragments survived to a height of 2–3 courses. At the E end of the path a paving slab was found with a pivot hollow presumably for a door or gate.

Illus 54  
Later Phase 7 settlement: alterations to the *NE*  
building, *E* and *SE* yards.





Illus 55  
 Later Phase 7 settlement: final modifications to the *NE* building and yard, and to structures in the *E* yard. Insets show: upper) industrial hearth in the *NE* building; scales – 50cm; from W; lower) *NE* building during excavation showing the NW cell to its corbelled roof height; from SW.

This path was later repaved and the door or gate removed. The old rampart cell, which by this time was filled in with rubble, was blocked off by a single-faced wall and the floor at the E end of the W room was resurfaced with large slabs. These overlay the NE wall which had now been demolished as had the SE wall, turning the room into a large open yard.

An earth and flagstone floor was laid in room **H** and a hearth was added which was open to NW and SE but kerbed along its other two sides. There were no deposits on the hearth, suggesting that it probably was never used. N of the hearth was a square stone setting which was possibly a post socket for a lean-to roof over the hearth, in an otherwise open area.

In spite of these alterations, activity in this yard seemed to be short-lived with few deposits forming and little evidence to suggest what activities took place. The yard was later abandoned, allowing a build-up of refuse, clay-wash and stones from the rampart to cover most of the S half of the area. Rubble from the yard walls spread W and S over the N part, upon which a stony earth abandonment horizon developed. This also accumulated in the **E** yard, indicating that it, too, was abandoned before the structures and walls of both the **NE** and **E** yards were thoroughly levelled and an extensive rubble surface created.

The original Phase 7 buildings (the **E**, **NE** and **SE** buildings) were not levelled now but the entranceway to the **NE** building and the dividing wall between the **NE** and **E** yards were demolished and the gap between the **E** and **NE** yards was infilled with rubble.

This rubble surface contained much midden material including bone and shells, as well as iron-working refuse, pottery and stone tools, indicating that dumping from the **NE** building as well as other areas – perhaps the rampart – had taken place. The yard surfaces now reached the height of the levelled walls. It is probable that these buildings were levelled at the same time as the buildings on the W when the broch tower interior was cleared.

## THE **NE** BUILDING

### SECONDARY FLOOR 3 (illus 55)

This remained in use, with the dumping of a large quantity of furnace lining and slag against the remnant of the yard dividing wall. Shed **L** was rebuilt on a slightly different alignment, with a new earth and stone floor and a new curved S wall, with an entrance at its E end by the rampart, which was faced with upright stones. The entrance into the **NE** building now was probably through its E wall, past the shed and yard as the original doorway appears to have been blocked by the levelling of the entrance passage.

New paved floors were laid in the N and NE cells, although the latter was now no bigger than a large cupboard due to the continuing rise in floor levels (illus 55 lower inset). Approximately 0.2m of earth, stone and organic deposits developed on the floor before a rectangular hearth (illus 55 upper inset), surrounded on three sides by irregular kerbing, was added, to form a large work area. The hearth was open to the S, but a gap in the kerb stones in its NE corner was filled with the deposits of a small furnace. A 0.25m thick deposit of grey to pink-orange ash, filled the kerbed area around the hearth, and extended S over the earth floor.

This kerbing contained two stone-packed sockets, of which the westernmost may have provided a support for both furnace and hearth. The other socket was only fragmentary and was located in the NE corner of the kerbing. SE of the hearth was a third area of stone packing, which was probably also a socket.

Towards the end of this occupation, several stone collapses occurred. Clay and rubble fell off the rampart on the E, blocking the doorway into the shed, and another collapse from the rampart on to the yard surface may also have occurred at this time. Following the build up of debris in the entrance to this shed, the E entrance to the house was deliberately blocked, and it is possible that the original doorway was used again.

## THE **E** YARD AND SHEDS **J** AND **K** (illus 55)

Sometime after the tower had been cleared out, the structures to the S and W (**B**, **C**, **E** and **G**) were levelled, almost to their foundations, leaving an extensive area of flattened rubble over the W of the site. Over half the area of the Phase 7 **E** yard remained as a levelled surface during this last stage of activity, but two sheds, **J** and **K**, were built in the S part of the yard. Shed **J** was formed from the N wall of the previous room, and the old wall of the original Phase 7 E cell. Its S wall utilized the surviving stones of the **SE/E** yard dividing wall while the E wall was single-faced. The latter was built of both upright and level stones with an entrance 0.6m wide at its S end. Surviving small stones set on edge suggested that the entrance originally had a sill-stone. A buttress, 0.7m high, was built against the W wall to support the SW corner of the shed and possibly its roof. The shed was given an earth floor, and a hard packed layer of clay in its NW corner may represent fallen clay luting from the early Phase 7 cell, or the base of a later entrance cut through the N wall. A second contemporary shed, **K**, was constructed within the remains of the early Phase 7 rampart cell. It had a new curved E wall of four large upright stones, which continued S as a coursed wall, dug into the rampart clay.

Shed **K** was given a new doorway, with a sill-stone set between two flanking stones on edge, and a paved floor, set on an earth levelling layer. Overlying the paving against the E wall of the shed, was a deposit of yellow clay luting, 0.2m deep, and between the two sheds was an earth surface which was intermixed with the underlying levelling material.

These sheds were abandoned and the S wall of the yard was levelled after part of it collapsed, spreading rubble between the buildings and blocking access to the W shed. A new entrance to this shed was made through its N wall, but it was abandoned shortly afterwards when the broch tower collapsed again.

## EFFECTS OF BROCH COLLAPSE

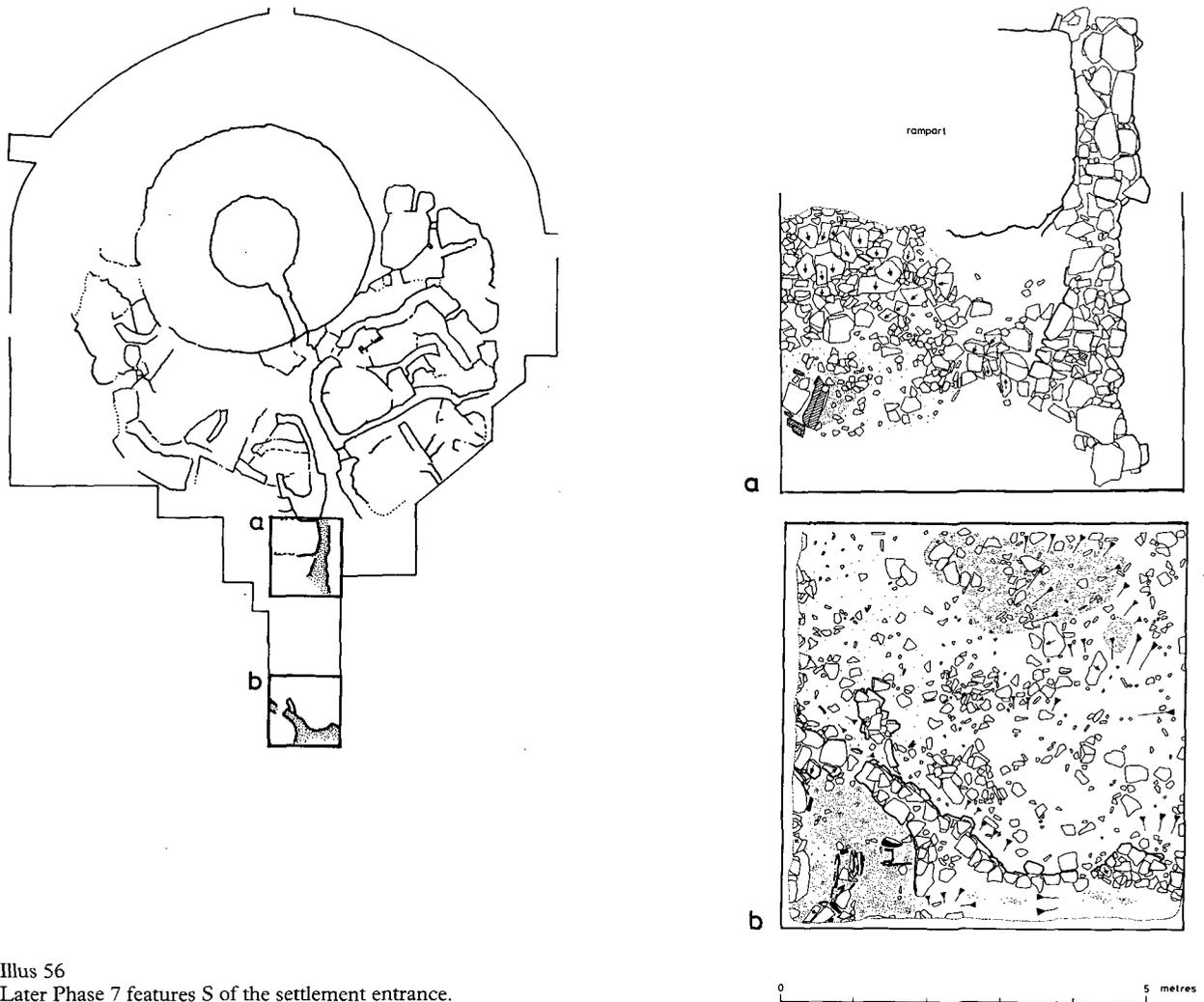
Phase 7 was brought to a close by the collapse of much of the S wall of the broch tower, spreading massive amounts of rubble across the site. This collapse blocked the broch entrance and spread a 2m deep layer of rubble over the levelled area to the S and SW. The entrance passage to the **NE** building was completely blocked, although the building itself escaped the full brunt of the collapse; rubble partly filled the **E** building but its surviving W wall shielded it from the worst of the collapse.

## BEYOND THE DEFENCES

Detached but related to the Later Phase 7 settlement were two areas S of the defences which were partially revealed in a long trench opened along the line of the North-South Section (illus 164; 56a; 56b).

The first was found over the fill of the Phase 7 ditch which had been filled with domestic refuse and had a new rampart

built upon it (see above). After an earthy ground surface had developed over this rubbish, a hearth was built into it, although no walls were found associated with it. This hearth was 0.62 × 0.8m and had large stones on edge, forming kerbs to the S and E sides. No deposits were found on the hearth slab, but orange ash was found adjacent on the earth surface.



Illus 56  
Later Phase 7 features S of the settlement entrance.

Some 12m to the S was another hearth in the corner of a building which was only partly revealed within the excavation. It lay to the S of extensive spreads of midden, ash, charcoal and rubble. Only a couple of courses of the walls forming a corner of the freestanding building survived. A metre length of rubble was found attached to its N face, forming a further wall. At its S end, the wall split into two, one arm continued S as the E wall of the structure, while the other face curved and angled E. Both these walls were single-faced, and were built into the ash and charcoal ground surface. Presumably these were the foundation courses of double-faced, freestanding walls which had been destroyed by recent ploughing if they had not already been levelled.

Within the building was an ash and charcoal floor containing a hearth set into a layer of yellow clay, with a number of small kerb

stones and a socket to the E. To the E, between the hearth and the wall, was another stone setting of small upright stones which may also have been the remains of a socket. N of the hearth, against the wall of the building, was a large granite boulder SF 5376 interpreted as an anvil. It was held in place by upright stones to E and N.

It is clear from the evidence for buildings within this trench that the settlement continued outside the line of the defences, at least during Phase 7. Because there was not time to excavate these buildings, it is unclear whether earlier occupation also occurred here and the full extent of the area of the settlement beyond the defences remains unknown. The lack of domestic buildings near the decaying broch during the Later Phase 7 may perhaps be due to the location of these buildings, away from the broch in the unexcavated areas beyond the ramparts.

#### 4.1.3 • PHASE 7/8

This phase mainly concerns the broch tower with a continuation of its late Phase 7 floors, after a series of wall collapses. Access to the broch was gained from over the top of its walls as the entrance was blocked at the beginning of Phase 8. It is uncertain whether these two last floors in the broch, concerned with iron-smelting and bone-working, built up before or during the large S collapse of the tower. Collapses from the N ramparts occurred at this time as well as the construction of a building over the filled in SW ditch. During this phase, around the 4th century cal AD, there was a change to plainer pottery vessels, and a painted pebble was found.

## OCCUPATION OF THE BROCH TOWER

### THE INTERIOR

This succession of major wall collapses necessitated a complete reorganization of the broch interior because the S side and the broch entrance passage were buried by rubble. Reoccupation seems to have followed swiftly, although access was now over the remains of the W wall across the rubble which rose almost to its full surviving height, and down the staircase. A level platform of flagstones partly enclosed by a low wall was built on the rubble at the foot of the stairs. An opening on the W side led to the inner circle, whilst the E end opened onto the rubble surface. The rubble was cleared from the inner circle but not from the bays or the entrance passage which were blocked off by a stone across the old entrance, and by a wall on the E. This reorganization left only the inner circle and the northernmost bay usable and this, combined with the difficulty of access, must have deterred any major working.

### SECONDARY FLOOR 3

A new floor, 3, was laid within the inner circle (illus 57; 58a) and the existing Later Phase 7 tank and earlier kiln were filled in and sealed by new slabs. A further levelling layer was spread over the floor, before a large hearth was set in the centre. The thickness and size of its main slab suggested that it was the missing covering slab to the S bay. Over the hearth was a layer of red ash which spread out of the hearth's open W end which was cut by the base of an iron smelting furnace that was only 0.15m deep. It had a clay-lined base which still contained willow branches, with a

maximum diameter of 0.05m (7.2 Plant Report below), which had been reduced to charcoal before being laid in crisscross layers in the furnace. The later kiln was retained but seems to only have been used once during the life of this floor. It was fired from above and contained a single pure buff ash layer.

There was evidence for some stone and possibly antler tool working still being carried on here, before the central area of the floor with the hearth gradually settled about 0.3m into the rubble filled soakaway below.

### SECONDARY FLOOR 4

A new floor, 4, was laid, filling this depression, and the hearth was replaced by two new ones (illus 58b). One hearth was small and had an area of flags at its open N side. The only other feature on this floor was a small unrelated post setting, only 0.15m across, between the hearth and the rubble on the S side. Finds from this floor include a group of antler tools including 10 knife handles, 9 of which were found jammed into the small area of broch wall-face that was accessible at this time. Throughout this period, rubbish and rubble continued to be dumped on the E side of the tower interior before being covered by later rubble.

Use of this floor was ended by a shallow collapse of rubble to the W of the inner circle. This rubble may well have come from part of the staircase, since it seems that the collapse rendered the interior inaccessible. A layer of natural silting and small rubble mixed with dumps of rubbish gradually built up within the interior.

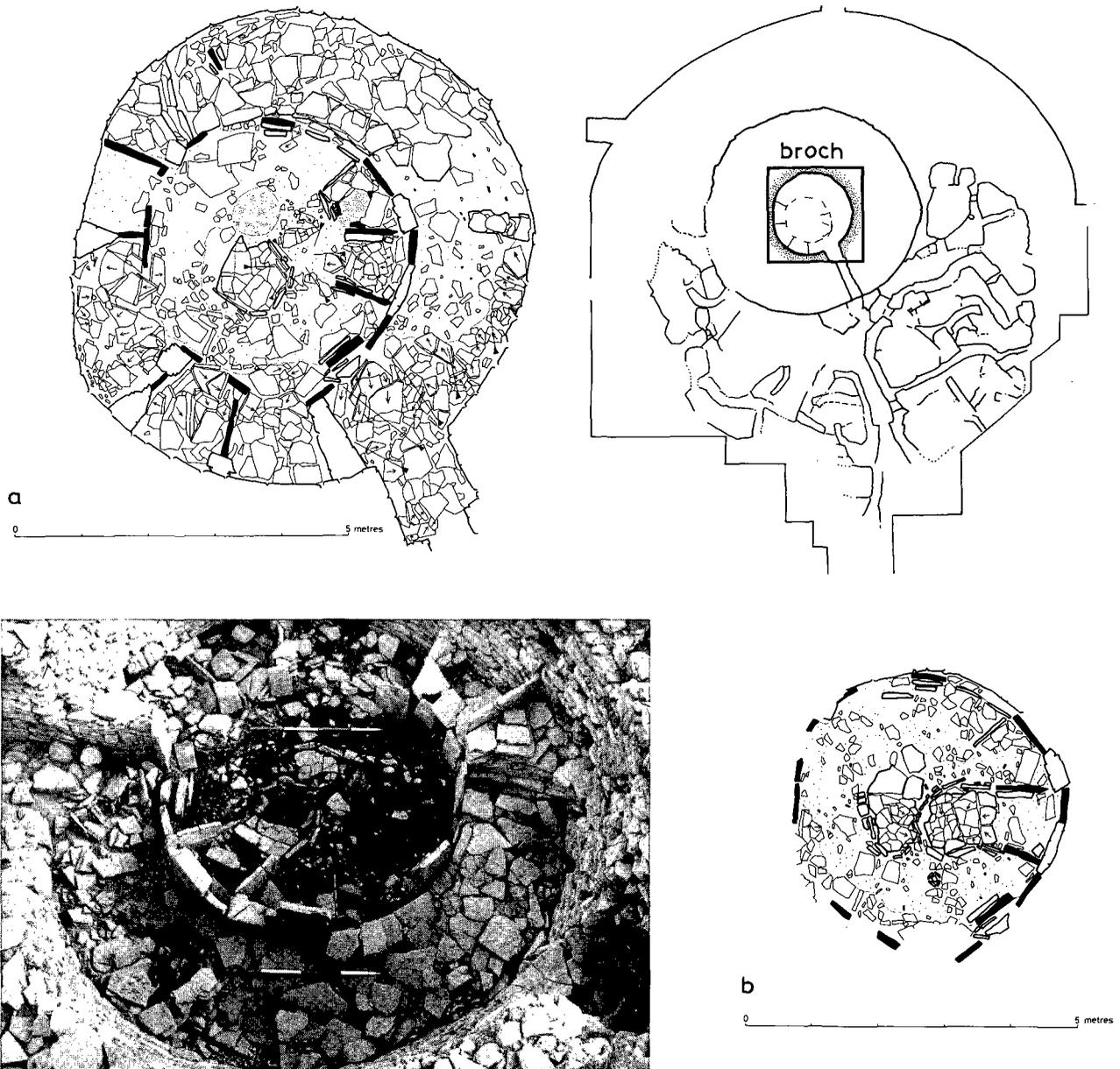
## THE COLLAPSE OF THE N DEFENCES

A series of collapses occurred to the steeply sloping revetted sides of the ramparts on the N of the broch during Phases 7/8. It was impossible to date individual collapses with any certainty, although a broad sequence has been worked out. A trench was dug through the defences to the N of the tower along the line of the main N-S section on E71 (illus 164). The events recorded here were subsequently tied in to the adjacent sections of the ramparts during the rest of the excavation.

During Phase 7, there was a major collapse of the rear of the surviving Phase 5/6 rampart, which filled the inner ditch between the rampart and the tower to a depth of 0.6m. This occurred before the outer face of the N side of the tower collapsed outwards, completely blocking the ditch with rubble. The effects of this collapse have already been discussed above.



Illus 57  
Phase 7/8: floor 3 within the broch tower; scale – 2m; from E.



Illus 58  
Phase 7/8: later floors, a) 3 and b) 4, in the broch tower. Inset shows floor 4; scale – 2m; from W.

The outer face of the Phase 7 refaced rampart collapsed outwards, bringing with it a mass of the clay core, which formed a thick layer deepening towards the bottom of the outer ditch. The immediate effect of these collapses was to fill the inner ditch between the broch wall and rampart so that only about 0.4m of the broch outer face showed above the slight hollow between it and the remains of the rampart. Beyond the

rampart, the clay-capped rubble sloped gently into the outer ditch.

A period of stability followed during which an almost continuous shillet ground surface developed on the rubble and a layer of silt built up in the remains of the outer ditch.

#### THE BUILDING OVER THE DITCH IN THE SW (on illus 62)

A building was constructed over the ditch on the SW side of the site, after the ditch had completely filled up late in Phase 7. It was built on a shell midden deposit and a layer of loam with charcoal, but only two to three courses of the E wall, 1.8m long and 0.5m

wide aligned NE–SW, survived with part of an adjacent earth floor containing a charcoal lens. Over this was a thick layer of large rubble, which probably derived from the SW broch tower collapse.

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## 4.2 • THE BROCH 2 TOWER AND SETTLEMENT • DISCUSSION

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The builders of the Phase 7 settlement inherited an approximately circular defensive circuit consisting of a rampart and ditch that enclosed an area *c* 30m in diameter. The interior was dominated in the NW by the tomb mound, *c* 28m diameter, with the remains of the Phase 6 broch (Broch 1) on it. The main area in front of the mound was systematically levelled and Broch 1 reduced to its remaining stable masonry. The replacement broch was built with a much thicker wall, *c* 5.5m, which covered the whole tomb mound. This was apparently an attempt to avoid the problems encountered with the preceding two buildings, where their outer faces had slipped down the slope of the mound. However, the Phase 7 builders also failed to cope adequately with these structural problems and had to rebuild a large section of the new wall after it collapsed during construction.

The remaining area for houses was enlarged by cutting into the back of the Phase 5/6 rampart and stepping it out into the ditch. This had already happened once before in Phase 6, by the rampart entrance. The resulting space was then divided into six units, three on either side of the passage that led from the rampart entrance to the broch. Each unit was self contained with a single doorway that gave access to a house and what appeared to have been an open yard. The sizes and shapes of these six domestic units were not uniform as their shape was governed by the available space between the rampart and the broch. Internally, although not identical, the houses were fitted out in a remarkably similar manner.

Where the original floor survived (in five out of the six houses), the units had a flagged entrance area that opened onto the main room which contained a hearth with an adjacent ash pit, a stone-lined tank set into the floor and an oven built into the wall. At least one house, and probably the others as well, had a commode built into the wall. Each house had one or two cells opening off the main room and separated by a flagstone screen. The yards were only roughly surfaced and most had a separate cell or small room which was also presumably roofed.

### THE STATUS OF THE BROCH TOWER UNIT

It is clear that these six units functioned as six separate houses, each with an adjacent yard. What is less clear is the original function of the broch. The interior of the broch was divided into three main areas by flagstone partitions: an inner, off-centre circle, *c* 4m in diameter, a passage, *c* 2m wide, on the right of the entrance, that ran two thirds of the way round the inner wall face, and a group of three two-storey flagstone cupboards divided by radial partitions, set against the S side. There was also an intramural cell, 1.3m above the broch floor on the N side, and the entrance to an intramural staircase at the same height on the W side. This height of 1.3m was simply the height to which the clay core of the Neolithic tomb mound survived within the wall core, and it was unlikely to have had any greater significance as has been suggested by Hedges (1985, 163). There was no direct evidence for higher floors within the Phase 7 broch, because the inner wall face did not survive high enough to confirm the presence or absence of a 3.6m level scarcement. However, there were no post settings or holes for timber uprights and, although it was possible that an upper floor could have rested on stone or timber supports that rested on the orthostats of the inner circle and on the inner ends of the radial partitions, it seems unlikely. Certainly the radial partitions for the cupboards had been constructed from very thin flags and did not appear to have been capable of supporting loads heavier than their flagstone roofs, which survived *in situ* at a height of 1.0–1.2m. The presence of an intramural staircase need not have implied the existence of an upper floor, and may just have served the wallhead.

The original floor of the inner circle had been cleared out and partially dug away later in Phase 7, and all that survived was a fragment of a hearth and some packing. As the floor plan of the broch interior was similar to that in the adjacent houses, it may be argued that the broch functioned as another house, of which the domestic fittings (the hearth, oven and tank), have unfortunately been destroyed. This is possible, but the division of the interior space could equally suggest that it served a storage function. The screened-off 2m wide curving passage, that occupied a large proportion of the floor area, would not have formed a particularly useful living space. However, the two-storey cupboards, the intramural cell and the still accessible Phase 5 earthhouse, would all have provided a large storage area.

Whatever the function of the interior design, it was not unique to the Phase 7 broch at Howe. Similar layouts were revealed in the 19th-century excavations at the brochs of Burrian (Russland) 8km away in Harray, and

at Burroughston on Shapinsay (Renfrew 1985, 162, fig 8.3, pl 8.2). As at Howe, on entering Burrian, there was a curving passage which ran round the right side of the interior, with radially divided compartments to the left, and a central circular area. A similar layout was found at Burroughston, although here it was associated with a scarcement and an upper floor landing reached by the intramural staircase. This tripartite layout was also seen in the Phase 6 broch (Broch 1) at Howe as well as in the much earlier thick-walled roundhouse at Bu (Hedges 1987a). It seems, therefore, to have been a traditional layout with clearly domestic origins.

If, however, the Phase 7 broch at Howe formed a seventh domestic unit in the settlement, it lacked the yard possessed by the other six, and it was housed within a radically different structure. It may be wrong to assume that the scale of the broch was simply the product of its function as the most imposing residence, presumably inhabited by the settlement's most important family. This could well have been its secondary function, with the occupiers simply using the available space within a building constructed for other, perhaps defensive, purposes.

It was unfortunate that only one area outside the defences was excavated at Howe because, as a result, very little is known about the structures or activities that occurred outside the enclosed area of the settlement. In the area immediately outside the rampart entrance was a poorly preserved structure which appeared to belong to Phase 7, although it is unclear whether it formed part of the original design or was a subsequent addition. Either way, it confirmed the possibility of a more extensive settlement. It can be argued that the quality of the housing found within the defences was exceptional, and therefore must have indicated elevated status. Thus the defended area of the Phase 7 settlement could have contained what were, in effect, the luxury homes of the ruling elite, serviced by a larger population that lived beyond the rampart. There was, however, no evidence to suggest such a two tier system of settlement, with poor quality houses outside the defences; alternatively, these external structures could have been workshops or agricultural buildings, for which there was no room within the defences.

### ALTERATIONS TO THE DEFENSIVE NATURE

At Howe, the Phase 7 defended settlement had been maintained and repaired to its original design for a considerable period of time. This work included the rebuilding of collapsed walls in the **SW** building and the **NE** yard, and the replacement of furnishings in the **SW** and **S** buildings. Throughout this time, the settlement still functioned as seven discrete units. The first recorded change occurred to the broch, where the E wall collapsed at the inner end of the entrance passage. This was the result of subsidence into the remains of the underlying Phase 2 Neolithic tomb entrance passage. When the wall face between the E door jamb expansion and the interior was rebuilt, neither the door jamb nor the bar-hole were replaced. The original bar-hole was found blocked up behind the replacement wall face, during the excavation. Although the sill-stone was retained at the passage expansion, there was no pivot-stone in the replacement paving of the inner entrance (unless it had been subsequently robbed). It is clear that a barred door was no longer required within the entrance passage, and one of the much vaunted defensive features of brochs had gone. There was still a door, but it was now built into the outer wall of the cell at the mouth of the passage entrance. The cell had been rebuilt at about this time, and the two events may well be related. The original design of the cell was not clear, but it may have been rebuilt solely to provide a suitable replacement main door to the broch. Similar outer cells and door arrangements are known at other Orkney broch sites (eg Lingro and Gurness), apparently as part of the original design, but their specific function is unknown.

### THE OTHER UNITS

The stratigraphy in the six buildings surrounding the broch falls into the W and E sections, and these are rarely linked during the history of Phase 7. Thus the sequence of events is clear within these two halves, but not between them.

W of the rampart entrance passage, the three houses burnt down in more or less their original form, no later than the 2nd century cal AD (the latest date for the burnt roof timber from the **SW** building). Before their destruction, there was some evidence for a general decline in the standard of maintenance. The inner face of the rampart, which formed the S wall of the **SW** and **S** yards, collapsed and had not been rebuilt before the fire. The oven and tank in the **NW** building went out of use, although domestic occupation seems to have

continued as its yard was used for the dumping of domestic refuse. In the light of subsequent events, the failure to repair the rampart facing appears to have been the first evidence for the abandonment of the defensive circuit. Confirmation of this followed shortly afterwards, during the reorganization of the W half of the settlement. After a brief period when they lay empty, the **SW** and **NW** buildings were demolished and the site levelled, apparently in preparation for rebuilding. The excess rubble and waste cleared from this area was dumped into the ditch terminals beside the rampart entrance. However, the inhabitants never managed to rebuild these houses and instead, a series of small rooms and cells was put up, reusing the still standing walls of the **S** and **SW** buildings, and partly overlapping the inner face of the rampart.

The purpose of these structures remains uncertain, largely due to their poor preservation. They may, however, have been temporary replacements for the destroyed houses. The new rooms **D** and **E** reused much of the old **S** building, and, with a separate cell **C**, could have been used as a single domestic unit. Structures **A** and **B** were linked, but interestingly, there was no evidence for an entrance from within the rampart, suggesting that they were entered from across the rampart as was certainly the case later in Phase 8. Following this demolition and rebuilding, the entrance passage through the rampart was repaved, covering the original door sill and pivot-stones by the rampart, which were not replaced.

In summary therefore, within a single short episode, three of the six or seven domestic buildings had been lost and replaced by rather indeterminate structures, the rampart entrance was left permanently open and the defensive ditch had been abandoned. What was the condition of the rest of the settlement at this time?

The broch tower experienced a major fire which could have been contemporary with the fire in the settlement on stratigraphic grounds. This fire had no obvious structural effects, as the demolition of the cell at the outer end of the broch entrance passage, which took place at this time, was part of the general clearing of the W part of the settlement after its fire. The loss of this cell which housed the outer door of the broch must have altered the door arrangements of the tower yet again, but no evidence survived for any replacement door.

The sequence of events in the **SE** and **E** buildings was similar, with good evidence for a prolonged period of domestic use being provided by the repeated replacement of hearths and repaving of the floors. Subsequently, the yards of both units were divided, although not necessarily at the same time, and probably roofed over. This created additional rooms with side cells similar in size to the original houses, and the presence of hearths, earth floors and paving suggested that they served as additional domestic rooms. Although it could not be proved stratigraphically, these rooms could have been constructed to compensate for the loss of the W houses, by providing temporary accommodation for the displaced inhabitants.

No contemporary floors survived in the **NE** building, as it had been systematically cleared out shortly before this time. After the **E** yard had been divided to form an additional dwelling, a passage was cut through the wall, linking it to the **NE** yard. Because access from the **NE** building to this yard had been blocked during the refurbishment, it seems reasonable to assume that this alternative route via the **E** yard had been formed at this time. The **NE** building was provided with a porch which had both a sill and pivot-stone at its entrance from the passage. These were an alteration to the original design, where the pivot- and sill-stones had been placed at the outer door to the house and yard, rather than at the inner door to the house. This reinforced the impression of change in the building layout at this time.

The lack of detailed stratigraphic links across the entrance passage and between the individual structures made it impossible to be certain that the events described above took place precisely in this sequence. However, a number of features may be emphasized regardless of this uncertainty. The defensive role of the rampart and ditch had clearly ceased by the end of the 1st century cal AD, and this was marked by the gradual collapse of the rampart and the dumping of rubbish in the ditch. Although the broch remained largely intact, its function may well have changed, following the apparent abandonment of any defensive role, in view of the alterations to the door and the decay of the rampart. It was also clear that the orderly pattern of domestic units had been lost, but if the alterations to the **E** and **SE** yards have been correctly interpreted as the provision of temporary accommodation, then the total population of the settlement need not have declined.

The next significant event was the collapse outwards of a large section of the tower wall on the W side of the site. This affected the old **NW** building and its yard, which had already been abandoned and had been used

for dumping rubbish and as a casual burial ground. Four human corpses were found, none with any sign of formal burial. The only structure in this area was a small shed, **F**, that had been built against the broch wall. Because of this, the collapse had caused little damage to the settlement, although it had reduced the **W** side of the broch to the level of the foot of the intramural staircase, and left the adjacent intramural cell open to the sky. The response was to block up part of the intramural cell in order to strengthen the wall, whilst maintaining access to the staircase, and to buttress the collapsed rubble, presumably to reduce the risk of further movement. The damaged intramural staircase was subsequently replaced by an internal staircase that rose from the **W** end of the curving passage, demonstrating that the broch was still wanted as a more than single storey structure. Only the inner, solid, section of these stairs survived intact, but a corbelled support for the upper steps showed that they had risen only to the height of the surviving wallhead, or perhaps marginally higher (3.0–3.5m). This was either the height of an upper floor, or was the level from which the original intramural staircase still survived. The next recorded event was the collapse of the **N** side, again primarily outwards, but it also caused the collapse of the roof of the **N** intramural cell, which fell inwards. This was not cleared away, and the broch was temporarily abandoned, with perhaps half of its wall intact, the other half reduced to a height of between 3 and 4m.

Following the **W** collapse of the broch, there was relatively little new activity in the **W** half of the settlement. A small earthhouse, **G**, was dug into the collapsed rubble of the broch wall, and some of the small rooms built against the rampart face apparently continued in use. Room **B** definitely extended over the rampart now.

The original Phase 7 layout was progressively rearranged in the **E** half of the settlement. Access to the old **SE** building was reversed following the blocking of the original doorway from the main rampart entrance passage, and a passage had been opened through the rampart and into the former yard, which now functioned as a room. This indicated that the ditch had already been filled in here as well as by room **B** on the **W**. Occupation does not appear to have been continuous in either the **SE** or **E** buildings, where a succession of poorly constructed floors were found, separated by layers of rubble and domestic refuse. The building in the **E** yard was rebuilt on two occasions, but there was very little surviving evidence of activity within it. The **NE** building had been renovated, apparently for domestic use, and was now adapted for iron smelting and smithing, with the floor dominated by a sequence of large hearths and kerbed working areas. There was little evidence for contemporary iron-working elsewhere in the settlement, other than a bowl furnace in the **E** building and smithing hearths on the **W** side of the site.

### TRANSITION FROM BROCH TO FARMSTEAD

The overall structure of the settlement at this time is difficult to establish. The original three **E** houses were no longer discrete domestic units, and the neat house and yard pattern had gone. The **NE** building had become a smithy, and the other two may have gone out of use. The **E** house and yard seem to have functioned as two separate units, linked by the **NE** yard. In view of the abandonment of the defences, it is possible that the settlement was spreading beyond them, away from the collapsing broch. The fragmentary structure outside the rampart entrance (described above) may have belonged to this period, and other evidence included a hearth found over the filled ditch by the entrance, and a fragmentary freestanding structure constructed in the upper ditch fills further to the **W**. These were sufficient to indicate the existence of other buildings, but it is not known what proportion of the settlement they represented.

It is clear that there were now fewer houses within the confines of the former defended area, but this need not, until now, have implied a population decline. However, the layout of the Phase 8 settlement indicated that an actual decline had occurred and it is possible that this may have taken place late in Phase 7, *c* cal AD 100–200.

Shortly before the end of the Phase 7 settlement, additional alterations were made that further destroyed the original plan. The **E** yard wall was demolished, to create a large open area in front of the **NE** building and the building in the old **E** yard was converted into two small sheds, **J** and **K**. The **E** building was now abandoned and left with its **N** side open, and the **SE** building had also been abandoned, following the collapse of its walls and the adjacent rampart face. At the same time, the surviving structures on the **W** side were levelled but not replaced, and the broch was cleared out and reused. This reoccupation seems to have been short-lived and the evidence consisted of four superimposed floors, associated with pottery, stone and

bone tool manufacture as well as iron smelting. The interior was only partly roofed at this time, leaving the curving passage and the secondary staircase open to the sky.

The inner circle remained roofed and was entered through the original gap in the orthostat screen by the broch entrance passage, which was now marked by both sill- and pivot-stones. This reoccupation was ended by the final series of major broch collapses, although initially the inhabitants were not put off. The first of these collapses involved the previously repaired N wall on the E side of the inner entrance passage. This now blocked the entrance passage and partly filled the interior, although it was still possible to reach the interior by walking over the remains of the collapsed W wall and down the secondary staircase. At the same time, the old doorway through the inner circle screen was blocked up to buttress the collapsed rubble.

The final abandonment came soon after this, either because access became too inconvenient or because the staircase itself collapsed. Most of the S side of the broch fell outwards, blocking the outer end of the broch entrance passage, filling the abandoned **E** building, and covering much of the levelled W side of the settlement. This major collapse marked the end of Phase 7.

### THE ECONOMIC EVIDENCE

The structural evidence presented above showed that a defended settlement of seven units constructed in perhaps the 1st century cal BC, had lost its defensive function by the 1st century cal AD, and had, by the 4th century, been reduced to a single unit farmstead which persisted into the 8th century. It seems worth examining in the light of the structural evidence, how the original Phase 7 village functioned, and what evidence there is for these changes between Phases 7 and 8.

Analysis of the plant and animal remains has shown that the Phase 7 settlement practised a mixed arable and pastoral agriculture, growing naked six-row barley and keeping cattle, sheep and some pigs. This was supported by the hunting of wild animals, birds and fish, and by the gathering of wild plants and marine shellfish. There is no reason to believe that this was simply a consumer settlement, as there was evidence for cereal crop processing, the primary butchering of animal carcasses, and for animal dung. It is also thought that all the Phase 7 pottery was of local manufacture, and that the raw materials for the manufacture of iron, stone and bone tool artefacts were available locally. Again, there was no evidence for the manufacture of these items on the Phase 7 settlement, although this may have been because space within the rampart was limited. Given that the six units around the broch have all been seen as having a primarily domestic function from their surviving layout and furnishings, the external yard adjacent to each of the six houses would have provided a sheltered and well lit space in which to perform such tasks, but none produced evidence for any such specialized activities. These yards may also have housed livestock, although the numbers involved must have been small.

Domestic fowl were kept and it is possible that pigs strayed about the settlement rather than being put out to forage. Camilla Dickson has identified burnt dung, probably from milk-fed calves; however, only one sample of dung was found that could have been burnt *in situ*, (on the final floor in the **SW** house, during the major fire which destroyed the building). Yet, this does indicate that young animals at least were kept somewhere within the settlement.

The essentially domestic character of the early Phase 7 structures within the rampart may, however, partly have been an illusion created by the lack of evidence of other activities. The settlement was certainly well maintained and kept very clean throughout this period, and evidence for manufacturing identified later in Phase 7 comes largely from dumps of waste and refuse. Given an economy founded on subsistence agriculture, hunting, gathering and utilizing very local resources, it is hard to find evidence for organized trade, consumption of luxury items or prestige goods, that might imply wider political contacts or a high social status for its inhabitants. The only evidence for trade is a few small, luxury items such as jet arms bands, glass beads, continental jewellery and, from later in Phase 7, a scatter of Roman material typical of Orkney broch settlements.

Despite the structural emphasis on defence – a rampart and ditch – and regardless of the function of the broch, no weapons were recovered from the site, unless some of the small rounded pebbles are to be identified as sling stones. This may simply reflect careful use of iron as a rare and valuable material, and this

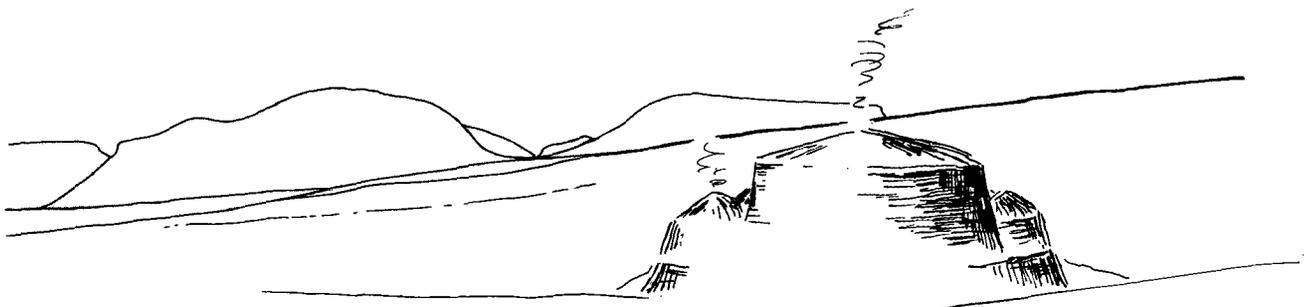
is made more likely given the number and diversity of the stone tools manufactured and used in the settlement. In general, Iron Age weapons are rarely found on settlement sites.

The later stages of the Phase 7 settlement produced much more direct evidence of manufacturing, and this is probably due to changes in the organization of the settlement. There is no reason to believe that the scale of iron-working for example, represented more than was necessary to meet internal needs, and it probably also occurred earlier in Phase 7, but outside the rampart. However, McDonnell (8.7 Slag Report below) has described how the quantities of residues found at Howe could well represent the products of a single smelting operation, rather than any sustained activity.

The distinction at Howe between industrial and domestic buildings later in this phase, emphasizes the lack of evidence for industry within the rampart earlier in Phase 7. Comparisons between the early and the late stages of Phase 7 have been further limited by the specialist treatment of the Phase 7 material as one sample. In addition, the major part of the Phase 7 material was recovered from dumps and rubble spreads late in the phase, with very little material being recovered from the original floors and yards.

There are clear changes in agriculture and hunting practices between Phases 7 and 8, but it cannot be shown how rapidly, or when, these changes occurred. Late Phase 7 does have the earliest record of hulled six-row barley on the site, which is otherwise confined to Phase 8 contexts. With the exception of possible emmer wheat, the only cereal identified up to late in Phase 7 was naked six-row barley, recovered in large quantities. Even in Phase 8, naked barley remains the dominant cereal, mixed occasionally with hulled or bere barley, suggesting that it was a minor contaminant in the naked barley crop. This may indicate that naked barley seed was imported on occasion, from further south, from an area where hulled barley was also grown, and as a result some contamination occurred. Alternatively, hulled barley may have been tried as a crop, but rejected as inferior, remaining afterwards as a contaminant.

The underlying economic pattern that is displayed in the Phase 7 settlement is one that will be seen, with modifications, in the subsequent Phase 8 settlement.



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## THE LATER IRON AGE FARMSTEAD

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A large collapse of the broch walls, resulting in the abandonment of the tower, marks the division between Phases 7 and 8, sometime during the 4th century cal AD. The tower was used as a dump and subsequently an iron-working shed was built into the rubble of the broch collapse. The focus of the settlement shifted to the **NE** building which formed the nucleus of a domestic settlement with a cluster of yards, interpreted as the farmstead. The focus then switched to a new **Stalled** building in the W of the site and in Later Phase 8 back to the modified **E** building. These continuous additions, modifications and periods of rebuilding are covered by 12 stages, 1–4 in Early Phase 8 and 5–12 in Later Phase 8.

The main environmental changes which distinguished Phase 8 was the decline in the use of wood as a fuel and the substitution of heathy turves. There is a diversification in arable agriculture with the presence of hulled six-row barley, the appearance of flax and possibly cultivated oats in the farmstead. There is also a marked decline in red deer with greater reliance on sheep in particular in this mixed farming economy.

Working in iron continued in this phase, with a late surge before its general decline. Antler working was still practised and composite hair combs, previously found on other sites in Late Iron Age/Early Norse levels, were produced. Copper-alloy jewellery continued to be important, distinctive objects from the earlier stages representing a period of the mid-4th to 6th centuries AD and from the later stages material ranging from 2nd century BC to 7th–9th AD. A gaming board, usually associated with Norse levels, was also found. The occupation of the settlement could have ended during the 7th century AD, but may have continued on to as late as the 9th.

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### 5.1 • THE STRUCTURAL EVIDENCE

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#### 5.1.1 • EARLY PHASE 8 (illus 59)

Following the collapse of its S walls, at some point in the 4th century cal AD, the broch was abandoned and subsequently used as a dump. The Phase 7 **NE** building continued in use, mainly as a domestic structure, with 4 stages of activity. It gained the addition of an **Oval** building, after some clearing away of the broch tumble, and a path led from it to sheds in the Phase 7 **E** yard. The Phase 7 **E** building was modified and continued in use.

Into the rubble of the broch collapse and the general rubble build-up on the S and SW area, an iron-working shed was constructed with a paved courtyard. It was later replaced by a **Stalled** building with apsidal ends, for domestic use.

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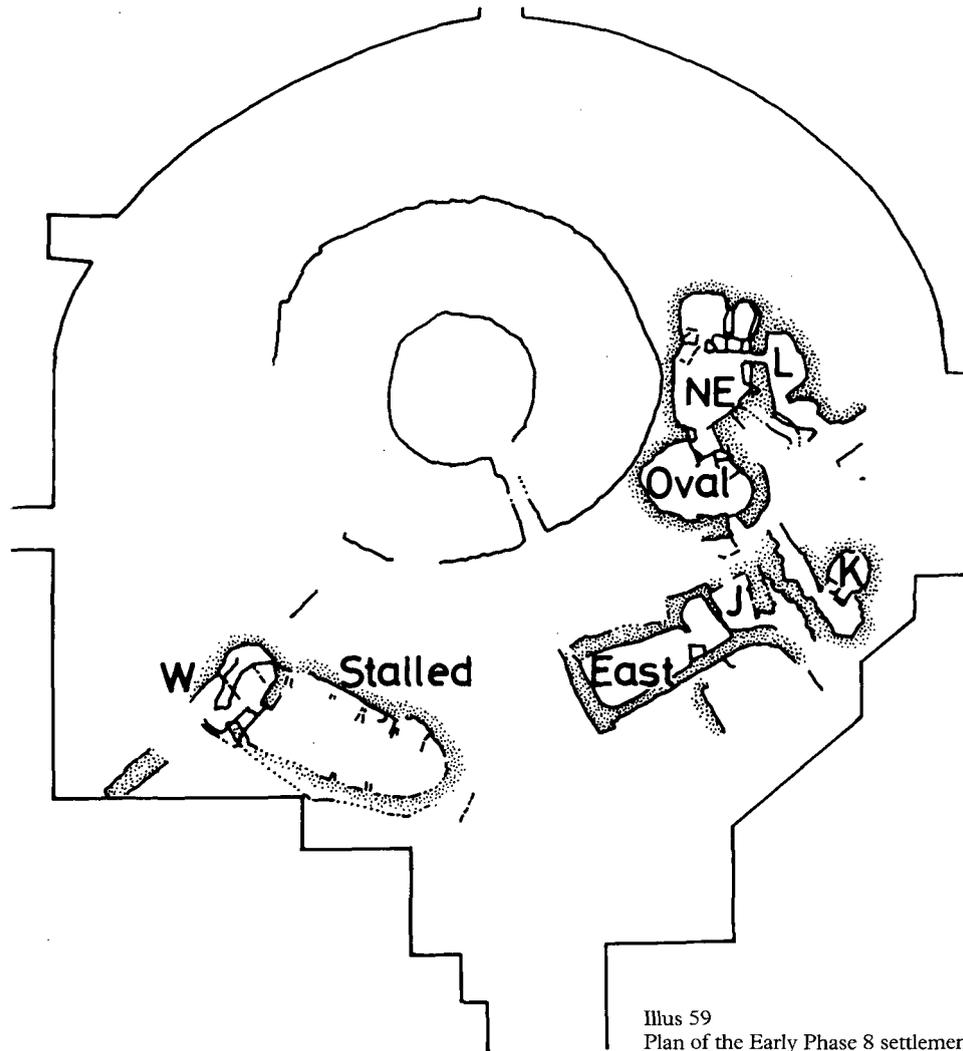
### THE BROCH TOWER

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Following a period of stability when the broch was used for dumping rubbish, a series of massive collapses began sometime in Phase 8 which almost filled the tower. The first fall that triggered these final collapses was in the entrance area, and was probably from the same unstable E side of the entrance passage that had caused the earlier Phase 7 collapse. This left a large heap of rubble across the SE quadrant of the interior. A series of small collapses followed, mostly on the S and E, until the S face was completely buried and little more than 0.5m of the broch wall showed above the rubble elsewhere. Throughout these collapses, rubbish rich in bone, shell and pottery was still being dumped here. The only specific event that could be identified was the collapse of the S end

of the corbelling which left a compact heap of massive flagstones, mixed with yellow clay, which had presumably been used to bond the corbelling together.

Following the final collapse, the remaining hollow between the broch and the rampart on the N side gradually filled with rubble and earth as material weathered and washed in. The remaining exposed sections of the broch wall also weathered, gradually masking the broch's outline. During this decay, extensive stone robbing began on the S side of the tower. The earliest robbing was in the entrance area where the wall was cleared down to the passage lintels which were then removed. As the lintels had



Illus 59  
Plan of the Early Phase 8 settlement.

remained intact, the passage below would have been free of rubble and appears to have been used as a store. Following the removal of the lintels, the passage gradually filled with a fine stony wash.

A number of undatable holes in the wallhead may also date from

this late Iron Age period. The only other ancient feature was a small fragment of wall, dug into the E side of the broch interior against the broch wall. This single-faced wall survived 0.5m high and enclosed a disjointed flag floor. Most of the building was destroyed by recent digging but the remaining fragment was built in a typically late Iron Age style.

## STAGE I (illus 60)

### THE NE BUILDING

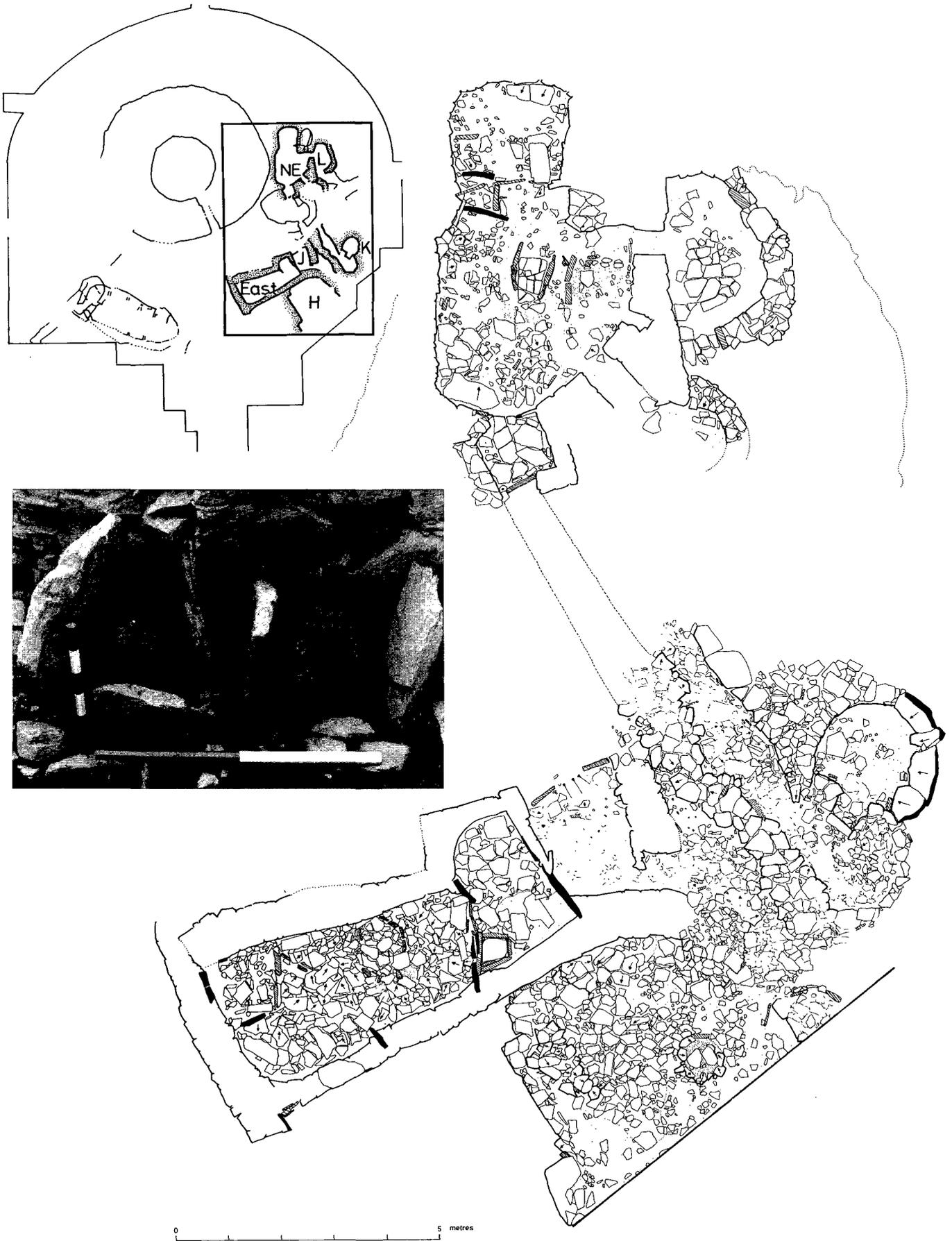
After the S side of the broch collapsed, partly covering this Phase 7 building, major alterations were carried out. Some of the rubble was cleared away to the S of the house and a square porch was built in front of the original doorway. It had a flagged floor and the door was marked by a sill-stone, and pivot-stone. The W wall was built against the rubble collapse but the E wall was partly freestanding. The junction of the W wall was later strengthened by the addition of a buttress. A path led S from the porch towards other buildings in the old E yard (see below).

Within the building the changes included the construction of two opposing buttresses in front of the N and NE cells (illus 60 Inset). Each was constructed from three upright flagstones surmounted by coursed masonry. The construction of these supports and the

rebuilding of the E entrance suggests that the building was reroofed now.

The NE cell was now abandoned as the floor levels within it had built up to the top of the corbelling and the E buttress was constructed directly in front of it. The N cell was refloored with a partly paved earth floor and had an upright stone projecting from its W wall. A collapsed orthostat on the floor marked the site of an entrance screen.

The rest of the NE building was given a partly paved earth and rubble floor contained some ash and patches of charcoal. It had a central hearth, 1.2 × 0.72m, which was kerbed by upright stones on the E and W; deposits of ash and charcoal from here were dumped against the E wall defined by a second kerb, 0.3m to the E of the hearth, and by the remains of a linear setting to the N.



Illus 60  
Early Phase 8 settlement: stage 1 buildings on the E side of the site. Inset shows buttress in *NE* building; scales – 50cm & 1m; from E.

A new shed, **L**, was built into the collapsed rampart bordering the yard, just outside the rebuilt E entrance. It was entered from the S, through a paved entrance with a stone upright on the E side, and it had a partial flagstone and earth floor.

Immediately beyond shed **L** was the curved wall of another freestanding structure which abutted the remains of the Phase 7 E wall of the building. The rest of this structure was destroyed by later disturbances and its extent and shape are unknown. It had an earth floor and was reached by an entrance and passage which cut through the E wall of the building. Beyond and surrounding these structures, a mixed earth and rubble surface formed over the previous yard surface.

### THE **EAST** BUILDING

The **East** building was also affected by the S collapse of the broch, and was now partly cleared of rubble. The S half of the building was cleared down to levelled rubble and an E-W double-faced cross wall blocked off the rubble filled N half. The E cell was still intact and was repaved with stone, and a tank,  $0.65 \times 0.7\text{m}$ , was built in the SE corner. The original entrance was retained.

An irregular, partly kerbed hearth,  $1.15 \times 0.8\text{m}$ , was built against the new N wall, paved with an uneven layer of flagstone. There was little accumulation of hearth or floor deposits, which may indicate that use of this building was short lived, perhaps due to difficulties of access. No evidence survived for a doorway to the building and access was probably gained over the W or S walls.

### THE **E** YARD

The late Phase 7 sheds in the **E** yard were reoccupied now; shed **K** was modified whilst shed **J** remained unaltered. The new

flagstone path was constructed over the late Phase 7 levelling rubble and ran between the two sheds to the **NE** building. About 6m of this path survived, with the S end being traced as far as the disused rampart whilst the N end was destroyed by later building activity. The S end overlay collapse from the yard dividing wall which had a rubble and earth surface levelling layer over it. This levelling partly blocked the entrance to shed **K** which was rebuilt and raised, with a new sill-stone placed between two masonry door jambs which were built into this levelling layer and were only faced on the inside of the cell. The floor of the shed was also raised by the addition of another layer of paving in the entrance and earth in the rest of the room. Both sheds **J** and **K** may have continued in use during Stages 2 and 3 as the path remained in use.

### THE **SE** YARD

A new flagstone floor was laid over the rubble collapses and general build-up within the late Phase 7 yard, **H**. To the NE, earlier rubble was still visible and, at the SE end, an irregular shaped hearth  $0.75 \times 1.0\text{m}$  was built of sloping stones set around two flat hearth slabs. It contained deposits of earth and charcoal, which were also found surrounding the hearth. A sloping heap of rubble on the E side of the flagstone floor was derived from the Phase 7 yard wall in the E. The exact relationship of the rubble to the flags was not ascertained. If the rubble was deposited before the flagstones, it suggests that the flags were merely flattened rubble and the occupation, only temporary. If the rubble was later, a more permanent arrangement was suggested, which may not have been fulfilled because of the threat of collapsing masonry.

Apart from a 0.7m length of single-faced wall, built on the flags in the N part of the room, the use of building **H** was short-lived. It was abandoned before the sheds in the N and rubble and debris from these accumulated over the floor. This area then remained out of use until Phase 8 Stage 5.

## STAGE 2 (illus 61)

### THE **NE** BUILDING

Alterations to the **NE** building continued during this stage. Further rubble from the large broch collapse was cleared away and some was used in the construction of a large **Oval** building immediately to the S. The W end was built into the rubble but the E end was freestanding, and it incorporated the Stage 1 porch of the **NE** building and reused part of the Phase 7 entrance passage wall which had survived the broch collapse.

An irregularly shaped entrance, with passage and internal sill-stone in the S wall, linked it to the Stage 1 path and the sheds to the S. An alcove was built into the SW wall, and the building had an earth floor which contained much peat that had probably derived from a partly kerbed rectangular feature to the W. This feature,  $0.9 \times 0.45\text{m}$ , has been interpreted as a hearth, even though it had no base slab. The E half of the building had a paved floor and also had a buttress at its N end which may have supported the porch.

The porch of the **NE** building was repaved with flagstone and earth as was the rest of the floor. A smaller rectangular kerbed hearth was constructed over the top of the Stage 1 hearth, and ash from it became intermixed with the surrounding earth and flagstone floor. Further alterations at the N end of the building included the dismantling of the division between the NE and N cells which was now replaced by a small buttress, and the construction of a new curved wall over the top of the redundant NE cell, along the E wall to the E door (illus 61 Inset). The top of the E internal buttress was also rebuilt and extended to the W. The W internal buttress was partly dismantled, surviving only as a pair

of upright stones. The N end was now extended from a single cell into an irregular shaped room which must have been completely reroofed. It had a square hearth,  $0.55 \times 0.55\text{m}$ , in the centre which had a cracked flagstone base which was kerbed by low stones on three sides and open to the S.

Both E and SE doorways to the external shed and cell were maintained, although the shed **L** was refloored with earth and stone. The cell to the S remained unaltered. Beyond the buildings to S and E, a surface developed full of midden material of shell and bone, domestic rubbish, slag, and burnt clay.

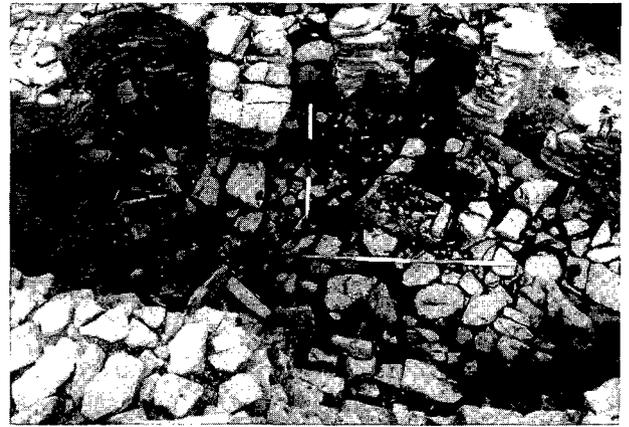
### THE **EAST** BUILDING

The rectangular room created in this building continued in use during this stage, although the cell was modified slightly by the addition of a buttress against its W wall to reinforce the junction with the Stage 1 N wall. After this the N part of the cell was repaved with close-set slabs set into silt and clay. Masonry collapsed into the cell and building, causing rubble to accumulate and the building to be abandoned until Stage 5. The sheds **J** and **K** and the path remained in use, unaltered.

### THE W SIDE OF THE SITE (illus 62)

For the first time since the levelling that preceded the S collapse of the broch, occupation took place to the W of the tower, with the construction of a square structure with an apsidal end within the rubble over the Phase 7 SW buildings and partly over the surviving

Illus 61  
 Early Phase 8 settlement: stage 2 buildings on the E side of the site. Inset  
 shows close up of **NE** building; scales – 2m; from W.





Illus 62  
Early Phase 8 settlement: a) stage 2, *W* building;  
b) stage 3 modification to *W* building. Inset shows  
building with stage 3 modification; scales – 2m;  
from S.

Phase 5/6 rampart. This building, the *W* building, had a door with a sill-stone in its SE freestanding wall. Opposite the doorway, abutting the NW single-faced wall was a partition of two stones which divided the building into two. The southernmost stone formed a step between the two rooms as the floors were at different levels. The NW wall of the building was single faced and backed into rubble. It curved to the NE and joined the SE wall. Ploughing had disturbed the SW wall which was originally freestanding, but only a fragment of it remained.

The SW room was 2.0 × 2.0m square, and had a partly paved earth floor. The doorway was paved and led into the lower NE room which was 2.3 × 2.5m. Lying centrally in this room was a kerbed hearth, 1.5 × 0.65m, with a cracked slab base set within an earth and flagstone floor. NE of this building was a layer of flagstones that formed a level yard surface which extended as far as the late Phase 7 retaining wall to the W.

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### STAGE 3 (illus 63a)

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#### THE *NE* BUILDING

Only minor alterations were made to the *NE* building during this stage. A new hearth, 0.58 × 0.54m, replaced the one in the N end of the building and a raised flagstone feature was built against the W wall opposite the E entrance, incorporating the remaining upright stone from the former *W* buttress. Its measurements were 0.82 × 0.34m and its function unknown.

The shed *K* remained unaltered, but the small fragmentary cell to the S was demolished, and the SE entrance from the building blocked. A series of new structures were built over the Phase 5/6 rampart, abutting the *NE* building and shed *L*. Their full extent and actual shape remains unknown as only fragments survived. A passage with a paved and earth floor led from shed *L* down a step to a room with a rectangular kerbed hearth set in an earth floor. This hearth, 1.0 × 0.65m, was repaved at least once during its lifetime. A curved single-faced wall abutted the shed and formed the N wall of this structure. Its S wall was parallel and was also faced with stone to the W. A curved length of wall abutted the E wall of the *NE* building and formed the S wall of the passage. Presumably this wall turned to the S, but like the rest of this structure was cut away by later buildings.

Both the *Oval* building and the porch were damaged and partly filled by falling masonry and rubble from the broch tower and the Phase 7 walls. The porch may have been completely filled, but the SE part of the *Oval* building was cleared of stone to form a small cell using the original entrance. A single-faced curved wall formed the boundary of this cell which had a

roughly paved floor. Only a few courses of the wall survived, and these had partly collapsed, suggesting that that the cell may not have been long-lived. There was still access from this building to the E and W sheds to the S.

#### *W* BUILDING (illus 62)

Alterations to building *W* on the W side of the site included a new enlarged hearth, 1.25 × 1.1m, which was built over the top of the Stage 2 hearth in the NE room (illus 62b). Slag deposits with clay and ash were found on the hearth, indicating an industrial use, and the floor around the hearth was largely repaved. The entrance and the SW room remained unaltered, and two slag deposits found on its floor probably derived from the hearth.

A layer of carbonised material in this room was either charcoal from the hearth or burnt roof material, and its deposition was followed by two rubble collapses. One collapse came from the curved NE wall while the other collapse originated from the SE corner where the wall fell outwards to the SE. This building was abandoned following these collapses and stone and rubbish accumulated in the ruins.

A layer of rubble was laid on top of the adjacent paved surface towards the end of the building's use, and an earthy surface developed over it. Beyond the paving to the E, rubble and earth continued to form a surface on top of the major S collapse of the broch tower, and an earthy surface developed within and just beyond the Phase 7 broch entrance.

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### STAGE 4 (illus 63b)

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#### THE *NE* AND *OVAL* BUILDINGS

Between Stages 3 and 4, rubble built up on the floors of the *NE* building to a depth of 0.3m, indicating that it had been abandoned for some time. Rubble and earth in the *Oval* building was levelled to create a roughly paved floor and a single-faced wall was built on the alignment of the *W* porch wall. Access might have been cleared between the *Oval* and *NE* buildings, but a further masonry collapse blocked this completely. The walls of the *Oval* building were maintained, and the entrance was buttressed externally. A new stone sill in the entrance formed a step down to a paved yard surface to the S. This yard was 2.5 × 3.0m, and its surrounding rubble effectively covered the site of the demolished shed *J* and its path. Shed *K* was infilled with rubble and an open area created in front of the *Oval* building which may have only been intermittently used as a store or shed as there was little accumulation of organic deposits on its floor. Only a small dump of ash and burnt stone was found in the Stage 2 alcove.

The *NE* building was now for the first time without a hearth. It was given a new earth floor with a central paved area, and a large stone setting, built between the E buttress and the W wall, was presumably a roof support. Collapsed masonry close to the W wall, appeared during the short period of abandonment between Stages 3 and 4. The building was entered now from the SE, through the original Stage 1 entrance which was unblocked, and

its NE wall strengthened by the addition of a buttress for the new lintel over the door.

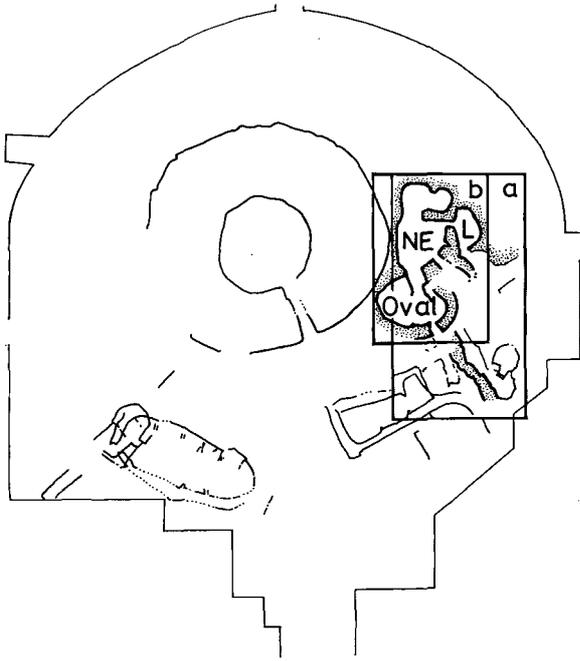
The E entrance was maintained but largely rebuilt and widened along its S side. The shed was kept, but with the addition of an earth and peaty floor. The structures added during Stage 3 had largely been demolished and masked under rubble.

It seems that the *NE* building was abandoned intact while the *Oval* building suffered further collapses. An extensive abandonment horizon of rubble developed across the E and NE part of the site, before further redevelopment took place later in Phase 8. The walls of the *NE* building survived to be reused again in the last stage of Phase 8.

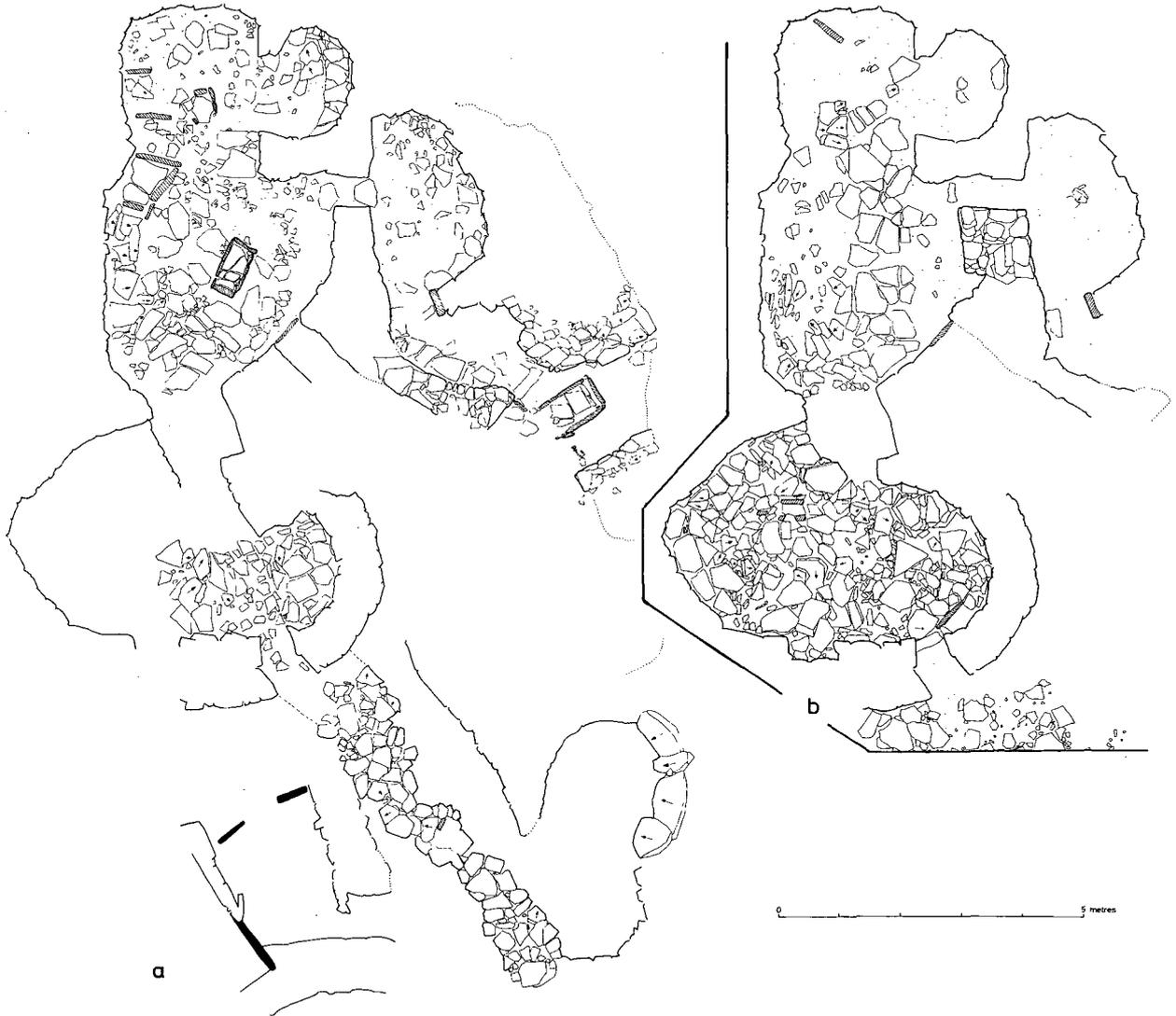
#### THE *W* SIDE OF THE SITE

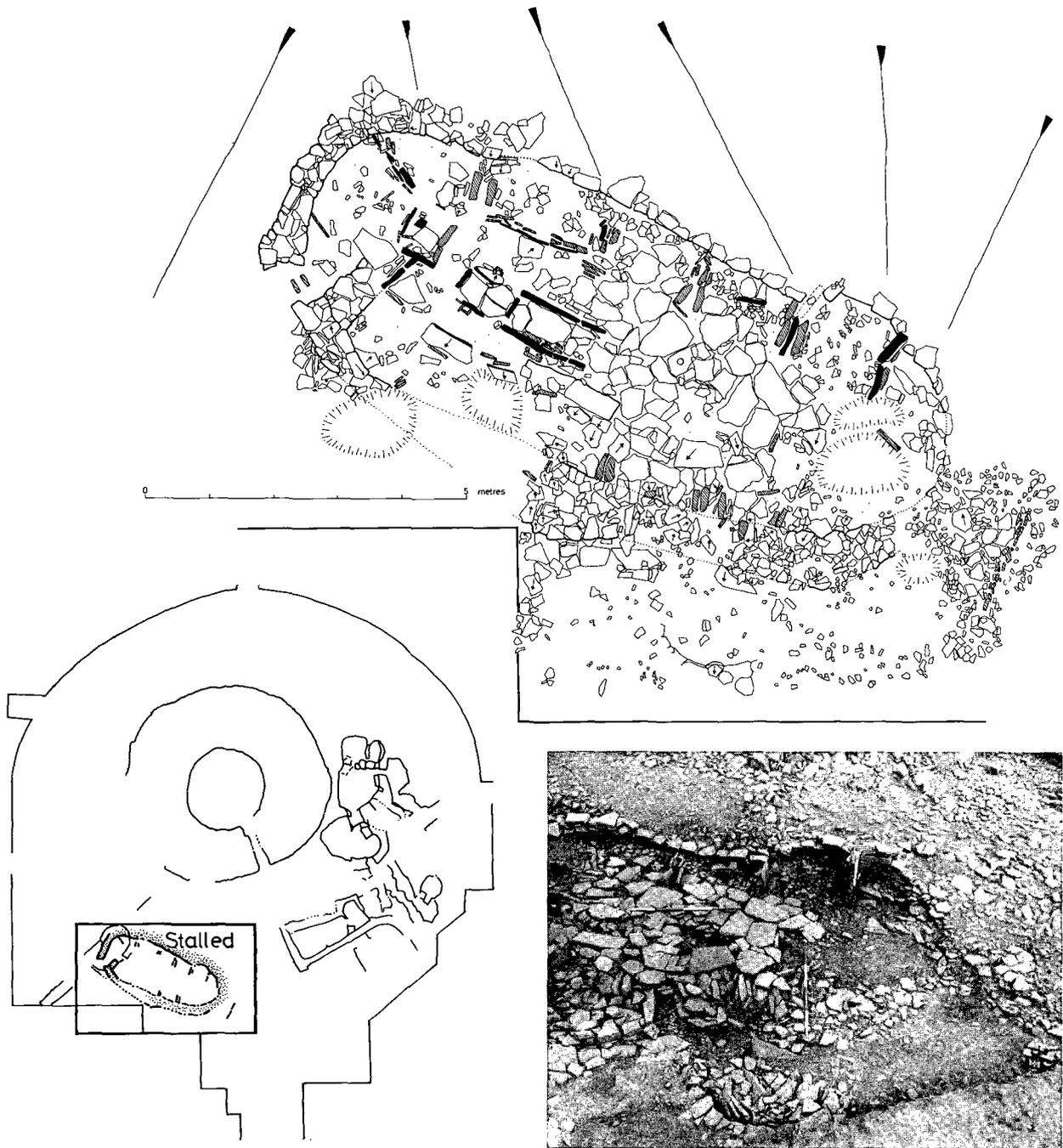
##### THE *STALLED* BUILDING (illus 64)

A new building was inserted into the rubble of the *W* building and the adjacent sloping ground surface. First a horizontal platform was dug out and an earthy levelling layer laid down, and any surviving walls of the *W* building were levelled. The new, *Stalled*, building, 10.5 × 4.0m, was constructed onto this prepared



Illus 63  
Early Phase 8 settlement: a) stage 3 alterations to buildings on the E side of the site; b) stage 4 modifications to buildings on the E of the site.





Illus 64

Early Phase 8 settlement: stage 4 **Stalled** building in SW Inset shows stalls and paving in E half of partially revealed building; scales – 1m & 2m; from S.

ground, and appears to have been all of one build. The curved NW wall survived, but the S wall and E end of the building were almost completely ploughed away. All that remained of the S freestanding wall were foundation stones and three stone settings which would have held upright stones. The curved freestanding W wall of the building contained a silled doorway. N of the entrance, where the wall curved to the N, it became single-faced, and backed by rubble. Along the inside of the N wall were two upright stones and their packing, projecting into the building, and the remains of a further three stalls. Each stall lay 1.6m from the next. Butting the N wall in the second stall recess was a 0.45m square, paved feature forming a small platform or buttress.

The W entrance was screened from the rest of the building by the SE wall of the earlier **W** building, reused as paving or a dividing wall. The **W** building's entrance sill-stone was maintained as an internal door into the new building paved on either side with flagstones. Immediately to the N was a 0.7m square feature of upright stones surrounding a central flat slab. This was probably a roof support as it lay centrally within the building. A line of small upright stones and packing formed a screen, which led between the roof support to the N wall, thus partitioning off the entrance area, or vestibule, from the rest of the building.

Set in the middle of the building, but towards its W end was a kerbed hearth,  $1.3 \times 0.8\text{m}$ , with opposing external sockets in the centre of the long sides. The hearth was open to the E and was constructed on two layers of coloured stone levelling material. To the immediate W and sharing a common kerb stone was a smaller hearth,  $1.0 \times 0.7\text{m}$ , which again had opposing sockets. Both hearths had base slabs and their uses were contemporary, even though the W hearth was probably a later addition.

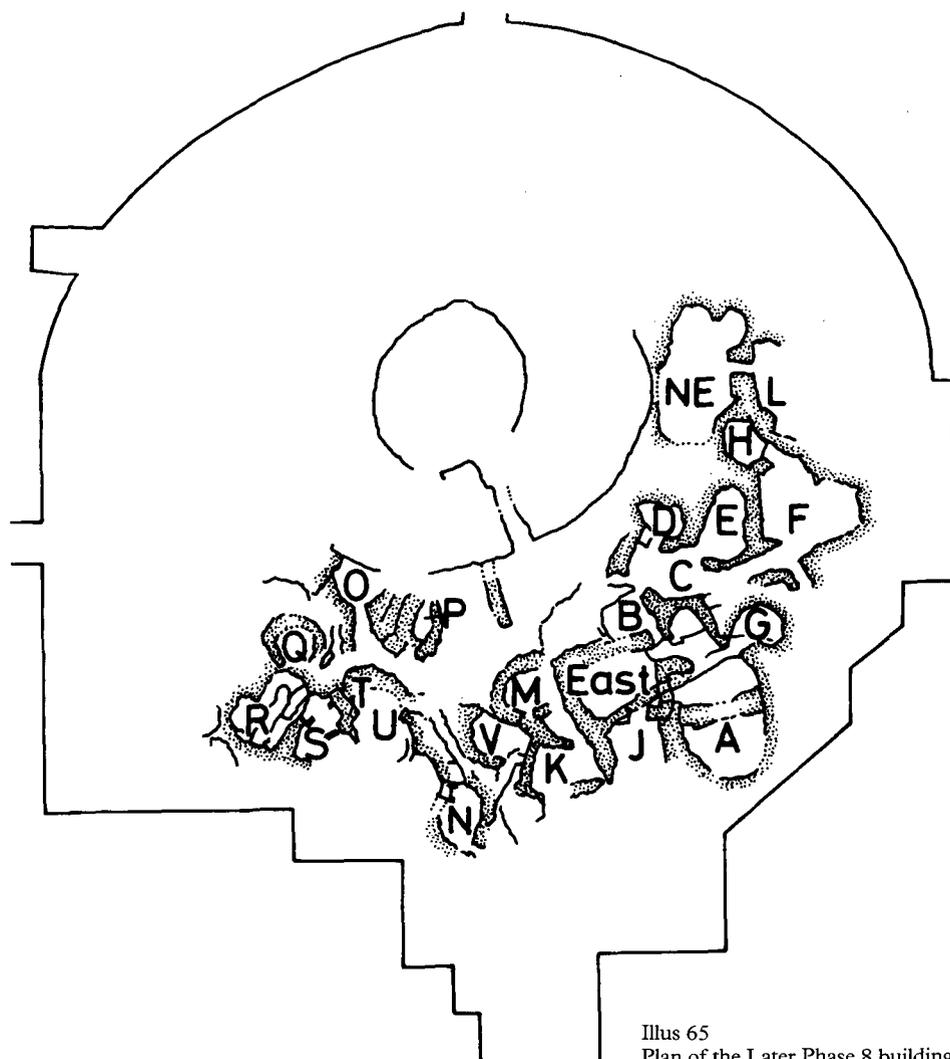
N and S of the hearths were the remains of two lines of upright stones, 0.3m high and lying 0.8m from the hearths. These formed a screened work area around the hearths complex. The N screen survived about 1.6m in length and the S one, although collapsed, was about 3.2m long.

The W end of the building was largely unpaved, while the area immediately E of the hearths was well paved with large stone (illus 64 Inset). This paving incorporated a soakaway using a quernstone with a central hole (SF 2049). The floor at the E end of the building was disturbed but showed evidence of some paving. Both hearths contained ash deposits which became intermixed with an earth floor that developed on top of the paved floor.

Beyond the E wall of the building was a small external paved area,  $1.1 \times 1.5\text{m}$ , kerbed by small upright stones to the E. This area was later repaved with larger stones. The N wall of the building slumped off its rubble foundations during its use, causing some rebuilding at this point. The building was later abandoned leading to the development of a deep rubble layer within it which was left undisturbed till Stage 10 of Phase 8.

### 5.1.2 • LATER PHASE 8 (illus 65)

This phase, divided into eight stages 5–12, is characterized by a series of additional structures, initially around the Phase 7 **E** building, in the form of small sheds, to the N and S. This domestic structure and its complex of buildings grew and then contracted, and gradually moved to the rubble areas of the W side of the site where new buildings were constructed with the use of old wall alignments. A figure-of-eight domestic building, **U**, with ancillary cells was constructed in the W and modified repeatedly. A contraction of available usable space led to a final reuse of the Phase 7 **NE** building before the site was finally abandoned.



Illus 65  
Plan of the Later Phase 8 buildings.

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## STAGE 5 (illus 66)

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### THE *EAST* BUILDING AND ROOMS *A* AND *B*

Habitation continued on the E side of the site in the *East* building, which was partly cleared of rubble. Two new entrances were built, one, in the SE, served a new sub-rounded room, *A*, to the S, and the other cut through the N wall of the building to allow access to a new room, *B*, beyond. The N entrance was faced with walls and provided with two steps. The floor of the building was levelled and covered with earth and new flagstones were laid in the Phase 7 E cell. The wall between the cell and the new N doorway was strengthened and extended northwards. As part of this remodelling, a screen of upright stones was formed from the Stage 1 tank to partition off the S part of the cell. Adjacent to this, a roof support for the whole building, 0.15m diameter and 0.46m high, was placed in a stone setting. Thus from the N entrance, a paved passage was created which bifurcated around the roof support.

A large rectangular hearth, 1.2 × 0.7m, set against the N wall, dominated the W room. Its well-paved base rested on a levelling layer of grey silt and it had a kerb of low upright stones which contained a grinding stone (SF 1136) in its SW corner (illus 66 Inset). Surrounding the hearth, 0.4m to the W and S, was a further low screen of small stones set on edge, to delineate the work area around the hearth. A stone setting was apparent in the screen's SW corner and beyond it, to the NW corner of the room, a low heap of silt and ash accumulated in a hollow in the underlying rubble. Ash had also become intermixed with the earth floor around the hearth and deposits of ash and charcoal were found within the hearth. Another stone socket was built in the NE angle created between the hearth and wall.

A new sub-rounded room, *A*, 5.0 × 4.0m, was added to the S, built into rubble beyond the *East* room. Its rubble single-faced walls were over 1.0m wide but were disturbed by ploughing. An earth floor was laid down in the room and an open ended hearth was placed N of centre. Only the side kerbings of this feature survived with a c 1.5 × 0.8m spread of ash and charcoal to the SE. Within the room, to the N, W and S, were patches of rubble,

probably the result of both wall collapse and later plough disturbance.

An anteroom, *B*, 2.3 × 1.8m, was constructed to the immediate N of the *East* building and was entered from the latter. Its W wall was built of orthostats and its N cut the early Phase 8 rubble collapse from the broch tower and incorporated a doorway at its E end. Large flagstones set into earth formed the floor of this room. Beyond, to the immediate N, a newly constructed freestanding wall (which abutted the masonry of the redundant *Oval* building) incorporated a stepped passage. The passage provided E–W access from the Stage 4 paving and levelled rubble in the E to a new structure in the W. The latter survived as a single freestanding wall, 2.5m long, to the immediate W of the Phase 7 broch entrance. The only other evidence supporting this building was a 1m diameter ash patch with a small stone setting set on levelled rubble and stone chippings. To both SW and E, this structure was disturbed by 19th century excavations.

The only other surviving addition during this Stage was a fragment of an enclosed stone-floored cell, constructed to the E of the anteroom.

### STAGE 5 : SECONDARY FEATURES

Alterations to the internal fittings of both the *East* building and the adjoining room, *A*, to the S took place during this Stage. The rectangular hearth in the *East* building was covered with earth floor material and replaced by two smaller, fragmentary hearths to the S. Three stones of a collapsed partition, 1.2m long, were inserted from the S wall between the hearths. During this Stage, a pile of butchered bone and rubble accumulated besides the N entrance. In room *A*, the hearth was replaced by one to the N. This had considerable use as it was repaved and contained ash deposits. The end of the earlier hearth was made into a post setting for the new one. After this, room *A* was abandoned and not reoccupied.

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## STAGE 6 (illus 67)

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### THE *EAST* BUILDING AND CELLS *G* AND *J*

This Stage began with a remodelling of the Phase 7 *East* room and a N expansion of the settlement. The S wall of the room was levelled and the E cell partition broken off at floor level to create a larger area. The S wall was rebuilt with irregular stones and in parts did not survive above one course. The wall of the E cell was broken through to create a doorway to a new cell, *G*, to the E, which was constructed into rubble. This rebuilding used the N parts of the abandoned *S* room as foundation for the new S and E walls. The alcove of the E cell was blocked up and faced with stone and the central roof support was replaced by one of coursed masonry which survived 0.7m high. A silled entrance was created in the S wall which gave access to a rectangular yard, *J*, with a W extension and an earth and flag floor. The full extent of this yard was lost to the plough.

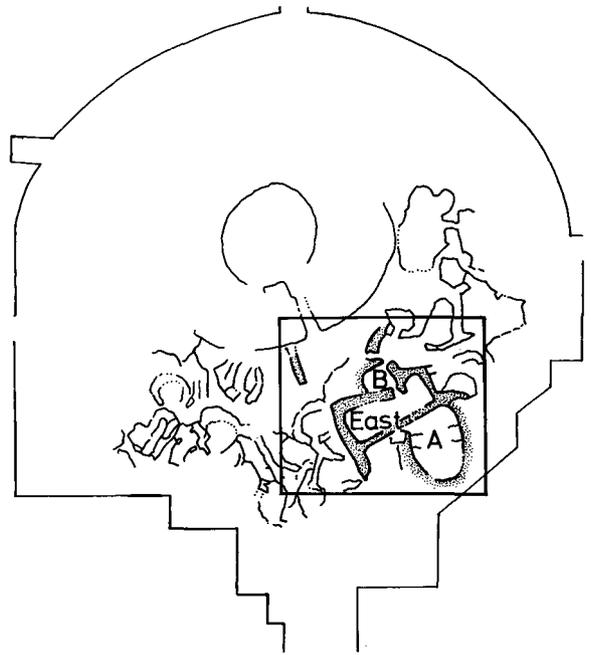
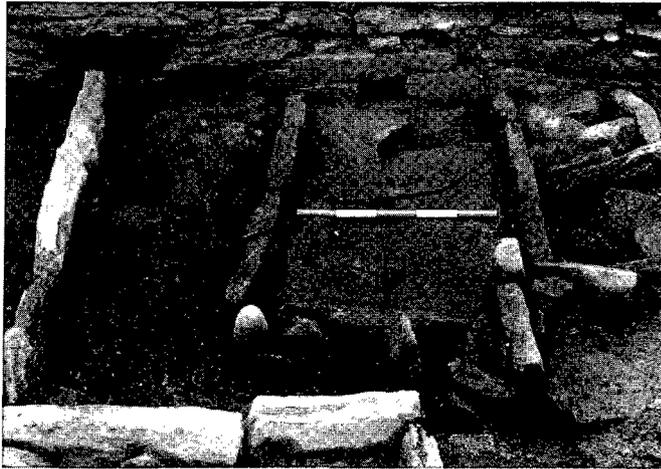
The *East* room was completed by the addition of further features. It was divided into three by a partition in the W (the reuse of the late Stage 5 hearth division), and by one to the E of the roof support. The W part of this room now measured 2.4 × 2.6m and contained a square hearth set into ash and silt. The hearth was kerbed on three sides, but open to the W, and ash was found around it. On the W side of the hearth, subsidence of the underlying rubble caused the depression to be filled with a dump of ash and silt. Some paving was laid onto the new earth floor in the N part of the room and a gap between the partition and the N wall gave access into the new central area. This measured 1.2 ×

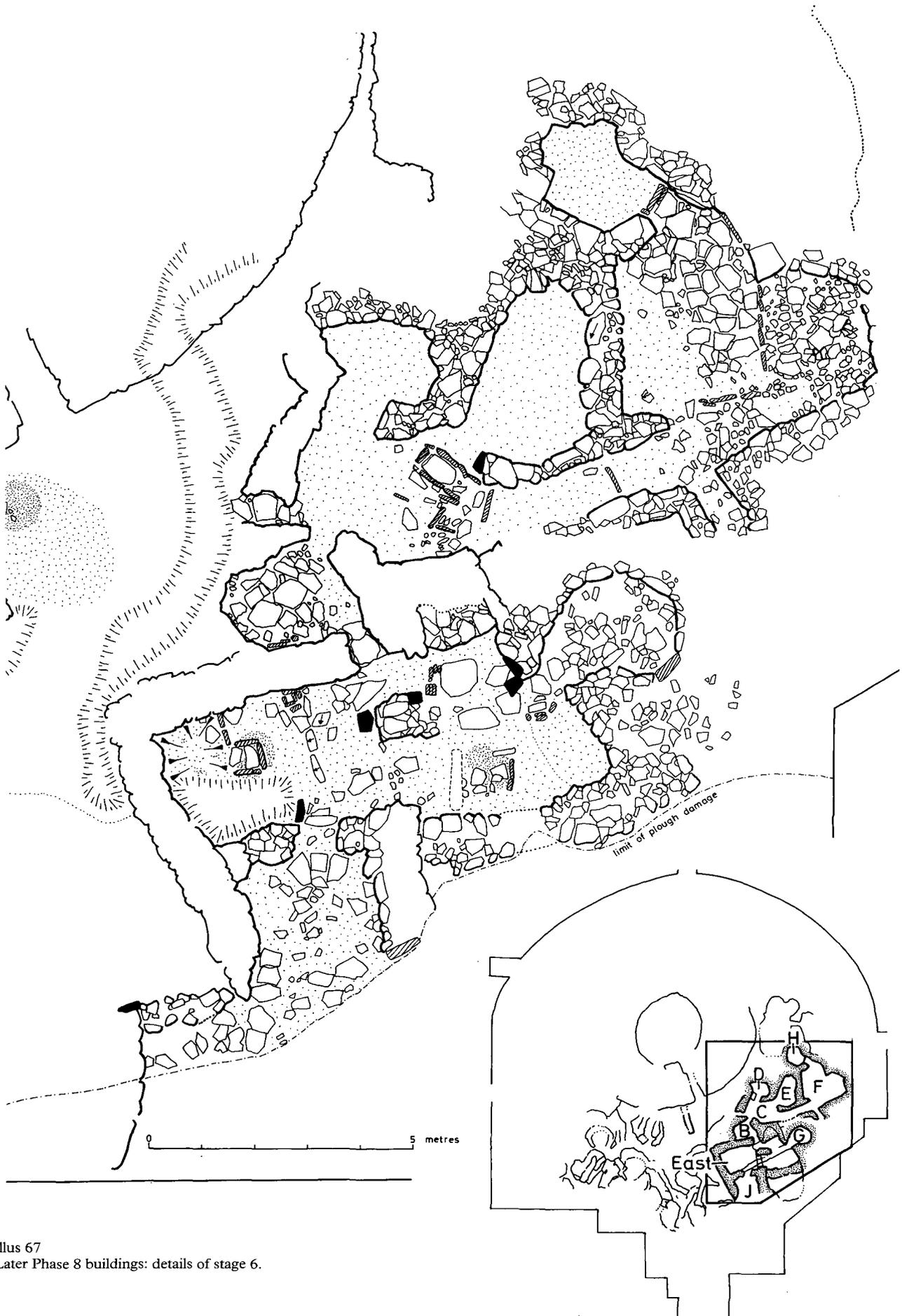
2.4m and was given a clean earth floor. Beyond the roof support and E partition an irregular shaped room with an E cell, *G*, was created. In the S part of the room a square hearth was built, open to the S and filled with and surrounded by ashes. The N half of the room was levelled with earth and surfaced with flags. The E extension was reached through a paved entrance broken through the old E wall. Cell *G* was paved with stones set into a levelling layer of earth and may have had a second doorway in the SE where a sill-stone was built into the wall. Anteroom *B*, N of this redesigned complex, continued in use as did its doorways. The passage to its immediate N was probably still used, as was the structure in front of the broch entrance.

### NE OF THE SITE: ROOMS *C*, *D* *E* AND *H* AND YARD *F*

New building on a large scale took place to the NE. Here, beyond the N entrance to the anteroom, three irregular but interconnecting rooms (*C*, *D* and *E*) were partly built into the levelled remains of the Stage 4 *Oval* building. The E wall of this complex reused the Stage 5 wall which retained the collapsed rubble from the broch tower. At the N end of this wall an irregular oval cell, *D*, was created by the addition of two walls to the N and E. The latter curved to the W and enclosed the earth floor of the cell, 2.2 × 1.2m, forming a 1m wide entrance for it. In doing so, it also created a wall for the room *C*, to the S, and a partition with

Illus 66  
Later Phase 8 buildings: stage 5. Inset shows close-up of hearth of reused  
*E* building; scale – 50cm; from S.





Illus 67  
Later Phase 8 buildings: details of stage 6.

the room **E** to the E. Room **E** was similarly constructed and was enclosed by an arm of walls in the E. Room **C**,  $3.3 \times 2.2\text{m}$ , with a levelled earth floor was formed; it was entered through a  $0.7\text{m}$  wide entrance from the SW. Lying in front of, and almost blocking the entrance to, room **E** was a rectangular hearth, oriented NW-SE, set at one end of the interconnecting room **C**. The hearth measured  $c 1.6 \times 0.6\text{m}$ , had a slab base, and was kerbed on three sides and open to the SE. Abutting it to the S, as part of the hearth complex, was a square kerbed feature. The rest of room **C**, into which the hearth had been constructed, had a thin earth floor over the top of levelled rubble. The hearth was badly located and effectively blocked the access to the **E** room and entry to a narrow passage which led to the E. In view of this, the hearth may not have been part of the original design. Alternatively, the W end of the enclosing wall to the **E** room may have been extended and widened during the early use of this complex.

A passage,  $0.9\text{m}$  wide, traversed the S end of the E room to a roughly levelled and paved yard, **F**, built against the surviving earlier rampart. In total, the passage was  $c 7\text{m}$  long and was faced to the S by a wall which was centrally breached by a  $0.5\text{m}$  wide doorway leading to the SE. The passage was predominantly floored with earth at its W end and stone and earth at its E. A sill-stone was erected in the passage opposite the end of the E wall of the **E** room. A buttress of coursed masonry was also constructed at the exterior corner of the **E** room. It had a dual function of extending the N wall of the passage and of being the W half of a doorway to a courtyard to the N. At this point a cross passage was created to give access into courtyard **F**. The courtyard was oriented N-S and was  $c 2.5 \times 3.5\text{m}$  long. It was enclosed to the E and partly to the S by a line of orthostats which formed a screen between the courtyard, the passage and the yard beyond. The SW half of the courtyard had an earth

floor and the rest of the area was well paved with large flagstones set into levelled rubble. At the N end of the courtyard a silled doorway led directly down into an irregular shaped room, **H**, interpreted as an earthhouse. Its walls were built into the angle formed between the old levelled *Oval* building and the end of the E wall of the Phase 7 **E** building. It measured  $c 2.2 \times 1.6\text{m}$  and had an earth floor.

## STAGE 6 : SECONDARY FEATURES

Although changes may have occurred throughout the occupation of this complex series of rooms, it is only known with certainty that alterations took place within the remodelled old *East* building. At the W end, as a result of slumping, more earth floor and a second layer of paving were added N of the hearth. Subsidence still affected the NW corner where large stones and earth were used to level the surface. The hearth was buried in a mixture of ash, earth floor and rubble on to which was placed a new hearth. It consisted of an angle of kerbing in the NE which enclosed an area of ash with two stake holes. Two  $0.1\text{m}$  diameter post settings were also constructed, one to the SW of the new hearth, and another against the W wall in the area of subsidence.

The central room remained unaltered, but in the E room the N half was refloored with flags which were eventually partly covered in ash from the hearth. The central roof support for the structure had its E end rebuilt as it had partly collapsed. A new partition of low upright stones was erected E of the hearth and cell **G** was also altered. It was given a new earth floor into which were placed some flagstones and a hearth at its E end. The hearth was poorly made but kerbed and open to the S.

## STAGE 7 (illus 68)

### EAST BUILDING AREA

Stage 6 may have seen a long occupation and new alterations interpreted as Stage 7 were the result of building collapse. An orthostatic-faced blocking was inserted over the top of paving in the E room of the *East* building and the cell **G** was reduced in size by the addition of a curved N wall. The alterations were not successful as the room and cell were soon abandoned following, or during, the collapse of the W partition and the recent blocking. After this abandonment, alterations were made in the W half of the structure. The N entrance was blocked and faced with stone and a new entrance was made through the N wall  $1.5\text{m}$  to the W. A new E wall to the W room was probably built at this time, which was later blocked by large stones at its W end because of slumping of the N wall of the building. A new earth floor was then laid in the W room. The earlier hearth and floor were covered with a thin layer of earth with some paving in the N and a new hearth built on top. The hearth, aligned E-W, was open to the W and measured  $1.1 \times 0.6\text{m}$ . Ash spread across the N part of the floor from the hearth which had been cleared, and later subsided to the W. As in the previous stages, the SW part of the room had been destroyed by 19th-century excavation.

The area to the S of this room continued in use and the deposits on top of its floor were capped with a flag surface creating a yard, **J**. Approximately  $3\text{m}$  to the SW, a new structure, **K**, was built into the abandonment rubble of the mound. Its W wall enclosed an area,  $2.2 \times 2.0\text{m}$ , of earth and ash and stone flooring. The E wall of this structure was curved but very fragmentary. The only other feature associated with this structure was a  $2\text{m}$  length of single-faced wall at its S extremity which was aligned N-S which seemed to be a later addition.

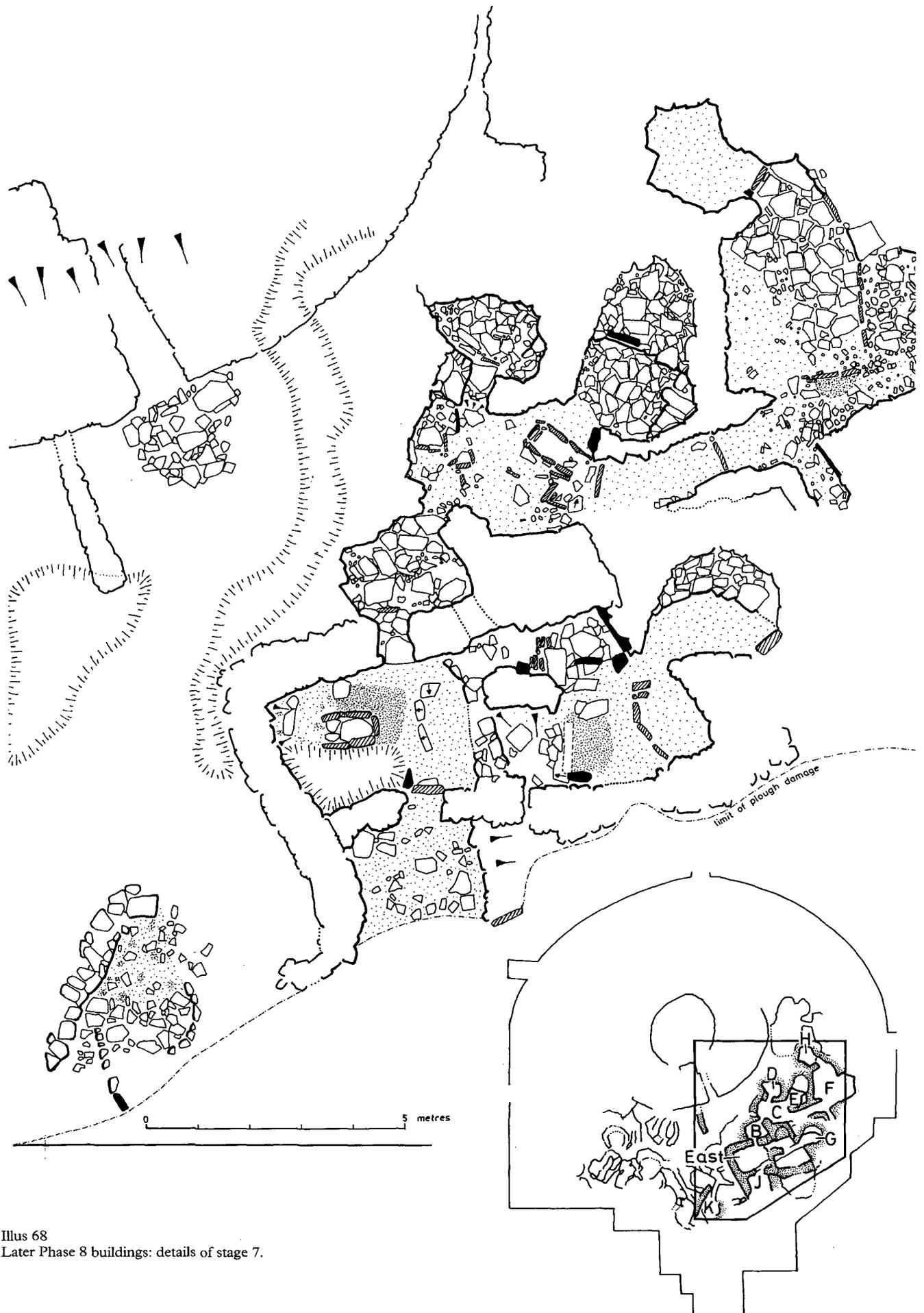
An area of heavy rubble was stacked in front of the broch

entrance, and also over the remains of the structure in use here in the previous two stages. This rubble may have been the result of removing the broch entrance lintels. N of the altered *East* building, anteroom **B** was repaved after the new entrance was pushed through from the S and the old entrance blocked. A buttress was also added against its W wall.

### NE BUILDINGS COMPLEX

The complex of structures to the NE were similarly altered during this Stage. The doorway to cell **D** was narrowed by the addition of a  $1\text{m}$  wide buttress from the W. The cell and its entrance were given a new flag floor, set into earth, with the addition of a sill-stone. A fragmentary additional wall or bench was built at the same time as the floor was laid down, but against the E wall of cell **D**. SW of the entrance, against the W wall of room **C**, a kerbed stone setting was constructed with a stone base. A small angular partition partly screened the setting to the SE.

Other alterations took place within the **E** room which was reduced in size by the addition of a central E-W blocking wall and filled in behind with rubble. This may have been a final solution to a badly constructed room whose walls were collapsing. Evidence of a small buttress, predating the blocking, was found in the N of the room, and the SE arm of the room was also strengthened by the addition of extra masonry. After these alterations the room was paved with large flagstones. The only other discernible additions during this Stage were a buttress in the angle of courtyard **F** with the doorway of earthhouse **H** and a dump of furnace lining, clay and slag against the S partition of the courtyard. This  $0.8 \times 0.5\text{m}$  dump of industrial waste is significant as it indicates the continuation of iron smelting on the site (see Slag report 8.7 below).



Illus 68  
Later Phase 8 buildings: details of stage 7.

## STAGE 8 (illus 69)

This stage covers the initial re-expansion of the settlement **W** into the area abandoned since Stage 4. Use of the **East** building and the rooms in the NE continued, but the most important changes were those relating to access.

THE **EAST** BUILDING COMPLEX

The entrance into the **East** building from the yard **J** in the S was blocked, while passage through the N complex of rooms and yards to the E entrance remained possible, if somewhat obstructed. A new entrance 0.7m wide was cut at the NW end of the **East** building wall. This was partly faced to the N and S by coursed masonry and had a flagged floor. Porch **M**, into which this led, and the contemporary sheds to the S and W are discussed below.

Within the **East** building the N-S partition, E of centre, was retained, but a new earth floor was laid, sealing the large hearth from the previous stage. Material from this floor produced a radiocarbon date (10 Radiocarbon dates below) of  $1450 \pm 50$  bp, which calibrated suggests a date somewhere around the mid 6th century cal AD. S of the entrance, an E-W partition was built of five uprights; four stood up to 0.1m above the floor level while the fifth, to the W, survived to a height of 0.3m, approximately that of the surviving wall. A small hearth, 0.5m square, was constructed against the N wall and, like its predecessor, was open ended to the W. It continued in use until the end of Stage 9 and some ash deposits remained between its earlier and later base slabs. This is the only hearth attributable to Stages 8 or 9 found on the site. Excavations last century had completely destroyed the rest of the floor in this room.

By Stage 8, wall slumps had led to the complete abandonment of the central room **E** in the NE rooms. Rubble covered the large hearth and its earth floor, which became a partly roofed or unroofed yard, **C**. Porch **B** which linked this complex with the old domestic area further S remained largely unchanged – except for a small buttress added to the W wall.

Room **D** continued in use unaltered: both its flagged floor and silled entrance were retained as were the setting and kerb around it. The only other building in use in the vicinity was the earthhouse **H** in the extreme N. Here a new earth floor, up to 0.4m deep, was laid and the threshold rebuilt with small orthostats and flags but the earlier sill continued in use. The earlier, partly paved, yard **F**, had become disused and covered with up to 0.5m of small stone fragments. For this reason, a staircase, consisting of seven steps, was constructed  $c$  2m N of the E entrance to the settlement and ending  $c$  1m S of the entrance to the earthhouse **H**. A single-faced retaining wall formed the W side of the staircase and abutted the S side of the entrance to the earthhouse, but an E wall was never found. This was perhaps a result of the construction of a building in Stage 12, although, equally, this could be seen as confirmation that it was still an open yard.

A new porch, **M**, was added to the entrance to the reused **East** building, it was oval and measured  $2.0\text{m} \times 1.8\text{m}$ . Its curvilinear wall cut deeply into the surrounding ground surface in the N and W. Its lower courses, buried in the ground surface, were single-faced, but higher up it was freestanding. The S end of this wall was entirely freestanding; it had a rubble core and rested on foundation stones set wider than the wall. The E part of the porch was missing as a result of rebuilding in Stage 10 and disturbance caused by the S end of a long, sinuous N-S robber trench.

Within the porch, a flagged surface was laid upon a deep layer of sandy loam levelling. The flags in the new entrance through to the **East** room were at the same level as this floor, although the relationship between them was also destroyed by the robber trench. E of the sill and slightly below the level of the flagged floor was a pivot-stone (SF 110), assumed to be *in situ*. S of the porch was a flagged surface, a yard, which replaced the inaccessible one,

**J**, further E. This new yard surface extended for 4.5m, as far as the limit of deep ploughing, but was cut to the E and W over most of its length by later structures so its original width cannot be determined.

## THE W SIDE OF THE SETTLEMENT

The only surviving occupation deposit in the W part of the settlement from this Stage was a fragmentary shell and bone midden, abutting the W wall of the porch and overlying the ground surface and some of the rubble bank. This may have been more extensive, but was cut on the N by another 19th-century excavation trench.

Phasing of the structures further W is tentative. In the NW were two arcs of walling each  $c$  2m in length. The furthest E of these was single-faced to the W and survived to a height of three courses. It was truncated to the N and S by later structures. Further W, was an even more fragmentary stretch of single-faced wall. These two walls need not have been contemporary but may have formed parts of a single arc, as tipped flags under later structures in the intervening area could have been part of this structure. Their function cannot be determined as no occupation deposits survived in association with them.

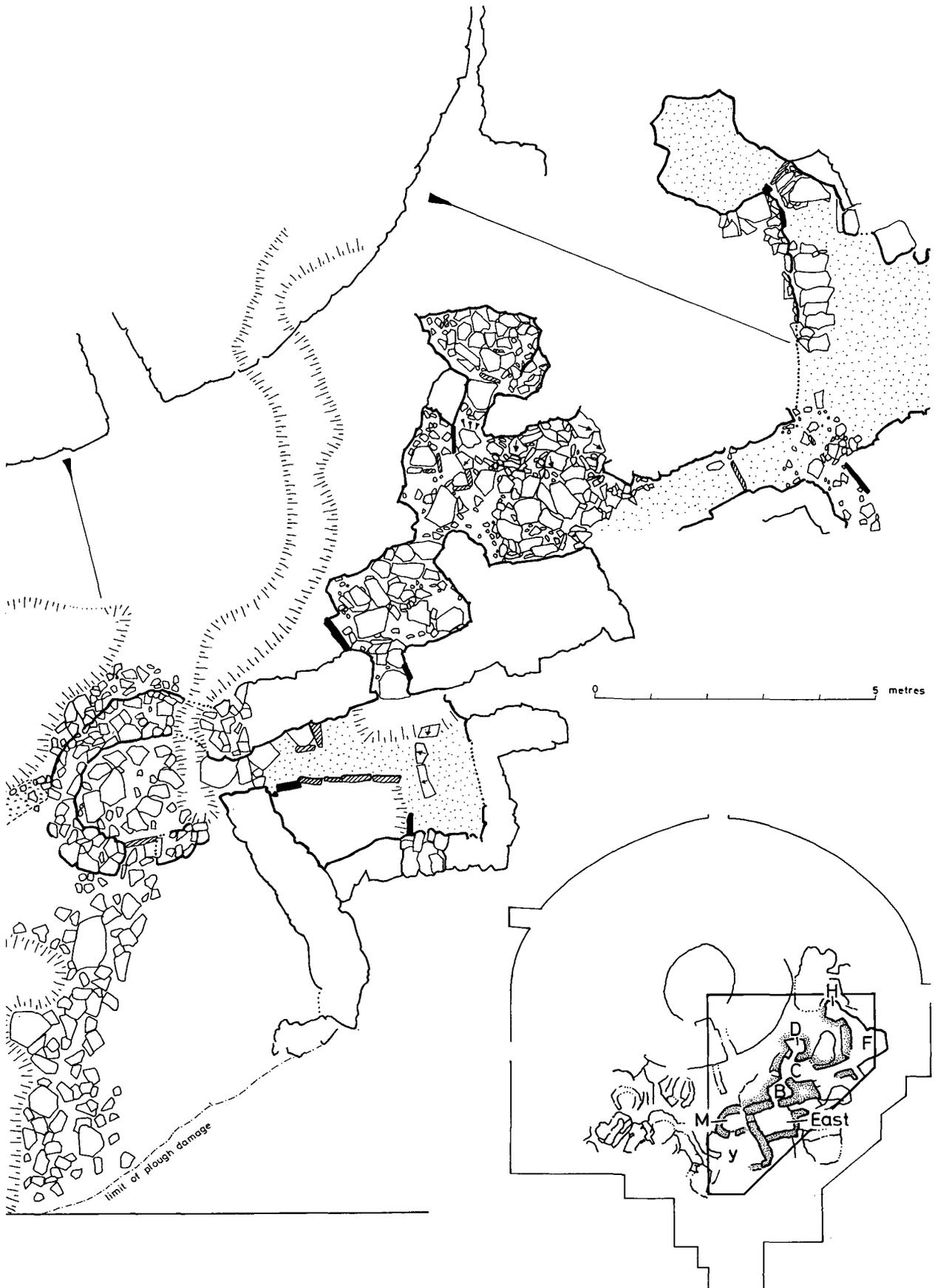
## STAGE 8: SECONDARY STRUCTURES (illus 70a)

The revived interest in the W rubble slopes from the broch tower led to the rapid development of the settlement into that area. Three new buildings can be assigned to the later part of Stage 8, together with a number of linking features. A building, **N**, with entrances towards the E and W was built to the SW of the new yard and porch **M**. It was approximately oval in shape and measured  $c$   $1.5\text{m} \times 2.2\text{m}$  internally. The N and E walls appeared to have been single-faced, though the rubble backing for the latter, which would have overlain the yard surface, was later robbed almost entirely. The S and W walls were freestanding and built predominantly of sub-rounded boulders, in contrast to the coursed flags from which the remainder of the structure was constructed. The entrance in the S end of the E wall was a simple gap. In contrast, the W entrance consisted of large upright door jambs between which were carefully laid flags.

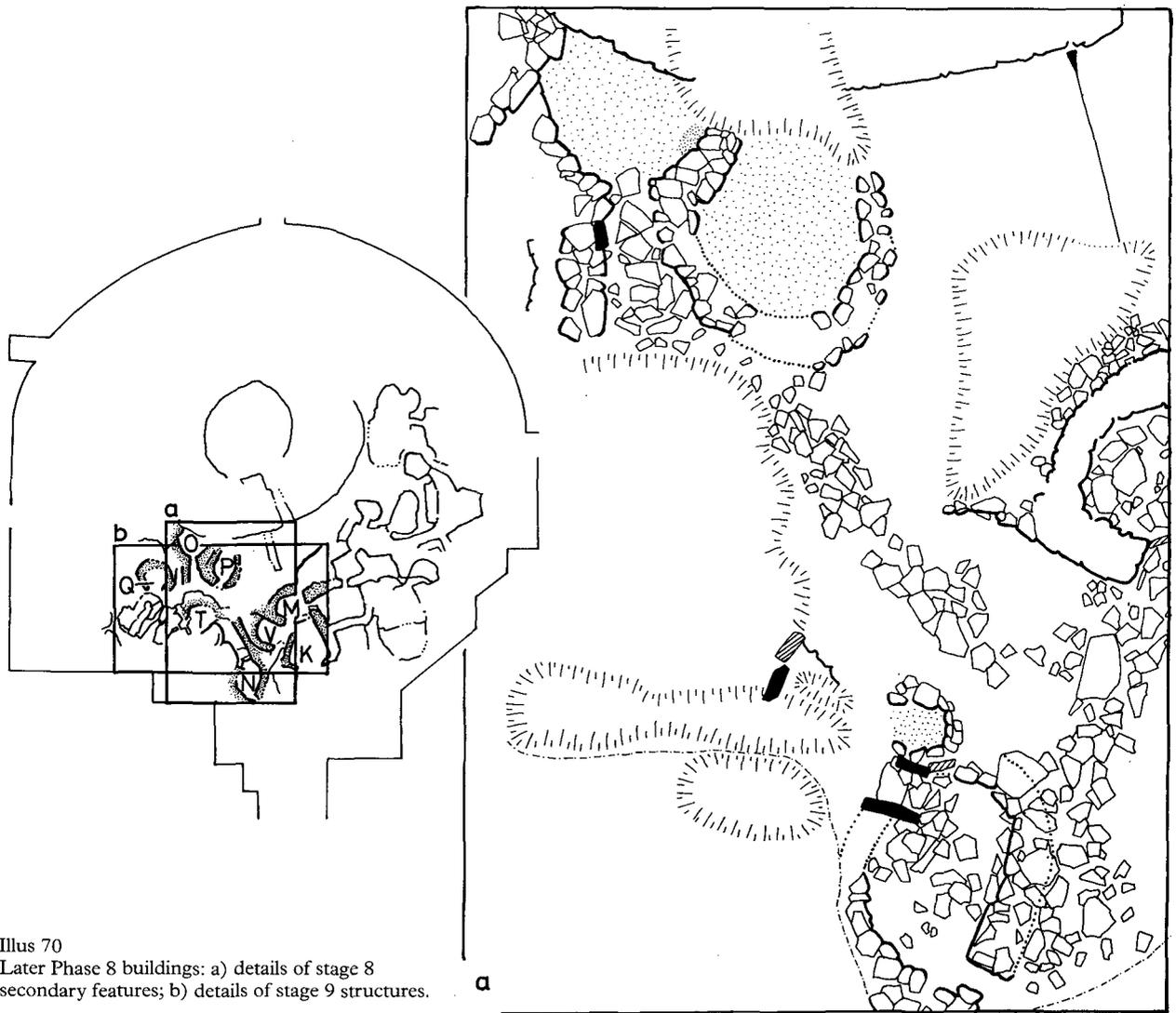
Most of the flag flooring within the room had been disturbed. Levelling under these flags and under the entrance could have existed for a time as an earth floor. Early in its use, the N wall and N door jamb were rebuilt to accommodate an earth-floored cupboard or tiny store room, 0.7m wide, with single-faced walling, and an opening to the W. It was truncated to the W by a recent field wall and so its original length is not known.

Half way along the yard, a flagged path led off to the NW towards two sheds, **O** and **P**, abutting the remains of the broch tower wall. This path passed a short stretch of single-faced wall inserted to retain the shell and bone midden W of the porch and was carefully bonded to the S wall of porch **M**. The path stretched in a straight line for  $c$  10m, though it was partly cut away at its N end during Stage 10 construction and ended at the entrance to shed **O**. Shed **O** was semi-circular in shape with maximum dimensions of  $2.5\text{m} \times 1.7\text{m}$  internally. It utilized the broch tower as its N wall, whilst the NW corner was composed of a single-faced retaining wall built against continued masonry collapse from the broch. This directly overlay a Phase 7 wall which had served the same function. Abutting the new retaining wall was the curved single-faced W wall of the shed, which had a very substantial rubble bank behind it including tipped flags which may have come from the earlier Stage 8 fragmentary walls in this area.

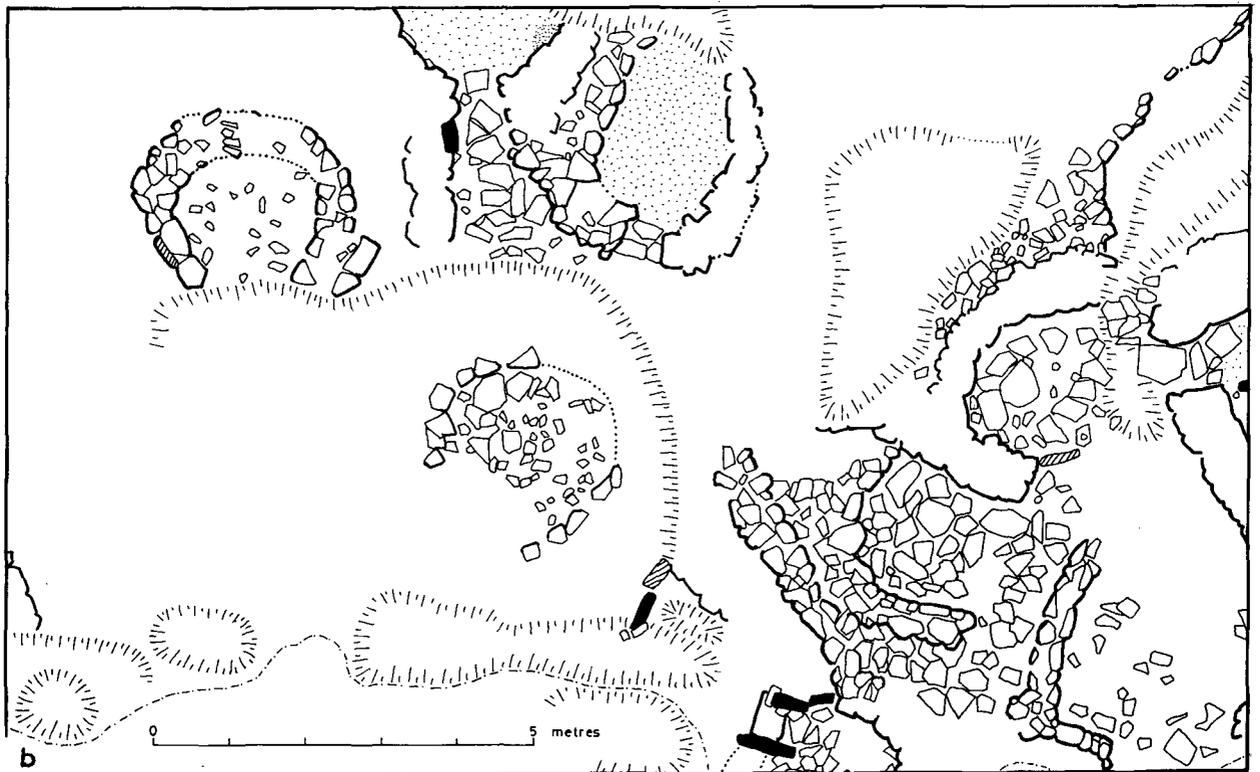
A freestanding wall at least 1.7m long, lying N-S, protected the W side of the entrance to shed **O**. Ash levelling under this wall was



Illus 69  
Later Phase 8 buildings: details of stage 8.



Illus 70  
Later Phase 8 buildings: a) details of stage 8  
secondary features; b) details of stage 9 structures.



noted and a substantial midden of shell and bone accumulated W of it between Stages 8 and 10. The floor of shed **O** was composed of earth and stone chippings and was largely clean except for an ash patch which abutted the wall between the two sheds. This dividing wall was 0.75m wide, had a rubble core, and was built on a mound of levelling. The S side of this E shed, **P**, survived in a very fragmentary condition and no primary entrance could be determined. Both the dividing wall and the E wall (also freestanding, but only 0.5m wide with a stone chip core) were cut to the S of the broch tower by a 19th-century stone robbing

trench. It is possible that the two sheds were linked by a passage in front of the broch wall, but it is assumed that the entrance to shed **P** was always from the path. Like its neighbour, it had a fragmentary stone floor.

From illustration 70a, it will be seen that the porch and three sheds, together with the linking path, had, by the end of Stage 8, formed a unified group. Although parts of the large Stage 4 **Stalled** building were still clearly visible there is no evidence that it continued to be used during this stage.

## STAGE 9 (illus 70b)

### **EAST BUILDING COMPLEX**

In this Stage, use of the area W of the **East** domestic room increased considerably but, as in Stage 8, no new hearth was evident. The **East** room continued in use together with the N rooms and earthhouse **H**, and without any apparent change in character (illus 71). Access to the W sheds beside the broch tower, which included a new structure **Q**, became more circuitous following the abandonment of the path. A new yard, **K**, in the S and a room in the angle between the Stage 8 porch and the N side of the wall of the **East** building were constructed at this time.

The latter consisted of a curvilinear wall built on a foundation of laid flags, and single-faced to the SE. It abutted the N side of the porch, through which an entrance was cut. The S end of the wall stood to a height of c 0.6m, but further N only one course of small flags survived. Almost the entire floor area was removed by a 19th-century stone robbing trench, as were any relationships to the structures to the SE.

To the SE of the entrance to porch **M**, a N-S freestanding wall was built forming one side of an enclosed yard **K**, c 2.0–3.2m wide, between it and the old Phase 7 wall. Yard **K** was entered from the S, through a 1.5m wide gap between the remains of the old wall and an insubstantial piece of freestanding masonry. The

surface of this yard was composed of flags and stone fragments and, whilst it may have been roofed, the wide entrance and type of floor suggest that it was not. The N end of the structure was redesigned in Stage 10 and therefore it is not known whether access to porch **M** from yard **K** was possible. No modifications were made to the porch in this Stage but a second pivot-stone (SF 109) was found at the E end of the sill.

A substantial curved wall abutted the S face of the midden retaining wall. It was constructed of squared sandstone blocks and survived to a height of at least 0.45m on a foundation of wider set stones. At its S end, where it turned towards the W wall of yard **K**, it was freestanding, but was single-faced elsewhere. Originally this part of the wall had been 1m wide. Above this it was 0.5m wide with the wider foundation course laying outside the room, **V**. After it had been completed, a flag floor was put down which continued through the entrance as flags. The fact that these flags stopped c 0.7m from the NE wall of the Stage 8 shed, **N**, probably indicates that its rubble backing was still in place.

Structure **V**, just described, overlay the flagged path which led towards the sheds in the NW and a stone chip ground surface sealed the path further N. A freestanding wall ran SE–NW in the direction of the sheds at the broch tower but was damaged at its N end in Stage 10. Its construction required the levelling of the tiny



Illus 71  
Later Phase 8 buildings during excavation in the E half of the site; scales – 2m; from S.

earth-floored store of the previous Stage. Oval shed **N**, to which it had been joined, remained unmodified in this Stage. The SE-NW wall can be seen as a retaining wall for continued ground surface build up and perhaps as the E side of an unsurfaced path to the NW sheds.

### THE W BUILDING COMPLEX

The westernmost of the two NW sheds, **O**, remained unaltered, but the E side of the dividing wall was buttressed by an extensive addition, reducing the internal width of shed **P** by up to 0.7m. A paved entrance from the S was associated with this rebuilding and was sited at a level indicative of considerable ground surface accumulation around the structure. Both sheds retained earth floors, and the shed **O** seems to have kept its flagged entrance.

The disused structure to the W of the sheds was replaced by a small freestanding building, **Q**, c 1.8m in diameter which survived to a height of a single course. It had a simple paved entrance on the W side, and its floor was of small compacted rubble. Damage caused by Stage 10 precludes reconstruction of the S end of this building, but it appears to have been sub-circular in shape.

Stratigraphically isolated from the other structures, but predating Stage 10, was a sub-circular single-faced structure, **T**, which was built into the stony ground surface. The floor of this c 2m diameter building was composed of flags in the W and rubble, silt and some charcoal elsewhere. No entrance to the building survived but may be assumed to have been in the SW. The building was heavily robbed in Stage 10. Access between the S and NW sheds must have been difficult because of differences in height between the various rubble surfaces.

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## STAGE 10 (illus 72; 73)

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### THE W BUILDING COMPLEX

This Stage saw the establishment of a large and important domestic complex in the area formerly occupied by the Phase 8 Stage 4 *Stalled* building. The old domestic *East* room may have continued in use in its Stage 8 form, but the porch between it and the new structure underwent modifications which suggest a change of use. Sheds **O** and **P** remained functional for at least a short time in a reduced form while shed **T** was levelled to facilitate access from E to W and was superseded by part of the new multi-roomed house. This new building exploited the advantages of deep rubble abandonment and also small fragments of the *Stalled* building. Its position on the shallowest slope of the site resulted in severe plough damage to the structure, but it is clear that this building marks a shift of focus for the settlement. All the older buildings were relegated to storage or other limited use.

### ROOMS/CELLS **R**, **S** AND **U**

The new building consisted of a heart-shaped cell, **R**, to the W and a figure-of-eight room, **U**, to the E with a further, much destroyed, cell SE of this. The two structures were linked by another room, **S**, which can perhaps be seen in the role of a porch. We do not know how much of these buildings to the S were destroyed by ploughing. Cell **R** survived complete, if with only one course of walling in places. Initially, porch **S** and cell **R** were flag-floored as was the N half of room **U**. The S part of the latter had an earth floor and contained an unenclosed hearth. The fragmentary SE cell also appears to have had an earth floor. A deep hollow had been made in the upper levels of a stony ground surface to accommodate the N wall of structure **U** and for parts of the N walls of the porch and room **R**.

Room **U** survived to a length of 4.40m, its floor areas each being up to 2.8m wide. Behind it, the area between wall face and ground surface was filled by rubble overlain by a layer of thick flags. It is probable that these flags represented an external ground level which only covered the rubble behind the E half of the wall. At the W end of the flags, at a slightly lower level, was a semi-circular alcove formed by small flags surrounded by uprights. In the W, the remainder of these walls were backed by rubble.

In the finely coursed E wall of Room **U** was a simple entrance which was approximately 0.6m wide. The S continuation of the E wall consisted of orthostats surmounted by flags; it abutted at right angles a small fragment of coursed wall which lay to the S of the entrance. The wall was rubble backed and its S end was formed from orthostats and masonry rebuilds of the Stage 4 *Stalled* building.

The wall of the fragmentary SE cell consisted of high orthostats, on a layer of rubble levelling, surmounted by coursed flags. Its N end, which abutted a reused orthostat, consisted of a rubble rebuild overlying a fragment of the Stage 4 *Stalled* building wall

which survived to a height of four courses.

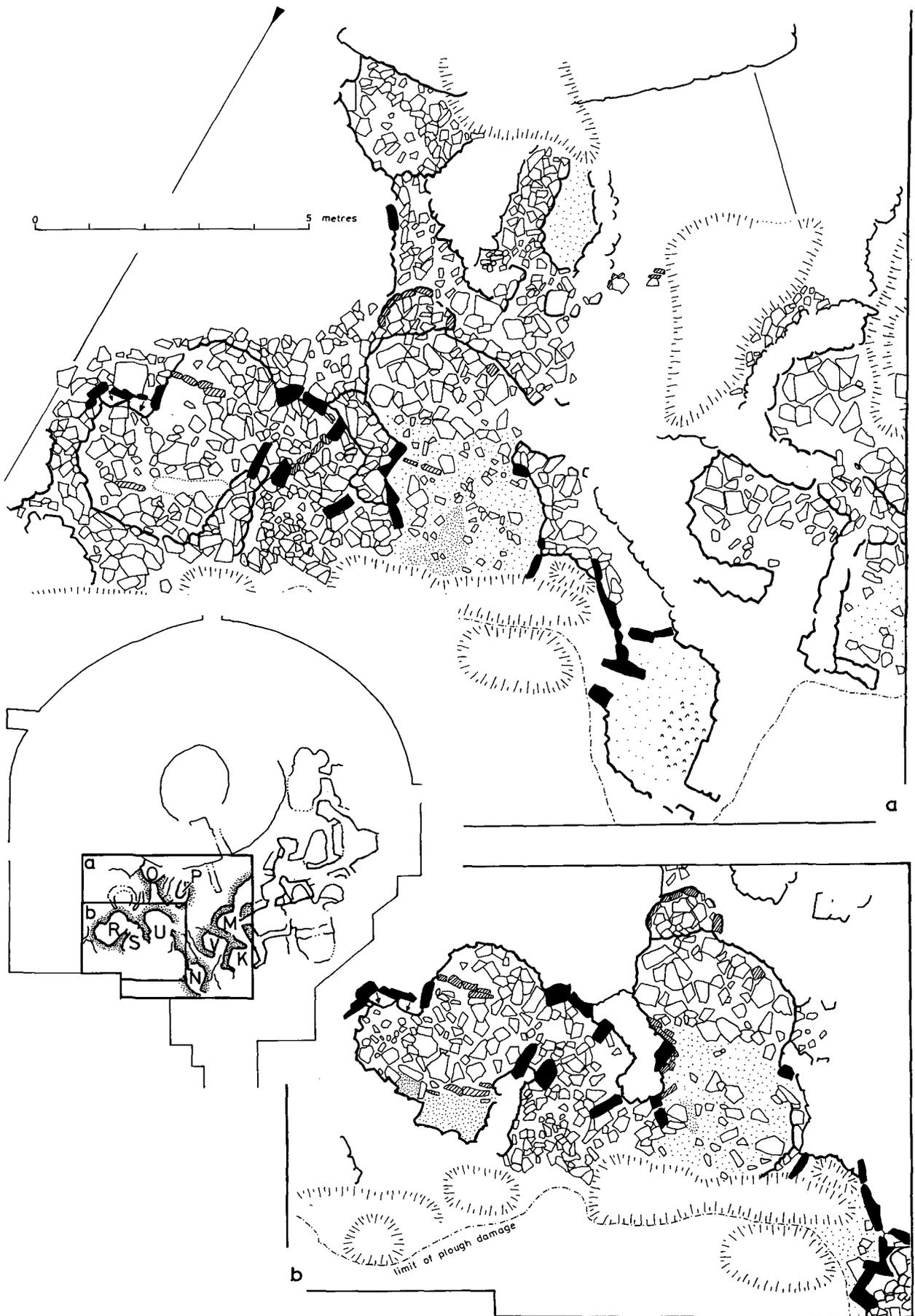
The N half of Stage 8-9 shed **N** was, by this time, filled with rubble, and an earth layer covered the tiny store. The new wall cut this earth abandonment layer and its S orthostat blocked the W entrance to the old shed, where small rubble was piled. A new orthostat was positioned to the S of the blocked opening to form a new entrance. As a result of robbing and plough damage, it is not clear whether the remainder of the W side of shed **N** remained an integral part of the new structure or whether a missing wall continued the curved path of the new orthostatic masonry.

The W side of room **U** was formed by a freestanding dividing wall, with the porch in the N and an orthostatic wall abutting it in the S. The latter contained three large uprights, the S and the large orthostat on the porch side of the wall were freestanding. The area between these two uprights was filled with flattened rubble. It is probable that that this area was never blocked and formed part of an entrance through to the porch. The W side of the dividing wall contained another large orthostat near to its N end. To the W of this were one small and two large orthostats topped by flags forming the N wall of porch **S** which led to room **R**. Another finely coursed wall, consisting of larger flags than the E wall of the figure-of-eight cell, **U**, abutted the orthostatic masonry just described. Beyond this, the W end of the room was constructed within the shell of the Stage 4 *Stalled* building.

The original style of the new wall in cell **R** was unclear due to the settling of its rubble backing. The wall formed a right-angled corner to the N, consisting of two large orthostats surmounted by horizontal flags. The W wing of the corner was of a hybrid construction, some large flags were arranged on points rather than edges, the intervening spaces being filled by rubble and smaller uprights. The W and S coursed walls of room **R** survived complete, and formed a room 3.5m by 3.5m. The backing rubble to the SE corner of the structure was destroyed by a recent animal burial pit. Only one course of the E wall of room **R** survived as a result of later rebuilding; unlike the W wall, this consisted of a rubble core faced with comparatively large blocks. The N end of this wall was terminated by two substantial orthostats, which formed an entrance c 0.85m wide with the orthostats of the single-faced wall opposite and with the massive upright abutting the other dividing wall.

The figure-of-eight building, **U**, had a sequence of four earth floors in the S area of the E cell, suggesting that it was in use for a relatively long period. Few links were present within the house to indicate the relationships of the numerous minor structural modifications to the sequence of hearth/earth floors. For this reason, the primary floor has been included on illustration 72a and the final hearth and floor on the composite plan of secondary features (illus 72b). The intermediate floors are not illustrated but described below.

The earliest floor in the S consisted of silt mixed with small rubble, immediately overlying abandonment rubble and an earth ground



Illus 72  
Later Phase 8 buildings: a) details of stage 10; b) details of stage 10 secondary features.



Illus 73  
Excavation of Later Phase 8 buildings on the W part of the site. Part of the stage 10 figure-of-eight building, U, can be seen in the lower centre; from NW.

surface. In the N of the floor, a spread of small rubble was distinct and could have been functional, perhaps as a post support. A pair of low upright flags were dug into the abandonment surface N of this. They seem too low to have served as a kerb to the hearth but may be seen as supports for a flimsy partition. A sequence of ash and charcoal layers developed to the S of the hearth area. A tiny choked stake-hole within this sequence may have been one of a group, but no others were recognized. The second floor consisted of a number of silts, overlain by ash patches in the W. A large flag dominated the hearth area although smaller stones were scattered elsewhere on the floor and other features included two small stake holes, possibly spit sockets. The third floor is described below (Secondary features).

The N area of the figure-of-eight building, **U**, had a floor of large flags, carefully levelled with earth with a deposit of willow/sallow charcoal (SF 1564) in the W. To the E of the flagged area, almost abutting the coursed N wall, an orthostatic block stood *c* 0.15m above floor level. Initially both room **R** and porch **S** had a flagged floor with no signs of a hearth. The floor to porch **S** was carefully laid, but the floor in room **R** was rather poor. In the S portion of the porch, extending as far as the limit of deep ploughing, levelled rubble formed the only surface.

Access to room **R** was across a sill constructed of four low orthostats, well packed with small stones. No pivot-stone was present. Compacted rubble (which included the gaming board SF 700) in the area immediately W of the sill, gave way to larger flags. Stones from a collapsed refacing to the N wall of the Stage 4 **Stalled** building were reused as a kerb or partition packing. The floor throughout the W room was of fairly sparse flags of very mixed size, laid directly onto the earth ground surface. Finally, within the fragmentary SE cell, small areas of earth flooring survived, mainly beside the orthostatic wall and the entrance.

### THE **EAST** BUILDING COMPLEX

SE of this complex of rooms, within the former shed **N**, a shell midden accumulated against the E wall. Since the rubble backing for this wall was removed at some point, this event is likely have taken place in this Stage, before the final disuse of the four buildings grouped around the W side of the **East** building and shed **N**

complex. It seems a valid assumption that the SE room of the new building was of similar size to shed **N** and may therefore have superseded it in functional terms. To the E, modifications were made to the enclosed yard **K** and the two S rooms of the Stage 8 and 9 development. In room **M**, no further information is available than for its Stage 9 state as a result of 19th-century robbing. In the room nearest to the new structure, **V**, a new floor was laid consisting of flags over the N half and small stones and earth within and to the W of the entrance. As in its Stage 9 use, no pivot-stone was present.

The former silled entrance to room **M**, immediately to the N, was blocked and faced with rubble and the N end of the freestanding wall between room **V** and the yard **K** to the E was bonded to it and to a new wall. This had the effect of enlarging room **M** and reducing the length of yard **K**. A narrow entrance without sill- or pivot-stone, led S from the enlarged room into the yard. The entrance area of the enlarged room was floored with carefully laid flags while the remainder was covered by very large, thick flags on a layer of levelling rubble *c* 0.3m deep. The status of the reused **East** building and the N complex, both last modified in Stage 8, remain debatable as a result of 19th-century excavation and will not be dwelt upon. These rooms are shown on the Stage 10 plan as though they were still in use, as there is no evidence to the contrary.

### THE NW SHEDS

Lastly, a final period of use is discernible in the NW sheds, **O** and **P**. The entrance in the NE of room **U** led to an area of stony ground surface and thereby permitted the use of the sheds via a route next to the broch tower wall. Although this area was robbed during the 19th century it was possible to see a blocking faced on the interior in the entrance to shed **O**, and a new floor of uneven small flags laid within it. In shed **P**, the already widened dividing wall was further buttressed, blocking the S entrance. The resulting floor area was *c* 1m wide. Beyond the E wall of this shed, two stone settings cutting the abandonment have been tentatively phased to this Stage, though their function is uncertain. A possible explanation is that they belong to a lean-to structure or shelter related to the two sheds.

### PHASE 10 : SECONDARY FEATURES (illus 72b)

It is assumed that the Stage 10 buildings had a comparatively long life. This is borne out by the presence of the hearth and earth floor deposits in the S cell of the figure-of-eight structure, **U**. Room **R** was partly redesigned and the SE and NW walls of room **U** refaced. Blocking of the two entrances in the E of the complex prevented access to the sheds **O** and **P**, and to the rooms grouped around the old **East** building. In room **R**, the S wall was rebuilt to include a rectangular niche, utilizing the dividing wall with the porch and a setting of three low uprights. The 1.1m × 0.7m area had an earth floor. Immediately to the W of this, two much larger orthostats enclosed a very small (0.4 × 0.3m) area of earth floor entered from the W. Most of the rest of the room received a new, but very uneven, flag floor. Porch **S** appears to have remained unaltered for the whole of the Stage.

In the N half of the figure-of-eight building, **U**, the E side of the dividing wall with porch **S**, was refaced with four orthostats. New, larger, flags were laid in the semi-circular intramural alcove in the N wall of the room. As has already been mentioned, the entrance in the E side of this wall was blocked, rather crudely with partly faced rubble and redeposited stone fragments. In front of this blocking, two superimposed blocky flags appeared to be a support or simple furnishing similar to the orthostat *c* 0.5m to the NW. In the S half of the room, the E wall was refaced with small, blocky, coursed flags on a foundation of small rubble. This curved W but was cut by the massive Phase 9 field wall and by plough disturbance. A large, thick flag lay beside the refacing and, like the smaller set stones further N, may have been more than simply a piece of flooring.

Ploughing also damaged the S extremities of the third and fourth earth floors in the room. The orthostat, which stood beyond the S end of the dividing wall, was abutted by a coursed refacing which overlay the second earth floor described above. The central section

of the orthostat wall to the N of this was also refaced or buttressed with coursed masonry. A small post setting was inserted beside the N orthostat of the wall but there was no indication as to whether this was structural or simply part of the adjacent hearth. The later earth floors of this building became progressively less extensive.

The E side of room *U* continued to be covered by the second floor throughout its later history, while the third floor, a grey-brown silt loam, overlay it in the W half. The third hearth produced a larger quantity of ash and charcoal and a charcoal spread, which overlay two low uprights to the N of the hearth area. This was later sealed by another silty loam earth floor with ash/earth dumps. These last

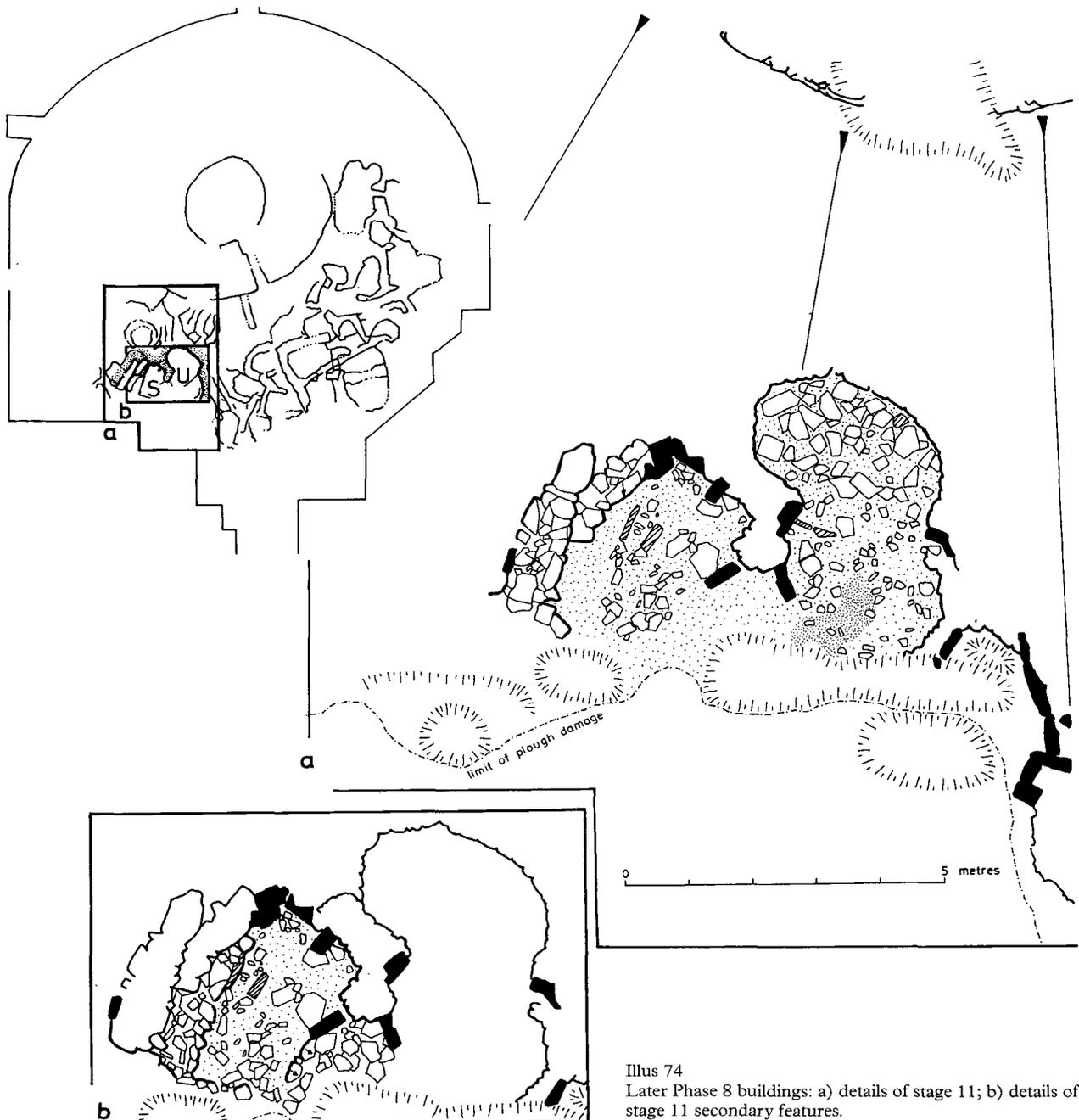
had the distinction of producing the only hazelnut shell (SF 1547) found in any period of the site. A burnt and much fragmented flag overlay this floor and seemed to represent the final form of the hearth, but no ash or charcoal can be attributed to its use. This hearth appeared to be unenclosed although a single orthostat, to the N, cut all the earth floors and was probably associated with it.

The E entrance from the fragmentary SE cell had an elaborate blocking consisting of a curved single-faced wall built between the entrance orthostats and backed by rubble, that partly filled the levelled structure. An orthostat was then positioned across the former entrance and the gap between this upright and the curvilinear wall filled with rubble.

### STAGE 11 (illus 74a)

The late stages of the settlement's history are difficult to interpret because of their fragmentary nature; however, Stage 11 represents continued use of at least part of the Stage 10 structures. This is

the last stage where continuous development can be proved as the Stage 12 structures and the late, unphased features cannot be tied to the end of the sequence.



Illus 74  
Later Phase 8 buildings: a) details of stage 11; b) details of stage 11 secondary features.

THE W COMPLEX : **R, S** AND **U**

The freestanding wall separating room **R** and porch **S** of the Stage 10 structure, was levelled to one course at the beginning of this Stage. It was replaced by a similar N-S wall built on a layer of small rubble, leaving an entrance in the S. An earth floor which had developed in porch **S** and within an area extending at least 0.5m W of the entrance, continued to build up throughout this Stage. The **W** room continued in use for a short time, still with the rough flagged floor, from the end of Stage 10. The earth floor overlay these flags in the new entrance. To the E, the same earth floor overlay the flags S of the dividing wall between porch **S** and room **U**, and it is therefore likely that this room remained in use. No hearth was found in the former porch, indicating that the unenclosed hearth in the E room probably remained in use. The only features present in the earth floor of the porch were some scattered flags and a post-setting, approximately in the centre of the room, which may have replaced a more fragmentary example further S which was sealed by some of the earth floor.

## STAGE 11 : SECONDARY FEATURES (illus 74b)

The old porch, **S**, was subsequently reduced in size and access first to the W and then (less certainly) to the E made impossible. The blocking of the W entrance was accomplished by the construction of a wall, single-faced to the E and overlapping behind the earlier Stage 11 W wall. Its S end was very uncertain due to plough damage but a few stones suggest that it curved to the SE within the surviving length. The W side of the room was then buttressed by a further rebuild which abutted both the earlier W walls and overlay the W orthostat of the post setting, though this would not necessarily have rendered the setting unusable. Immediately to the S of the setting and abutting the new wall was a patch of charcoal. As in the earlier form of the building, a fragmentary E-W wall survived to the S. Furthermore, this curved round to abut the large orthostat beside the S end of the dividing wall with room **U**. Although there must have been an entrance through this wall, too little remained to allow it to be identified.

## STAGE 12 (illus 75)

The main focus of activity on the site at this time was the old **NE** building which was reused for the first time since Stage 4. The walls of this c 6 × 3m building had remained largely intact since its abandonment and a new earth floor c 0.25m in depth was laid throughout. This floor was lost at its S end because of recent disturbance, but contained an area of flags in the vicinity of the E entrance, and some charcoal N of this. A stone setting NW of the entrance was a later feature and over lay a shell midden deposit within the earth floor. To the E of the entrance and the old rampart, a semi-circular yard, **L**, c 3.5m wide, was formed which had a thin flag and stony surface. The old adjacent earthhouse, **H**, was buttressed to the NW and the top of its SW wall was rebuilt.

It was entered from over the top of its former lintel as c 0.4m of earth and stone had developed within it.

Immediately S of the yard was a 4m square area, **F**, of flattened rubble, enclosed to the W by a single-faced wall. This wall retained the rubble collapse from the tower to the W, but it is uncertain whether it represents an open yard or part of a building. A line of small upright stones to the S may indicate the alignment of a wooden screen. Through the centre of the feature was a sunken channel partly delineated by low upright stones. Fragments of a wall to the N may have linked this feature to earthhouse **H**.

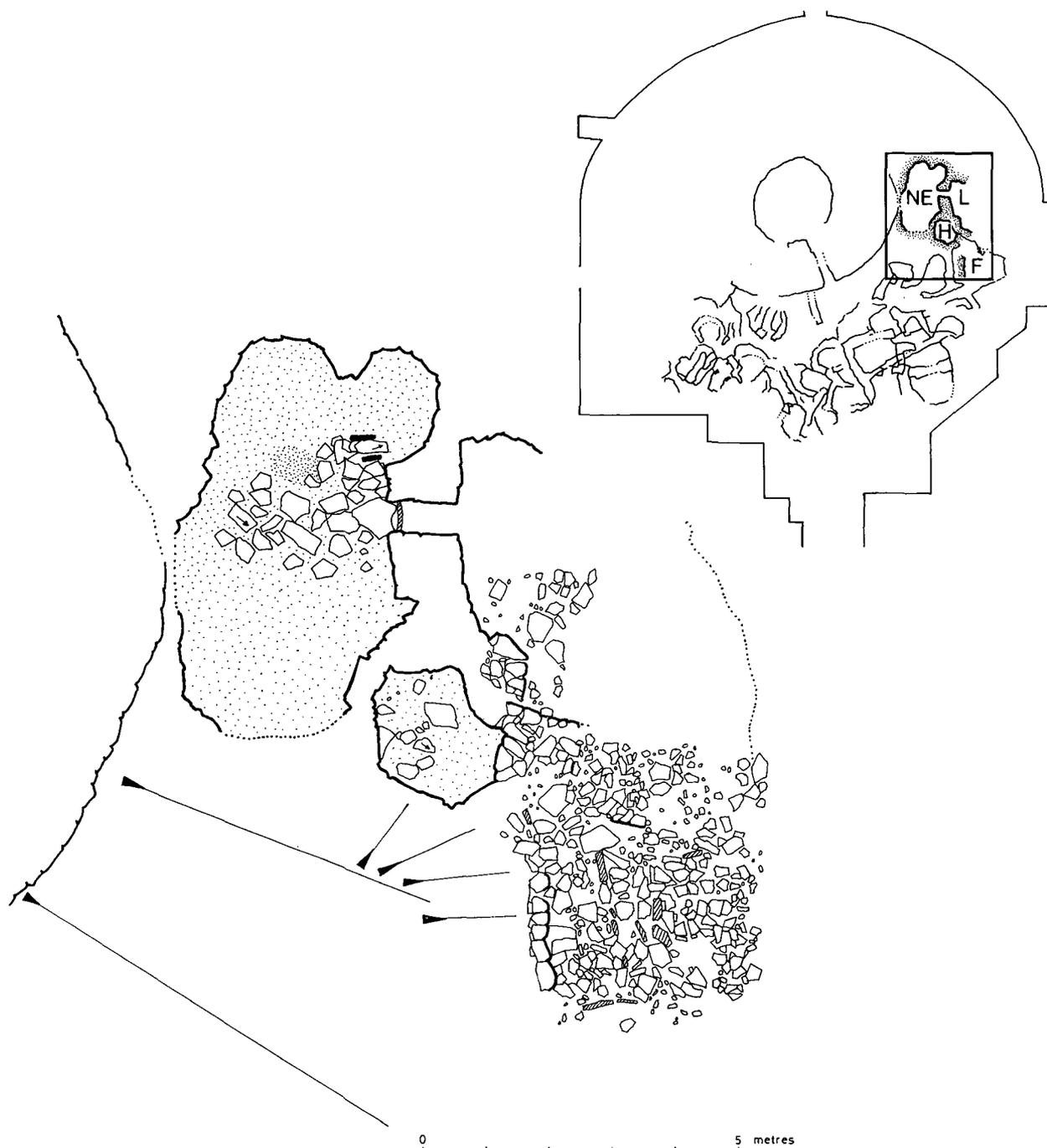
## 5.2 • THE LATER IRON AGE FARMSTEAD • DISCUSSION

The collapse of the broch tower to the S, marked the division between Phases 7 and 8. At that time only the **NE** building was still in use, with its yard formed from the old **E** and **NE** yards, which contained two small sheds in the old E yard. This collapse had an immediate effect on the settlement, by blocking the route to the **NE** building from the old rampart gateway. This was replaced by a new entrance, paved with flagstones, cut through the rampart between the sheds in the old **E** yard. In the early stages of Phase 8, this area became the focus of the settlement, which was bordered on the E by the rampart and on the W by the broch and its collapsed wall, but was open to the S, through the rampart.

The **NE** building was now clearly domestic in function, with no sign of the earlier iron-working. It was enlarged by the addition of a large oval room at its S end, and by small rooms between it and the rampart to form a single inter-connected complex. This combination of a domestic complex and a yard with its separate sheds, was typical of Later Phase 8, and this was the earliest example of what will, for convenience, be called a farmstead. This complex of buildings was not quite the only occupied area on what was becoming a stony mound, as two other short-lived structures were also built at about this time. One reused the S part of the rubble-filled **E** building, by clearing rubble to create a small rectangular room. This was probably entered from the E end of the S wall, and may have been associated with a new surface laid over the **SE** yard. This room with its hearth and tank, had little in the way of floor deposits, and was apparently not in use for long.

The second new structure was a small building with a paved floor and a hearth, built into the collapsed building rubble on the abandoned W side of the settlement mound. Its later use included iron-working, and it seemed best interpreted as a short-lived workshop. Although it was only 30m from the **NE** building, it was possible that this workshop formed part of a larger group of buildings that lay to the S of the rampart, but were not excavated.

The main domestic complex centred on the **NE** building had suffered some damage from the falling broch masonry, and this appears to have had two results. Firstly, the E side of the broch tower above the still



Illus 75  
Later Phase 8 buildings: details of stage 12.

occupied buildings was demolished, and the stone dumped into the broch interior. The broch had been used as a dump for some time, but now the domestic refuse was mixed with large rubble as the E side was reduced to a safe height. The second result was that the **NE** building was finally abandoned as a domestic structure, although it had been temporarily repaired and occupied for a short time after the collapse. The main **Oval** room and original rooms were subsequently refloored, although no hearth or other evidence for human habitation was found, suggesting that it may have functioned as a byre or store for the farmstead. The new location of the farmstead is unclear; however, on stratigraphic grounds, two excavated domestic structures were possible candidates. These were the modified **E** building, described above, and a new **Stalled** building that was constructed on the **W** side of the settlement. This new building had been built into the remains of the small iron-working shed and the rubble of the building collapse from the **S** side of the broch tower. The

presence of a well-developed soil over this rubble argued for a construction date of well into Phase 8. Its position on the W side fits nicely into Phase 8 of the site, when the complex of structures on the E side was finally abandoned. The other alternative is that a new house was built away from the mound, outside the excavated area.

The problem of interpretation caused by the presence of unexcavated or destroyed structures recurred throughout Phases 7 and 8, but was particularly acute at this point as it was difficult to demonstrate continuity of occupation for the few stratigraphically isolated structures that were found. Until later in Phase 8, when the stratigraphy became more secure, it can only be assumed that occupation continued and that it probably consisted of a similar farmstead to those seen both before and after this period. On balance, it is easier to accept continuity rather than repeated abandonment and reoccupation when interpreting these structures.

The *Stalled* building which appeared to fit into the sequence at this point was notable as the first new domestic structure to have been built since the start of Phase 7 that did not rely largely on the reuse of existing walls. Even so it incorporated part of an older workshop, although its size and shape were not constrained by these earlier features. It was sausage-shaped, being approximately rectangular, 10.5 × 4.0m, with apsidal ends. One long wall ran along the line of the inner face of the much reduced rampart, whilst the other was dug into rubble from the collapsed broch tower. It was entered from the W end, over the old rampart, through a paved entrance lobby that divided off the rest of the house, which was arranged symmetrically with central hearths at the W end, and five stall-like partitions extending down either side of the room. This well-planned building had no surviving associated structures other than some external paving, although other buildings were presumed to lie beyond the defences to the S, outside the excavated area. This *Stalled* building had no obvious architectural parallels on the site; it does present similarities to the *wags* of Caithness (Smith 1990, 37). Its design indicates what was considered suitable accommodation in the 5th–6th centuries cal AD in Orkney. It was abandoned following the collapse of its long N wall which had been dug into rubble.

Stratigraphic continuity was re-established with the reoccupation of the modified *E* building, which had last been used earlier in Phase 8. This building became the focus of an increasingly complex group of interconnected rooms, which had at times at least two linked domestic areas. This complex reused parts of the late Phase 7–early Phase 8 structures on the E side of the mound. They were linked by added walls to form an agglomeration of small rooms, with passages that led to paved yards, containing separate, approximately circular outbuildings. The presence of external yards and what may have been store sheds, surrounding the domestic structure suggests that most of the settlement at this period had been excavated. This complex was therefore interpreted as a single farmstead of the 6th–7th centuries, occupied by an extended family, much the same as at the start of Phase 8 c 300 cal AD.

Subsequently the focus of this farmstead shifted W following the construction of a new house over the levelled remains of the *Stalled* building, in an area which already housed a number of sheds. The core of this new house has already been described as a figure-of-eight building (Neil 1985, 206), although the presence of associated contemporary rooms created a more complex agglomeration and ‘clover-leaf’ may be a more appropriate description. The old house complex was partly retained, although with modifications, for non-domestic use. The new house underwent a series of alterations and repairs and its subsequent abandonment brought to an end the main Phase 8 structural sequence. Later, isolated Iron Age style buildings, and a final reuse of the late Phase 7 *NE* building add little to our understanding of the Phase 8 settlement. The presence of a fragment of a St Ninian’s Isle type brooch indicated occupation at least as late as the end of the 9th century, and parts of two rectangular structures on top of the mound, hint at continuity of occupation beyond the Scandinavian colonization of Orkney.

### THE FARMSTEAD ECONOMY

The Phase 8 economy was similar in many ways to that of Phase 7, with mixed arable and pastoral agriculture, combined with hunting and gathering. The range of stone artefacts was similar, and no new types were found now. Only simple hammerstones, whetstones, whorls and pot lids occurred in any quantity and querns became very rare later in Phase 8 (8.3 Stone Artefacts below). There is no evidence of iron-working after the beginning of Phase 8 (4th century cal AD), and pottery became much less abundant. These trends may reflect the declining population in the settlement, with an increasing chance of infrequent activities not surviving in the archaeological record. The standard of wall building was certainly inferior

compared to early in Phase 7, but otherwise there was no evidence for a decline in the quality of life. There was a similar scatter of imported decorative metalwork and glass beads, to that noted in Phase 7, and some of the Phase 8 burnished pottery was the finest recovered from the site.

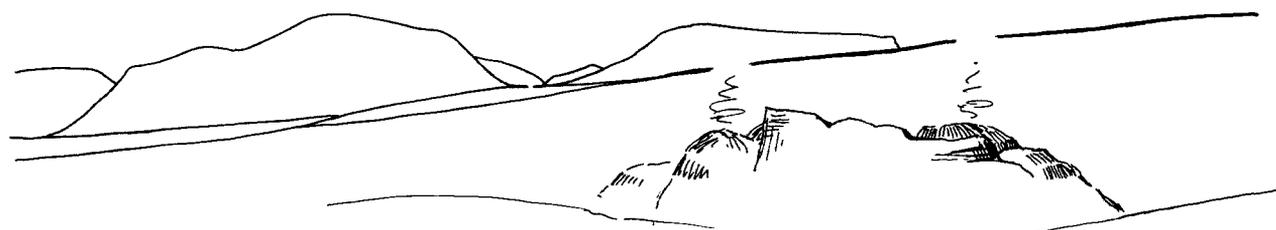
Analysis of the animal bones revealed a significant decline in red deer from Phase 7 to Phase 8. This is discussed in terms of possible environmental changes in the Animal Bone Report (7.2 below), where it is concluded that it was probably caused by economic factors. In the animal assemblage, red deer was replaced by relative increases in domestic sheep and pig, but not cattle. Sheep and deer would have competed for grazing, so that any increase in domestic flocks could have displaced the wild deer. Smith (*ibid*) draws attention to the changes in sheep mortality, with a greater proportion living longer in Phase 8 than in Phase 7, indicating either that there was improved husbandry or that there was a change in farming practice. Did an increased emphasis of sheep lead to the decline in deer hunting, or did a declining deer population force increases in domestic livestock numbers? Alternatively, the Phase 8 farmstead may have lost access to the deer herd available during Phase 7, or hunting was no longer a viable proposition for a small family group on their own. Data from other contemporary West Mainland sites would help to resolve this issue.

Flax is first recorded from the Phase 8 *Stalled* building, presumably as a crop, either for its fibres, or the edible seeds. Whilst the increasing numbers of oat grains in the late Phase 8 (7th–8th century cal AD), although not specifically identified, may indicate intentional cultivation of that cereal. The diversification of arable crops and apparent reduction in hunting leads to an economy that resembles other 7th–8th century settlements in Orkney, for example Pool, Sanday (Hunter, pers comm), and Buckquoy, Birsay (Ritchie 1977; Morris 1983; 1989). However, it was still a way of life that would have been familiar to the inhabitants of the Phase 7 village, 800 years earlier.

## CONCLUSIONS

It can be concluded that from at least the start of Phase 8, the 4th century cal AD, the settlement at Howe was occupied as a single farmstead. Contemporary settlements have been excavated at Skaill, Deerness (Gelling 1985) and at Pool, Sanday (Hunter forthcoming). Both sites have a long chronology spanning the period of Phase 8 at Howe and should, when published, provide a useful comparison. The excavations at Birsay also identified very late Iron Age structures beneath the Norse occupation: Ritchie's (1977) 7th–8th century farmstead at Buckquoy and Morris' (1983; 1989) similar structures nearby. Pre-Norse remains on the Brough of Birsay, dated by radiocarbon to the 7th and 8th centuries, are harder to interpret, but may represent a larger settlement than those seen at Buckquoy or Howe (Hunter 1986). The suggested political and social status of the settlement on the Brough may, if confirmed, make it an exceptional site.

If it is accepted that the settlement at Howe declined from a defended village to a single farmstead in the 1st–4th centuries cal AD, then unless the total population declined, people must have moved elsewhere. If this event was repeated in other defended nucleated broch settlements, then this period must have seen the dispersal of much of the population of Orkney in to new, unenclosed settlements.



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## LATER ACTIVITY POST ABANDONMENT

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This phase, 9, was used to include all undated and recent structures and covers the period from the abandonment of the site, that is from the 9th century or even earlier through to the 20th. Also included are an unphased burial, 19th and 20th century excavations and plough damage.

A number of important artefacts were recovered from the topsoil or were unstratified within this Phase. These included a carnelian intaglio with an imperial eagle, dated to the mid 2nd century AD and three fine copper-alloy objects: a long zoomorphic pin of the 4th to 5th centuries AD, a decorated brooch, similar to the St Ninian's Isle types, given a mid 9th century, Pictish, attribution and a spiral ring of mid Bronze Age to c 5th century AD.

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### POST PHASE 8 ABANDONMENT

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A continuous sequence of abandonment can be identified in most areas where Phase 8 Stage 11 occupation did not occur. The Stage 12 and the unphased late structures (below) represent discrete breaks in this sequence and indicate occasional use of the mound, rather than actual settlement, with the exception of building H which had a hearth. In the S and W of the mound the abandonment layers consisted of structural collapse of walls onto earth and flag floors. Building outlines were masked, and the pattern was somewhat disturbed by erosion,

robbing of higher level structures and by 19th-century digging. In a few areas abandonment was continuous, or all but so, from the last major broch tower collapse, and a layer of weathered stone fragments built up across the site. The interior of the broch tower remained out of use from Phase 7/8, subject only to wall collapses and filling in by rubble and earth (illus 76). Stone robbing of the tower wall head did take place and the lintels from the entrance were removed after Stage 6, which allowed the passage to be filled with a stony wash.



Illus 76

The top of the broch tower, shown filled with rubble after removal of turf and topsoil. The Phase 7 blocked landing is visible in the lower centre of the picture; scales – 2m; from W.

## UNPHASED LATE STRUCTURES (illus 77)

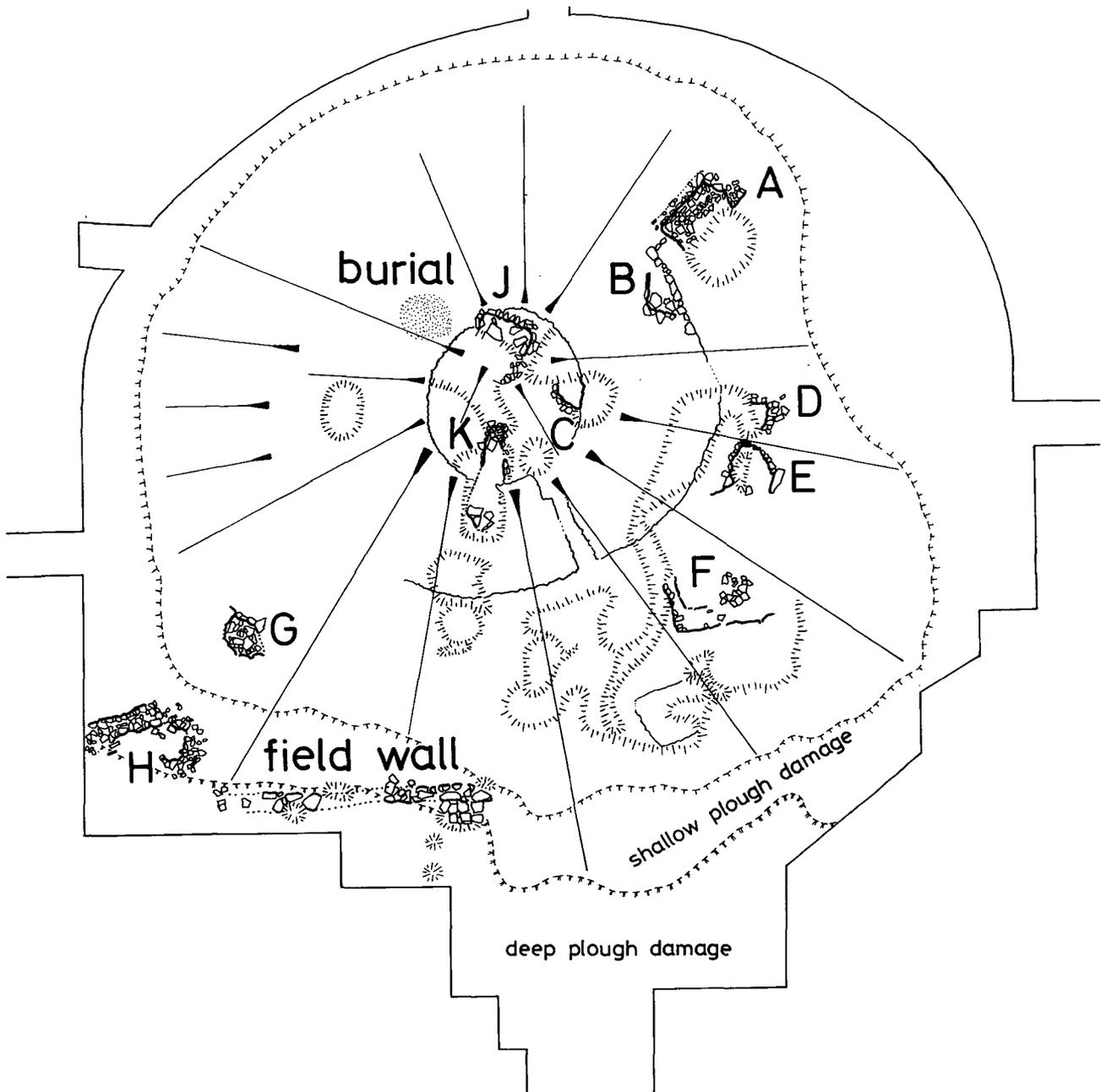
Parts of nine other late structures were present on the site which cannot be assigned to specific phases. These are shown together with three recent structures (18th-century or later), dated by finds, and the limits of recent stone-robbing and early archaeological investigations. Most of these structures merit little comment and are not stratigraphically linked.

## BUILDINGS A-H

Building **A** was rectilinear and lay in the upper fill of the area between the broch tower wall and the rampart revetment in the

NE. Three sides of a single-faced building survived, which cut into the abandonment rubble. The longest side, the NW, measured 2.8m, but the building was disturbed by a 19th-century excavation and only a 2m length of it survived. The walls survived to three courses in height and partly stood on stone and earth levelling. Onto the levelling was placed the flag floor of the building.

Building **B** was a tiny triangular fragment which cut the outer face of the broch tower wall at a level 1m above building **A**, and lay to the SW of it. Its wall was of upright stones and some flag flooring remained.



Illus 77  
Phase 9 features.

Building **C** was built against the inside wall of the broch tower and consisted of an arc of single-faced wall, dug into rubble. The wall survived to a height of 0.5m but was cut to the N and E by 19th-century trenches. Some flag flooring was present.

Building **D** lay to the E and consisted of a semi-circular arc of coursed stone which was cut by an arm of a Victorian trench.

Immediately below it was another semi-circular hut, Building **E**, open to the S with walls built of upright stones, and a stone chip floor.

Further S, to the E of the old broch entrance, was Building **F**, an L-shaped, 2m wide freestanding wall. It survived to only one course and lay on top of the abandonment surface. It is assumed that the flag surface to the NE belonged with the wall, but the building was cut by a 19th-century trench in the NW.

Another small fragment of a building, **G**, was located in the W within a Phase 7 rampart cell of the NW building. It was partly closed off to the N by a short length of single-faced wall and had a flag floor, c 2.0 × 1.4m.

In the SW, Building **H** overlay the upper fills of the ditch and cut the silting over the rampart. A freestanding wall, 1m wide, lay at right angles to the rampart, and a curved single-faced wall backed by rubble joined them together in the N. They enclosed an area

c 1.5m square which had an earth and rubble floor. To the S of the freestanding wall was an earth floor within which lay a hearth consisting of a fragmented base slab and an upright. Unlike other freestanding walls in Phase 8 this construction had squared blocks forming the faces with an earth infill.

#### FIELD WALL

Towards the SW corner of the site, a fragmentary, but solidly constructed, field wall, aligned E-W, possibly derived from the 19th century. In the middle, and immediately S of it, three cows were buried in pits and three calf burials were also found in the vicinity. Modern glass found in the pit of the former attests to its recent date.

#### LATE UNPHASED BURIAL

On the eroded broch tower wall-head, in a 2.0 × 1.5m area disturbed in the 19th and 20th centuries, was a concentration of human bones (SF 68). No datable finds were associated with the bones, but it is possible that the glass linen smoother from 19th century excavations came from this locality. If so, the suggested Norse date for the artefact (Marwick 1927, 121) could be applied. The bones were intermixed with others from the 1978 season by Hurricane Flossie, but were subsequently separated by identification.

### MODERN FEATURES AND DISTURBANCE

The top of the broch contained another feature, J, which was one end of a rectangular structure dug into the interior rubble on the W side. It had a large flag floor and was mainly destroyed by a recent trench. It is dated by glass and pottery to the late 18th–early 19th centuries. Two late stone robbing trenches may also date from this time.

It is recorded (Marwick 1927) that the site was ‘excavated’ in the 1860’s and, considering the techniques of the age, a deep trench cutting through the broch wall is a good candidate for this event. The trench consisted of a 1.2m deep hole which extended from inside the tower out into the centre of the wall, and a similar trench on the same line which cut the outer broch wall face, with a narrow trench between. The former hole was dug deep enough to reveal the clay core of the Neolithic mound and the latter, the outer faces of Brochs 1 and 2. The inner trench was used soon afterwards as the site of a long narrow structure, described above, which is best interpreted as a short-lived cold store, **K**. This structure was already abandoned when two large holes were dug into the top of the broch. These ‘excavations’ revealed long stretches of the broch wall face and were filled with 20th-century rubbish. They did, however, avoid the navigation cairn sited on the top of the mound, which may aid the dating of them.

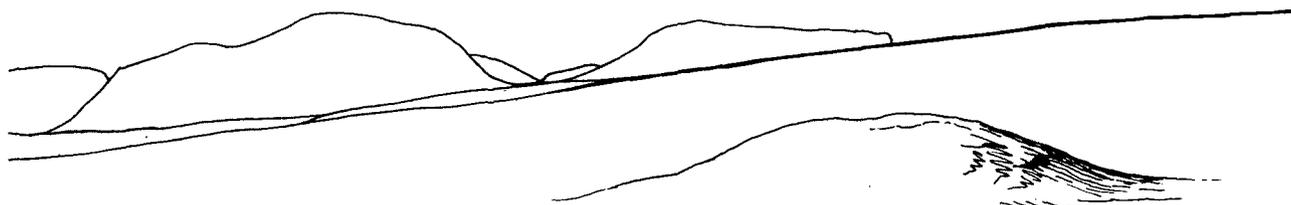
Related to these holes was a long sinuous trench which located the broch wall outer face on the E and progressed S another 10m. It cut through several stages of Phase 8 buildings and created two piles of

debris at its S end. On either side of the terminus of this trench, three other holes were dug and corresponding piles of rubble formed. Two other recent holes disturbed the unphased buildings **A** and **C** in the NE and in the interior of the broch tower.

#### PLOUGH DAMAGE

From the plan it can be seen that much of the S part of the site suffered both from shallow and deep plough damage. Here the slope of the mound was shallow and allowed the plough to make incursions higher up onto the site. Evidence was found into Phase 7 levels of stratigraphy which had been ploughed away since the site had been abandoned. Evidence of the clay-cored rampart E of the entrance was missing, together with parts of buildings built over the defences in later Phase 7, and the destruction of parts of buildings during Phase 8 was much in evidence. S of the defences, beyond the settlement entrance, only scant remains were found of activities during later Phase 7, as this area was subject to regular ploughing. The survival to a higher level of the defences on the E prevented much serious damage on this side. To both the N and W, the severe slopes of the mound discouraged ploughing and again damage was minimised.

It must be left to the imagination to speculate on the extent of settlement beyond the defences which has been lost to the plough.



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## THE ENVIRONMENTAL EVIDENCE

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This chapter presents the environmental data from the site in seven sections, beginning with an introduction (7.1) and followed by the specialist reports (7.2–7.7). Analysis of the data in the specialist reports has been made by phase, with limited data deriving from Phases 1–4, some useful information from Phases 5/6 but the major part of the evidence offering detailed discussion is limited to the Middle and Later Iron Age, Phases 7 and 8, perhaps covering a timespan from the 1st to the 8th century cal AD.

This represents the first comprehensive collection of information on the Iron Age environment from an excavation in the Northern Isles. The temporal distribution of the data from the site means that Howe cannot be easily compared with the adjacent Early Iron Age settlement of Bu (Hedges 1987a) or the immediately pre-Norse Iron Age sites in Birsay (Ritchie 1977; Morris 1983, 1989; Hedges 1983b), which only just coincide with the end of Phase 8. The closest comparable published site is Crosskirk in Caithness (Fairhurst 1984), although Pool on the island of Sanday, will soon be available (Hunter forthcoming).

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### 7.1 • INTRODUCTION

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During the excavations at Howe no off-site environmental data were collected and therefore the available information concerns the human exploitation of the immediate area rather than the wider environmental context. As a result, the data must be interpreted in terms of changes in demand, accessibility and methods of exploitation rather than the simple presence of a resource. It is clear that the nature of the settlement changed between Phases 7 and 8, from a defended, planned village, to a single farmstead. This must have involved a reduction in population and a change in social structure, leading to changes in demand for, and access to, resources.

Without detailed information on the contemporary settlement distribution in the West Mainland of Orkney, and on society's system of land exploitation and ownership, it is difficult to know what land and sea area supplied the materials found at Howe. The presence of substantial numbers of seabird bones from species like, gannet, shag, cormorant, and the auks, indicate access to the cliffs on which they nest (7.4 Bird Remains). The closest suitable cliffs to Howe are 6km away on the west coast and, with the exception of clearly exotic (traded?) materials, for example steatite, this could be the most distant area of resource that was exploited. All other plant and animal resources could have been obtained locally, on land or from the sea.

### PHASE 7 • BROCH TOWER AND SETTLEMENT

Previously published information on the past environment of Orkney is usefully summarized by Davidson & Jones in Chapter 2 of 'The Prehistory of Orkney' (Renfrew 1985). They conclude that by about 1300 cal BC, the climate, soil types and vegetation were very like those of the present day, although agricultural land use will have changed significantly. Over the last hundred years, agricultural land has been altered by extensive draining, a decline in arable cultivation, and the extensive use of artificial fertilizers. For the Iron Age, Davidson & Jones note the pollen evidence from the West Mainland for heathland mixed with arable and pastoral farmland on the lower ground, and blanket peat on the hills.

The plant remains from Howe (7.2 Plant Remains below; 7.2.1mf 1:C1–D2), confirm these conclusions, with only one identified species not forming part of the present day flora. The semi-natural vegetation represented in the plant remains includes a heath community which was brought to the settlement as peaty turves for fuel. Peat was also exploited as a fuel, although identifiable plant remains were rarely present to distinguish between upland blanket peat and valley mires. Both were available within a few miles of Howe during the Iron Age. Semi-natural woodland was represented by charcoal from native tree species. The abundance of willow (*Salix*) over birch (*Betula*), rowan (*Sorbus*) and hazel (*Corylus*) charcoal indicates that

the source of wood was willow carrs on the low lying marshes, rather than the more diverse birch woodlands, represented on Orkney today only by a fragment in Berriedale, Hoy. The picture of semi-natural vegetation is completed by the rare presence of brackish and freshwater plants and marine algae.

Of the man-made plant communities, arable fields were well represented from samples of barley straw and other crop-processing debris. The only crop identified from Phase 7, was naked six-row barley. This was grown in fields that were, using the evidence of weed seeds, fertilized, carefully weeded and rather wet in places. The existence of pastures cannot be directly demonstrated from the plant remains, nor is there clear evidence of hay production. However, the domestic livestock must have been grazed somewhere away from the arable fields.

The detailed geographical distribution of these communities is unknown, although it may reasonably be assumed that the main differences between this period and the present day distribution would be the greater extent of heathland and poorly drained areas of lowland. Cultivated land was probably restricted to the better drained slopes, such as those around Howe itself.

The vertebrate fauna of the islands was well represented in the archaeological record, with large samples of fish, birds, mammals and amphibians (7.3–6 below; 7.3.1–6.1mf 1:D3–G14). The fish bone assemblages have been interpreted by Locker as the product of an opportunistic fishery using small boats inshore, or simply fishing from the shoreline. Therefore the assemblages are a fair reflection of the range of species present in inshore waters at the time. The presence of significant quantities of corkwing wrasse bones is interpreted as evidence of warmer sea temperatures than at present. In view of the widespread evidence for a decline in air temperatures prior to the Iron Age (Davidson & Jones, 1985, 32), the possible persistence of warmer seas until a later date is an important factor in the changing Orkney environment. The poor representation of salmonid bones in the assemblage is interesting in view of the present day abundance of brown and sea trout in the Loch of Stenness only 0.5km from Howe. Sea trout are easily netted in the shallow water entering the loch from the sea. The lack of evidence for exploitation of what is now an obvious resource could imply its absence in the Iron Age.

Birds are represented in Phase 7 contexts by the bones of 91 taxa. The close agreement with the present day species list for Orkney is again striking, and a full range of breeding habitats is represented, from sea cliffs to heathland, farmland and freshwater locations. The breeding status and abundance of these species in Phase 7 is hard to establish, as over half the sample are represented by one or two bones only. However changes have clearly occurred in some species, for example, the small scale exploitation of gannets is evidence of local colonies on the Mainland of Orkney at that time. These colonies are now extinct, presumably due to over exploitation, and this was the fate of the great auk. Other than the great auk, the species of sea birds appear to have remained the same, with even the recently expanding fulmar present in Phase 7. The apparent abundance of red grouse in Phase 7 may indicate a greater extent of unimproved heathland, as it is restricted to that habitat, and is not now abundant on Orkney. Red grouse was one of the most abundant species of bird recovered from the Early Iron Age roundhouse at Bu, close to Howe (Bramwell 1987). The turnstone which apparently bred locally in Phase 7 does not breed in Britain at present, but whether this is the result of loss of habitat or some larger scale shift in distribution, is not known. The closest breeding birds are currently in W Norway. Bird species recorded from the much smaller Phase 5/6 assemblages are predominantly those common in the Phase 7 assemblage.

The bones of at least 14 species of mammal were identified from the Phase 7 assemblages (Table 12 below), of which six are domesticates (cattle, sheep, pig, horse, cat, dog), and four are certain human introductions (red deer, Orkney vole, field mouse, brown rat). Only the otter, seals and cetaceans are definitely native, whilst the status of fox is uncertain.

The bones of seals and cetaceans did not allow species identification, so that no comparison can be made with the present day distributions. The low frequency of cetacean bone is thought to result from carcasses being processed on the shore, with the bones only reaching the settlement for the manufacture of artefacts. The fate of seal carcasses is less certain; seal bones are also very rare (23 out of 12,102 identified from Phase 7), but unlike those of cetaceans, they are not found as artefacts. This suggests that some carcasses, or joints at least, were reaching the settlement. It is unclear whether this represents most of a small total, or a tiny proportion of an important wild animal resource largely disposed of on the shore. Where information exists

during the last hundred years, seal populations have been strongly influenced by hunting (Vaughan 1975), and this may well have been true in the Iron Age. The enclosed waters of the Bay of Ireland, which Howe overlooks, currently supports only common seals. Grey seals prefer uninhabited islands and inaccessible beaches on which to haul out, or breed. It is possible that seals were locally scarce in the Iron Age, due to over-hunting near Howe, as all the breeding and haul-out sites were easily accessible to hunters.

Foxes are not part of the modern fauna of Orkney, and the only published archaeological evidence is from the Neolithic chambered cairn at Quanterness (Renfrew 1979). Here, the bones were thought to represent the use of the tomb as a fox den some time after its final use for burial (ie after  $2430 \pm 90$  cal BC), and the bones were subsequently C14 dated to the Iron Age (Hedges *et al* 1987, 300–301). Clutton-Brock (1979, 113), suggests that the fox could have been present in Orkney prior to its post-glacial separation from Scotland. There is no evidence for this, and an intentional human introduction of the fox is equally possible. This must have happened before *c* 400 cal BC as fox bones were identified from the Phase 5/6 deposits at Howe. The presence of skeletons with knife cuts illustrates the disposal of skinned carcasses. The presence in Orkney of wild carnivorous mammals (other than the largely aquatic otter), during or even preceding the Iron Age, must have had a major impact on small mammals, ground nesting birds and red deer calves, as well as on domestic livestock.

Red deer were apparently introduced to Orkney in the Neolithic period (Clutton-Brock 1979), and were present at least in the Mainland and on Westray (Clarke & Sharples 1985). They were therefore a well established component of the Orkney environment by the Iron Age, and were presumably the main grazing animal away from areas used by domestic livestock. Red deer must have played a significant role in the permanent suppression of tree growth over most of the islands.

Three species of small mammal were present in the Phase 7 deposits. The history of the Orkney vole has been extensively discussed in the literature (Berry 1985, 125–7), and is probably a Neolithic introduction. It is the only abundant small mammal at Howe, although many of the bones could represent post Iron Age intrusions: The field mouse (*Apodemus sylvaticus*) was only represented by 16 bones in Phase 7, but occasional bones were present from sediments as early as Phase 3. It was also found in the Quanterness chambered cairn (Corbett 1979), so a Neolithic introduction is possible, unless they were also intrusive there. Berry (1985, 131), considers that the field mouse was introduced to Shetland and the Hebrides from Scandinavia, following Viking colonization. The presence of the brown rat (two bones only), is a remarkably early record for the North of Scotland, and the possibility of intrusion cannot be ruled out.

The considerable numbers of frog/toad bones are important because they confirm the status of one or both of these amphibians as being native, or at least successfully naturalized in Iron Age Orkney. At present the common frog is maintained only by repeated introductions, and the status of the common toad is in doubt (Berry 1985, 122).

The invertebrate fauna is inevitably less well represented in the archaeological record, as few groups leave any fossil remains. The marine invertebrates from Phase 7 are unremarkable, being species still common on shores and in shallow water today. The terrestrial molluscs reflect the man-made habitat in which they lived and reveal nothing about the wider environment outside the settlement.

## SUMMARY

In conclusion, analysis of the plant and animal remains has shown that the Phase 7 settlement practiced a mixed arable and pastoral agriculture, growing naked six-row barley and keeping cattle, sheep and some pigs. This was supported by the hunting of wild animals, birds and fish, and by the gathering of wild plants and marine shellfish. There is no reason to believe that this was simply a consumer settlement, as there was evidence for cereal crop processing, the primary butchering of animal carcasses, and animal dung.

Given that the six units around the broch have all been seen as having a primarily domestic function, from their surviving layout and furnishings, the external yard adjacent to each of the six houses may have housed livestock, although the numbers involved must have been small, and also been used for the storage of crops. Domestic fowl were kept and it is possible that pigs strayed about the settlement rather than being put out to forage. Camilla Dickson has identified burnt dung, probably from milk fed calves; however, only one sample

of dung was found in a place where it could have been burnt *in situ*, (on the final floor in the **SW** house, during the major fire which destroyed the building). This does indicate that young animals at least were kept somewhere within the settlement.

## PHASE 8 • THE LATER IRON AGE FARMSTEAD AND SETTLEMENT

The quality and range of the environmental data for Phase 8 is similar to Phase 7, and the picture they present is not radically different. However, changes were occurring in the subsistence economy of the settlement.

The main change noted in the exploitation of plant resources is the decline in the use of wood as a fuel (7.2 Plant Remains; 7.2.1mf 1:C1–D2). Local supplies of wood must have been a valuable resource since the Neolithic period when the natural woodland was largely destroyed. Therefore any trees must, by the Iron Age, have been a carefully managed resource and simple over-exploitation is an unlikely explanation for the Phase 8 decline. Loss of access to trees is a more likely cause of this change. The substitution of heathy turves as a fuel instead of wood must have had a serious impact on the heathlands that were being stripped for fuel and implies an insufficient supply of peat to the Phase 8 farmstead. Again, as with wood, access to supplies could have been a problem. Diversification in arable agriculture is indicated by the presence of hulled six-row barley, flax and possibly cultivated oats.

Late Phase 7 does have the earliest record of hulled six-row barley on the site, but it is otherwise confined to Phase 8 contexts. Even in Phase 8, naked barley remains the dominant cereal, mixed occasionally with hulled barley, suggesting that it was a minor contaminant in the naked barley crop. Flax is first recorded from Phase 8 stages 3–4, presumably as a crop, either for its fibres, or the edible seeds. The increasing numbers of oat grains in Late Phase 8, probably around the 7th century cal AD, although not specifically identified, may indicate intentional cultivation of that cereal.

In the faunal remains from Phase 8, the main changes are seen in the large mammal bone, with a decline in red deer from 18% of the identified animal bone in Phase 7, to 4% in Phase 8. This is balanced by an increase in domestic animals (sheep and pig). The proportion of red deer bone had in fact declined from 35% in Phases 5/6. It is tempting to view this as evidence for the gradual decline of the red deer population, leading ultimately to extinction, perhaps sometime after the Viking colonization. The evidence of a congenital abnormality in the red deer presented by Smith (7.3 Animal Bone Report below; 7.3.1mf 1:D3–G7) supports the idea of a small isolated population, but this was present from at least as early as Phase 3/4, implying that this small population was apparently successfully managed and maintained for at least 1000 years. If the deer population was declining, then it was probably because its position in the subsistence economy was changing.

Sheep and deer would have competed for grazing, so that any increase in domestic sheep flocks could have displaced the wild deer. Smith draws attention to the changes in sheep mortality, with a greater proportion living longer in Phase 8 than in Phase 7, indicating either that there was improved husbandry or that there was a change in farming practice. Did an increased emphasis of sheep lead to the decline in deer hunting, or did a declining deer population force increases in domestic livestock numbers. Alternatively, the Phase 8 farmstead may have lost access to the deer herd available during Phase 7, or that hunting was no longer a viable proposition for a small family group on their own. Data from other contemporary West Mainland sites would help to resolve this issue.

Two species of mammal are recorded for the first time in Phase 8, rabbit and pigmy shrew. The rabbit is intrusive and recent burrows were noted during the excavation. The pigmy shrew is represented by a single bone, and it is impossible to say whether it was present in the Iron Age or introduced at a later date.

## SUMMARY

The farmstead of Phase 8 presents new additions to the crop range of the Phase 7 settlement such as flax and hulled six-row barley; in addition, there are further economic changes such as the appearance of rabbits, the increase in domestic animals at the same time as the decline in deer and the use of heathy turves for fuel compensating for the decline in the use of wood.

The diversification of arable crops and apparent reduction in hunting leads to an economy that resembles 7th- to 8th-century settlements in Orkney, for example Pool, Sanday (Hunter, pers comm), and Buckquoy, Birsay (Ritchie 1977; Morris 1983, 1989). However, it was still a way of life, with mixed arable and pastoral agriculture, combined with hunting and gathering, that would have been familiar to the inhabitants of the Phase 7 village, 800 years earlier.

## 7.2 • PLANT REMAINS

Camilla Dickson

Howe is one of the very few prehistoric sites in Scotland where plant remains have enabled the study of a continuous record of occupation throughout the Iron Age. In the past, barley grains were recorded from broch excavations but the floor and midden samples were largely discarded. In recent years improved sampling has shown that environmental evidence has been preserved. At Howe the careful sampling of numerous contexts has produced more than eighty taxa of flowering plants and mosses, thus enabling a detailed picture of the use of plant resources over perhaps a thousand years of prehistory.

Pollen analyses show that the local scrub woodland was largely cleared and pastoral farming established before the chambered tomb was built. Barley was recorded from the earliest settlement; certain evidence for naked six-row barley dates from the roundhouse occupation and continues through to the end of the Phase 8 settlement. The ears of naked barley were probably plucked, dried and hand-rubbed. Whole ears were recovered from the Early Phase 7 fire in the broch tower where grain was dried and parched; some grain was cooked whole in broth or as gruel. From Later Phase 7 hulled barley partly replaced naked barley. Wild oats were found in Phase 7 contexts and oats may have been cultivated by Later Phase 8. Linseed/flax seeds were recorded from Early Phase 8 onwards. Fruits of crowberry and whortleberry or cowberry were collected in Later Phase 8. Plants found having ancient medicinal uses are lesser celandine, juniper, cf common skull-cap and cf dead-nettle.

The main roofing timbers were probably of conifer driftwood, larch and probably spruce are indicated; it is suggested that turf was used for gable ends and straw thatch was probably used wholly or in part. Willow was used for smaller roofing wood and for furnace fuel. Birch, ash and alder may have been used in building and part of an alder container was recovered. The striking decrease in wood after Phase 7 is tentatively linked with its exploitation for industrial use. A heather basket was found and heather was commonly used. Brackish water and sea-shore plants were collected, perhaps for animal bedding and fodder. Water supplies from Phase 7 onwards were probably from a loch or pond. Burnt dung indicates that milk-fed animals were housed in the **SW** and **S** buildings during part of Early Phase 7; the **SE** building was domestic.

## METHODOLOGY

Nearly 500 samples were examined in total; most were of carbonized material floated and sieved from the site. 36 wet samples were sieved in the laboratory and at least one sample from each context was prepared for pollen analysis; however, only two samples contained countable pollen. Each sample was examined using a stereo-microscope at x4 magnifications to extract identifiable remains. Fruits, seeds and charcoal were compared with those from a modern reference collection.

Detailed notes on identification are available in microfiche (1:C1-C4). The complete list of macroscopic plant remains from each sample is available in the archive and a summary by phase is set out in Table 2. The nomenclature is according to Clapham *et al* (1981) and Smith (1978) for the wild plants. The detailed results from contexts which are particularly informative from Phases 4 to 8 are set out in Tables 3-7mf (1:C7-C14).

## DETAILED DISTRIBUTION OF PLANT REMAINS BY PHASE

### NEOLITHIC

#### PHASES 1/2

Charcoal only, was recovered from Phase 1/2 contexts. From the pre- Neolithic surface, alder (*Alnus*), birch (*Betula*) and rowan type (*Sorbus*) were present, and from the area adjacent to a hearth spruce (*Picea*) was identified. The status of trees in Orkney is later discussed.

### PHASE 2

Two of the samples from contexts at the base of the chambered tomb mound were productive in both pollen and larger plant remains. One sample (SF 7299) had fragments of decayed turf c 3mm thick consisting of poorly preserved epidermal fragments, together with fruits or seeds of cf tufted hair-grass (cf *Deschampsia caespitosa*), cf rough-stalked meadow grass (*Poa cf trivialis*), conglomerate/soft rush (*Juncus conglomeratus/effusus*) and stinging nettle (*Urtica dioica*). These remains suggest damp grassland or pasture, probably disturbed ground.

The second sample of silts (SF 7302) contained seeds of wood bitter-cress (*Cardamine flexuosa*), hairy bitter-cress (*C. hirsuta*), conglomerate/soft rush (*Juncus conglomeratus/effusus*), blinks (*Montia fontana*), marsh yellow cress (*Rorippa islandica* ssp *islandica*) and procumbent pearlwort (*Sagina procumbens*). These could all have grown on damp ground with some bare mud near to water. Tufts of mosses consisted of *Hylacomium splendens*, *Hypnum cupressiforme* and *Rhytidiadelphus squarrosus* all widespread in suitable grass and woodland habitats with bog moss (*Sphagnum palustre*), found in marshes and wet woods, and *S. sect cuspidata*, some species of which can grow in similar habitats.

#### Pollen Analysis (Table 1mf 1:C4)

From their appearance then, context SF 7299 represents a turf line, and SF 7302 a tuft of moss with seeds, both denoting the original ground surface. They are therefore the equivalent of surface samples, and so local pollen will be over-represented and regional pollen under-represented. Further more, there are very high numbers of poorly preserved unidentified grains, in SF 7299, 72% and in SF 7303, 89%, probably mainly of the grass family (*Gramineae*) with some birch (*Betula*) and hazel/bog myrtle (*Coryloid*) pollen. However clear inferences can be made in spite of these problems.

The most striking features are the low tree and shrub values, only c 16% of the total, which must represent a very open landscape. Grasses form the most important group, over 50% of the pollen; the grassy nature of the immediate area is shown by the grass fruits in SF 7299. Appropriately, this sample contains the highest values for plantain (*Plantago*) species especially ribwort (*P. lanceolata*) at 7%, usually an indicator of pastoral farming; pollen of the buttercup family (*Ranunculaceae*), frequently a pastoral indicator, is also present. Other herb values are low and there is virtually no indication of arable farming; heather (*Calluna*) values are also low. The presence of ferns, up to 14% in SF 7302, from a damp mossy habitat, together with honey-suckle (*Lonicera*) pollen, may suggest the former existence of scrub woodland. In spite of the limitations, already mentioned, of the two samples, it seems reasonably certain that by the time the chambered tomb was built woodland was largely cleared and some pastoral activity established in the area.

Comparisons can be made with pollen analyses showing a more regional pollen picture in the late Neolithic. Analyses through deposits in the Loch of Skaill, c 8km NW of Howe, Glimms Moss, c 12km to the NNE (Keating & Dickson 1979), and Lesliedale Moss, c 12km E of Howe (Jones 1979) all depict a largely treeless landscape with mainly pastoral farming. Local arable as well as pastoral activity is shown from ditch deposits at the Stones of Stenness 3.5km to the NE (Caseldine & Whittington, 1978) and from Maeshowe nearly 5km also to the NE (Jones 1979).

From the same context, wood of Scots pine (*Pinus sylvestris*) was recovered; the status of pine in Orkney is later discussed.

#### PHASE 2/3

The discovery of peat fragments from this early period is of particular interest. In Orkney blanket bog did not begin to form until c 3500 bp as shown by Keating and Dickson (1979), who also note that valley bogs require drainage for ease of cutting. It seems unlikely, therefore, that this sample dates from the Neolithic, but is more likely to be from the earliest settlement. It is noteworthy that peat was not recorded again until Early Phase 7 contexts.

### IRON AGE

#### PHASE 3

The silts overlying the Neolithic ditch, containing midden and other occupational debris from the earliest Iron Age settlement, yielded a few plant remains and these are listed in the main table,

Table 2. The earliest evidence of barley growing at Howe is of one barley rachis fragment only. Birch, cf rowan, spruce, willow and heather were used.

#### PHASE 4-6

The plant material and associated finds from the most informative samples from Phase 4 onwards are listed in Tables 3 to 7mf (1:C7-C14). The plants comprising weeds are discussed later in the report, as is the burnt material resembling dung.

Wheat of emmer type (*Triticum* cf *dicocum*) is represented by one grain from a Phase 4/5 context. Emmer has been found in Orkney from Neolithic to Iron Age contexts, invariably as rare grains and usually with barley. Naked six-row barley (*Hordeum vulgare* var *nudum*) is tentatively identified from Phases 5 and 6 and with certainty from several Phase 5/6 contexts. Three samples, each containing hundreds of adherent grains, purely of naked barley, came from ditch fills; those from 1837 and 1835 had a little adherent carbonized material similar to either burnt flesh or dung. The barley seems to have burnt whilst cooking and is described later in the report. From Phase 5/6, below the late revetment, were found one grain of cf naked barley, rare straw fragments and a quantity of weed seeds including over a hundred fruits of stinging nettle (*Urtica dioica*); however a single nettle plant can produce hundreds of small fruits, so the large number is probably not significant. As all these remains from the ditch fills were carbonized, it is unlikely that any of the plants were growing in the ditch but probably represent straw with accompanying weeds cleared out from occupation deposits. Willow was the commonest wood used and found in thirty of the forty-one samples. Ash (*Fraxinus*), birch, cf spruce and willow were found on the earth floor of the roundhouse/Broch 1 and the presence of post-holes suggests that some of the wood at least was structural. Heather was found in the broch and four other samples.

Unburnt plant material from the Howe occupation was rare, but a little was incorporated in the chocolate-brown silt within the E well, Phase 4-6. The very small plant fragments included one seed and a stem/leaf fragment of rush, two stinging nettle fruits and rare moss leaves including three species of bog moss (*Sphagnum*); bog mosses have a number of uses due to their absorbent properties. Burnt plant fragments consisted of a few heather stems and leaves, a barley grain and a sedge nutlet.

Small fragments of material resembling burnt dung with adherent straw were tentatively identified from the earth floor of the roundhouse/Broch 1. There is insufficient evidence to decide whether the presumed dung was inadvertently brought in with the straw or possible evidence of animals housed within the broch at this time.

#### PHASE 7 – EARLY SETTLEMENT

A cupboard in the broch tower contained, together with a barley grain and a little charcoal, the sole occurrences of single nutlets of three noteworthy plants. Sheep's sorrel (*Rumex acetosella*) was perhaps gathered for medicinal use although in common with other sour docks or sorrels it has been used as a pot-herb (Grieve 1931). Another plant, cf common skull-cap (cf *Scutellaria galericulata*), is now rare on Orkney being restricted to storm beaches in the northern islands (Bullard 1972). Cf dead-nettle (cf *Lamium* sp.) (tentatively identified since the nutlet is smaller than reference nutlets) is also represented; both genera have medicinal uses.

A layer of burning within the interior passage of the broch tower consisted of willow charcoal and peat. The floor of the blocked W intramural cell, c 1.6m above the broch floor, yielded a few barley grains, birch, spruce, willow and heather charcoal; weeds and straw with adherent small fragments, to 6mm diameter, which are probably of dung. Also found were occasional tubers of cf lesser celandine (cf *Ranunculus ficaria*), and an achene, these suggest medicinal use of the plant and are discussed below. Although there

is so little occupational evidence preserved, these sparse remains suggest that peat was burnt and heather used; wood may have been structural or used for fuel.

Occupation evidence from the early part of the Phase 7 settlement is mainly from the two buildings damaged by fire, that is the **SW** and **S** buildings. The yard leading to the **SW** building had an ash and charcoal floor which formed before and during the life of that building. The floor sample consisted of straw (probably barley) and willow charcoal with rare barley and wild/cultivated oat grains, weed seeds, heather charcoal, and, tentatively identified, burnt dung, with adherent straw and peat. A deposit from the entrance paving contained seventy barley grains but was otherwise very similar to the previous sample with the addition of possible tubers of lesser celandine. Inside the building, silting in the corner of a tank contained one oat grain and 16 uncarbonised oospores of stoneworts (*Chara* spp.). Stoneworts are found in calcareous fresh and brackish waters of lochs and ponds and therefore strongly suggest that the tank had contained water. From context 1498, one sample consisted mainly of straw containing 16 barley and 12 oat grains, two of which are certainly of wild oats, and weed seeds; these included capsules of chickweed seeds which suggest that the straw, including the weeds, had not been disturbed after gathering. This implies that the ears had already been collected separately for threshing. Four samples from this context, which covered most of the floor of the building, had dung-like material adhering to straw and willow charcoal. From ash overlying this context a 10cm thick layer of burnt straw was preserved on top of silts resting on a stone. rare fragments of heather were found in it but no burnt dung; this could be one of the rare instances of roofing thatch being preserved. Worked willow wood from the same context was of at least 35mm diameter and may have been used as a roofing support. Samples from context 1394 consisting of rubble, earth and the underlying deposits were of particular interest. Several fragments of larch (*Larix*) charcoal show very narrow annual rings; they are probably from the outer wood of a large piece of timber. This may well be the first prehistoric find in Scotland and must have arrived as driftwood from North America. Larch together with willow charcoal, which now measures 30 × 35mm across, are presumed to be part of the roof; this use is discussed later. Also recovered was plant material similar to that from the partly underlying context 1498 with the addition of a little peat, and a discrete lump and characteristically shaped fragments of dung (illus 78 and notes on the identification in microfiche, 1:C1–C4). Since some of the dung has adherent straw it seems more likely to be from milk-fed calves than from infants.

As has been shown from the archaeological account, there is no other line of evidence to suggest that animals were housed in any of the buildings at Howe. It is important therefore to consider whether dung would have been brought in to store and used as fuel. All the dung recognised at Howe must have been carbonized when fresh; dried dung from suckling animals, including humans, does not appear to form vesicles when burnt. Such fresh dung would not readily dry out in the humid atmosphere of an enclosed building on Orkney. We have no burnt dung from any of the hearth samples. In an Iron Age farmhouse in the Netherlands, dung of only sheep or goats, which is of lower water content, was found in the hearth although cattle dung was readily available (Therkorn *et al* 1984). Another possibility is that dung was deliberately intermixed with straw and used as roofing material. This, however, would have the disadvantage that dung would wash through the straw when ever it rained. The importance of animal manure as fertilizer was certainly recognized by the Iron Age inhabitants of Britain and it seems unlikely that such a valuable product would have been used other than for arable crops. The most plausible explanation is that at this stage the building was used as a byre.

From the occupation debris of the **S** building, an oat grain, straw, weeds, heather and willow were recovered and each of three samples contained burnt dung with adherent straw, wood and stems. It seems likely that this building was also used for animal housing at the time of the fire and the partly dung-covered wood in both buildings could represent fallen roof supports. The

presence of straw and adherent dung covering the living areas and the virtual restriction of cereal grains to the straw are good evidence that the two buildings were used exclusively for animal housing at this period. A single rowan seed may date from the use of the **S** building as a dwelling house.

Intriguing finds from the **SW** and **S** buildings are rare fruits of spiral tasselweed (*Ruppia cirrhosa*); a fruit was also found in the **E** building yard of the later settlement. Spiral tasselweed is confined to brackish water and consists of thread-like stems and leaves; these drift up in autumn in masses in the nearby Loch of Stenness (ER Bullard pers comm). Similar stems are produced by horned pondweed (*Zannichellia palustris*) and these were formerly used in Shetland to stuff mattresses (Fenton 1978). Since the *Ruppia* fruits were found in the same contexts as animal dung, and from a Later Phase 7 settlement yard, it seems more likely that the stems were collected for fodder or possibly to supplement straw for animal bedding.

The double cupboard in the **E** building contained eight barley grains, two of them definitely of naked barley, heather and willow charcoal. The oven contained a little heather, peat, and possibly dung, presumably from fuel. Stake-holes near the S wall of the building held decayed uncarbonised wood, tentatively identified as alder. There is archaeological evidence for possible domestic iron smelting from this building.

Ash deposited from the hearth in the **SE** building produced over a hundred barley grains many of them possibly naked barley, weed seeds were also noted. From a paved area just N of the hearth nine barley grains, one oat grain fragment and small fragments of heather and willow charcoal were recovered. This building seems to have been solely domestic; it is probable that only naked barley was grown at this period. There were no recognizable remains of fuel in the ash dump which suggests that peat may have been used in the hearth. The absence of straw and dung suggest that animals were not quartered in either building.

## PHASE 7 – LATER SETTLEMENT

Within the broch tower willow and spruce charcoal were found in the S part of the inner circle of floor 1 and the N collapsed part of the outer circle of the second floor occupation deposits; wood of 25mm diameter or more is indicated. It is not known whether this represents fuel or roof supports.

A sample from the clay floor contained 17 barley grains with a little burnt chaff and straw and a few weed seeds. On top of this floor, ears of naked six-row barley (illus 79) were laid out to dry in front of the kilns, covering the whole inner circle of the broch tower. Some at least of the barley lay directly on the clay floor and the imprint of the grains remained where they had been trampled into the ground after accidental burning. Associated with the barley was a layer of straw a few millimetres thick containing chaff and weed seeds. A fragment of probable dung with adherent straw may have been brought in with the crop or possibly relates to an earlier use of the tower. From the same context large pieces of willow were identified which are thought to be from fallen roofing. One piece was shaped with two adjacent flat faces, each 30mm across, cut at a slightly obtuse angle; part of these faces and the other two faces had burnt away. Fragments from a long piece of alder had been roughly shaped; they measure 34 × 17mm and 42 × 19mm, and were perhaps part of a slat-like piece. Also from the barley context part of a staved container of alder was found near the barley ears; this and a woven heather basket are described below. Contemporary with the barley fire were the contents of a kiln which contained one oat grain and eight barley grains with weed seeds, presumably all introduced with straw for kindling. Also present were the remains of plants associated with heathy turf and also presumably used for fuel; this was the earliest certain occurrence of turf-forming plants from Howe and they are described below. Post-dating the barley fire, a second kiln had been used for drying barley and 238 grains were found in the ash fill of the lower part of it which also contained rare heather and willow fragments: these were presumably the remains of fuel. We

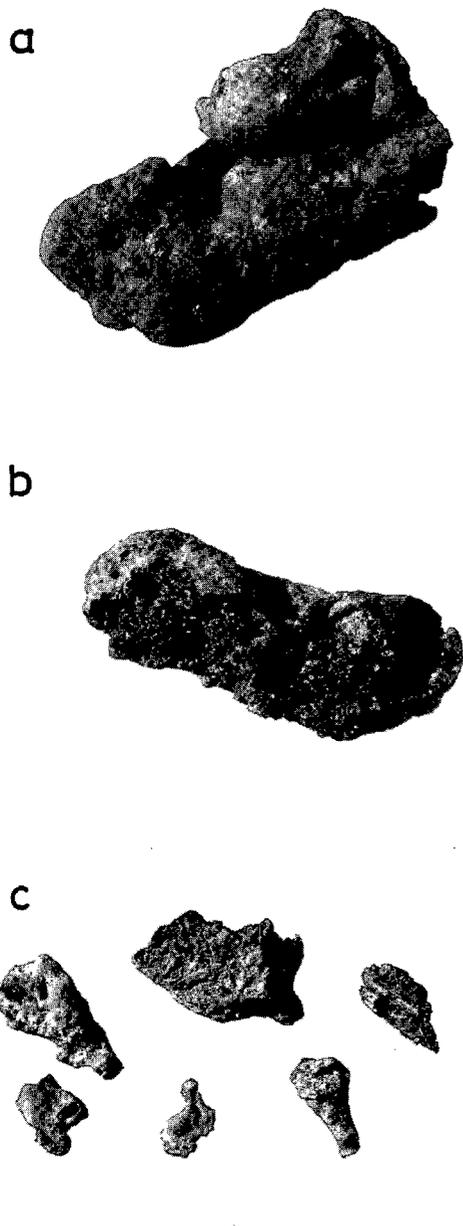
Table 2: Summary of plant remains

	Type of remains	Phase															
		1	2	2/3	3	3/4	4	4/5	5	4-6	5/6	6	5-7	5/7	7	7/8	8
<b>Woodland</b>																	
<i>Alnus</i> (alder)	c			1							2			3		2	
cf <i>Alnus</i> (alder)	w													1			
<i>Betula</i> (birch)	c	1			1						1			4			
<i>Coniferae</i> (conifer family)	c								1					2		1	
<i>Corylus</i> (hazel)	n															1	
<i>Fraxinus</i> (ash)	c										1					1	
<i>Larix</i> (larch)	c													1			
<i>Picea</i> (spruce)	c	1			2							4		9		2	
cf <i>Picea</i> (cf spruce)	c											2		5			
<i>Pinus sylvestris</i> (Scots pine)	w	1															
<i>Prunus avium/padus</i> (gean/bird-cherry)	c															1	
<i>Salix</i> (willow or sallow)	c		1		3	1	7		5		12	2	1	3	104	7	78
<i>Sorbus aucuparia</i> (rowan)	s														1		
<i>Sorbus</i> (rowan type)	c		1		1										1		
<b>Cultivated plants</b>																	
<i>Hordeum vulgare</i> var <i>nudum</i> (naked six-row barley)	g									1	4			8		18	
<i>H. vulgare</i> cf var <i>nudum</i> (cf naked six-row barley)	g								1		1	1		12		8	
<i>H. vulgare</i> var <i>vulgare</i> (hulled six-row barley)	g													1		2	
<i>H. vulgare</i> cf var <i>vulgare</i> (cf hulled six-row barley)	g															4	
<i>H. vulgare</i> sl (six-row barley)	g												1	12		32	
<i>Hordeum</i> sp (barley)	g													7		11	
<i>Hordeum</i> sp (barley)	rac ba				1									5		4	
<i>Linum usitatissimum</i> (flax/linseed)	s															5	
<i>Triticum</i> cf <i>dicoccum</i> (emmer wheat)	g							1									
<b>Arable and waste ground</b>																	
cf <i>Anthemis cotula</i> (stinking mayweed)	cy															2	
<i>Avena fatua</i> (wild oats)	g, fl ba															3	
<i>Avena</i> sp or spp (wild or cultivated oats)	g												1	8		21	
<i>Brassica rapa</i> cf ssp <i>sylvestris</i> (wild turnip)	s		1													3	
cf <i>Elymus (Agropyron) repens</i> (couch-grass)	car															1	
<i>Galeopsis tetrahit</i> agg (hemp nettle)	n										1		1	4		5	
<i>Galium aparine</i> (goosegrass)	fr										1			2		2	
<i>Odontites verna</i> (red bartsia)	s															1	
cf <i>Poa annua</i> (annual poa)	car											1		1		1	
<i>P. trivialis</i> (rough-stalked meadow-grass)	gl+car													1			
<i>P. cf pratensis/trivialis</i> (smooth/rough-stalked meadow-grass)	car	1											1	14		1	
<i>Polygonum aviculare</i> agg (knotgrass)	n										1			4		13	
<i>Rumex crispus</i> (curled dock)	n															2	
<i>R. cf crispus</i> (cf curled dock)	n				1											6	
<i>R. obtusifolius</i> (broad-leaved dock)	n															20	
<i>R. cf obtusifolius</i> (cf broad-leaved dock)	n				1									2		6	
<i>R. cf obtusifolius x crispus</i>	n															1	
<i>Spergula arvensis</i> (corn spurrey)	s														1	9	
<i>Stellaria media</i> (chickweed)	s				1			1			1		1	21		32	
<i>Tripleurospermum inodorum</i> (scentless mayweed)	cy													1		1	
<i>Urtica dioica</i> (stinging nettle)	a		1								1	1	1	4		1	
<b>Grassland, heaths and mires</b>																	
<i>Achillea cf ptarmica</i> (sneezewort)	cy															2	
<i>Alopecurus cf geniculatus</i> (marsh foxtail)	car															2	
<i>Arctostaphylos alpina</i> (black bearberry)	fst															1	
<i>Calluna vulgaris</i> (heather)	c				1			1	5	2			1	58	2	185	
<i>C. vulgaris</i> (heather)	l													2			
<i>Cardamine flexuosa</i> (wood bitter-cress)	s		1														
<i>C. hirsuta</i> (hairy bitter-cress)	s		1														
<i>Carex binervis</i> (ribbed sedge)	n									1	1			7		36	
<i>C. dioica</i> (dioecious sedge)	n															1	
<i>C. flacca</i> (glaucous sedge)	n															3	
<i>C. hostiana</i> (tawny sedge)	n															14	
<i>C. nigra</i> (common sedge)	n													2		20	
<i>C. panicea</i> (carnation sedge)	n													2		4	
<i>C. pilulifera</i> (pill-headed sedge)	n													3		6	
<i>C. pulicaris</i> (flea-sedge)	n													2		8	
<i>C. serotina</i> (small-fruited yellow sedge)	n															3	
<i>Danthonia (Sieglingia) decumbens</i> (heath grass)	car															8	
cf <i>Deschampsia caespitosa</i> (tufted hair-grass)	car		1														
<i>Eleocharis palustris</i> (common spike-rush)	n													2			
<i>Empetrum nigrum</i> (crowberry)	fst													1		24	
<i>Erica cinerea</i> (bell-heather)	l, s													2			
<i>Eriophorum vaginatum</i> (cotton-grass)	sp													1			
<i>Hylocomium splendens</i> (moss)	l sh										1						
<i>Hypnum cupressiforme</i> (moss)	l sh													1			
<i>Juncus articulatus</i> type (rush)	s													1			
<i>J. conglomeratus/effusus</i> (conglomerate/soft rush)	s		2								1						

	Type of remains	Phase															
		1	2	2/3	3	3/4	4	4/5	5	4-6	5/6	6	5-7	5/7	7	7/8	8
<i>J. squarrosus</i> (heath rush)	s														2		14
<i>Juncus</i> sp or spp (rush)	l/st									1						1	2
<i>Juncus</i> sp or spp (rush)	s														3		3
<i>Juniperus communis</i> (juniper)	fst																2
<i>Lotus</i> sp (birdsfoot – trefoil)	s																1
<i>Luzula</i> sp (woodrush)	s																7
<i>Montia fontana</i> (blinks)	s		1					1							3		9
<i>Pedicularis sylvatica</i> (lousewort)	s														2		3
<i>Plantago lanceolata</i> (ribwort)	s													1			12
<i>Polygala cf serpyllifolia</i> (Thyme-leaved milkwort)	s																3
<i>P. cf vulgaris</i> (common milkwort)	s																2
<i>Polygala</i> sp (milkwort)	s																1
<i>Potentilla erecta</i> (tormentil)	a													1			13
<i>P. palustris</i> (marsh cinquefoil)	a																2
<i>Ranunculus acris</i> (meadow buttercup)	a																1
<i>R. ficaria</i> (lesser celandine)	t																1
cf <i>R. ficaria</i>	t													1			1
cf <i>R. ficaria</i>	a													1			
<i>R. flammula</i> (lesser spearwort)	a													2			7
<i>Rhytidiadelphus squarrosus</i> (moss)	l sh		1														
<i>Rumex acetosella</i> agg (sheep's sorrel)	n														1		
<i>Sagina procumbens</i> (procumbent pearlwort)	s		1														
cf <i>Scilla verna</i> (spring squill)	s																1
<i>Selaginella selaginoides</i> (lesser clubmoss)	m													1			4
<i>Sphagnum</i> sect <i>cuspidata</i> (bog moss)	l		1							1							
<i>S. sect sphagnum</i>	l		1							1							
<i>Sphagnum</i> sp or spp	l									1							
<i>Vaccinium aulliginosum/vitis-idaea</i> (bog whortleberry/ cowberry)	s																2
<i>Vaccinium</i> sp or spp	s																2
<i>Viola cf palustris</i> (marsh violet)	s																1
Aquatic and waterside																	
<i>Chara</i> sp or spp (stoneworts)	oo														1		1
<i>Rorippa islandica</i> spp <i>islandica</i> (marsh yellow-cress)	s		1														
cf <i>Scutellaria galericulata</i> (common scullcap)	n													1			
Brackish and maritime																	
<i>Carex cf maritima</i> (curved sedge)	n																2
Fucoid alga (seaweed)	th													1			2
<i>Puccinellia</i> sp (salt-marsh-grass)	car																3
<i>Ruppia cirrhosa</i> (spiral tassel pondweed)	f													3			
Miscellaneous																	
<i>Bromus</i> sp (brome or log-grass)	car														1		
Bryophyta (moss)	1 sh														1		1
<i>Carex</i> sp or spp (sedges)	n														7		36
<i>Galium</i> sp (bedstraw)	f					1											2
Gramineae (grass family)	car					1									12		27
cf <i>Lamium</i> sp (cf dead-nettle)	n														1		
<i>Potentilla</i> sp (cinquefoil or tormentil)	a														1		2
<i>Ranunculus</i> sp (buttercup)	a																1
<i>Rumex</i> sp or spp (dock or sorrel)	n					1			1						8		21
<i>Viola</i> spp (pansy or violet)	s																1
unidentified	ro														1		1
	J																1
	f																2
	rh														1		10
	s										1				5		12
<i>Calluna-Eriophorum</i> peat (heather-cottongrass peat)																	1
<i>Calluna</i> peat																	1
Peat					1						2				20		5
cf peat																	10
Burnt plant material		1			2				2	3	1				16		22
Total no of samples		3	5	1	9	1	7	1	2	4	23	3	4	1	167	7	235

## Key to plant tables

ab	abundant	fi	fibre	n	nut or outlet	sp	spindle from leaf base
a	achene	fl	floret	oc	occasional	ste	stem
adh	adherent	fr	fragment	oo	oospore	str	straw
ba	base	fq	frequent	pe	perianth	th	thallus
bs	budscale	fst	fruit-stone	pl	plant	t	tuber
car	caryopsis	g	grain	rac	rachis segment	unc	uncarbonized
carb	carbonized	gl	glume	r	rare	unident	unidentified
ch	chaff	h	hulled six-row barley	rh	rhizome	w	wood
c	charcoal	l	leaf or leafy	rc	root	+	present
cy	cypsela	m	megaspore	s	seed	++	barley, more than 50 grains
f	fruit	na	naked six-row barley	sh	shoot	++	straw, more than 1/3 of sample

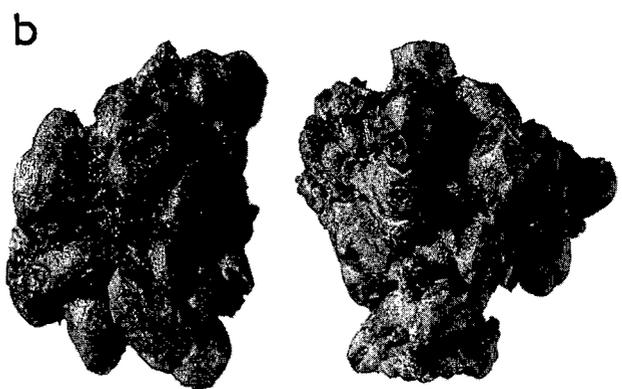


Illus 78  
 a) Carbonized dung of calf from the **SW** building, Early Phase 7 (context 1394); 42mm long; b) as above, fragment showing vesicles and cavities, 19.7mm long; c) as above, fragments, some with club-shaped ends, 10–22mm long; mm scale.

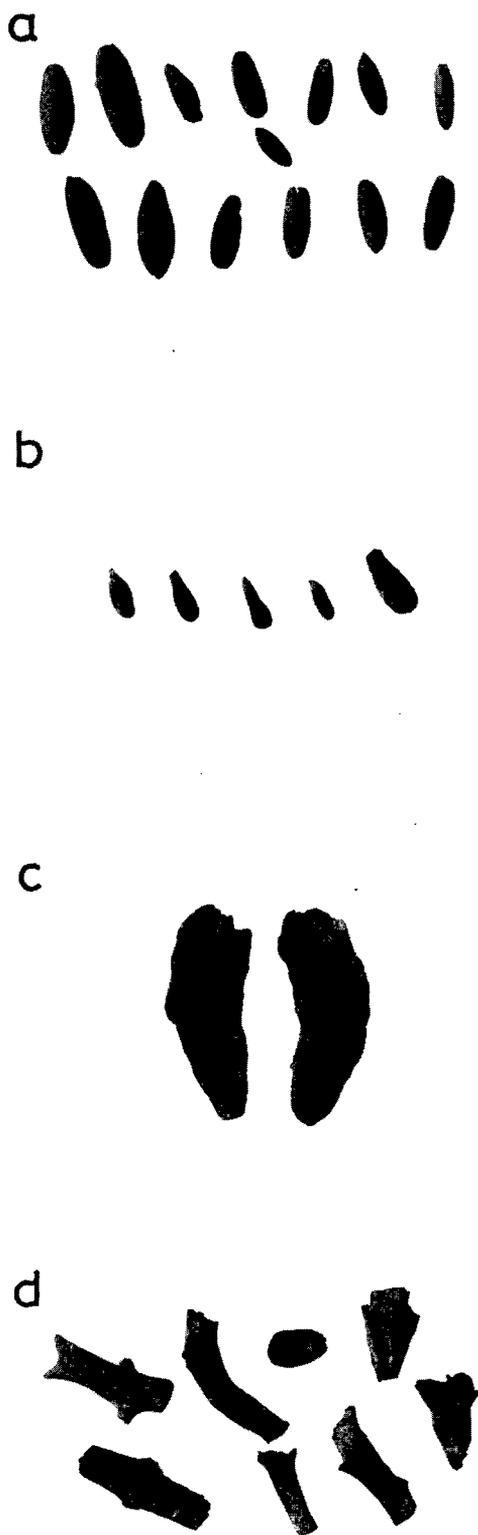
may conclude therefore that during part of the Later Phase 7 period of occupation, the broch tower was used for cereal processing. Barley ears were dried there and grain parched in a kiln. A quern, SF 2453, gives evidence that some of the grain was processed further.

From the path linking the broch to the settlement, three ground surfaces overlying one another, gave evidence of transporting barley, heathy turf, heather, willow and possibly peat.

The settlement buildings contained traces of mostly naked barley, heathy turf, heather, willow, spruce and peat. It seems probable that both turf and peat were used for fuel, although turf was also used for roofing in Orkney.



Illus 79  
 a) Burnt ears of naked six-row barley (*Hordeum vulgare* var *nudum*) on floor 2 of broch tower, Later Phase 7 (context 861); scale – 40mm; b) adherent clusters of naked six-row barley, ditch fill, Phase 5/6 (context 1857).



Illus 80

a) Pure sample of oat grains, wild or cultivated (*Avena* sp), from unphased rectangular building (context 892); grains 3,2–7.0mm long; b) lesser celandine (*Ranunculus ficaria*) tubers, Later Phase 8 settlement (context 644); tubers 2.9–3.7mm long; c) root, split lengthwise, *E* building, Later Phase 7 (context 1356), 29mm long; d) *Fucoid alga* (seaweed), thallus fragments, *E* cell of *NE* building, Early Phase 8 (context 1353); fragments 3.0–9.0mm long.

On the earth floor of the *S* building were found five small pieces of willow roundwood of 10–15cm diameter, 10–13 years old, one piece had been cut obliquely and could represent wattle or kindling.

From the floor round the hearth in the *E* building, two halves of a root cut lengthwise were found, each measured 29 × 10mm (illus 80c). Starchy roots have been used for food in the past in times of scarcity, sometimes ground and used as meal, and medicinal uses are recorded for some species. The earth floor of the yard produced another fruit of tasselweed previously found in Early Phase 7.

A cell of the *NE* building yielded over 100 barley grains of both naked and hulled six-row barley; this is the earliest occurrence of hulled barley from Howe. The furnace dump in the yard contained heather, willow, of spruce and peat.

#### PHASE 7/8

From the third and later floor of the broch tower about a sixth of the total contents of a furnace were examined (illus 81). All the charcoal identified, over 1000g, was of willow (*Salix*); a little was of roundwood, twenty pieces of which measure 14–24mm diameter and range from 6–23 years growth. A few fragments of rush leaves/stems and other stems were noted.

From the fourth floor, a sample contained two fragments of willow roundwood each 12mm diameter, one of which had been cut obliquely, together with fragments of larger diameter willow.

#### PHASE 8 – EARLY SETTLEMENT STAGES 1–4

In the *stalled* building a single seed of flax/linseed (*Linum usitatissimum*) came from floor levelling below the paving, as did



Illus 81

Pieces of willow (*Salix*) charcoal from floor 3 of the broch tower, Phase 7/8; scale – 20cm.

two thallus fragments of a fucoid seaweed and a small fragment of alder. This is the earliest flax seed found on the site; the plant's possible use at Howe is later discussed. A few grains of tentatively identified hulled and naked barley and rare grains of wild or cultivated oats were found in hearth deposits; naked barley and less well-preserved barley grains came from other contexts. The soakaway contained 60 oospores of stoneworts, aquatic plants from fresh or brackish waters as previously found in an Early Phase 7 tank at Howe. Willow charcoal of over 40mm diameter was noted from below the paving. Pieces of worked alder wood were found in the hearth; the carbonized wood had two adjacent incomplete flat faces, 35 and 45mm wide, cut at a slightly obtuse angle, the other two sides were burnt away. It seems probable that alder and willow were both used, perhaps as roofing supports. Heathy turf and possibly peat, found in hearth deposits, were presumably used as fuel, but the use of turf also for roofing cannot be excluded. Rare fragments of tentatively identified burnt dung together with tiny straw fragments, were also found.

The plant remains from the **NE** building, its S annex and the yard show similar signs of domestic occupation. Barley grains, rare except for the 27 found in the hearth of the yard, were poorly preserved but naked barley was present. Willow, heathy turf and peat were found in hearth and floor samples. Well preserved heather-cottongrass (*Calluna-Eriophorum*) peat was found in the main building. From the separate cell to the E, 50 small thallus fragments of a fucoid seaweed (illus 80d) were found with willow and heather charcoal on the earth floor. Seaweed has only been noted from two other contexts at Howe, one small fragment from a shelly deposit in Phase 7 and two from the Phase 8 **stalled** building. Similar fucoid seaweeds have been used medicinally (Grieve 1931), they were also used to supplement cattle food in winter (Fenton 1978) and for fuel. Seaweed is still used as manure.

Willow charcoal was recovered from the charcoal spread derived from destruction deposits which partly covered the hearth in the **W** building, an iron-working shed.

From the hearth in the reused **E** building were found over 80 barley grains, some definitely referable to the naked variety. From the same context, gean or bird cherry (*Prunus avium* or *padus*) charcoal was identified; no *Prunus* species are native to Orkney and this is the only find from Howe. From the same hearth a single fruit-stone of juniper (*Juniperus communis*) was identified; this is of particular interest since the fruit has a long history of medicinal use and is still so used. Its culinary use with meat is of more recent origin. Although the fruit could have been introduced with kindling none of its charcoal was found.

#### PHASE 8 – LATER SETTLEMENT STAGES 5–10

As shown in Table 7 (1:C13–C14), hulled as well as naked barley was recovered from stages 5 and 6 of the Phase 8 settlement. Wild/cultivated oats were found, usually as one or two grains with barley. From context 378, 36 grains of naked barley and 13 grains of oats were recovered; as with all the oat grains from Phase 8 there were no glumes left to enable specific identification, so it is not known whether this represents a very weedy crop or the earliest instance of cultivated oats from Howe. Seven seeds of flax/linseed (*Linum usitatissimum*) were recovered from stage 5 floor samples and two single seeds from stage 9, from silt and levelling under the floor.

The remains of various berried fruits are of particular interest; 18 fruit-stones of crowberry (*Empetrum nigrum*) with three seeds of bog

whortleberry or cowberry (*Vaccinium uliginosum* or *vitis-idaea*) were found in a stage 6 hearth deposit. From a later stage of the same building six crowberry stones and two seeds of bog whortleberry or cowberry with nine poorly preserved seeds of *Vaccinium* type together with a single fruit-stone of black bearberry (*Arctostaphylos alpina*) were recognised, also from a hearth deposit. Crowberry fruits are eaten by Inuits and used to be eaten by highlanders; they are quite palatable, although not very flavoursome. Fruit of *Vaccinium* spp are particularly sought after in northern countries, all are useful sources of vitamin C and *Vaccinium* spp have medicinal uses also (Launert, 1981). The black bearberry is an uncommon plant usually of montane vegetation but Bullard and Goode (1975) point out that such vegetation is found in exposed parts of the Orkney Islands, and the plant still grows on three of them (Bullard 1972). The juicy berries are 6–10mm across, the fruit-stone seems particularly resistant to decay as this one was not carbonized. The same context produced another juniper fruit-stone and with 45 nutlets of broad-leaved dock (*Rumex obtusifolius*) imply deliberate collection, both plants have medicinal properties which are later discussed.

A few fragments of a hazel (*Corylus*) nut shell were found in a stage 10 hearth; hazel is now almost extinct in Orkney and this is the only find of hazel from Howe.

Nine tubers of lesser celandine (*Ranunculus ficaria*), five shown in illustration 80b, were found in an ash dump just below a hearth, context 640. The tubers, which are formed just below the ground, must have been deliberately collected; they have been used medicinally, certainly since classical times. The properties of the plant are discussed later; the young leaves have been used as a salad (Launert 1981).

Ash (*Fraxinus*) wood, as previously stated, was presumably brought to Orkney, it was found in a yard S of the N room. From the same context were found a single nutlet of curved sedge (*Carex cf maritima*) and two fruits of a species of saltmarsh-grass (*Puccinellia*). They must have come from the sea shore, (the nearest is 0.5km away where *Puccinellia* still grows), perhaps from vegetation gathered from the strand line for hay. It is possible of course that detached fruiting pieces were adhering to the spruce driftwood which was found in the same context. A single fruit of saltmarsh grass was noted in another Phase 8 context and both species were present in a stage 5 context.

Heather (*Calluna*) peat was definitely identified from stage 6 and peat was probably used throughout stages 5 to 9, although very small fragments were only tentatively identified from stage 9. In 16 of 19 stage 10 hearth contexts only heather twigs were found. Remains of heathy turf plants were found with peat in some hearths, but there was no good evidence for turf in stage 10. Willow was noted from some of the hearths. Part of a root 25mm long by 10mm across was recovered from a wall core from stage 10; this is only the second root fragment from Howe, the other was from Later Phase 7.

#### LATE – RECENT AND UNPHASED

A sample from an apparently rectilinear structure SW of the settlement yielded 40 oat grains (illus 80a). 14 of these measure 5.0 (3.2–7.0) × 1.8 (1.2–2.4) × 1.6 (1.2 × 2.5)mm. Although they fall within the size range of both wild and cultivated oats it seems unlikely that a pure sample of wild oats would be found within a building, and so they are more likely to be black oat (*Avena strigosa*) or common or white oat (*A.sativa*); black oat was the species traditionally grown on Orkney. Fragments of willow wood were also recovered.

## WOOD AND CHARCOAL

### ORKNEY WOODLAND

Woodland cover has always been light on Orkney and on mainland Orkney at present the only native small trees and shrubs remaining are those of aspen, juniper and willows. Pollen analyses have shown that birch-hazel scrub, light even before the Neolithic,

became largely replaced by pasture certainly under the influence of man and his grazing animals and also perhaps through climatic change (Keating & Dickson 1979). However, sheltered valleys would still have sustained woodland as is shown by remains of wood in peat and post-Neolithic pollen analyses. The only native woodland still remaining is on the island of Hoy where, in a

sheltered valley, aspen, birch, hazel, rowan and willow still grow, accompanied by tall herb communities such as still exist in other Orkney dales. In earlier times therefore we may assume that, in places sheltered from the very strong, salt-laden winds which inhibit tree growth at the present time, woodland vegetation would provide leaves of trees and shrubs and herbage which would supplement grasses as food for the larger herbivores such as red deer. However, if the grazing pressure intensified and tree seedlings were eaten preventing regeneration, trees would only remain in places inaccessible to animals, for example aspens on cliff sides such as survive at present. Similarly over-exploitation by man could equally well remove the remaining woodland.

### ORIGINS OF THE WOOD USED AT HOWE

Only birch, hazel and willow are certainly known to have grown on mainland Orkney, evidenced by wood and, in the case of hazel, nuts preserved in peat; additionally, there is evidence of juniper from locally distributed fossil pollen. It is almost certain that rowan also once grew in mainland Orkney where rowan seeds have also been identified from two other archaeological sites. Alder and pine wood have been found on Orkney from the Neolithic and later archaeological contexts but their native status has never been definitely established. However, since their pollen has been found in relatively high values, especially before the Neolithic in the case of pine, it seems possible that due to exploitation by man they became extinct on Orkney. As already stated, ash and gean or bird-cherry are not native Orkney trees and must have come from the Scottish mainland.

Larch has never been a native British tree and spruce ceased to be a native many tens of thousands of years ago. Graham (1952) suggests that spruce driftwood probably originated from North America, where spruces, the American larch and other conifers still extend along the NE coasts, remnants of the great forests which existed before the 17th-century colonization began. Many of the fallen conifers would have been swept out to sea and floated eastwards on the prevailing currents. Fenton (1978, 111) quotes from the captain of a sailing ship who kept meeting 'Great Firre trees', on a voyage from Orkney to Iceland in 1577. No doubt the driftwood logs which are still occasionally found on Orkney beaches would have been much more plentiful in the past and it is notable that spruce wood had been found at numerous coastal archaeological sites in the N and W isles of Scotland, some containing holes bored by marine organisms.

### THE USES OF WOOD AT HOWE

The charcoal most commonly found was that of willow, present in 135 Phase 7 contexts and 78 Phase 8 ones. Willows would be common on the undrained often impervious soils; they are particularly fast growing and so the removal of branches would give a renewable resource over many years if browsing were prevented. Willow seems to have been used for roofing supports, although the small size of present day willows on Orkney suggests that long timbers would be very difficult to find. The position of willow charcoal after the fire in the Early Phase 7 SW building suggests fallen roofing, and shaped wood from the Later Phase 7 broch tower may have had a similar origin. Wood of at least 30 × 30mm across was used. Willow wood was used exclusively for the Phase 7/8 furnace in the broch tower and included roundwood. Willow was found in one of the five Phase 7 hearths and in 18 out of 98 Phase 8 hearth deposits.

Alder charcoal was present in eight contexts from the Neolithic and Iron Age periods. Decayed alder wood was tentatively identified from stake holes in the clay floor of the *E* building of Early Phase 7 date; its uses could be connected with domestic iron smelting in that building. From the Early Phase 8 *stalled* building, worked wood, partly burnt away, was found in the hearth; it was at least 45 × 35mm across and could have been structural in origin.

The only certain wooden artefact from Howe consisted of carbonized fragments of an alder wood container from the Later

Phase 7 burnt grain floor of the broch tower. The wood is all cut tangentially, the two faces parallel to the tangential plane are usually slightly curved. The growth rings suggest that wood ranging from c 60–500mm in diameter was used (the measurements are based on the degree of curvature of the growth rings and assume equal growth all round the tree). The sides are now c 15mm in thickness with a rounded unthickened rim. Each of the better preserved pieces has a flat face shaped along one longitudinal side at between 110° and 120° to the inner face. The only piece with a complete cross section has the other longitudinal side at 90°. Narrow grooves on the two small fragments suggest that the pieces may have been held together with bands of fibre or metal. Vessels and other artefacts of alder have occasionally been found in archaeological contexts (Coles *et al* 1978).

Birch charcoal was recovered from seven samples at Howe from Neolithic and Iron Age contexts. Birch is a harder wood than willow and may have been used structurally since it was found on the earth floor of the Phase 5/6 roundhouse/Broch 1 earth floor with ash, willow and cf spruce all in the same context as six post-holes used as roof supports. A fragment of a possible birch artefact was found in an Early Phase 7 wall context. It has been cut tangentially from mature wood and appears to have been rounded at one end and broken transversely. The length is now 50 × 43mm broad and 10mm thick. It could be part of a spatula; the even grain and relative hardness of birch makes it a suitable wood for small objects.

Ash wood may have been used structurally in the roundhouse/Broch 1 as previously described; a fragment was also found in the yard of a Late Phase 8 house. Ash is a hard, heavy wood and so unlikely to have arrived as driftwood; it may have been reused wood. Its flexibility makes it ideally suited to boat building.

Gean or bird-cherry was represented by a single fragment from the hearth of the *E* building in the Early Phase 8 settlement; the hard fruit woods have been previously used in prehistory for handles and ferrules (Coles *et al* 1978).

Three finds of rowan type charcoal were recorded from Neolithic and Iron Age contexts and they do not relate directly to buildings.

A single piece of pine wood was preserved in the waterlogged silts of the chambered tomb mound.

A single find of larch came from the Early Phase 7 SW building. Larch heartwood is naturally durable and stronger than any other common softwoods. Larch is used for beams and joists and would last longer than any other available wood for roof timber which could well have been its use at Howe.

Although spruce was recovered from all periods at Howe, as 18 certain and seven tentative identifications, it is not clear whether it was used for building although doubtless, as with larch, long straight trunks would be washed up on the shore. In common with other resinous wood, larch and spruce have a high calorific value making them particularly useful as fuel.

### DISCUSSION

The evidence for the use of wood in building derives mainly from buildings damaged by fire. From the Early Phase 7 settlement, pieces of willow charcoal were found in three contexts within the SW building and from their position they appear to be from fallen roofing. The largest remaining pieces were of 35 × 35mm and 35 × 30mm minimum diameters. Wind-shaped willows growing on Orkney at the present time are much branched and only attain a height of about 2m and therefore do not produce substantial timber but could be used for smaller roofing wood. The absence of post-holes in most of the settlement buildings suggests that there were usually no central posts to support the roofs.

Wood for rafters and tie-beams would need to be of timber up to 4m or more in length. It is unlikely that any wind-trimmed native

tree could produce such long straight lengths. However, as already noted, conifer driftwood would meet this need and the timber could be cleft until it was a suitable width. Some of the larch fragments from the **SW** building have broad, curved growth rings from near the centre of the tree and other fragments have very narrow rings of only 5mm in twenty-two years denoting the very slow growth of a large tree; this suggests that substantial timber was employed. If straw thatch were used, a pitch of not less than 40o would be needed; this would involve the building of substantial gable ends to the required height. For ease of construction, turf or peat could be used for this purpose on top of the stone walls. There is, not surprisingly, no evidence for gable ends at Howe. Turf, if used, would, on re-roofing, be renewed and the old turf used for fuel or spread on the arable fields. There is evidence for the use of turf for composite walls in Norse and pre-Norse dwellings in the Northern Isles (Fenton 1978, 112) and gable ends of turf have been recorded on old buildings in Shetland, one such resting on a wooden lintel forms part of a byre (*ibid*, fig 59). If the form of construction were similar to that traditionally used in Orkney and Shetland, employing tie-beams (*ibid*, fig 64) the purlins could be of smaller wood such as narrow, short lengths of willow. Driftwood, roughly shaped, was traditionally used as roofing timber in Orkney and Shetland. It was covered with thatch, turves and flagstones used separately or in combination and secured with ropes of heather or straw.

Spruce seems to have been the conifer most often used by the prehistoric populations of the N and W isles. Spruce timber has been found in a Bronze Age context at Stanydale, Shetland where it was used for 10 inch wide posts and perhaps rafters, lengths of 20 feet upwards would have been employed (Calder 1951). The use of driftwood in building construction continued certainly into the late seventeenth century in Orkney (Fenton 1978, 111) and to as late as the nineteenth (BBS pers comm), although whether this resulted from shipwrecks is not known.

## DECLINE IN WOOD USE

As shown in the main table (Table 2), wood was used throughout the history of Howe. Although little evidence remains from the Neolithic period, the presence of alder, birch, pine, rowan type, spruce and willow shows the variety of woods available. The long Iron Age occupation used the same woods with the exception of pine but with the addition of ash. The Phase 8 occupation lacks birch, pine and wood of rowan type. As shown in Table 2, the number of Phase 7 and Phase 8 samples is very similar and so a comparison may be made between them in the use of wood. Only about half as many Phase 8 as Phase 7 samples contained wood and this reduction affects all the trees. This contrasts with heather which is present in more than twice as many Phase 8 as Phase 7 samples. Of the Phase 8 samples, 98 are from hearths but only six of the Phase 7 samples are from hearths; Phase 8 hearths account for 83 of the 185 heather samples, but even excluding these hearth samples, the use of heather increased considerably and that of wood decreased substantially during the Phase 8 occupation.

The industrial development in the Later Iron Age at Howe would increase the demand for fuel. Iron working in Later Phase 7 used willow, cf spruce and peat, and willow was used in the Phase 7/8 furnace. Willow charcoal found in the Early Phase 8 iron-working shed was probably used in a furnace there. An ash and slag dump from Later Phase 8 produced willow, peat and heather although no industrial hearths were found after Early Phase 8.

It may be that increased use of wood caused demand to outstrip the supply and that for domestic use, heather and heathy turf were increasingly used. Peat was only certainly found in two Phase 8 hearth deposits but present in several floor samples; since peat burns more readily to ash, leaving no coarse debris, its use may be underestimated when examining floated and sieved samples.

## CROP PLANTS

As shown in the tables (1:C7–C14), naked six-row barley was the cereal most commonly grown at Howe from the time of the earliest Iron Age settlement right through to the latest Phase 8 occupation. Naked barley is known from Orkney from the earliest Neolithic occupation onwards.

Several thousand adherent grains of pure naked barley were recovered from Phase 5/6 ditch fills. The grains are depressed where they press against adjacent grains (illus 79b; this is probably caused by the grains being picked at a milk-ripe or nearly dough-ripe stage. Ripe grains and dried unripe grains do not readily become depressed on cooking. Ripe grains do not adhere to each other unless cooked in a medium such as a gelatinous stock or in milk; in these, the carbonized media glue the grains together. No such substance was seen on the Howe grains. The use of milk-ripe pearl barley for soups is recorded by Pliny (AD 23–79). Perhaps these grains represent a thick barley broth; if so, it is one of the very few records of prehistoric soup. A 'porridge' of hulled and naked barley cooked in some unidentified medium was found in a Late Iron Age house in Finland (Aalto 1982). Some of the burnt deposits found on pot sherds at Howe were of cereal-type cells and barley was tentatively identified on one of them, as described elsewhere; these were preserved on sherds from all phases from 3 to 8. It seems most probable that thick broths and gruels were cooked, although we have no good evidence for any milk-based products.

Some of the stages of cereal processing are indicated from the Late Phase 7 floor in the broch tower where a fire had preserved individual ears of naked barley laid out to dry by the warmth of kilns or ovens. Three of the six rows of barley in each ear can still be seen (illus 79a), the other three rows would lie underneath; they appear to be of the nodding lax-ear variety although this could not be confirmed from the rachis segments since they and most of the chaff had burnt away. It is not known definitely whether the ears and straw were harvested separately. However it was noted that

samples of straw, whilst including weed seeds, did not include rachis fragments and in one instance appeared to have been undisturbed since gathering, in fact rachis fragments were only rarely recovered from any Howe sample. As Hillman (1981, 152) points out, rachis remains are very prominent in charred remains of threshed straw that has been reaped together with the free-threshing ears. Ears of corn were plucked by hand in historic times in Orkney if the corn was short stalked, as longer lengths of straw were required for thatching (Fenton 1978, 337). The presence of the low growing chickweed (*Stellaria media*) in with the straw, suggests that the straw was gathered low on the stalk. One possible example of straw thatch was found as a 10cm thick layer overlying some of the other deposits in the burnt **SW** house from Early Phase 7.

One of the traditional methods of separating naked cereal grains is by hand-rubbing followed by light winnowing (Hillman 1981, fig 6). This leaves pure grain free of chaff and weed seeds; such grain was found in the kiln from the same floor in the broch, presumably being parched there before use or storage. Pure grain had been previously described from the earlier ditch fills. It seems likely that grain was sometimes toasted before grinding and mixing with milk for 'burstin', a traditional cereal dish described by Fenton (1978, 375, 395). Parched grain could be ground for barley-meal bread or bannocks, and a quern, SF 2453, suggests that this was also carried out in the broch. From Iron Age bread found at Glastonbury, Somerset, Helbaek (1952, 212), distinguished fragments of wheat and hulled barley. Barley was also malted for ale making in Iron Age Britain and farm kilns survived into this century in Orkney largely for drying malt; however none of the barley showed the sprouts which would indicate that grain was being used for this purpose.

From Late Phase 7 onwards, hulled six-row barley, also known as bere barley, was often found in the same samples as naked barley grain. Although it would first need hummeling to remove the long

awns (Fenton 1978, 373), bere could be ground without dehusking and bere bannocks became one of the traditional foods in Scotland and are still made in Orkney. However, for broth and gruel, naked barley would be preferable since hulled grain would first have to be dehusked using a knocking stone and pounder (*ibid* 390). It is noteworthy that knocking stones were not found in context at Howe, so it seems probable that naked barley continued to be grown for broth and gruel for children. Naked barley continued in cultivation at least during the Norse period in parts of the N Isles; presumably some factor such as greater susceptibility to disease, poorer yields or weaker straw led to its complete replacement with bere barley which continued to be the main barley crop grown until earlier this century in Orkney.

There is no indication that farming standards changed during the long occupation; as described elsewhere, the barley grains were of similar size throughout. Barley grains were often associated with seeds of chickweed, a plant of rich soils, a good indication that barley fields were regularly manured.

Oat grains were generally present as rare grains with the barley, although it does not seem possible to specifically identify glumeless grain on carbonized material. Grain from Phase 7 seems to be all or mainly of wild oat (*Avena fatua*). Later Phase 8 samples have a higher proportion of oat grains, which may imply weedier fields or deliberate cultivation. It is worth noting that wild oats used to be roasted for burstin. A single pure sample of 40 oat grains from a late or unphased building must surely indicate deliberate collection. Grains of black oat (*Avena strigosa*) have been recovered from an undated deposit in Gurness Broch, Evie, Orkney (Dickson 1987b), and cultivated oat (*Avena sativa*) was identified (Donaldson *et al* 1981) from Norse deposits at the Bay of Birsay, Orkney.

Of particular interest are the seeds of flax/linseed (*Linum usitatissimum*) from Early and Later Phase 8 buildings. Previous pre-Norse records of the plant from northern Scotland have been of a single seed from a broch in Caithness (Dickson & Dickson 1984), and rare seed and capsule fragments tentatively identified from human coprolites at Warebeth broch, Orkney (Bell & Dickson 1989). The Warebeth find shows that the plant had been

grown for consumption as linseed. Bond and Hunter (1987) list Norse and later finds from Orkney and Ireland. They also discuss the complex processing needed to prepare the flax fibres for weaving which seems unlikely to have been carried out by subsistence economies. The interpretation of flax/linseed (*Linum usitatissimum*) grown as a fibre plant is dependent on finds of linen processing implements as pointed out by Bond and Hunter. A weaving comb related to Early Phase 8 could have been used for wool or linen weaving, but there is no unequivocal evidence for linen manufacture at Howe.

#### ARABLE WEEDS

The weed seeds were usually found with barley grains, sometimes with straw and chaff also present but the latter readily burns away. It seems likely that most of the weed seeds originated with the barley crop and were discarded together with the straw and the chaff during the processing. Weed seeds were not usually present in large numbers and there is no suggestion that any of them were collected for food. Where present in dwelling houses, there seems to be no difference in their distribution between the floor and the hearth. It is not certain whether they represent the refuse from cereal processing in the houses or came from straw brought in for kindling; collapsed straw roofing is another possible source.

Relatively small numbers of weed seeds were found in the larger straw samples which suggest that the crops were carefully weeded.

Chickweed (*Stellaria media*) was the most commonly occurring weed represented; although hand weeding of the young corn would remove most arable weeds, chickweed can grow and seed in five to seven weeks, its presence denotes richer soil. Other frequently occurring arable weeds were hemp-nettle (*Galeopsis tetrahit*), meadow grasses (*Poa cf pratensis* or *trivialis*), knot-grass (*Polygonum aviculare* agg), broad-leaved dock (*Rumex obtusifolius*) and corn spurry (*Spergula arvensis*). Plants of wet places occurring with the straw and chaff were marsh foxtail (*Alopecurus cf geniculatus*), common spike-rush (*Eleocharis palustris*) and lesser spearwort (*Ranunculus flammula*), all probably growing in wet hollows in the corn field.

### EDIBLE FRUITS AND NUTS

Fruit which had been deliberately collected was only found in the Later Phase 8 houses. Fruit-stones of black bearberry (*Arctostaphylos alpina*) and crowberry (*Empetrum nigrum*) and seeds of whortleberry or cowberry (*Vaccinium uliginosum* or *vitis-idaea*) were found in hearth deposits of the second and third stages of use of the same building. Although crowberry stones occurred as isolated finds in 24 Phase 8 samples, they were always accompanied by heather and sometimes also by plants of heathy turf; it is probable that in most instances therefore they came in turf. Cowberry and black bearberry are now only locally distributed and usually found near the summits of hills in Orkney (Bullard & Goode 1975). It is doubtful whether suitable habitats ever existed close to the low lying Howe area. Perhaps they were brought back to dry for winter use or, as has been already suggested, the *Vaccinium* species could have been collected for medicinal use.

The discovery of these autumn fruiting species in the hearth debris of the last fires of Phase 8 suggests that the dwellings were rebuilt or reroofed in the autumn perhaps to take advantage of the new season's straw and heather for thatching. Fruit must have been scarce on Orkney: neither raspberry (*Rubus idaeus*) nor blackberry (*R. fruticosus*) for instance are native there, although bilberry (*Vaccinium myrtillus*) would be frequent in dales and heathland. Berries were evidently sought after but were no doubt normally eaten where collected and so finds such as these are unusual.

A few hazelnut fragments, also from Later Phase 8, were the only evidence of hazel at Howe and it was probably not grown locally. However, hazel charcoal was found in another part of mainland Orkney in Norse or earlier deposits at the Bay of Birsay (Donaldson *et al* 1981).

#### DOCKS (*Rumex*)

##### CF CURLED DOCK (*Rumex cf crispus*) AND BROAD-LEAVED DOCK (*R. obtusifolius*).

Two samples of pure collections of large numbers of uncarbonised dock nutlets were found in well-stratified deposits. It was noted that some of them germinated after the samples were collected and bagged. It was considered possible that these were still viable ancient seeds and a single nutlet from SF 6369, associated with

the germinated ones, was submitted to the Oxford Accelerator for dating. The date proved to be modern and so it must be assumed that the other nutlets from these two samples are also modern. Details are given here of the finds and possible mechanism for their presence since similar collections may well be found at other archaeological sites.

From Early Phase 7 rubble at the rampart face, c 2.0–2.5m below the topsoil, at least 100 nutlets were found in damp stony silt, mostly contained within an area 0.2m square. The nutlets were

identified as broad-leaved dock (*Rumex obtusifolius*) by their shape and cell pattern. One nutlet only was still enclosed in the perianth. A further collection consisting of over 450 *Rumex* nutlets was found scattered between paving slabs in the Early Phase 8 occupation of the **NE** building. The sample was *c* 1.50m below the topsoil but not waterlogged. Most were identified as broad-leaved dock (*R. obtusifolius*), and only one nutlet retained the perianth. Three nutlets were tentatively identified as *cf* curled dock (*R. crispus*) and a number are intermediate in shape and cell pattern between *R. crispus* and *R. obtusifolius* which are known to produce fertile hybrids.

Curled dock (*Rumex crispus*) and broad-leaved dock (*R. obtusifolius*) grow in the vicinity of Howe at the present time. Dock fruits are often produced in large quantities; curled dock can produce over 40,000 fruits and broad-leaved dock over 60,000 per plant in a year (Cavers & Harper 1964). The fruit of both species is mainly wind-dispersed complete with enclosing perianth segments; those of curled dock can also be water-dispersed, and the spines on the perianth of broad-leaved dock also enable the fruits to adhere to animal coats. Viable nutlets of broad-leaved dock have been found in cattle droppings and those of curled dock from the excreta of various birds (Salisbury 1961, 102, 104).

The Howe mound consisted mainly of stone and rubble and was riddled with cavities. Although it is improbable that weeds were blown or moved down by tunnelling operations into discrete areas, it is possible that small rodents could have collected them. To test this hypothesis nutlets were placed where mice were known to feed and up to 500 nutlets of broad-leaved dock (*R. obtusifolius*) (perianth segments removed) were taken overnight but none when the papery perianth was left intact covering each nutlet. A specimen of field or wood mouse (*Apodemus sylvaticus*) was trapped the following night (author's observations). Bones of field mice were commonly found from the excavation at Howe, and it seems probable that field mice were responsible for the collection of uncarbonised nutlets.

A collection of 45 carbonized nutlets of broad-leaved dock (*R. obtusifolius*) were found in a Late Phase 8 hearth deposit along with seeds of berried fruits which must have been deliberately collected. There seems to be no record of the collection of curled (*R. crispus*) or broad-leaved dock nutlets for food in Britain, probably because of their astringency, but it is just possible that they were gathered for medicinal use (Grieve 1931). These docks are commonly found as weeds in waste places and field margins; their nutlets are also present in small numbers in other samples in company with other arable weeds.

## MEDICINAL USES OF PLANTS

It is only rarely that plants with claimed medicinal uses have been recorded from prehistoric sites in Britain. We have no definite proof that the medicinal properties were known or even that the plants were gathered for medicinal purposes at Howe. However, such knowledge was widespread in S Europe dating back some four millennia in a more or less continuous tradition. For instance Hippocrates' (b 460 BC) use of medicinal plants was quoted and added to by Pliny (23–79 AD) and others. Fruits or tubers of the following plants (Table 10) which have medicinal uses appear to have been deliberately collected.

Firstly, the evidence for deliberate gathering must be examined. As previously stated, the absence of juniper charcoal suggests that the fruit alone was collected. *Cf* skull-cap may have been growing by a stream-side or in a fen; no other plant from Phase 7 comes from such a habitat and its presence solely in the broch cupboard also suggests a special purpose. The only occurrences of sheep's sorrel, a plant of heaths, grassland and cultivated land together with that of *cf* dead-nettle are from the same stone cupboard. The dock nutlets, as already described, have mostly been rubbed free of the enveloping perianth. To obtain the root tubers of the lesser celandine the plant would need to be deliberately uprooted.

### PLANTS EMPLOYED FOR MEDICINAL USES

#### JUNIPER (*Juniperus communis*)

The fruits have the following active ingredients: as aromatic essential oil, flavone, tannin, resin, glycoside, bitter principle and

sugar. The effect is strongly diuretic, digestant, antiseptic; causes redness, relieves flatulence and stimulates the menstrual flow (Launert 1981). The species was known to Theophrastus (370–285 BC) and the many medicinal uses given by Dioscorides (fl AD 64) suggest that the antiseptic and emmenagogic properties were known by him. Pliny recognizes the carminative, digestive, diuretic and emmenagogic qualities of the fruit (Book 24, 36). Both authors also recommend juniper for coughs and ruptures. Its use continued through the Renaissance and it is still used in herbal medicine to alleviate rheumatic and similar pains and for dropsy, bladder and kidney disorders (Launert 1981). It is of interest that a preliminary plant list from a late Roman Iron Age site in Finland (Aalto 1982) contained fruit stones and needles of juniper and other useful collected plants.

#### DEAD-NETTLE (*cf Lamium* sp)

The petals and flowering shoots of various *Lamium* spp are used as an infusion. The active ingredients of *L. album* include mucilage, tannin, tyramine, methylamine, choline, saponin and flavone-glycoside. The effect is astringent and diuretic (Launert 1981). Fuchs (1543), probably quoting from classical sources, recommends the pounded leaves for nose bleeds, boils, goitres, open wounds and ulcers. Culpepper (1652) gives similar uses. In herbal medicine *L. album* is used for kidney and bladder complaints, amenorrhoea, catarrh, burns and septic cuts (Launert 1981).

Table 10: Plants with medicinal uses • types and location

Juniper ( <i>Juniperus communis</i> )	Early Phase 8 <b>E</b> building, 1 fruit-stone in hearth deposit. Later Phase 8 stage 7, 1 fruit-stone in hearth deposit.
<i>cf</i> Dead nettle ( <i>cf Lamium</i> sp)	Early Phase 7 broch tower, 1 nutlet in stone cupboard.
Lesser celandine ( <i>Ranunculus ficaria</i> )	Early Phase 7 broch tower, <i>cf</i> 1 achene, <i>cf</i> 2 tubers in intra-mural cell, and <b>SW</b> building, <i>cf</i> 6 tubers on paving. Later Phase 8 stage 5, 9 tubers in ash under hearth.
Sheep's sorrel ( <i>Rumex acetosella</i> agg)	Early Phase 7 broch tower, 1 nutlet in stone cupboard.
<i>cf</i> Common Skull-cap ( <i>cf Scutellaria galericulata</i> )	Early Phase 7 broch tower, 1 nutlet in stone cupboard.

**LESSER CELANDINE (*Ranunculus ficaria*)**

The root tubers and the whole plant are used; the active ingredient is not known but the effect is astringent. Theophrastus records the use of the plant and Dioscorides (Gunther 1934), recommends the juice for the purging of the head and as a gargle. Fuchs (1543) repeats Dioscorides' uses and adds that the juice heals and gets rid of piles. By the 17th century, the main use of the plant was for the relief of piles and it became known as the pilewort (the tubers bear some resemblance to haemorrhoids and this use was ascribed according to the doctrine of signatures). Because of the plant's astringency this use is considered particularly effective and piles are still treated with the plant extracts in herbal and homeopathic medicine. The young leaves have also been used as a treatment for scurvy (Lounert 1981). There seems no definite evidence for its use for haemorrhoids prior to the middle ages and its earlier use seems more likely to have been for catarrh and sore throats.

**SHEEP'S SORREL (*Rumex acetosella* agg)**

The plant in common with other sorrels, contains binoxylate of potash. The whole fresh plant is used. The action is diuretic, refrigerant and diaphoretic and the juice is used in urinary and kidney diseases (Grieve 1931). The leaves are antiscorbutic.

**COMMON SKULL-CAP (cf *Scutellaria galericulata*)**

The flowering herb yields the active ingredient scutellarine; it is anti-inflammatory and alleviates fever; although it is no

longer used for these purposes, an infusion is sometimes given for throat infections (Lounert 1981). *S.galericulata* possesses nervine properties similar to the American *S.lateriflora* which also has strong tonic and anti-spasmodic action. Skull-cap is also given as one of the best remedies for insomnia (Grieve 1931). Skull-cap is still used as a herbal preparation.

An intriguing question is whether any of these finds throws light on the health of the inhabitants; since most plants have several properties this cannot readily be ascertained. However, dead-nettles, lesser celandine, juniper and some *Vaccinium* spp (collected as berried fruits) contain tannins giving astringent properties. Astringents cause the contraction of tissues and so diminish discharges, some of the plants have been used for diarrhoea and dysentery. Tannins also have an antibiotic effect by precipitating protein in mucus membranes and so deprive bacteria of nutrition, they are therefore used for slow-healing wounds and suchlike (Lounert 1981). Several plants contain vitamin C, sheep's sorrel and lesser celandine in the leaves and *Vaccinium* species and crowberries also in the fruit; scurvy may well have been a problem as it was in historic Scotland. Other plants would have been used as pot-herbs and doubtless roots were also eaten, but these fruits and tubers remain because of their durable nature and are not necessarily representative of the wide range of plants with medicinal uses which would have been available.

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## HEATHY TURF, HEATHER AND PEAT

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Some of the plants found are characteristic of the dwarf shrub heathland which used to cover much of the mainland of Orkney before it was reclaimed for agricultural use. The heaths are often heather dominated with crowberry (*Empetrum nigrum*), bell heather (*Erica cinerea*), cross-leaved heath (*E.tetralix*) and small grasses among the commoner plants. Many of the species listed under grassland, grassy heath and mires are to be found in these heaths especially the species of sedges (*Carex*), heath rush (*Juncus squarrosus*), woodrush (*Luzula*), lousewort (*Pedicularis sylvatica*) and tormentil (*Potentilla erecta*). This heath, when found on thin peaty soils, can be stripped off with the peaty layer and when dried gives a turf some 30–50mm thick. The uses of such turf is known from past centuries: for fuel, also for building composite walls and, until quite recently, to roof farm buildings on Orkney. Naturally the removal of such turf leads to soil erosion and is no longer practised.

Some samples contained seeds of several species of heathy turf plants and it seemed likely that these represented burnt turves. To test this hypothesis, turves from Orkney heaths were collected and samples broken up and sieved in the laboratory. Many heather stems and roots, occasional sedge rhizomes and seeds of heather, crowberry, bell heather, sedges, tormentil and woodrush were recognised together with a megaspore of lesser clubmoss. As some of these species are exclusive to heaths in Orkney, it seems highly probable that the seeds and other associated remains such as heather stems derive from burnt turves.

Remains of turf plants were found from Later Phase 7, from a broch kiln, a floor around a hearth and an earth floor; it seems probable that the first two at least were used as fuel. Early and Later Phase 8 hearth and floor deposits contained remains of both turf plants and peat. This could be an early example of the use of turves as back peats. Turf and peats were used together when peat

was scarce and this also increased the quantity of ashes for manure (Fenton 1978, 207, 212).

Heather was present in many samples especially in Late Phase 8. Some of the heather undoubtedly came from the heathy turves but heather only was found in hearth deposits from the very last stage of the Later Phase 8 houses; it is possible that peat was also burnt but left no trace in the ashes. Springy heather also makes comfortable beds. Straw would probably be reserved for animals and thatching.

Baskets have frequently been made from heather and a fragmentary basket survived from the Later Phase 7 use of the broch tower (illus 82). It measured c 13 × 17cm, and was made of 10 double strands of straight heather stems or stakes, c 4mm in diameter, simply woven (randing) with young heather shoots, c 1.5mm in diameter, passing in front of one pair of stakes and behind the next pair. The convergence of the stakes and the addition of at least one other pair suggest that it was part of the side of a basket which survived, from above the base and below the rim or border. The additional stakes indicate that the basket had a slightly flared shape. The tight weave may also imply its use was as a measure for meal, and was not unlike the traditional Orkney heather baskets or *cubbies* and more specifically the *luppie* which had a shape like a basin (Fenton 1978, 261–262).

Peat was found throughout the occupation and it may be assumed that it was an important fuel source for domestic use; it was also found in a Late Phase 7 furnace dump with other fuel. Heather and cotton-grass were very occasionally present in the mainly very small fragments of peat which survived. Blanket bog peat began forming on hillsides between 1800 and 1300 BC in Orkney although small valley bogs could have been dug for peats if first drained. Slow burning peat fires are ideal for smoking meat and fish for winter use.

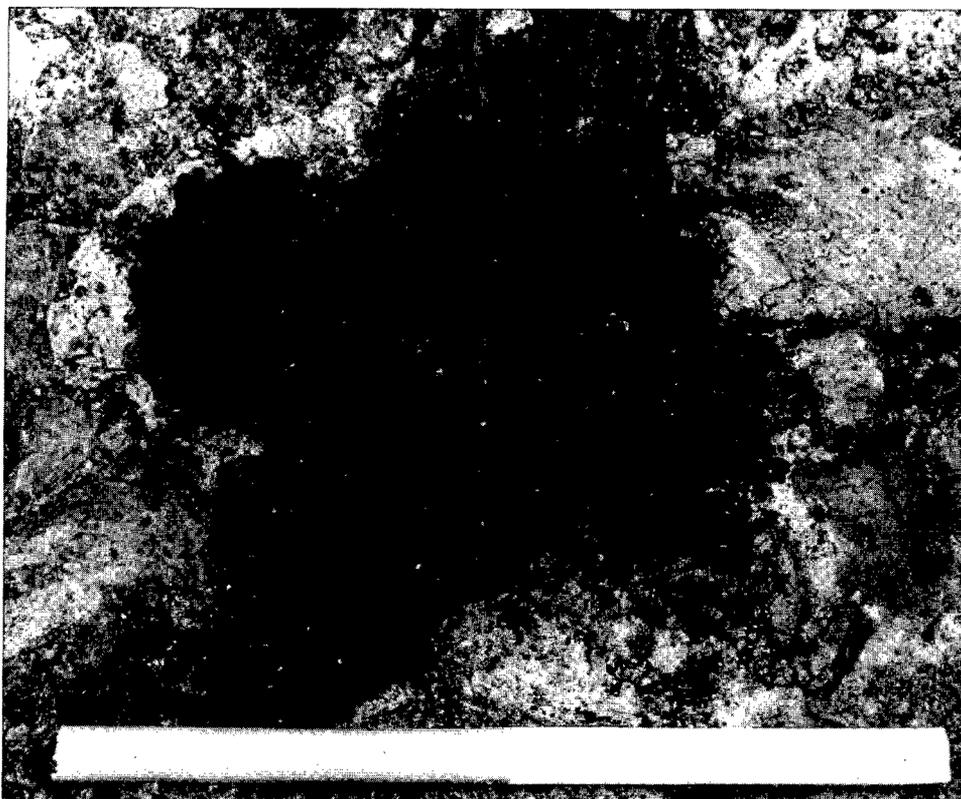
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## FRESHWATER, BRACKISH AND MARITIME PLANTS

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Fruiting bodies (oospores) of stoneworts (*Chara* spp) were recovered from the silt in a clay-luted stone tank in the burnt SW building of Early phase 7, and from the soakaway in the Early Phase 8 *stalled* dwelling. Stoneworts grow in calcareous, usually shallow, fresh or slightly brackish waters with little water movement. They would be most unlikely to grow in a deep well

and it may be that when the well which was used from Phases 4–6 was made inaccessible, other sources of water were used. The nearest permanent source of water is the shallow Loch of Stenness, less than 0.5km distant, a brackish water loch with c 15% salinity along the SW side, nearest Howe (Nicol 1938, fig 1); however, the Orkney coast has become submerged during the



Illus 82  
a) Section of heather (*Calluna*) basketwork from floor 2 of the broch tower, Later Phase 7 (context 861); scale – 20cm; b) suggested reconstruction drawn from early 20th-century examples.

post-glacial period and the loch may formerly have been less brackish than at present. Alternatively, a pond could have been dug in the clayey subsoil at Howe, the stoneworts could have grown in a pond or in slightly brackish water. The evidence for water storage in a tank is of particular interest, providing one clear use for what was probably a multi-purpose container. At the time of the fire, the tank seems to have contained water for animals. Water disposed of in the soakaway of the Early Phase 8 stalled house was probably from human use.

Spiral tasselweed (*Ruppia cirrhosa*), the brackish water plant represented by fruits from two Early Phase 7 buildings used by animals and a Late Phase 7 yard, must have been deliberately collected for fodder or bedding. Fruits of salt-marsh-grass

(*Puccinellia* sp) from three Later Phase 8 contexts, stages 5 and 6, would have come from the nearby shore, perhaps from vegetation gathered from the strand line for hay.

A fucoid alga is represented by fragments from a Phase 7 shelly deposit and from two Early Phase 8 contexts. The seaweeds of sheltered Orkney shores are dominated by fucoid algae (Jones 1975), and no doubt the several possible uses, as previously listed, were fully exploited by prehistoric peoples.

The sea and loch shores would have provided valuable grazing as they do at present, and it may be noted that sheep in North Ronaldsay, Orkney, fed solely on seaweed, are said to thrive better than those fed on grass (Fenton 1978, 466).

## COMPARISONS WITH OTHER SITES

Plant remains from the prehistoric period in N Scotland are rather few and the pre-broch sites so far published have produced mainly charcoal and barley grains (Dickson 1987a).

Both naked and hulled barley were recorded from a pre-broch phase at Dun Mor Vaul broch, Tiree (Renfrew 1974). No weed seeds were present in the cereal sample; perhaps the ears were plucked separately and hand-rubbed as the evidence suggests for Howe. Crosskirk Broch, Caithness (Dickson & Dickson 1984), produced a few grains of naked six-row barley and wild oats, a flax seed, heather and other heathland plants, bracken and arable weeds. Tanks containing ash from cereal chaff were probably used to store seafood. A cist from the Broch of Burrian, N Ronaldsay, Orkney (MacGregor 1975), contained red ash with bones and shells; the cist, also, was thought to have been used to preserve food. Cereal grains of six-row barley appeared to be of the hulled variety, pine charcoal was also noted. Bu of Cairston roundhouse, less than 2km from Howe (Dickson 1987a), yielded grain of naked six-row barley and weeds, with heathland plant remains similar to those found at Howe. It is probable that at Bu also heathy turves were collected for fuel but at an earlier time than the evidence suggests from Howe as the radiocarbon date indicates that the Bu deposits date from around 600 cal BC (Hedges & Bell 1980).

Six-row barley, with wild oats, was recorded from a possible Pictish building amongst Pictish and Norse sites in the Bay of Birsay on mainland Orkney (Donaldson *et al* 1981). From the same area, pre-Norse and Norse

excavations have produced charcoal of willow or poplar, birch, hazel, pine and oak often alongside burnt peat. The bulk of the charcoal was of willow/aspen type and Donaldson (1982) notes that: 'The presence of so many twigs and fragments of native trees in the excavation indicates the exploitation of a local resource'.

Dung has rarely been recorded from this period but an Early Iron Age farmstead in the Dutch polders (Therkorn *et al* 1984) has preserved what appears to be cattle dung containing seeds of arable weeds and those from salt-marsh habitats and other damp places.

### 7.3 • ANIMAL BONE REPORT

Catherine Smith with the late G.W.I. Hodgson, P. Armitage, J. Clutton-Brock,  
C. Dickson, T. Holden & BBS

A total of 26,079 mammalian bones, 1,499 bird bones, 355 frog/toad bones and 19 coprolite samples, dating from the Neolithic to the Late Iron Age were recovered from Howe. The majority of the bones came from Phases 7 and 8 (Table 11). The mammalian bones are from both domestic species, cattle, sheep, pig, horse, dog and cat, and wild species, red deer, fox, otter, seal, whale, Orkney vole, field mouse, pygmy shrew, brown rat and rabbit. The latter two species were probably intrusive.

The skeletal remains of the cattle from Phases 7 and 8 correspond in size range with those reported from other Iron Age sites in northern Scotland, but are significantly smaller than those from northern Neolithic sites. Many of the sheep remains compare favourably with those from primitive Scottish breeds, the resemblance to modern Soay being the most striking. The dimensions of the pig bones, including those of a substantially complete adult skeleton, suggest that there was a small Iron Age type of pig. The horse remains came from animals which compare favourably in stature to those of a small Shetland pony.

During Phase 7, adult female sheep were allowed to produce four crops of lambs before culling, while during Phase 8 a greater number of sheep survived for longer, producing five crops of lambs. Hunting or the selective culling of red deer played an important part in the economy especially in the early phases, but became less important with time. Increased scrub clearance and agricultural activity in the Iron Age, coupled with possible over-browsing, may have contributed to the destruction of the light woodland habitat favoured by deer, leading to their eventual extinction within Orkney.

Congenital anomalies in the dentition of both red deer and fox indicated a degree of inbreeding not unsurprising in an island population. This was perhaps an additional factor which led to the extinction of both species from the island group in the Late Iron Age.

Table 11: Total numbers of animal bones by phase

Species	Phase																	Total
	1	2	2/3	3	3/4	4	4/5	4-6	5	5-6	5-7	6	6/9	7	7/8	8	8/9	
Cattle	1	7	3	196	10	112	9	7	32	479	12	14	10	4663	608	2994	84	9241
Sheep	-	2	1	69	2	36	3	2	22	225	-	33	10	3118	375	3612	37	7547
Pig	-	2	-	5	-	2	3	-	10	51	1	21	3	1486	369	1734	9	3696
Red deer	-	2	-	3	5	12	-	84	8	415	-	5	-	1993	106	369	3	3005
Horse	-	-	-	-	-	1	-	-	-	2	-	-	-	93	4	63	3	166
Dog	-	-	-	-	-	1	-	-	-	1	-	-	-	14	1	8	-	25
Fox + cf fox	-	-	-	-	-	-	-	-	-	3	-	-	-	94	19	75	-	191
Cat	-	-	-	-	-	-	-	1	-	-	-	1	-	13	-	129	-	144
Otter	-	-	-	-	-	-	-	-	-	2	-	-	-	9	3	9	-	23
Seal	-	-	-	-	-	-	-	-	-	1	-	-	-	23	2	10	-	36
Cetacean	-	-	-	2	-	5	1	-	4	20	-	-	-	130	1	55	1	219
Vole	-	-	-	-	-	-	3	-	1	-	-	10	-	125	15	517	1	672
Field mouse	-	-	-	1	-	-	1	1	-	4	-	-	-	16	-	10	-	33
Pygmy shrew	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
Rat	-	-	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-	2
Small mammal	-	-	-	2	-	-	19	5	-	24	-	5	-	324	9	680	-	1068
Rabbit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	10
Totals	1	13	4	278	17	169	39	100	77	1226	13	89	23	12102	1512	10275	138	26079

## METHODS AND MEASUREMENTS

Mammalian and amphibian bones were identified by direct comparison with defleshed specimens of modern animals, including a Chillingham cow and Soay sheep of both sexes. A collection of red deer skeletons from the Scottish mainland, ranging in age from new-born calf to adult were also utilized. Specimens of Orkney vole and otter were acquired from mainland Orkney. Bones of brown rat were identified by Dr PL Armitage.

Despite difficulties inherent in distinguishing sheep from goats it was not thought that goat was present in Phases 1 to 8. Similarly, because of the difficulties in distinguishing certain bones of fox from those of gracile dogs, only those long bones of fox which were found associated with skulls, mandibles or teeth were ascribed to 'fox'. Isolated but apparent fox bones were described as 'cf fox'.

Vertebrae, other than the first two neck vertebrae, ribs and unidentifiable fragments were merely examined for the presence of butchery marks but were not assigned to species and thus do not appear in the total number of bones identified (Table 11). Loose teeth were assigned to species but are not included in the total. Cast or unspecified antler, fragments lacking a burr, which therefore may not represent dead animals, were not included in the total numbers of bones. A comparison of the relative frequencies of the main food-forming animals, including horse, based on the minimum numbers of individuals is given in Table 13.

The scheme of measurement follows that proposed by von den Driesch (1976), unless otherwise stated, and all measurements are in millimetres. A summary of bone size ranges for all species found,

is given in Table 44mf (1:F1-F12) and the anatomical distribution of bones over the whole site, in Table 45mf (1:F13-G7).

Relative frequencies were estimated by comparing the minimum numbers of animals present and by fragment counts. Counting the numbers of bone fragments present tends to bias the estimate of the frequencies of species present in favour of the larger animals, such as cattle, with respect to the smaller animals, such as sheep, because the long bones of larger animals tend to break into more fragments than long bones of smaller animals.

The minimum numbers of each species present have been estimated by selecting one bone for each species which is common to all phases. Hence some species which are poorly represented in a given phase may disappear from the record if the selected bone is not present in that phase. Conversely, species represented by, for example, only one bone, such as the Pygmy shrew, are perhaps over-represented with respect to those species represented by large numbers of bones (Clason 1972, 141). Table 12 shows the minimum numbers of animals in each phase, together with the bones used for estimating them. Cetacean bones have not been included in this table as these tend to consist of either indeterminate or worked fragments, or vertebrae.

'Small mammals', as a category, has been omitted from Table 12 as it was thought that the majority of these bones came from the Orkney vole. The apparent increase in the number of small mammal bones in Phase 8 is due to the fact that a greater number of sieved samples were taken from this phase.

## DISTRIBUTION AND LOCATION

### PHASES 1-5

Small quantities of bones of the main domestic mammals, cattle, sheep/goat and pig, were retrieved from the earliest contexts of the site (Phases 1-2) as were bones of red deer. In the Early Iron Age

(Phase 3) most of the cattle bone was derived from a midden, and although sheep/goat and pig bone were also found in this phase, red deer bone was not found in great abundance. However, the presence of meat-bearing bones was evidence of this species providing food as well as the raw material for antler artefacts.

Table 12: Estimated minimum numbers of animals present in each phase

Species	Phase																Total	
	1	2	2/3	3	3/4	4	4/5	4-6	5	5-6	5-7	6	6/9	7	7/8	8		8/9
Cattle	-	-	-	2	-	3	-	-	3	4	1	-	-	63	10	34	1	121
Sheep	-	-	-	2	-	-	-	-	-	4	-	1	1	88	7	63	2	168
Pig	-	1	-	1	-	-	-	-	-	1	-	-	-	35	2	41	-	81
Red deer	-	-	-	1	-	-	-	6	-	8	-	-	-	50	2	6	-	73
Horse	-	-	-	-	-	-	-	-	-	-	-	-	-	4	-	2	-	6
Dog	-	-	-	-	-	-	-	-	-	1	-	-	-	2	1	1	-	5
Fox	-	-	-	-	-	-	-	-	-	-	-	-	-	3	1	1	-	5
Cat	-	-	-	-	-	-	-	1	-	-	-	-	-	1	-	3	-	5
Otter	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	2
Seal	-	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-	-	2
Vole	-	-	-	-	-	-	-	-	1	-	-	5	-	45	7	151	1	210
Field mouse	-	-	-	-	-	-	1	-	-	1	-	-	-	4	-	3	-	9
Pygmy shrew	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
Rat	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	1
Rabbit	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	1
	1	2	2/3	3	3/4	4	4/5	4-6	5	5-6	5-7	6	6/9	7	7/8	8	8/9	Total

Bones used to estimate minimum numbers were:

Cattle	L. humerus	Dog	L. mandible	Field mouse	L. mandible
Sheep	L. humerus	Cat	R. maxilla	Pygmy shrew	R. mandible
Pig	L. humerus	Otter	R. mandible	Rat	R. mandible
Deer	L. tibia	Vole	Skull (only where both maxillae present)	Rabbit	R. humerus
Horse	L. calcaneum			Fox	L. mandible

Table 13: Minimum numbers and percentages of main food-forming animals, including horse

Phase	Cattle		Sheep		Pig		Red Deer		Horse	
	MN	%	MN	%	MN	%	MN	%	MN	%
1										
2					1	100.0				
2/3										
3	2	33.3	2	33.3	1	16.6	1	16.6		
3/4										
4	3	100.0								
4/5										
4-6							6	100.0		
5	3	100.0								
5/6	4	23.5	4	23.5	1	5.9	8	47.1		
5-7	1	100.0								
6			1	100.0						
6-9			1	100.0						
7	63	26.3	88	36.7	35	14.6	50	20.8	4	1.7
7/8	10	47.6	7	33.3	2	9.5	2	9.5		
8	34	23.3	63	43.2	41	28.1	6	4.1	2	1.4
8/9	1	33.3	2	66.6						

Phase 4 marked the first appearance of dog and horse bone from buildings and defences. Also found were bone debris from domestic animals, red deer and cetacean species derived from domestic refuse, especially on the W side of the site.

From Phase 4/5 came the first site evidence of both cat and Orkney vole. All the bone came from ground surfaces between the Neolithic mound and the ramparts.

The E well in Phase 4-6 was notable for the relatively high numbers of red deer bones which had been dumped into it, and at least six individuals were represented. There was evidence of burning on many of these bones, particularly on whole long bones of very young or neonatal animals.

Bone from Phase 5 came mainly from contexts associated with rampart building and ditch fills, although a few fragments of cattle, sheep/goat and red deer were recovered from a drain.

#### PHASES 5/6

Bones were included in the walls, ramparts and building debris connected with this phase and, in particular, the ditch fills at the settlement entrance. On the E side of the site, silts which may represent rubbish dumping, produced many cattle bones and the remains of a single otter.

Dog/fox bones were recovered from the rubbles in the S ditch and also from the E side of the site. The deposits forming the E well cut contained a significantly higher proportion of red deer than other food species, constituting 69.5% of the food-forming mammals. About half of the red deer bones came from very young animals. This rather puzzling evidence of relatively high numbers of red deer, many of them very young, is similar to that found in the E well during Phase 4/6.

#### PHASE 6 – BROCH 1

Bones in this phase came mainly from the wall core of the broch tower, deposited during the construction of the building, and were probably redeposited from an earlier period. Bones of cattle, sheep/goat, pig and cat were contained in the broch wall, as well as antler and bone points.

#### PHASE 7 – EARLY

##### BROCH TOWER

The rubble in the Phase 7 broch tower walls included general domestic rubbish and bone, presumably originating from an earlier date. One fragment of brown rat was found among the rubble (see below). From a paved floor came whalebone and a fox bone.

##### THE SETTLEMENT

The levelling rubble which formed the prepared ground for the Phase 7 buildings contained a large amount of animal bone, probably originating from domestic rubbish.

##### NE Building

The cleaning of floors apparently removed much of the material from the structure and entranceway. However, the earliest floor in this building contained antler tines and bone artefacts as well as bones from red deer and domestic mammals. A relatively high proportion of red deer bones came from the later floors of the passage and the external cell.

##### E Building and Yard

The walls and rubbles of this building contained bones from domestic mammals and red deer. Whale and seal fragments were retrieved from a later floor. However, the clay floors, hearths and ashes produced very little bone, suggesting its removal by cleaning, as in the other buildings.

Rubble levelling in the yard contained bones of domestic mammals and red deer as well as whalebone and antler artefacts cleared from the floors of the building. Floors above and below this rubble contained very little bone and had probably been cleaned.

##### SE Building

A late hearth, and rubble in the entrance passage, produced mainly red deer and cattle with the addition of sheep/goat. Two horse bones were included in a wall.

**S Building**

Bones were very scarce, possibly because of frequent cleaning of the floors.

**SW Building**

The walls contained the usual assemblage of animal species, including cat (see below). The earliest earth floor contained a sheep burial, alongside more general bone refuse. The clay floor of the cell in this building produced four dog bones.

**NW Building**

The floors and hearths of this building contained relatively few bones suggesting that cleaning took place frequently, with the rubbish being dumped in the yard. The yard produced bones of domestic ungulates, as well as dog. One dog bone was also found in the deposits of a cell floor.

**DITCHES**

The ditches appeared to have been used as a dumping ground during Phase 7 and contained the remains of cattle, sheep/goat, pig, red deer, horse, dog, cf fox, otter and whale.

**PHASE 7 – LATER****BROCH TOWER**

The second workshop floor in the broch tower contained cattle, sheep/goat, pig, red deer and fox. Contemporary deposits contained burnt bone, among other evidence of burning. The most interesting animal finds came from rubble at the end of this phase. From this possible period of abandonment came the remains of a single fox and an almost complete pig skeleton (see below).

**SETTLEMENT****Southern Buildings**

A dump outside the broch tower, and probably deriving from it, contained bones of domestic species, red deer, dog/fox, whale and seal, as well as bone artefacts. The rubble fill of an earthhouse, **G**, built into the **W** collapse contained a fox skeleton.

**NE and E Yards**

The **NE** and **E** yards contained two major layers which formed an extensive dump of material including bones from bird, fish, frog and mammals.

A notable difference between these two contexts is that while the **NE** yard produced 38% red deer, compared with only 2.1% pig, the preference was apparently reversed in the **E** yard, with only 9.5% deer compared with 19.4% pig. Since the total numbers of bones found in each layer was almost equal and conditions of preservation appear to have been similar, this difference is most striking. Compared with Phase 7 as a whole, the **E** yard appears to have been uncharacteristically low in deer compared to pig.

**E Building**

The floor material of this building was notable for the presence of a skull of a brown rat (see below).

**SE Building**

An earth floor within the building contained large amounts of red deer bone amidst the bones of domestic animals. This suggests a lack of cleaning of the floor and contrasts with the apparently higher standards of cleanliness in the earlier part of Phase 7.

**PHASE 7/8****BROCH TOWER**

The third workshop floor in the broch tower contained the nearly complete skeleton of an immature pig of c 13 months of age, which may have been dumped as the building went out of use. The floor showed other signs of having been dirty, containing many other bones, although the hearth was relatively clean.

As in the third floor, the hearth of the fourth contained a paucity of material, while the floor itself produced bone and antler objects as well as food refuse. The broch tower was eventually infilled with domestic rubbish. Context 770 was a substantial dump of bone in which cattle, sheep/goat, red deer, pig, horse, dog, fox, seal and otter were represented. Bones of cattle and sheep/goat were found in almost equal numbers, while the deer remains were only poorly represented. The skulls of one male and one female red deer and a fox skeleton were present.

Bones from an articulated cattle foreleg (an entire right humerus, radius and ulna), showed signs of having been gnawed by a carnivore such as a dog or fox.

**PHASE 8 – STAGES 1–4****BROCH TOWER**

During this phase the broch tower continued to have been used as a midden and within it was the largest single dump of bone on site. Bones of sheep (48% of food-formers) were dumped in greater numbers than those of cattle and pig, in contrast to earlier phases where cattle were more frequent than sheep.

Pig bones (23.1% of food-formers) were almost as numerous as those of cattle (26.4%), while a great reduction in the numbers of deer, compared with earlier phases, was apparent. Deer formed only 2.4% of the food forming mammals, while horse contributed 0.1%. Other species represented in this context were dog, cf fox, Orkney vole, frog, seal, bird, fish and human. Rabbit bones may have been an intrusion.

**S collapse of the Tower**

Context 37 represents the collapse of the broch tower which must have caused some redeposition of bone contained within its walls. Since dumping of rubbish may still have been carried on within the ruins, the origin of the material must be uncertain. However, the increase in sheep/goat bones at the expense of cattle, which seems to have been typical of Phase 8, was apparent, while the incidence of red deer continued to show a decrease compared with that in Phase 7.

A ground surface later built up on top of the **S** collapse. Included in this layer were bones of fox and frog as well as the usual domestic animals remains, although the earliest floors in this area contained relatively few bones, suggesting that some cleaning took place. The later floors contained much debris but the hearths appear to have been kept clean.

**THE SETTLEMENT****S & Stalled Buildings**

Ground surfaces which developed on the **S** and **SW** collapses of the tower contained much bone. Cattle, sheep/goat and pig were

Table 14: Comparison of worked bone and artefacts from Phases 7 &amp; 8

Species	Phase 7 artefacts		Phase 8 artefacts	
	No of frags	%	No of frags	%
Cattle and large mammal*	54	8.0	31	9.0
Sheep/goat	20	2.9	13	3.8
Pig	6	0.9	9	2.6
Horse	1	0.1	1	0.3
Red deer antler	468	68.9	234	68.2
Whale	130	19.1	55	16.0
Totals	679	99.9	343	99.9

\* 'large mammal' indicates bones cannot be ascribed to species but on the basis of their size are probably from cattle.

well represented, while red deer again appeared in comparatively reduced numbers. Cat bones were more frequent than in earlier phases.

#### W Workshop

The hearth and floor of this building contained domestic animal bone as well as antler. At the end of its use, the building was filled in with material which included 23 antler fragments.

#### SUMMARY

The general impression gained from Early Phase 8 is one of repeated redeposition of bone, from broch and building collapses and levelling, which became incorporated into new wall cores. Perhaps the most noticeable trend in Early Phase 8 was the decline in red deer and increase in sheep/goat. It is perhaps significant that while the percentage of artefacts made from antler, compared from those made from bone, remained constant from Phase 7 to Phase 8, the percentage of red deer bones actually decreased (see Table 14).

Deer remains fell from 17.6% of food forming mammals in Phase 7 to 4.2% in Phase 8. It is possible that supplies of antler were imported in Phase 8, perhaps from the mainland, when the island red deer population decreased. (See also 8.2 below for possible import of reindeer antler from Norway).

#### LATER PHASE 8 – STAGES 5–12

The trend of reduced numbers of red deer continued into Later Phase 8, while sheep/goat apparently increased. This shift in the balance of the site economy suggests that it was no longer necessary to hunt deer, since the protein requirements of the community were being met by increasingly better kept domestic stock. In addition, the deer population may have been reduced by the depletion of the light scrub cover which would have formed their habitat. An additional factor in the demise of the red deer may have been the increase in the numbers of pigs in Phase 8 as compared with Phase 7. Increased competition from pigs foraging on scrub land, combined with increased pressure from sheep on the more open ground may have contributed to the eventual extinction of red deer on the island.

Although cattle numbers decreased in Phase 8 (34.1% food-formers compared with 41.6% in Phase 7), they continued to be an important resource. Horses, however, were present in only small numbers in Phase 7 (0.8%) and Phase 8 (0.7%).

The number of cat bones showed a large increase in Phase 8.

This may have been due in part to the ramshackle nature of some of the later buildings which would have provided shelter for a thriving cat population. Food in the form of the Orkney vole would have been abundant, as shown by the large numbers of vole and small mammal bones which were retrieved.

#### STAGE 5

The usual domestic mammals, as well as cat and whale bone were recovered from this stage. Red deer antler artefacts outnumbered those made from domestic mammal bone.

#### STAGE 6

Bones were found in both walls and floors. A fox skull was found in a wall as were several cat bones.

#### STAGE 7

Most of the bone originated from floors and included one otter bone.

#### STAGE 8

Bones from rubble levels were reworked into wall cores. Cat bones were especially frequent within these walls. One partial skeleton of an adult cat showed signs of gnawing by rodents. One red deer skull was recovered from an earth floor.

#### STAGE 9

Bones in general were not plentiful but cat bones related to a skeleton found in rubble in Stage 8 were recovered.

#### STAGE 10

This phase contained the usual domestic mammals as well as seal, cetacean and of fox.

#### STAGE 11

Only small numbers of bones from cattle, sheep/goat and pig were found.

#### STAGE 12

The E floor [1269] contained bones of cattle, sheep/goat, pig, red deer, and the partial skeleton of a kitten.

## TYPE, SIZE, AGE, AND SEX OF ANIMALS

### CATTLE (*Bos* sp.)

Very few complete long bones of cattle have been recovered from Howe, a pattern which is reported at other prehistoric sites in the north of Scotland. The measurements of 21 complete cattle long bones are given in Table 15mf (1:D3). For the purposes of comparison, data on metacarpal length from other northern Scottish sites are quoted in Table 16mf (1:D4).

The metacarpals from Howe show the typical Iron Age reduction in size from the larger Neolithic type of cattle, but one larger bone is possibly from a bull. Published information on metatarsal length is scarce, although measurements from Noddle (1976) from pre-Norse Buckquoy, are comparable with those from Howe.

Few horn cores survived intact, but those which did suggest that the cattle were akin to the Celtic Shorthorn type. The horn cores were small, curved, pointed in a forward direction, and were apparently all from cows or castrates. No polled individuals were found, although this is not surprising considering that most of the skulls were reduced to very small fragments.

Noddle (1983) has used the varying position of the nutrient foramen of the femur to demonstrate differences and similarities in cattle populations. Fifty specimens of Howe cattle femora were examined and the position of the foramen noted in Table 17mf (1:D4). The percentages shown are not substantially different from those given by Noddle for Pictish cattle at Skail.

The age of cattle at death was determined through assessment of the state of epiphyseal fusion of long bones and eruption and wear patterns of mandibular teeth (Tables 18 and 19mf (1:D5)). Absolute ages could not safely be given to the long bones because the age at which epiphyseal fusion occurs is not constant in domestic animals. It can be affected by genetic factors, levels of nutrition and sex of the individual (Noddle 1984, 21). Comparison of the Tables shows a large discrepancy between the ages derived from epiphyseal fusion evidence and those derived from mandibular evidence. Differential preservation may have played a part in obliterating evidence of the more fragile foetal/neonatal (F) (only 2.5% in Table 15mf (1:D3) compared to 38.6% in Table 16 (1:D4)) and juvenile (J) bones, thus biasing the results towards older animals. The number of foetal and juvenile mandibles is undoubtedly an underestimate, suggested by the large numbers of loose deciduous and unworn teeth which were found.

In the case of mandibles from older age groups, it was noted that the larger mandibles tended to be more heavily fragmented, either by post-mortem damage, or more probably by butchery as some older specimens bore knife marks. Breakage effectively removed them from the record. Similarly, the adult long bone count of 27% is almost certainly an underestimate, as they would have been removed from the bone assemblage for the purpose of producing artefacts.

Although the recognisable bones which were utilised as artefacts have been added to the appropriate age categories, it is obvious that many were not recovered. In spite of these discrepancies, it may be cautiously speculated that on combined evidence, about a quarter of the cattle population at Howe reach maturity. These animals were probably kept for traction and breeding purposes.

Fenton (1978, 428) described the Orkney cattle of 1814, before improvement, as being small, of various colours, though commonly black, with low heads, high backs, thin buttocks, and horns which were short and contracted, with their tops bending towards the forehead. It would seem that in some respects the Iron Age cattle from Howe would not look entirely out of place among the unimproved beasts of early last century.

### SHEEP (*Ovis* sp.)

Dimensions of complete sheep bones are given in Table 20mf (1:D6) in comparison with measurements from a modern 4-year-old male Soay sheep. The mean measurements of the long bones are shorter than those of the Soay in all cases except the tibia, which is slightly longer. The Howe metapodials were substantially shorter than those from Jarlshof, with the exception of a single example from Phase 3. The tendency towards shorter metapodials was also observed by McCartney (1984) in her examination of sheep bones from Crosskirk Broch, Caithness.

The sheep horn cores showed great similarities in length and shape to the modern Soay, falling into two distinct groups. The smaller, shorter specimens which were more oval in cross section, were assumed to be female, or perhaps castrates. The much heavier and thicker examples with a more circular cross-section were from males. Only one polled skull was found.

A total of 93 sheep femora were examined for the position of the nutrient foramen in comparison with data from other Orkney sites and modern Soay (Table 21mf, 1:D7). As in the case of cattle, it also varies its position (Noddle 1978). It would seem that the sheep populations of Howe and Pictish Skail correspond, as they both contain foramina in the anterior proximal position in 50% of the samples. Howe examples with midshaft positions also compare well with Neolithic Skara Brae sheep and to the modern Shetland breed.

A total of 176 sheep half mandibles were assessed for tooth eruption and wear pattern, after the method of Payne (1973) (Table 22mf, 1:D8). Only Phases 7 and 8 contained enough specimens to enable separate culling curves to be drawn for each phase (Tables 23 & 24mf, 1:D9–D10). Table 22mf shows that from the site as a whole, almost half the sheep, and probably many more if differential preservation is taken into account, died in what was most likely their first year of life. Approximately 30% of the flock survived to the end of the second year, and it is presumed that the animals which survived to the age of 8 years were either females or castrates.

An interesting variation in age groupings occurs when Phases 7 and 8 are compared (Tables 23 & 24). In Phase 7 only 22.6% of sheep had survived to the second year of life (stage D), but in Phase 8 this was 40.2%. Similarly, proportionately more animals survived into their third and fourth years in Phase 8 than in Phase 7 (see below).

The overall picture from the skeletal evidence is of a sheep with strong affinities to other animals from prehistoric sites in Orkney and the north of Scotland, and in many respects appearing to resemble the modern Soay (see also Ryder (1982, 34).

### GOATS (*Capra* sp.)

In spite of the difficulties of distinguishing the bones of goats from those of sheep, a numerical procedure was carried out on the metapodials (Boessneck 1971, 353–5), which gave a reliable clue to the presence or absence of goat. Of the 25 specimens (complete metacarpals and metatarsals) all were shown to be sheep. In addition no horn cores from goat were recognized.

It is thought that goat bones were not present in the Howe samples during Phases 1 to 8 in contrast to small numbers of goat found at Broxmouth (Barnestson 1982, 102), Crosskirk (McCartney 1984, 133) and Buckquoy (Noddle 1976, 205). However a fused radius and ulna from Phase 9 was thought to have come from a goat.

### PIG (*Sus* sp.)

The find of a substantially complete pig skeleton from Phase 7 (SF 2152/3011) indicated a domestic animal, small by modern standards, with slim, fine bones. The measurements of this animal appear in Table 25mf (1:D11–D12). This pig exhibited some arthritic changes in one shoulder and in its right hind limb. There were no signs of butchery on the skeleton.

101 pig mandibles from the site were assessed as to tooth wear and eruption (Table 26mf, 1:D13) (Bull & Payne 1982). It can be seen that 52.5% of the pigs from Howe were killed about the end of their first year of life. It was not thought possible to assign most of the pig long bones to a fusion category due to the fact that pig epiphyses detach readily during cooking and that fusion points of the epiphyses are probably subject to differential preservation. However, 15.8% of the pig long bones could definitely be ascribed to foetal animals. This is probably an underestimate, due to the very small size of the bones which suggests that not all may have been retrieved during excavation. Table 27mf (1:D13) shows the percentage of pigs killed up to 1 year old, in comparison with other Iron Age Orkney sites. Only a few animals would have been required to reach breeding age in order to keep numbers stable and the high cull of very young animals reflects the high litter yield of pigs.

Very little evidence was available as to the sex of the pigs. The canine teeth which were found were, in the majority of cases, split or broken and offered little evidence of the sex of the animals from which they came. The single pig skeleton, described above, had well formed muscle scars, but these may have been as much an indication of advanced age or energetic lifestyle, as evidence of maleness.

The summary of pig bone sizes indicate animals both slightly smaller and larger than those from Crosskirk (McCartney 1984). None of the Howe pigs appear to have approached the size of wild pigs and all of the specimens were probably from a domestic animal not unlike the 'hardy, ferocious and tasty' beast which survived into historic times (Gillespie 1983).

### RED DEER (*Cervus elaphus*)

Few long bones of red deer survived intact but the dimensions of those which did are shown in Table 28mf (1:D13). Comparable dimensions of a modern 4.5-year-old red deer from the Scottish mainland are shown in Table 29mf (1:D14). Comparisons between these measurements and those given by Noddle (1974 & 1982) for various Neolithic and Iron Age sites throughout Britain show the presence of animals which were smaller than Neolithic specimens but larger than those of the present day.

Evidence of age of the Howe red deer came from 86 half mandibles which were grouped in age classes 0–10 according to the tooth wear scheme outlined by Lowe (1967) and Ratcliffe (1977) (Table 30mf, 1:D14) (see also Mitchell & Youngson). A subdivision of age class 0 was designated 'F' to include newborn animals which had unworn or erupting deciduous teeth. A diagrammatic representation of the probable age at which red deer were killed is shown in Table 31mf (1:E1).

There appears to have been a high incidence of neonatal mortality, with 46.6% of the red deer dying or being killed in the first year of life. This may not however, reflect the true herd structure of the wild animals, but a deliberate culling pattern (see below). The high proportion of individuals killed in the age classes 4–8 is remarkably similar to the present day situation where the average age of the hind cull lies between 4–5 years and the stag cull between 6–7 years (RW Youngson pers comm).

Further evidence of the age of the deer came from analysis of the antlers. In modern Scottish red deer stags the sequence of appearance of antler tines is as follows:-

1st year a simple spike appears after 10 months of age, 2nd year a

spike and brow tine, 3rd year a spike, brow and trez tine, 4th year a brow, trez and 2 'points on top', and 5th year a brow, bez, trez and 2 'points on top' or crown tines. In subsequent years more crown tines are added.

Evidence of the ages of the Howe deer from antlers is unfortunately scanty. In spite of the large number of antler fragments recovered, all had been butchered, worked or otherwise damaged. In addition, the majority of fragments were cast or were indeterminate, and do not represent dead animals. Table 32mf (1:E2) shows the least age from the 2nd to the 6th year, at which a total of 65 cast or indeterminate fragments must have been shed. It must be emphasized that assessment of the thickness and weight of the antler fragments suggests that the minimum age of shedding has been greatly underestimated. In addition, 3 further fragments with brow tines and attached skull fragments, must have come from animals of a minimum age of 2 years at death.

The numerous finds of antler indicates the presence of male animals, but two skulls which had no pedicles and had never borne antlers showed the presence of females. There is, however, the slight possibility that these had come from male animals which were castrated before the age of 10 months, when the pedicles appear in modern Scottish deer (Staines 1980, 12).

### HORSE (*Equus* sp.)

Measurements from a very few complete long bones are given in Table 34mf (1:E2). These indicate that the Howe horses did not differ greatly in stature from those of a small modern pit pony, and compare favourably with measurements from Jarlshof (Platt 1934a), Crosskirk and the modern Shetland pony (McCartney 1984).

Both young and adult animals were represented in the sample. Table 33mf (1:E2) shows the proportion of unfused long bones in comparison with the age of fusion in modern animals (Silver 1969). Unfortunately, no mandibles or maxillae bearing teeth were found, although the presence of unworn loose teeth confirmed that immature animals had died.

### DOG (*Canis* sp.) and FOX (*Vulpes vulpes*)

Only 25 bones out of a total of 216 canine/vulpine bones were ascribed to dog. Very few measurements of dog bones were obtained. However the dimension of a complete dog skull SF 5959, and a maxillary fragment SF 3867, measured according to Harcourt (1974) are given in Table 35mf (1:E3), along with the dimensions of a partial fox skull SF 2605 and Harcourt's measurements of the Jarlshof dog. Dog skull SF 5959 (illus 83) was shorter in length than the Jarlshof example and other Iron Age examples given by Harcourt. However, it did not otherwise diverge from the pattern of Iron Age dogs: that is, it had broad zygomatic arches, a moderately long snout and a fairly broad muzzle.

Of the bones, 2 left mandibles came from puppies of c 4 months, but the possibility that these mandibles came from fox cubs could not be ruled out. The remaining dog mandibles came from adult animals. In one right mandible, SF 3946, the 3rd incisor still retained its characteristic fleur-de-lys shape, which is completely lost by 2 years of age in modern animals (Silver 1969).

All the dog long bones came from adults with the exception of 2 scapulae from foetal or new born animals, which again could have come from fox cubs. Immature foxes were present, although all these bones were assigned to the 'cf fox' category (see above).

Skull SF 3867 had a palatal breadth of 76.2mm, which is much larger than measurements given for Iron Age dogs by Harcourt, indicating that it could have been a wolf. Table 36mf (1:E3) shows a comparison between measurements made on this skull, a female



Illus 83  
Dog skull (SF 5959), Phase  
7.

wolf of French origin and an Iberian wolf. Clutton-Brock (pers comm) suggests that the main difference between Howe skull SF 3867 and the French example, lies in the flat shape and small size of the tympanic bulla of the Howe specimen, a dog-like feature. She suggests that SF 3867 came from a hybrid between wolf and dog. Alternatively she argues that the example came from a very small wolf whose skull was imported from the mainland along with its skin as it is unlikely that wild wolves were present on Orkney as late as the Iron Age. If, however the animal was a domestic dog, it was certainly a large one and may possibly have been a guard dog or a 'dog of war' (Barnetson 1982, 104).

An incomplete ulna from Phase 7 was from a dog with an estimated shoulder height of 52cm (Harcourt 1974, 154). This is in agreement with a height range of 47-56cm calculated on the ulna for Iron Age dogs. Platt (1934) estimated the shoulder height of the Jarlshof dog at 45.72mm (18 inches). A short but strongly curved ulna SF 126 from a disturbed context was similar to a specimen illustrated by Mennerich (1968, 144). It probably came from a small bow-legged dog and may have been recent in date.

#### CAT (*Felis* sp.)

Dimensions of complete cat bones are given in Table 37mf (1:E4). It was thought on the basis of long bone size that these bones came from domestic cats, rather than wild. Further evidence came from a mandible in which the teeth showed crowding, which is often cited as a sign of domestication.

A single left maxilla from Phase 8 contains a deciduous molar and is thought to have come from a kitten. All of the mandibles present (a total of 8) came from animals over the age of 6 months (illus 84). However, the evidence of fusion of long bones shows that kittens as well as adult animals died or were killed (Table 38mf, 1:E4).



Illus 84  
Domestic cat, right mandibles (SF 3009 & 3728), Phase 8.

**OTTER (*Lutra lutra*)**

Three mandibles, a maxilla and a skull all came from adult animals. An unfused proximal tibia indicated that one immature otter was present in Phase 8.

**SEAL (family *Phocidae*)**

Two left humeri from Phases 7/8 and 8 had both their epiphyses missing and probably came from seal pups. Three other bones from Phases 7 and 8 had unfused epiphyses suggesting they were also from juvenile seals.

**SMALL MAMMAL**

This category includes Orkney vole (*Myocrotus arvalis orcadensis*), Field mouse (*Apodemus sylvaticus*), Pygmy shrew (*Sorex minutus*), Brown rat (*Rattus norvegicus*) and Rabbit (*Oryctolagus cuniculus*).

A large number of immature animals were present, mainly Orkney

vole and a few field mice. Table 39mf (1:E4) shows the percentages of unfused bones recovered.

Six bones of brown rat were however identified and sent to PL Armitage for confirmation. The Howe specimens were stratified in Phase 7 but it was questioned whether they were in fact brown rat, as the species was not introduced to the British Isles until the late 17th–early 18th century. Recent identifications of the black rat (*Rattus rattus*) from Roman levels in London and York establish an earlier introduction than previously thought for the species (Armitage *et al* 1984).

The Howe bones were however confirmed as brown rat (*Rattus norvegicus*) but posed the problem that they had burrowed down through 1.5m of rubble both within the broch wall and on the E side of the site. Disturbance and excavation in the 19th century may have allowed entry of small mammals into the site to burrow to lower levels. Another example of this is the finding of viable dock (*Rumex*) seeds (7.2 Plant report above), again on the E side of the site, due most probably to the activities of the field mouse (*Apodemus sylvaticus*).

**COPROLITES – BBS**

Identifications by Camilla Dickson (Glasgow) and Tim Holden (London)

Other mammalian evidence came from the site in the form of coprolites (Table 40mf, 1:E5), the desiccated and partly fossilized remains of excreta. In all, 19 samples were collected with the majority found in Phase 7. The earliest samples were connected with the E well, either deposited inside during Phase 4–6 or in rubble associated with its alteration in Phases 5–6. The Phase 7 samples came mainly from levelled rubble surfaces associated with the settlement in Later Phase 7 – the workshops in the S, SW, SE, NE and the broch tower. This contrasts with only two Early Phase 7 samples which were found in rubble layers. One sample only came from Phase 8, from a midden context. The trend towards a more untidy and less well maintained settlement from Later Phase

7 onwards, with debris and rubbish in and around buildings, has been noted with respect to other finds types and contrasts with the situation in Early Phase 7.

The contexts in which the coprolites were found ensured a rapid desiccation and, or mineralization, and enabled this form of environmental evidence to survive. Where analysed, the amount of hair and bone suggest that the majority of the samples were from dogs, and only four samples could possibly be referred to as human – from the Phase 4–6 well silts, and from Later Phase 7. Many of the samples were highly mineralized and no firm identification as to their origin or contents was possible.

**PATHOLOGY**

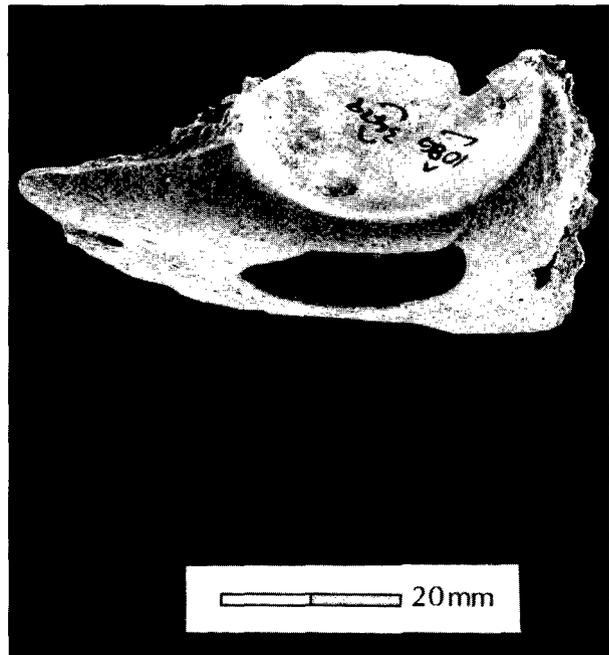
Surprisingly few of the bones of domestic animals were affected by disease, injury or congenital anomaly. The wild red deer and fox, were affected by apparent congenital dental anomalies and some were affected by arthritic changes. Pathological specimens from all phases, are listed by species in Table 41 (1:E6–E11).

Congenital dental anomalies were present in only two cattle mandibles, where the absence of the lower 2nd premolar, PM2, was noted. This condition was not uncommon in prehistoric domestic ruminants (Andrews & Noddle 1975). Several of the cattle had suffered from osteoarthritis.

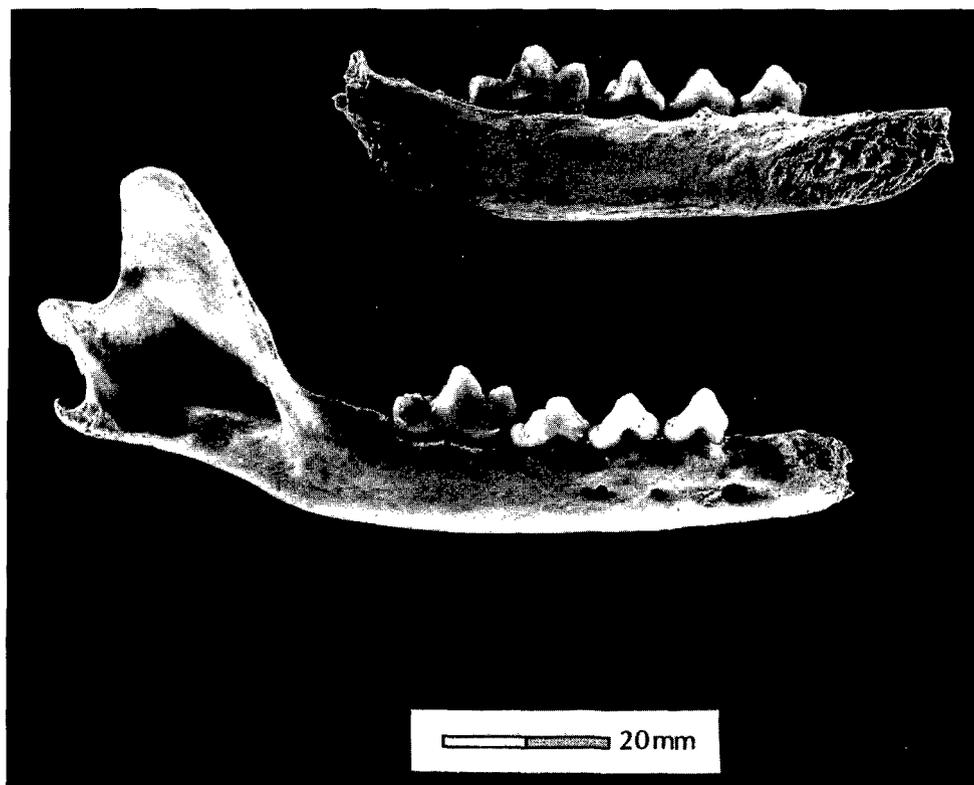
As with cattle, dental abnormalities were noted in two sheep mandibles and osteoarthritis in several sheep long bones. Some sheep were apparently affected by spavin, which is an arthropathy of the hock joint. Several sheep bones also showed indications of having suffered traumatic fracture, infection and dislocation.

Pathological conditions of pig included evidence of a healed skull fracture (illus 85). This injury was possibly the result of a previous abortive attempt to kill the animal which died at least c2–3 months after receiving the blow, sufficient time to allow the injury to heal (Noe-Nygaard 1974, 245). One neonatal pig skeleton showed symptoms of rickets, and tooth crowding in other examples may have indicated inbreeding.

Dental anomalies were seen in 14 half mandibles of red deer (reduced 3rd pillar or 5th cusp of the third molar). This condition occurs in present day populations, but the large numbers involved suggest a limited gene pool. Periodontal disease was also observed in several mandibles.



Illus 85  
Skull fragment of a young pig showing evidence of a healed fracture (SF 3479), Phase 7.



Illus 86  
Fox, left and right  
mandibles (SF 3135),  
Phase 7.

Skull SF 5959 (illus 83) also exhibited a degree of dental anomaly unusual for an adult dog. It had lost both the left and right 2nd upper premolars and the sockets or alveoli were resorbed. There were also two sockets for its 1st premolar in the right maxilla, where the tooth was lost post-mortem (Table 41mf, 1:E6-E11), rather than the normal single socket.

Dental anomalies in fox half mandibles range from lack of development of the first premolar (PM1), to absence of the same tooth, possibly due to injury (see also Lund 1962). In two cases of paired fox mandibles (illus 86), it was noted that both the first premolar and the third molar were absent in both sets. This indicated that the absence of lower cheek teeth in the Howe foxes was congenital.

Lloyd (1980, 238) has suggested that tooth loss in foxes may be either inherited, or dependent on diet. It is thought that the opportunities for predation on domestic animals must have been good, and wild food in the form of the Orkney vole was abundant. Lund (1962, quoted by Lloyd 1980, 71), found that *Microtus* of which Orkney vole is a sub-species, was preferred by red foxes. Similarly, studies in Poland have shown that 65% of the diet of foxes consists of small mammals, of which a further 93% is the common vole (*Microtus arvalis*) (Gosczyński 1974, quoted by Lloyd 1980). Therefore, lack of reasonable diet as a cause of dental abnormality may be ruled out. As with the red deer, inbreeding due to enclosure within an island group may have led to frequently occurring abnormalities arising in the population.

## HUSBANDRY AND ANIMAL MANAGEMENT

Farming at Howe from Phase 3 onwards was probably mixed, with both the keeping of domestic animals, cattle, sheep and to a lesser extent pigs, and the growing of cereal crops, notably barley. Cattle were relatively small and presumably hardy; sheep could have been similar to the modern Soay or the native North Ronaldsay breed; pigs were small and horses similar in stature to a modern Shetland pony. Comparison of the nutrient foramen of the femur of cattle and sheep suggest that the domesticated animals at Howe were similar to those from other Iron Age sites in Orkney.

Hunting of wild species, especially red deer, was an important aspect of the site's economy. Environmental evidence for phases prior to Phase 7 is limited and the information drawn from the early remains is inconclusive. However, during the earlier phases, prior to and including Phase 5/6, red deer were more important as a food species than either cattle or sheep. From this it is possible to suggest that husbandry of the domesticated animals was either inefficient, difficult, or problematic due to the harshness of the environment (Grant 1981, 209).

The increase in survival of environmental evidence from Phase 7 onwards allows a more detailed analysis of the settlement's farming methods. Mixed farming was the standard practice with changes noted in both cereal production and animal management, as well as hunting practices. In Phase 7 the sheep population had increased in size over that of cattle, while deer remains became less profuse. By comparing the kill-off curves of sheep in Phases 7 and 8 it can be seen that in Phase 8 relatively more sheep survived to a greater age than did in Phase 7. This change in emphasis in sheep husbandry was accompanied by a dramatic decrease in the numbers of red deer bones found in Phase 8.

Evidence of a high infant mortality rate amongst the domestic animals and pathological evidence (see above) suggests that animal husbandry methods, whilst not efficient, were adequate to ensure a mature breeding stock. The high infant mortality could be due to poor husbandry rather than killing off the animals deliberately for meat. Conversely, the more pliant animal skins may have been valued as highly as wool from adult sheep. By contrast, evidence of potentially crippling pathological conditions

suggests defective animals were not killed off but were allowed to survive to maturity.

The ability to overwinter stock was most likely to have been dependent on the collection of hay, supplemented by chaff, and possibly heather and seaweed (7.2 Plant Report above; 7.2.1mf 1:C1-D2). Little evidence of the stalling of domestic animals has been identified from within the Phase 7 settlement, although the **S** and **SW** buildings may have been used as byres at the very end of Early Phase 7. The general lack of environmental deposits from this phase does not help solve the problem of whether animals were stalled in the house yards during the winter months, nor does the evidence from the Phase 8 buildings where a little burnt dung was found. Given the environmental conditions of an Orkney winter, and the tradition, from the 8–9th centuries to the present day, of stalling cattle inside from the autumn to the spring, the inference is that Iron Age cattle were probably also kept inside during the winter.

Yards provided some structural evidence in the form of upright stone slabs or stalls set at right-angles to the yard walls, in the **NW** building, and a soakaway in the **SW** building. Subsequent rebuilding and accumulation of building debris have not aided the preservation of these structural remains, and what evidence there is, is not consistent within each yard. The paucity of suitable environmental evidence, may be due to organized manuring of fields in the spring and the thorough cleaning out of the yards. The use of manure as a fuel has already been commented on, and no evidence of it was found in hearth samples. This does suggest that animal dung was used as a fertilizer on the fields and that fields were manured regularly (7.2 Plant Report above). Transportation of manure from byre to field is an unresolved problem suggesting some form of wheeled vehicle or the use of straw or heather baskets.

## RED DEER

The most important wild species at Howe was the red deer. Now extinct on Orkney, red deer were probably imported by Neolithic settlers, their survival after the last glaciation as a relict species being unlikely (Clutton-Brock 1979, 113). It has been suggested, by the same author, that the deer population of Neolithic Orkney was under the direct control of the inhabitants as evidenced by the presence of foetal deer remains at Quanterness.

Jarman (1972) has suggested that deer in the Mesolithic and Neolithic were semi-domesticated, the relationship between man and deer tending to produce a husbanded herd. Certainly the kill-off pattern of the Howe red deer gives the impression of selective culling, but the eventual herd structure may have been produced unintentionally rather than by conscious selection.

Modern attempts to farm red deer in the same way as other

domesticated animals have met with difficulties arising from the behaviour patterns of the wild animal. Deer are highly territorial creatures and the stags, especially at rutting time, become very unpredictable, while the hinds can also become untrustworthy and aggressive. It has been found that the traditional British deer park, where the deer are confined within set boundaries but are not otherwise interfered with, has proved the most successful means of managing herds of this, at times, both timid and aggressive animal (Clutton-Brock 1981, 182–3). Certainly an island would have formed an ideally naturally limited environment, and it is probable that the Howe deer were not managed, other than by culling.

Definite evidence of domestication would have been provided by the presence of castrate antlers. In the first year these are difficult to distinguish from normal yearling antlers but in subsequent years may become grotesque and malformed. Castration prior to puberty precludes antler growth (Goss 1983, 270–2) but no evidence of such was found at Howe.

The culling of very young or neonatal deer was seen during Phase 4/6 from the bones of six individuals recovered from the E well. Many of these bones were burnt, which suggests that whole carcasses of young deer were roasted over a fire.

Pathological analysis of the red deer bones indicated inbreeding, perhaps a contributory factor in the status and declining numbers of red deer during the Iron Age in an enclosed island environment (Youngson pers comm). The decrease in deer remains seen from Phase 5/6 and especially in Phase 8 many have been due to environmental changes brought about by the activities of Iron Age man and of the deer themselves. The natural light scrub woodland, the habitat of red deer, was exploited for fuel, charcoal and presumably for timber. A substantial decline in wood use during Phase 8 relative to the earlier periods (7.2 Plant report above; 7.2.1mf 1:C1–D2), perhaps indicates an over-exploitation of woodland resources which may directly correlate to the decrease in the number of deer bones recovered.

The decrease in the number of deer utilized by the inhabitants at Howe may indicate an actual decrease in the deer population, as animals were forced into less favourable and more open habitats by the combined effects of reduced tree cover, caused by over browsing and felling, and by arable farming. The decrease in size in red deer between Neolithic times and the present day has been attributed to decreasing nutritional status and poorer habitat. Perhaps the relatively small size of the deer bones from Howe compared with Neolithic specimens is an indicator of the results of escalating human pressure on the deer population, due to an increased need for arable land and pasture for domestic animals. Certainly the fact that there are no red deer on modern day Orkney indicates that removal of scrub/shrub vegetation and the increased use of land for farming has led to their eventual extinction on the islands.

## USE OF ANIMALS

### BUTCHERY

Evidence of butchery marks was found on bones of domestic species such as cattle, sheep, pig, horse, and cat and on wild species such as red deer, cf fox, otter, cetacean and bird. Armitage (1978, 134–5) has described three stages of butchery encountered at an archaeological site: primary butchery – a dressing down of the carcass, ie removing the head and the horns; secondary butchery – or disjointing, ie dividing the carcass into two halves and the production of joints of meat; tertiary butchery – the cracking and splitting of the bones to extract marrow, and the cutting of flesh from the bone.

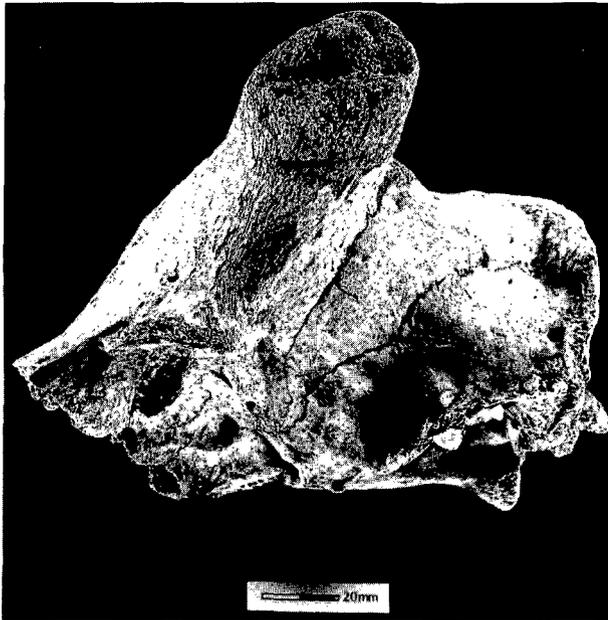
### PRIMARY BUTCHERY

Evidence of primary butchery as regards removal of the head was demonstrated by the incidence of butchered cervical (atlas and

axis) vertebrae. Only four cattle atlas vertebrae out of a total of 73 survived relatively intact. The remainder were butchered either by chopping in the sagittal plane, by chopping down through the lateral edges or by oblique blows across the body of the centrum, and knife cuts were visible on many of the specimens. Similarly only one cattle axis out of 82 survived whole. Most of those which had been butchered were chopped obliquely, and then again in a transverse direction. In one case a cattle axis had been sawn rather than chopped.

Red deer cervical vertebrae were treated in a similar manner. However, a larger percentage of deer axis vertebrae survived intact, perhaps as a result of their somewhat smaller size. This trend was repeated in the case of sheep.

Horns or antlers were cut off if present, either before or after the removal of the head. One cattle horn core had grooves cut into it



Illus 87  
Sagittally split male red deer skull with knife cut on pedicle, antler and burr removed (SF 3244), Phase 8.

near the tip, possibly to facilitate removal of the horn sheath, and one sheep horn core was sawn near the base. Several red deer skull fragments (illus 87) had knife cuts on the pedicle, associated with antler removal. In addition to removing the horns or antlers, sheep, cattle and red deer skulls were further subjected to butchery by being split, often in the sagittal plane, presumably to remove the brains. One fragmentary cattle and one incomplete pig skull bore knife cuts probably associated with this operation.

## SECONDARY BUTCHERY

### Carcass splitting

There was very little evidence from the vertebrae of cattle and red deer to suggest that carcasses were split into two halves as is the modern practice. Instead of this, the majority of the vertebrae had had their lateral edges chopped off. A large number had then been chopped in a transverse direction, leaving only the centrum and many broken neural spines.

In the case of sheep and pig, more vertebrae tended to survive intact than did those of cattle and red deer. Of those which had been butchered, although a minority were chopped sagittally, a greater number were dealt with in the same way as the vertebrae of larger animals. Armitage (1982) has shown that many of the cattle, sheep and pig vertebrae from the Roman levels of various sites in the City of London, instead of being split in half, had their lateral edges sliced off in a similar manner to those at Howe. This suggests that butchery took place while the carcass was lying either on the ground or on a table, in contrast to suspending the animal by its hind legs in order to split it into halves, as is the modern practice.

### Cuts of meat

Evidence for the production of recognisable joints of meat is provided by sets of bones which were articulated (eg a red deer right radius and ulna) with knife cuts. The distal part of an articulating red deer right tibia and astragalus had been discarded as being relatively meatless, the upper part of the tibia providing the shank joint. Many sets of articulating carpals and metacarpals were found, presumably as with the tibia and astragalus, these had

been thrown away with the connecting tissue (tendons and ligaments) still intact, thus ensuring the eventual recovery of the smaller elements.

## TERTIARY BUTCHERY

### Extraction of marrow

Many of the long bones, especially of cattle and red deer, had been split, usually in the sagittal plane, probably to extract as much of the valuable marrow as possible. In addition several phalanges of red deer were found to have circular holes pierced through one wall near the distal end possibly to extract marrow though other explanations such as the production of artefacts may be postulated. Curle (1933-4) cites the case of six similarly perforated ox phalanges found at Jarlshof, and one from a chambered cairn at Lower Dounreay.

### Cutting flesh from the bone – boning-out

There was a great deal of evidence for this stage of butchery. Thin knife cuts were apparent on many of the food bones, especially around the scapula, distal humerus, innominate and the proximal end of the metapodials. This type of fine cut was also seen on fragments of a cat skeleton, and on bones of otter, fox, cf fox and seal. These cuts may have arisen either through skinning of the animals or through utilizing them for food, or oil in the case of seal.

## DISPERSAL OF PARTS OF THE CARCASS

Table 42mf (1:E12) shows the expected numbers and percentages of bones from the carcass of a complete ox or sheep (excluding ribs, sternebrae, hyoids and vertebrae other than axis or atlas), compared with actual numbers recovered.

It can be seen that the smaller elements such as carpals and tarsals are somewhat under-represented, though sieving did not recover large numbers. Because of this, there is an apparent over-representation of limb bones; however, the numbers of high meat-yielding bones (humerus and femur) compared with the numbers of low meat-yielding bones (metacarpals and metatarsals) gives a ratio which is the same as that obtained for a complete skeleton. This indicates that butchering took place on the site and that butchery waste and kitchen refuse were dumped in the same place. The comparatively high numbers of mandibles may indicate the relative loss of long bones through bone working.

The statistics for red deer indicate that whole carcasses were brought back to the site. This would have been much more practical than bringing deer back as a collection of joints of meat, antlers and hide. Evidence of this can be seen in the disposal of six young or neonatal animals in the Phase 4/6 well after having been roasted whole.

## BONE WORKING

(See also 8.2 Bone Artefact Report; 8.2.1mf 3:A3-D2)

Bone and antler were obviously valued as raw materials to be used in the production of artefacts. The long bones used most frequently were sheep and cattle ulnae for awls and points, sheep tibiae for awls and points, cattle/deer metapodials for handles and awls, sheep metapodials for weaving tools, pig fibulae for needles and pins, cattle and horse scapulae for shovels and cattle/deer femur heads for spindle whorls. Other unidentifiable shafts of long bones were used to make scrapers and awls.

Antler was valued for its strength and resilience, being without the medullary cavity found in long bones. It was eminently suitable for manufacturing such items as handles, picks and weaving combs (illus 97; 101; 102). The tines may have been used without much modification as awls, although some tines may have been

naturally polished by the activities of the living deer in removing their velvet.

Cetacean bone was another natural resource (illus 104; 105). The vertebrae of large species were hollowed out to form vessels, while the vertebral epiphyses were made into lids. Weaving combs and mattocks were also made from whale bone.

Bone gnawing by both carnivores and rodents was noted on samples retrieved from the site. These could have included the activities of dog, fox, otter and Orkney vole. Bones gnawed by rodents have also been noted on other Orkney sites (Platt 1935, 342).

### USES OF DOMESTIC ANIMALS

When considering the role of animals in the economy of the site, it is of value to assess the uses to which they and their by-products could have been put. During their lives, the mature cattle and sheep could have provided milk for human consumption at least once a year, through whether prolongation of lactation in cows was considered worth the effort is open to doubt. A second by-product of the living beast was wool from the sheep. Although neither wool nor textiles were recovered from Howe, the evidence of various weaving and spinning artefacts indicate that the sheep were wool bearing.

Thirdly, both cattle and horses would have provided transport or traction for carts and plough. Also all of the domesticates would have produced dung (see above). As well as providing meat, the animals would have yielded hides for the manufacture of clothes and shoes. Thongs made from hide would have been a major resource, providing fastenings for clothes and shoes, and bindings for tools and building timber. Lamb and calf skins from the numerous young animals which died would also have been used for pliable and decorative clothing which was probably valued as highly as wool from adult sheep. Although no leather was recovered from Howe to corroborate this, the Early Christian site at Iona provided examples of leather from cattle, horses and goat (Groenman-van Waateringe 1979, 319). Both cattle and sheep provided horn for the making of utensils and evidence from the site shows that the horn sheath was indeed stripped off the core. Pigs produce neither wool nor milk for human consumption, so their main value comes from their meat, fat and manure. The entrails of both sheep and pigs have been used traditionally in the Northern Isles in food production – puddings and sausages, and as well as providing fat, pigs would have afforded their bristles, perhaps for rope making. Cattle hair could equally well have been used to make ropes and tethers (Fenton 1978, 431, 451).

Dogs and cats, once their working lives were over, may have been skinned before disposal. Knife marks were present on some cat bones which indicate that this indeed was the fate of the felines. None of the scant remains of dogs had been butchered, which perhaps suggests they were of higher value than cats. The comparative lack of dog remains may indicate that they were buried outside the settlement and were not recovered. Although there is a possibility that cats may have been eaten, tasting midway between rabbit and hare (Montagne' 1961, 222), most of the cat bones represented partial or complete skeletons. They were likely to have been discarded with the flesh, or at least with the ligaments intact.

### USES OF WILD ANIMALS

As with the domestic cats, the evidence of knife cuts on several bones of foxes and otters shows that these animals were utilised for their skins, although they may also have been used for food. However the Larousse Gastronomique is not complimentary about either species (Montagne' 1961, 428). The presence of several almost complete or partial fox skeletons implies that the flesh was not eaten although additional isolated fox bones and all of the otter bones were found singly or in pairs, scattered throughout the levels.

Otters were traditionally hunted or trapped in Orkney and they are mentioned in the Orkneyinga Saga as being hunted in Rousay (Groundwater 1974, 267). They were caught in stone traps called 'otter-hooses' which were built above ground over the otters' tracks (Fenton 1978, 525).

Seals, both common and grey seals, were caught principally for their skins and oils, but their flesh was also palatable (Brown 1981). Seal skins were traditionally used to make shoes, and seal oil used for a variety of purposes such as lighting, spinning and for oiling harnesses. It was also used as cattle fodder in recent times (Fenton 1978, 525).

Whales, probably in the form of beached carrion, were also used. The amount of bone recovered is probably a poor indicator of the amount of meat and blubber actually taken, since most of the unwanted remains would have been left on the beach. Smaller species of whale such as the Pilot, or Ca'ing whale (ca'ed like sheep) may have been driven ashore in schools (Miller 1976). This practice is still carried out in the Faroes from small boats.

The bones of small mammals and frog/toad, along with those of the smaller birds (7.4 Bird Report below) were more likely to have originated from the activities of birds of prey than from man. These predatory birds were probably owls, rather than hawks or falcons, because of the uneroded condition of the bone recovered (Bang & Dahlstrom 1974, 198). Bones of the Tawny owl were recovered from the site, as well as bones of the Short-eared owl, which is considered to be the principal predator on the modern day Orkney vole (Groundwater 1974, 279).

The presence of amphibian remains indicate that damp conditions prevailed in the vicinity of the site, confirmed by the finds of plant remains from mires and peat bogs (7.2 Plant Remains above).

### USES OF COPROLITES AND URINE • BBS

It is possible that both animal and human urine was collected during Phase 7. Each house contained a large slab-lined water-tight tank set into the floor, usually with a pair of notches cut into the end slabs. The notches indicate that items were suspended inside, hung on or over poles stretched the length of the tank. Urine may have been collected in the tanks and in the form of ammonia used for the processing and preservation of leather by sweating to remove the hair (Hodges 1989, 148–149). Dog excreta could have also been used, and perhaps also bird droppings, as an infusion on leather to make it flexible and softer (Thomson 1981, 164). Ammonia was also used for the dyeing of fleeces (Frazer 1983, 15) and for the preservation of ropes and fishing nets.

## ANIMAL BURIALS

Details are given in Table 43mf (1:E13–E14) of burials of cattle, sheep, pig, foal, dog and cat from Phases 5/6 to 9. All were accompanied by bones of other animals, probably in the case of Phases 8/9 and 9, by bones of greater antiquity than the burials themselves. Apart from the intrusive burials of Phase 9, all others with the exception of three partial cattle skeletons from Phases 7, 8 and 8/9, were securely stratified.

It would seem that the horn cores of the buried cattle and sheep were butchered in order to remove the horn sheaths before disposing of the rest of the animal, which must have been unfit for consumption as food, but were otherwise unbutchered. The exact means of disposal, whether by actual burial or by merely throwing the animal onto a midden, is unclear in the case of the non-intrusive skeletons. The good preservation of some of the skeletons suggests however that burial was rapid. The **SW** building

in Early Phase 7 contained a sheep burial within its original floor which seems to have been a deliberate action.

Only three partial cat skeletons have been included in Table 43mf, although it was thought that the isolated bone finds of cat in many of the contexts were probably all that remained, or was recovered, of animals which were dumped intact, as is usually the case at archaeological sites. Even if the skin was removed, the carcass was unlikely to have been eaten by humans and thus the bones would have been deposited together. Scavenging by dogs would result in the later chance finds of single bones.

The presence of cat bones within walls was noted from Early Phase 7 onwards. Although their location within the structures of buildings may have been fortuitous, derived from the reworking of older rubble and midden material, it is possible that they were introduced deliberately. In more recent times, whole cat skeletons have been found built into walls of dwellings as a form of sympathetic magic against rats and mice (Clutton-Brock 1981, 111–2).

Many cat bones were found within the building walls during stage 8 of Later Phase 8. It is possible that the bodies of felines were deliberately buried to 'act' against rodents. Certainly the large numbers of small mammals in this phase may have forced the human inhabitants to resort to any means available to be rid of the nuisance.

Carcasses of foxes were also likely to have been skinned but not eaten by humans. Three fox skeletons are not included in Table 43mf (1:E13–E14), but it is interesting to note that the partial skeleton of a fox was retrieved from the same context as a pig in Phase 7. The fox, SF 2152/3011, had suffered from an infectious arthritis in the feet. The animal may have crawled into the unused broch tower and died there naturally. Alternatively the body may have been thrown on to the floor in an articulated condition after having been skinned. The accompanying and almost complete pig skeleton had no signs of butchery. The animal however suffered from a probable infectious arthritis, particularly in the left shoulder. Its meat was possibly purulent and thus unfit for human consumption.

## CONCLUSIONS

A factor in the keeping of animals which is difficult to assess is the status conferred on the owners of, for example, cattle. Tacitus, writing about the Germani, said 'it is a national custom for gifts of cattle or agricultural produce to be made to the chiefs' and, again, that among other gifts, a team of oxen and 'a horse with its bridle' were given as a dowry (trans Mattingly 1980, 114, 116). Although Tacitus was recording the customs of quite a different, but contemporary culture to that of Iron Age Orkney, it is possible that the criteria of wealth were not dissimilar.

When old age, disease, natural mortality or human selection brought about the death of the domesticates, the main value of the carcass would have been as meat, both dried and fresh. Butchery marks on the bones show that horses as well as cattle, sheep and pigs were used for their meat. The fact that the Early Christian church in Celtic Britain frowned upon the custom of eating horseflesh as a 'practice fitting only for thieves' (McCormick 1979, 315) indicates that it was customary, at least before conversion, so to do.

Animals such as fox, otter and to some extent cats were utilized for their pelts. The small numbers of skeletons found suggest that furs were for local need rather than for trade or export. However, the status of cat during the Iron Age is slightly dubious, valued both as a rodent killer and for its fur. The occurrence of kitten bones does indicate that the animals bred successfully in the settlement, although the appearance of cat from Phase 4/5 and certainly from Phase 6 indicates that the evidence from Howe is earlier by a century or two than the postulated introduction of the animal by the Romans. It is possible however, that small numbers of domestic felines may have arrived in the British Isles through trade-links between the Phoenicians and the Celts (Tabor 1991, 36).

The status of dog is also questionable. Do the few remains indicate a valued species? Certainly the large sized specimens suggests hunting animals for rounding up both the domestic livestock and red deer, but it is not known whether they were bred for specific purposes. The non-utilisation of their skins indicates a different status to that of cat.

The hunting and use of red deer poses many questions concerning ownership, territoriality, organization and leadership, not just within the settlement at Howe, but between Howe and its neighbours. How far did the Howe inhabitants travel to hunt deer? Where did they hunt? Did the Orkney mainland herds satisfy the demand of the local inhabitants or did people hunt on neighbouring but less well populated islands such as Hoy? Was there organization between broch settlements for a regular cull on the deer herds? Did specific numbers of deer belong to certain settlements and how was the meat shared out? What happened when the red deer herds declined significantly in numbers but the demand for antler artefacts remained high? Certainly, the evidence from the later phases of the site indicates that antler was valued so highly as a raw material that its importation, in isolation from the rest of the carcass, must have occurred. Its place of origin and the possibility that it was an article of trade remain a matter of conjecture.

The information gleaned from the faunal remains from Howe is unsurpassed by any previous Iron Age excavation in the Northern Isles. The preservation and stratigraphic analyses have provided an insight into

the life of the settlement in great detail. Recently published evidence from the nearby Warebeth Broch (Sellar 1989, 122–127) shows a similar picture to that from Howe, although the material was from a restricted context, that of the broch well. Information from the recent excavations on the island of Sanday and from Skaill in Deerness may broaden the picture established by Howe and fill in some of the missing details to provide a more comprehensive view of Iron Age husbandry and hunting practices.

## 7.4 • THE BIRD REMAINS

Dr Don Bramwell with BBS

The excavation produced one of the largest stratified bone assemblages in the north of Scotland with bird bones recovered from all but the earliest phase. Over 1700 bird bones were found (Table 47). Of these, 90% were identified representing 113 species (Table 46mf 1:G9–G14). Only one of these species, the great auk, has become extinct, while the rest are still found as island breeders or visitors.

### DISTRIBUTION BY PHASE

Very few bones, about 6%, were recovered from Phases 2 to 6 of the site, from ditch fills and levelling horizons. Some of the larger food species, gannet and great auk are represented, but from the small number of bones preserved no conclusions can be drawn. The majority of the bird bones, 76%, were found in Phases 7 and 8. 17% were unstratified.

The greater survival of bird bone in the Iron Age Phases 7 and 8 is consistent with the more detailed preservation of the archaeological record at this time; equal numbers of bones were found from these phases (Table 47). Most bones were found in levelling layers and ditch fills, with the larger food species – the gannet, cormorant, golden plover, great auk, and red grouse – being well represented. Large numbers of smaller birds present during these phases – the thrushes and starlings – represent birds that were breeding on the site.

Bones of a single goshawk were spread across the E half of the site in Phase 7, and bones representing one short-eared owl were found in several floors and rubble horizons inside the broch tower during Phase 7–8. The earliest record of domesticated fowl and geese came in Phase 7 but in small numbers. There are some changes in bird bone numbers later in the Iron Age, in that there are twice as many red grouse in Phase 8 as in Phase 7, but half the number of great auk bones, whereas the presence of golden plover and starling remained consistent throughout these two phases. The filling of the derelict broch tower in Phase 8 produced a large number of bones from 30 species, including debris from food species such as grouse, as well as bones of smaller birds which may well represent the prey of ravens who seem to have nested in the disused building. The presence of bones of red kite, juvenile crane and stock dove in Phase 8 represent unusual kills (see below).

### EXPLOITATION OF BIRD RESOURCES

#### HABITAT AND AVAILABILITY

No detailed attempt has been made to categorize bird species by habitat as their natural environments are complex and their definitions are being constantly refined. Guides to the birds of Britain and Europe cite the breeding and non-breeding habitats of individual species and they are not repeated here. Many types of habitat provide the opportunity for Howe's inhabitants to capture birds; sea cliffs for guillemot, razor bill, shag, cormorant, gannet and perhaps raven, with puffin and black guillemot at the top and at the base; shorelines and estuaries for ducks and wading birds; moorland for golden plover, some gulls and red grouse; marshes and lochs for passage and wintering ducks, geese and swans; farmland for wintering birds and foragers such as rock dove, golden plover and starling. The settlement at Howe (illus 1) was situated close to open sea, shorelines and inland lochs, with the nearest marsh and moorland about 3km away and high sea cliffs about 6km away.

Small birds, such as thrushes, blackbirds and starlings were most likely to have been resident breeders about the site, using old buildings and surroundings fields, whilst redwing and fieldfare may have inhabited the area of the settlement during passage north and south.

The smaller birds, the thrushes and buntings, may have also been victims of predators such as owls, merlin and peregrine which could have used derelict buildings on the site as roosts or plucking stands. They may also have become casualties of hunting foxes, otters and the domestic cat which brought its prey to the settlement.

It is assumed that most of the larger birds would have been hunted and brought to the site by man, as food. Other species such as the birds of prey, may have been accidental finds, trophies of the hunt, or used for hunting, and their location in the archaeological record might well be for reasons other than for food (see below).

Table 47: Total number of bird bones by phase

Phase	2	3	3–4	4	4–5	5	5–6	5–7	6	6–9	7	7–8	8	8–9	9	Totals
identified	1	2	1	1	2	18	50	1	19	5	545	75	582	1	272	1499
unidentified		1				2	2		2		58	7	32		27	126
Totals	1	3	1	1	2	20	52	1	21	5	603	82	614	1	299	1625

## ACQUISITION

With a lack of direct evidence from the site, methods Iron Age man used to acquire birds as food have been inferred from examples used in the Northern and Western Isles during the last two centuries. The bird remains from Howe have not provided evidence for the processes of capturing and killing, but blunt-ended arrows, clubs and snares were probably used (Clark 1948, 116, 117). It can only be suggested that ropes, probably of heather simmens, were used to explore the cliffs and reach nesting birds which could then be clubbed or killed by hand. Hooks and nets may also have formed part of the apparatus of bird collection (Baldwin 1974, 67, 89). Most birds taken as food were adult. Immature and juvenile birds account for only 14% of the total number of bones. Sea birds were exploited as a common food from the 16th to the 19th centuries (Fenton 1978, 510), and there is no reason to suppose they were not exploited in earlier times to supplement the diet, especially in the summer when made vulnerable by cliff nesting in large numbers (*ibid*, 522). Last century, men working nests on cliff ledges would throw the bird down to a waiting boat at the foot of the cliff, or carry the birds on their backs. The bird bone numbers from Howe suggest small scale killing of sea birds, for which a boat may not have been necessary. Gulls, shags, auks and perhaps gannets could have been taken by hand or with nets and dogs. Puffins could have been poked out of their burrows with a hooked stick or noose or pulled out by hand (Fenton 1978 517, 518, Steel 1975, 62).

First in the summer season would have been the taking of sea bird eggs, notably puffin, black guillemot, guillemot and gulls, followed by the culling of the birds in June or July. Heather baskets either carried or suspended on a rope were most likely used for the collection of eggs (Fenton 1978, 513). There are only a few fragments of eggshell from Howe, and none of it has been identified, the rest presumably was recycled.

Gannet is well represented at Howe with 68 bones present from Phase 5/6 onwards. It has been suggested (P Reynolds & I Lorimer *pers comm*) that local gannetries were present in Orkney in the past, which have since been over-exploited or abandoned by the bird. The relatively small number of gannet bones, as compared to the number of birds taken earlier this century on St Kilda (Steel 1975, ch 2), suggest that 51km journey by boat to Sule Stack, west of mainland Orkney (now Orkney's only gannet

colony) was not justified. Small scale local exploitation seems the norm for the Iron Age inhabitants at Howe.

Sloping rock platforms, accessible rock ledges and caves mainly found on the west coast of the Orkney Islands would have formed suitable nesting sites for the flightless great auk (Buckley & Harvie-Brown 1891, 245). It would seem that access to, and killing of, these birds was quite easy and less hazardous than other species, as more bones (77) are recorded from the site than any other sea bird.

During the autumn, it is evident that Iron Age man turned to the heather moorland and fields, to the red grouse for meat. In poor winter weather grouse would have also come down to feed on stubble in fields (Buckley & Harvie-Brown 1891, 195; Cramp 1980, 392). There they could have been trapped or caught by dogs. If hawking was in practice, birds like the peregrine and goshawk (see below) could have been employed to attack grouse in flight (Vesey-Fitzgerald 1946, 1–26). The larger number of grouse (165 bones for the Iron Age), both from Howe and the neighbouring settlement of Bu, indicate that it was the bird species most commonly taken. Apart from sea birds and grouse, fresh water fowl such as swans and duck could have been killed using arrows, nets and dogs, probably during the winter months when migrant birds in large numbers would have been quite noticeable on the lochs. Also during the winter migrating and passage, geese coming to rest in fields and inland wetlands would have been relatively easy targets for the Iron Age hunter. Fields in the vicinity of the settlement would have provided feeding grounds for greylag geese as well as rock doves, golden plovers and starlings. Snares, hawks, arrows or dogs would probably have been used to take the larger birds. Golden plover are reported to be excellent eating, but difficult to catch (Vesey-Fitzgerald 1946, 164). In Phase 8, juvenile crane bones (see below) form one of the most important samples from Howe, indicating the taking of a young bird from its nest on boggy ground. Seasonality of the availability of birds and their eggs was probably an important consideration of inhabitants at Howe. The general paucity of young bird bones suggests that in the main they were not taken, in spite of the heavier meat weights of fledglings such as gannet. Provision of meat may have only been one of several factors in the taking of birds but the relatively small number of total bird bones compared to mammal bones indicates that killing birds was only a subsidiary activity and the inhabitants of Howe were not dependant on them.

## UTILIZATION OF CARCASSES

Some of the Iron Age bird bones from Howe exhibit evidence of butchery. Once caught, a gannet from Phase 5–6, SF 6448, was butchered to remove its wings and legs, whilst knife cuts on its head might indicate that the carcass was split down the middle then hung up to dry.

In the same phase, a pair of great auk legs, SF 6463, were found which had been roughly hacked off the carcass and discarded. Knife cuts were also found on other great auk bones in Phase 7. Butchery marks were noted on species found in Phase 8, whooper swan, greylag-domestic goose and domestic fowl. The combination of butchery marks and the grouping of some bones in Phase 7 suggest that wings, feet and heads were removed from carcasses before cooking, smoking, drying or eating raw.

At a time when all food was predominantly boiled or stewed, some of the bird carcasses may have been hung up to air dry out of the wind or smoked above the domestic fire, to provide some dietary variety. On St Kilda, some birds were hung up to dry in store houses to preserve them, and the fat from boiled sea birds was skimmed off and used to provide fuel for lamps (Steel 1975, 58, 67). Nothing from bird carcasses was wasted and Howe's inhabitants would have readily made use of sea bird oil and fat for lighting, medication and culinary uses.

There are a few examples of charred bird bones. In Phase 7 a few samples showed evidence of birds having been cooked, found either near hearths or in a burnt condition, such as a calcined guillemot humerus and a scorched cormorant humerus.

It is quite likely that some raptors would have been taken for their feathers, for example the white-tailed eagle, red kite and ravens, whilst scavenging on middens for refuse, or on dead lambs and pigs. Sea birds may have also been utilized for their skins, which would have been both light and warm (Fenton 1978, 520). The paucity of eiders from all phases, and also at Bu, is quite remarkable, as they are easy to approach when on the nest. They could have been exploited for eggs, meat and especially feathers. Their scarcity in the Iron Age might suggest low bird numbers due to over exploitation, or that the species was protected for its down. Eider duck were supposed to be a favourite food (Groundwater 1974, 83–85).

Although wing extremities of some sea birds are noted as being removed from the carcass, some groups of bones have been clearly identified as being from wings, such as the guillemot bones from the broch tower in Phase 7. It is suggested that these wings may have had a domestic use in the form of a brush or winnower (Baldwin 1974, 96, Plate 46).

## BIRD SMALL FINDS

(see also Bird Bone Artefacts in Small Finds Reports)

Only four worked bird bones were found made into tools or implements. Two goose ulnas, SF 3398 and 3326, from Late Phase 7 were rubbed down, the former formed a smooth square sectioned shaft, whilst the latter had been sawn at one end and then

broken by use (illus 89). In Early Phase 8, two smoothed gannet ulnas SF 1958 and 1976, were found. The former was damaged.

A bird bone tube was found among the bone collection from the broch of Midhowe, Rousay. It was identified as a goose sp. or white-tailed eagle ulna (Platt 1934b, 489, fig 29, 516), but few such finds have been made on Orcadian sites.

## DISCUSSION OF CHANGES IN BIRD DISTRIBUTION AND GENERAL REMARKS

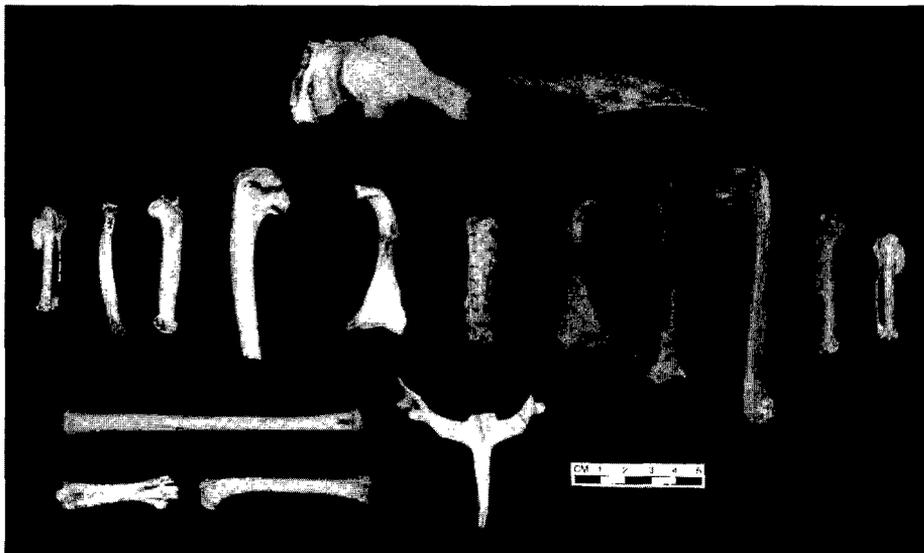
Comparison of the number of bones of the species with their present day abundance (see Meek 1985), infers that some species were always plentiful, such as gannet, cormorant, shag, red grouse and raven. Other species such as the now extinct great auk and the white-tailed eagle which is no longer a breeding bird or a regular visitor, were obviously more numerous in the prehistoric period. In spite of the haphazard collection of animal and bird bones from previously excavated Orcadian prehistoric sites, the pattern of common bird species is more or less consistent (Smith 1984, 262–264).

Other bird species have high bone numbers, but in some cases they only represent single individuals, such as the adult goshawk in Phase 7 and 8, found in rubble contexts on the E side of the site, and the white-tailed sea-eagle in Phases 8 and 9, again on the E side of the settlement. Goshawk is at present a rare visitor in Orkney, and although it is predominantly a bird of woodlands, it might have passed over Iron Age Orkney during migration periods. Alternatively, the goshawk has been highly prized for hawking for game birds as it easy to handle and returns to the hand. It might have been a prestigious object of trade or exchange to someone of high social rank, unlike the peregrine or kestrel which could have been caught and trained for hawking locally (Vesey-Fitzgerald 1946, 1–3).

It is interesting that bones of rare birds of prey such as the red kite from Late Phase 8 and an immature tawny owl from Later Phase 7 found their way to the settlement at Howe. The tawny owl is an unusual predator whose presence in Norse times has previously been noted in Orkney (Brothwell *et al* 1981, Table 3). These birds could well have been blown off course; whilst looking for shelter these tired and disorientated birds would have been easy prey to the hunter.

The occurrence of four ravens and adult and immature short-eared owls in late rubbles in the broch tower, suggest nesting and roosting birds in the derelict building. Walls would have been used as plucking stands to deposit torn off wings and sternum and other bones of their kill onto the rubble beneath. This probably accounts for the high numbers of starlings and thrush species found in these contexts. Young raven may have been eaten or kept as pets, as several at the fledgling stage were found (Luff 1984, 41).

The great auk (illus 88) is an extremely interesting and exciting find. The best collections of bones in the British Isles have come from Orkney, although none were identified from the settlement at Bu. Its lack of



Illus 88  
Composite skeletal remains of  
great auk bones found at Howe.

flight and the fact that it bred colonially on shelving rock platforms, rock ledges and in caves close to the tidal levels made it easy to kill. In Phase 7, parts of a juvenile bird were found, indicating culling by the islanders in late summer. Juvenile bones were found in Phase 6–9, indicating again locally reared young, but in the main, young great auks were not primary targets for food. When the great auk was not breeding it was probably widely dispersed at sea. It was last seen in Orkney in 1813 and became extinct in June 1844 (Buckley & Harvie-Brown 1891, 245; Cramp 1985, vol 3, 207).

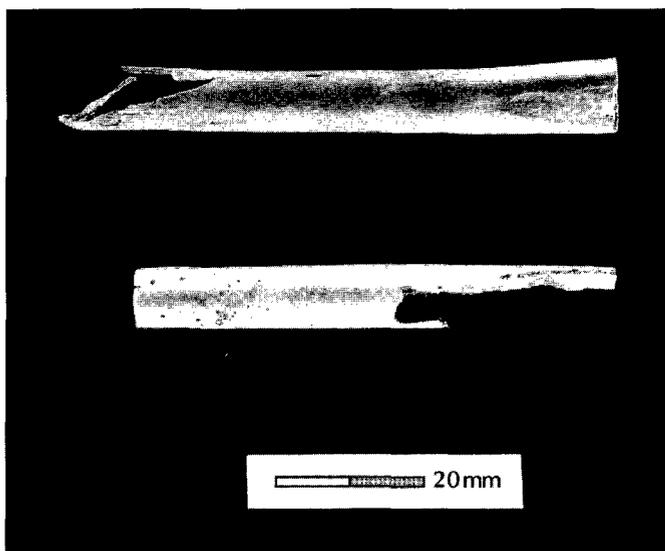
The presence of fulmar at Howe during the Iron Age is also worthy of note. The fulmar is known to have expanded southwards from Iceland in the 18th and 19th centuries, only reaching the British Isles in 1878 (Cramp 1980, vol 1, 122), and only since the 1900s has it rapidly increased its numbers. The five fulmar bones, from well stratified contexts in Phases 5/6, 7 and 8, do not significantly aid our interpretation of its past status. They do, however, indicate that the species was at least present as a visitor rather than breeder.

The juvenile and immature bones of turnstone in Phases 7 to 8 are also of interest as they may indicate that the bird was a former breeder on the islands. Its present status is that of a passage winter visitor. Bones were found of a very young crane, SF 3305, possibly a single individual from an abandonment horizon in Phase 8. Confirmation of the identification and the following report is by Dr CJO Harrison and Mr GS Cowles.

The ends of the bones are incompletely ossified, making recognition difficult. Those offering some diagnostic features are a pair of femora, a humerus showing some development of the proximal part of the brachialis depression at the incomplete distal end, but almost featureless and rounded at its proximal end; and a tarsometatarsus, expanded proximally, and distally incomplete but retaining the basal part of the trochlea for the second toe, and showing the elongated facet at its base for the attachment of the first, or hind, toe.

On comparison with a large range of material it is apparent that these are the bones of a juvenile crane, comparable in size with those of the common crane (*Grus grus*). The tarsometatarsus is much shorter than that of an adult, barely half the length, and this together with the relatively unmodified ends of the bones indicates that the bird was a chick, and almost certainly in down. This would appear to constitute good evidence, possibly the first in juvenile form, for local breeding of a crane in the British Isles. It is claimed, mainly on the basis of early writings, that the common crane bred in southern England, in East Anglia, until about 1600 and perhaps in Ireland until the 14th century (British Ornithologists Union 1971).

It should be noted that a second larger species of crane, now extinct – the European crane (*Grus primigenis*) – was present in north-west Europe including the British Isles from the Late Pleistocene until the Iron Age and Romano-British period (Harrison & Cowles, 1977). Its breeding grounds are unknown, and while the smaller species is the more likely in this instance, the larger species cannot be ruled out absolutely on the basis of such juvenile material. Crane is at present a very rare visitor to Orkney (Meek 1985, 38).



Illus 89  
Bird bone whistles, (upper) greylag? goose ulna (SF 3326),  
(lower) gannet ulna, (SF 1958).

The ubiquitous starling was a common breeding bird on the site, during the excavation, and tolerated disturbance near its nests. With starlings nesting inside Iron Age walls it is possible that some of their bones are intrusive. Their presence in Phase 5/6 and their high numbers in Phase 7 and 8 indicate that the starling was equally common in the Iron Age as it is at present. Starlings were also found in quite large numbers in the Iron Age at Bu broch, just over 1km away from Howe.

‘One hundred and fifty years ago it [the starling] was a comparatively rare bird, except in the NW of Scotland and the Scottish islands, but since then its increase has led to it becoming one of our more widespread birds.’ (Fearce 1986, 378). The starling exploited the cultivated fields around Howe, and was unlikely to have been culled for human consumption.

The earliest evidence of domesticated birds has come from the **SW** building in Early Phase 7 with both fowl and goose recorded. Domestic fowl was also identified from Later Phase 7 and contexts in Phase 8. Domestic duck is less well represented but it was present in the broch tower in Phase 7–8. Only domestic fowl has been noted from other Orcadian Iron Age sites such as Midhowe and Broch of Ayre, but none were identified from the brochs of Gurness or Bu (Bramwell 1987, 135–136). Domestic fowl and goose were recorded from the Pictish and Norse site of Buckquoy (Bramwell 1977, 209–211) and the Norse and post-Norse phases of Newark Bay (Brothwell *et al*, 1981, Table 3), but have generally not been well noted from Orcadian sites. Further work on present and future excavations may help our understanding of the fluctuating fortunes of bird populations both natural and domestic.

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## 7.5 • THE FISH REMAINS

Alison Locker

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A total of 3,122 fish bones (including 8 fragments of crab claw) identifiable to species or group level were present in deposits in Phases 3 to 9. These were mainly recovered by sieving and sometimes by hand picking on site.

The species and non-specific groups and the total number of bones from each in each phase are shown in the summary Table 48; the more detailed tables indicating the bone type identified for each species/group in every context for each phase are available in the archive. Unidentifiable material (often found in quantity in fish bone deposits as a result of fragmentation due to the friable nature of the bone) has been omitted from the summary table, but is indicated as present or absent in the tables (described in detail in the archived report).

It is clear from the summary table that the most important and numerous species from the whole site belong to the cod group (77%), and in particular saithe (49%). Evidence for the exploitation of marine resources, and in particular that of immature saithe, rises in the broch tower and village occupation of Early Phase 7, peaks in the later settlement of Late Phase 7 and continues, with an increased variety of species, during Late Phase 8.

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## DISTRIBUTION

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### THE EARLY PHASES 3–6

Little fish bone was found in Phases 3 to 6 which encompass the Early Iron Age occupation of the site, the roundhouse and Broch 1, until its levelling early in Phase 7. Given the site location, it could appear that fishing was not considered important during this period but more likely suggests a lack of suitable deposits, although the preservation of fish is both good and prolific from Phase 7 onwards. The most interesting find from these early phases is the only example of angler fish from the site, identified from a maxillary fragment from the shillet bank in Phase 5. This is a bottom living fish, most commonly found below 18 metres on sandy, shell or gravel bottoms, and has a tasty if fibrous flesh (Wheeler 1978, 145). The fishery for young saithe is indicated by 42 fragments from Phase 5/6 and a line fishery for ling by three bones.

### PHASES 7 AND 8

From the construction of the broch tower and surrounding village in Early Phase 7 to the later settlement of Phase 8 a wide variety of species have been identified. In terms of their food value and frequency of occurrence they can be broadly divided into three groups:

- a) Prime food fish – roker (and other elasmobranchs), eel, conger eel, salmonids, cod, saithe, ling and the flatfishes.
- b) Food fish (but occasional) – haddock, hake, whiting (and ?poor cod and ?Norway pout), garfish, scad and mackerel.
- c) Incidental? (these are mainly small shoreline species) – rockling, bullrout, corkwing wrasse, sea scorpion, cf bass, grey gurnard, sea bream and black goby.

Table 48: Fish remains – summary

Species	Phase										T	%
	3	4-6	5	5/6	5-7	7	7/8	8	8/9	9		
Elasmobranch						1		4			5	.1
<i>Elasmobranchii</i> indet												
Roker								2			2	.06
<i>Raja calvata</i>												
Ray indet.	1							1			2	.06
<i>Rajidae</i> indet.												
Eel		1				6		35		2	44	1.4
<i>Anquilla anquilla</i>												
Conger eel						4	1	21			26	.8
<i>Conger conger</i>												
Salmonid						11		8		3	22	.7
<i>Salmonidae</i> indet.												
Angler fish			1								1	.03
<i>Lophius piscatorius</i>												
Cod						11		42	1	4	58	1.8
<i>Gadus morhua</i>												
Haddock							1	2			3	.09
<i>Melanogrammus aeglefinus</i>												
Whiting								4			4	.1
<i>Merlangius merlangius</i>												
cf Poor cod						50		10			60	1.9
<i>Trisopterus minutus</i>												
cf Norway pout						3					3	.09
<i>Trisopterus esmarkii</i>												
Saithe				42		1214		276			1532	49.0
<i>Pollachius virens</i>												
Rockling						7		10			17	.5
<i>Rockling</i> indet.												
Ling				3		2		10		1	16	.5
<i>Molva molva</i>												
Sm Gadoid		6			1	292		145		2	446	14.2
<i>Gadoid</i> indet.												
Lg Gadoid						119	3	121		5	248	7.9
<i>Gadoid</i> indet.												
Hake						2		1			3	.09
<i>Merluccius merluccius</i>												
Garfish						14		5			19	.6
<i>Belone belone</i>												
Stickleback								1			1	.03
<i>Gasterosteus aculeatus</i>												
cf Grey Gurnard								1			1	.03
<i>Eutrigla gurnardus</i>												
Sea scorpion						31		7			38	1.2
<i>Taurulus bubalis</i>												
Bullrout							1	3			4	.1
<i>Myoxocephalus scorpius</i>												
Cottid indet.						8		4		5	17	.5
cf Bass						7					7	.2
<i>Dicentrarchus labrax</i>												
Scad						19		9		1	29	.9
<i>Trachurus trachurus</i>												
cf Sea Bream								12			12	.3
<i>Sparidae</i> indet.												
Corkwing wrasse						59	5	8			72	2.3
<i>Crenilabrus melops</i>												
Wrasse indet.						2		385			387	12.3
<i>Labridae</i>												
cf Black goby								3			3	.09
<i>Gobius niger</i>												
Mackerel						3					3	0.9
<i>Scomber scombrus</i>												
Plaice/flounder						8	1	13			22	.7
<i>Pleuronectes platessa/</i>												
<i>Platichthus flesus</i>												
Sole						3		1			4	.1
<i>Solea solea</i>												
Flatfish indet.								3			3	.09
Crab						7		1			8	.2
<i>Cancer</i> sp												
Total	1	7	1	45	1	1883	12	1148	1	23	3122	100
%	.03	.2	.03	1.4	.03	60.2	.3	36.6	.03	.7	100	

In the first group of prime food fish, saithe is the most numerous occurring species, and the measurements (see archive – Appendix 3) and estimated total lengths of the fish suggest that the majority are between 20–40cm, with a small number below 10cm. These are immature fish and Wheeler (1979, 159) states that from Scotland northwards young saithe are particularly abundant in inshore waters, in their first year in intertidal pools and in their second year close to the shoreline. They could therefore be easily netted or caught on lines by the inhabitants of the settlement. Rokers and other rays could be caught on lines from the shoreline or from small boats, The latter were also probably used for catching cod or ling, as seasonal migrations of many species bring them into shallower waters at certain times of the year. Conger eels often inhabit rocky shorelines and crevices and can be caught on lines or in traps. Eels may also have been caught along the shoreline with the flatfishes.

Most of the species assigned to the second group could equally well have been put in the first if they had occurred more frequently. Whiting, cf poor cod and Norway pout were probably netted and haddock, hake, garfish, scad and mackerel caught on lines. The garfish was identified from its distinctive jaws as well as vertebral centra.

Mainly small shoreline species have been assigned to the third group. Many of these could be found in rocky pools and are not normally regarded as food fish, although Colley (1983, 163) cites the bullrout and five-bearded rockling as providing extra food and variety in the diet of communities of the Shetlands and Orkneys from the 16th to 19th centuries.

Within Phases 7 and 8, certain buildings had larger deposits of fish bones associated within them than others. In particular the S workshop in Late Phase 7 had large numbers of saithe and wrasse bones (some of which were burnt) as well as other species (see appendix 2 in archive).

The buildings of the Early Phase 7 broch and village, the Late Phase 7 settlement and Phase 8 buildings up to stage 8, do show a wide variety of species, even if individually they are not very numerous. If these deposits are a fair representation of the fishing and fish consumption of the community, then fishing would appear to be opportunist, exploiting all habitats whenever possible, rather than as a result of a specific strategy.

The small group of unstratified material from Phase 9 contains many of the species identified from earlier phases although saithe is absent.

## COMPARISON WITH OTHER SITES

The importance of the fishery for young saithe in Orkney in the more recent past shown by Colley (1983) has already been mentioned. Her tabulation of the species from five Orkney sites (*ibid*, 159) Isbister, Noltland, Bu Broch, Saevar Howe and Brough Road, Birsay, dating from the Neolithic to the Norse periods, shows a close correlation between the species identified from those sites and those from Howe.

Wheeler (1979) identified 7 species from the Neolithic tomb at Quanterness, including ling, five-bearded rockling, scad, corkwing wrasse, ballan wrasse, sea scorpion and flounder. He comments on the scarcity of the corkwing wrasse in the region today (which was also identified from Isbister and Noltland as well as Howe), suggesting its apparent abundance in the Neolithic could be indicative of a warmer climate than at present. The Howe finds extend this possibility into the Iron Age.

At Bu quantities of small fish in Iron Age deposits (Colley 1987) of under 15cm in length led Colley to suggest that these were the contents of otter spraints rather than human food remains. The bones from these deposits correlated well with the species and size of fish identified during zoological studies of contemporary spraints. Although there are fish in this small size range from Howe, their association with larger fish remains, sometimes burnt, within buildings has suggested to the author that this is not likely to be a significant source of contamination in this instance.

## SUMMARY AND CONCLUSIONS

Fish bones from the settlement overlying the Neolithic tomb at Howe are mainly found from Iron Age deposits in Phases 7 and 8. The cod fishes are the most important group, in particular large quantities of immature saithe found in the deposits from the S workshop. In addition small shoreline species were also frequently present especially small wrasse. Bones from large cod and ling were rarely found, and the measurements from Phase 8 were insufficient to suggest whether there was any increase in deep water fishing from Phase 7 to 8 which might be shown by any increase in size in the later period.

In conclusion, fishing as represented by the fish remains from Howe seems to be largely opportunist, exploiting the immediate shoreline with nets, lines and traps, extending into the shallow water inhabited by immature saithe, but rarely penetrating into deeper water for large cod or ling. The shoreline and nearby waters may have always provided plenty of fish without having to make the effort of taking to the open sea.



the Norway lobster (*Nephropus norvegicus*). These species are still found in Orkney today but their occurrence in the molluscan record for Howe suggests there was no serious exploitation in the Iron Age.

A further point may be made on the utilization of the limpet species. In all phases where limpets were recovered there were numbers of individuals which were partially burnt and encrusted

with orangey-brown material of ferrous origin. Originally thought to be from the iron-working on the site, it is now assumed that limpets were not used in metal production for their lime content, but rather the encrustation was a natural accretion leached from soil and rocks. With the start of Late Phase 7 and throughout Phase 8, both fresh and well work individuals were present which further suggests that limpets may have been serving another purpose other than as a dietary supplement.

## DISCUSSION

The majority of species within the sample are edible varieties but the flat periwinkle (*Littorina littoralis*) is too small to have been considered as a food source. The species is not present in any significant numbers to suggest other than their accidental incorporation into the material, either in consequence of the collection of other species or perhaps in the collection of the large kelp (*Laminaria*), which tends to inhabit the shallow sublittoral zone where there is an abundance of molluscs, crustaceans and echinoderms (Jones 1975). The small quantities of grey top shell (*Gibbula cineraria*) and fragments of *Echinus* species including the seurchin (*Echinus eschulentus*), may also have been incorporated accidentally in the exploitation of the shallow sublittoral zone. The great scallop (*Pecten maximus*) and other scallop species (*Chamys*) are present but both in very low numbers. They inhabit the level bottom areas around the Orkney Islands, with limpet and mussel on the littoral rocks and cockle in the estuaries and sandy shores.

In terms of dietary importance, limpet, flat periwinkle, common mussel, common cockle are the significant species. Throughout the different phases of the site, the size of the individuals collected of flat periwinkle (*Littorina littorea*) and common cockle (*Cerastoderma edule*) does not greatly fluctuate. The same cannot be said of limpet *Patella* and common mussel (*Mytilus edulis*). During the periods of the Early Iron Age, Phase 6 and Early Phase 7 the size of limpet remained fairly constant, consisting of small to medium sized individuals with very low cones. With the start of Late Phase 7 not only were much larger specimens being selected with high cones but there was also a fuller range of sizes present in the sample. The relationship between the height and the length of limpet shells is determined to be primarily due to their position in the intertidal zone. Limpets which inhabit the lower parts of the tidal shore are much flatter than those on the higher parts. The limpets collected during the earlier phases of the site appear to have been collected from this lower part of the tidal zone, perhaps even from low tide situations exposed during the spring tides. This may suggest an exploitation of the species during these phases at a specific time period, ie early spring. A change in the Late Phase 7 phase toward larger limpets and a wider range of sizes may also suggest a dietary change or one of economy. This could imply that limpets were utilized primarily as bait for line fishing (Clarke 1976) rather than as a food source. Perhaps even, an over exploitation of the lower tidal reaches during the earlier periods of the site necessitated a change in collection practices. The size of the common mussel (*Mytilus edulis*) also increased overtime and by Late Phase 7 individuals were fairly large, up to 90mm in length.

Marine shells were noted on many of the earlier excavations in the Northern Isles, but on the whole were not considered important enough for detailed analyses. Many of collections, if indeed they were collected, have long since been lost. Marine molluscs were however, reported from Clickhimin broch, and especially from the early levels where the three main species of limpet (*Patella*), cockle (*Cerastoderma*) and common European oyster (*Ostrea edulis*) were recorded (Hamilton 1968, 168). The latter species was found at Howe but not in any significant numbers, and suggests that different marine habitats were exploited.

Mollusca totalling 671 shells were also collected from Crosskirk Broch in Caithness, but from selected contexts. The species present closely parallel those found at Howe with limpet and flat periwinkle having the highest numbers but no conclusions were thought significant in the light of the sampling procedures (Fairhurst 1984, 135). Mollusca were also recovered from Bu but totalled less than 1000 shells (Colley 1987, 130, 134). The assemblage closely resembled that from Howe reflecting that a similar marine environment was exploited, but further south on the Cairston headland. In comparison with both Crosskirk and Bu, Howe has produced a very significant collection of marine molluscs, and further research would undoubtedly produce more information on the exploitation of this resource during the Iron Age period.

In conclusion a wide range of marine species is represented at Howe, in particular large quantities of the edible species limpet, flat periwinkle, common mussel and common cockle. Although these species may have provided an important dietary component of the site, only the limpet in particular may have served a secondary function.

## 7.7 • NON-MARINE MOLLUSCA

Stephen Carter

Non-marine mollusca, although not intentionally sampled for, were recovered from many contexts in either of two ways. These were, the hand collection of large shells and the wet sieving of soil samples. Neither of these methods was satisfactory as hand collection was biased towards large species and usually recovered only one, and the wet sieving programme used a minimum mesh size of 1mm. Many shells are smaller than 1mm and therefore a 0.5mm is usually recommended as a minimum mesh (Evans 1972). However, in view of the lack of any prehistoric assemblages from this period in Orkney, any results are worth noting if only as species list.

Table 50: Non-Marine mollusca by phase (Nomenclature follows Kerney, 1976)

Species	Phase 5 Context 999	7 Early 1539	7 Late 981
<i>Carychium tridentatum</i>		2	
<i>Cochlicope lubrica</i>		5	
<i>Cochlicopa spp</i>		7	
<i>Lauria cylindracea</i>		7	
<i>Discus rotundatus</i>	25	177	7
<i>Vitrina pellucida</i>		1	
<i>Vitrea contracta</i>		51	20
<i>Aegopinella pura</i>		3	
<i>Aegopinella nitidula</i>		9	
<i>Oxychilus cellarius</i>	1		1
<i>Oxychilus allarius</i>	14	13	29
<i>Clausilia bidentata</i>		12	2
<i>Balea perversa</i>			1
<i>Clausiliidae</i>			1
<i>Cepaea/Arianta spp</i>		1	
<i>Hydrobia ulvae</i>			16

Contexts 999 – earthhouse 1539 – ditch fill 981 – dump

## RESULTS

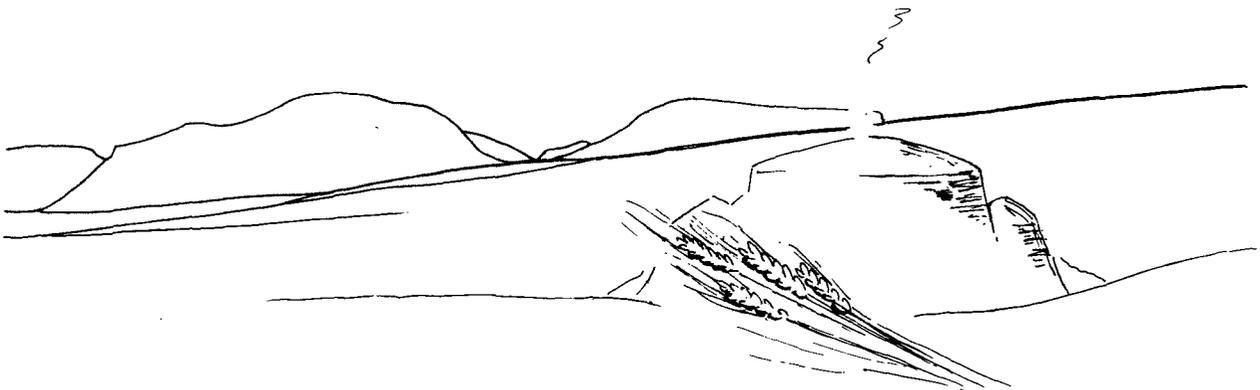
## SIEVED SAMPLES

Only six soil samples from two contexts contained sufficient shells and these are listed on Table 50. All the species recorded are still present in Orkney and the terrestrial species include those common around settlements notably, *Discus rotundatus*, *Vitrea contracta* and *Oxychilus spp*. The only unusual record is *Hydrobia ulvae* from the Phase 7 dump [981]. This is a brackish water species and must have been carried unintentionally into the settlement, perhaps on animal fodder. The carbonized remains of salt marsh plants were identified by Camilla Dickson from other contexts on the site.

## HAND COLLECTIONS

In all except one case, all large shells were of one species, *Arianta*

*arbustorum*. The exception was the collection of shells from the floor of the Phase 5 earthhouse [999], and this assemblage is listed on Table 50. The earthhouse was clean and contained only these shells and the skull of a wren (identified by Dr Bramwell). The bird and the snails could all have entered the earthhouse until Late Phase 7 when the entrance shaft was permanently sealed under paving. Large collections of *Arianta arbustorum* came from the main rubble layers and broch walls where there were large gaps between the stones for the snails to move into. It is interesting that in a collection of 690 shells from deposits spanning a 1000 years, no examples of *Cepaea hortensis* were present. This large helicid snail, very similar in appearance to *Arianta arbustorum* is present in Orkney today and was recorded from Neolithic deposits at the Knap of Howar (Evans and Vaughan 1983) where *Arianta arbustorum* was apparently absent.



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## THE MATERIAL CULTURE

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This chapter describes the wealth and nature of the material culture from the excavations. The first section of introduction presents an overview of the detailed evidence from the following ten sections. It is of necessity confined to the Iron Age phases; earlier chapters have indicated that the material culture of the preceding Neolithic and Bronze Age phases is limited to a very few stone and ceramic items.

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### 8.1 • INTRODUCTION

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In addition to the buildings, the most durable evidence of habitation and life in the settlements at Howe was the range of artefacts. Those best preserved were of bone, stone, metal and ceramic. Although the organic material of skins, hides, wool, leather and other vegetable matter did not survive, tools found amongst the bone and inorganic artefacts indicate their presence during the Iron Age.

Compared to most other land-based Iron Age excavations (prior to Howe) which have taken place in the Northern Isles of Scotland, Howe yielded the largest collection of stratified finds. Over 18,300 artefacts were recorded, and this number excludes the organic material described in the preceding section. This apparently overwhelming amount of data is not merely due to the exceptionally good preservation at Howe, but is also the result of the total excavation of occupation contexts such as floors and of the walls and rubble foundations on which structures were built. In this respect, at the time of excavation, Howe was exceptional.

In the following overview of the material culture, it must be borne in mind that some of the apparent differences may be a product of the proportionately greater preservation of the later phases, in particular Phase 7. This is in part a result of the repeated thorough clearance of existing settlements, especially severe at the beginning of Phase 7. Problems are also apparent when reviewing the archaeological material from the later phases. Repeated contemporary cleaning, demolition and clearing of buildings, and the reworking of rubble layers have left a disjointed and somewhat unsatisfactory artefact record.

### EARLY IRON AGE • PHASES 3–6

The Early Iron Age history of the site covers the period from some time after the abandonment of the Phase 2 Neolithic tomb, through phases of enclosed settlement to the construction of a roundhouse and then the first broch tower. From this period 2464 artefacts (13% of the total) were recovered, which reflect the human exploitation of the available environmental resources (7 Environmental evidence above).

### MATERIALS UTILISED

Artefacts were produced from the by-products of domestic animal production, notably cattle, sheep/goat and pig. Wild species were also present in the assemblage; antlers of red deer were used; and the vertebrae of whales. Stone was another important local resource which was used, not just for building, but for a variety of durable tools. The exploitation of stone was as wide as it could have been, given the largely unvaried geology of Orkney. Finds of sea-borne pumice and flint within the settlement suggests the utilization of all kinds of stone, no matter how small, from which more varied tools could be produced.

Also present in these early phases, were small amounts of metal, the earliest being a lead (?)stud from Phase 4/5. The rest of the metal work, an iron nail, a piece of waste iron, a copper-alloy ring headed pin and a pin head all came from Phase 5/6. The additional evidence of the presence of iron slag in Phases 5 and 5/6 and of (?)crucible fragments, indicate the establishment of metalworking sometime during Phases 5 and 6, the period of the roundhouse and of the first broch. Lead and the ores of iron and copper are available in Orkney, within a 10km radius of the site: to the N of Stromness, in the N of Hoy, and at Yesnaby. It is

however conceivable that local copper ores were never used (see below). Other materials exploited for artefact use during this period were local clays and stone for pottery making and possibly crucible manufacture.

The vast majority of artefacts from these phases were made of local resources either at source or within the settlement, although specific work areas and working debris from bone and stone manufacture were not found. The standard of Iron Age technology was simple (see below) and very few items came from elsewhere. Of these, a steatite spindlewhorl probably derived from Shetland, and the copper-alloy items and (?)crucible fragments were most likely imported with the related technology.

## RANGE OF ARTEFACTS

The data is so limited from these four early phases, that it is impossible to make any comparisons between them but treated as a whole, the artefacts indicate certain activities on the site. From the earliest settlement evidence, a rotary quern denotes food processing. Quern rubbers, a mortar, non-rotary querns, pounders, pestles and a bone scoop also support this occupation. Ceramics, mainly undecorated but some with simple incised line designs, indicate both cooking, and food storage with the addition of stone lids. Cloth production is shown by both stone and bone spindlewhorls, a bone needle and pins, an antler long-handled weaving comb and possible stone loom weights. Bone awls and bone and flint scrapers could have been used for leather working and the preparation of skins. Pottery was produced and no doubt agricultural land was prepared with the use of bone mattocks. Personal items were few, but beads, a counter and the copper-alloy ring-headed pin and pin head hint at things beyond the normal necessities of survival.

The evidence for copper working during the Early Iron Age at Howe, rests solely on the, unused, (?)crucible fragments of which there were two. The paucity of additional material as well as the lack of a tradition of copper-alloy working in the Orcadian Bronze Age (Øvrevik 1985) points to the introduction of the technology during the Early Iron Age. However, copper-alloy working was never a dominant or important aspect of life in the Iron Age at Howe, as most of the copper-alloy artefacts found in Phases 7 and 8 were imports (see below).

These remnants of artefactual evidence cannot confirm the high status for Howe which the constructional works of Phases 5 and 6 suggest. The paucity of information from these Early Iron Age phases prevents further detailed discussion into the economic life of the settlement. Nonetheless, it would appear that outside material influences were minimal during the latter half of the first millennium but the exact extent of contact and exchange of ideas amongst the local Iron Age society at this time cannot be determined. Only in the next major phase on the site can better approximations of these factors be arrived at.

## MIDDLE IRON AGE • PHASE 7

The resources and economic prosperity suggested by the remnant evidence for the Early Iron Age above, are more apparent during Phase 7 from the wealth of surviving material evidence. Not only were the buildings the best preserved on the site, the range and numbers of artefacts from the Phase 7 settlements reached a peak. 13,256 objects, over 72% of all the artefacts from the site, with pottery representing the major percentage, were recovered from this phase. The range of resources were similar to that of the earlier Iron Age but derived from an expanded environment, allowing a greater variety of tools and equipment to be made. Problems of the survival of organic resources however, with the exception of one or two examples, remained the same in Phase 7.

It is likely that the immediate territory of the settlement at the beginning of Phase 7 was similar to that covered in Phases 5 and 6. The environment had not significantly changed, and both domestic and wild livestock were fundamental providers of bone for use in tool manufacture and for recreational items new in the assemblage, such as counters and whistles. The availability of access to beaches for stone for building and tool-making was presumably unchanged. Flint and pumice pebbles were still present in the artefact assemblage, but the vast majority of stone used was that derived from the local geology, especially that of the sandstones. The expansion of iron technology seems not to have radically altered the stone tool assemblage from that already present in the earlier phases, and the assemblage was maintained. Some new tool types were however developed to cater for demands of iron production (see below). Other new tools were grinders

(almost an exclusive Phase 7 tool), cleavers and pebble polishers. These did not simply reflect developments due to improved technology and possibly to changes in food processing, but were also modified according to the influence of personal needs. In Phase 7 are first recorded items of personal adornment such as beads and armlets, made from stone and bone. However, none of the new items required a new manufacturing skill, except the use of a lathe for armlets. The techniques of chipping, grinding, pecking, hammering, polishing and boring to make stone tools had been employed since the Neolithic on Orkney. The same can be said for the production of bone artefacts (eg antler comb *illus 90a*), where the cutting, splitting, scraping, boring and polishing of the raw material with stone tools were traditional skills. As mentioned elsewhere (8.3 Stone Report), the evidence for stone and bone tool manufacture on the site was limited due to the paucity of relevant production debris.

One undervalued resource, found in limited numbers throughout the Iron Age at Howe, were flint tools. Although some were undoubtedly residual from the disturbed Neolithic phases, it is possible that other tools were contemporary with the phases in which they were found. The evidence of a high standard of craftsmanship was seen on the flint tools even from Phase 7 contexts (8.5 Flint & Chert Report), but the question as to why certain pieces were still required in the Iron Age remains unresolved (Hunter 1990), unless some were used with iron fire-steels.

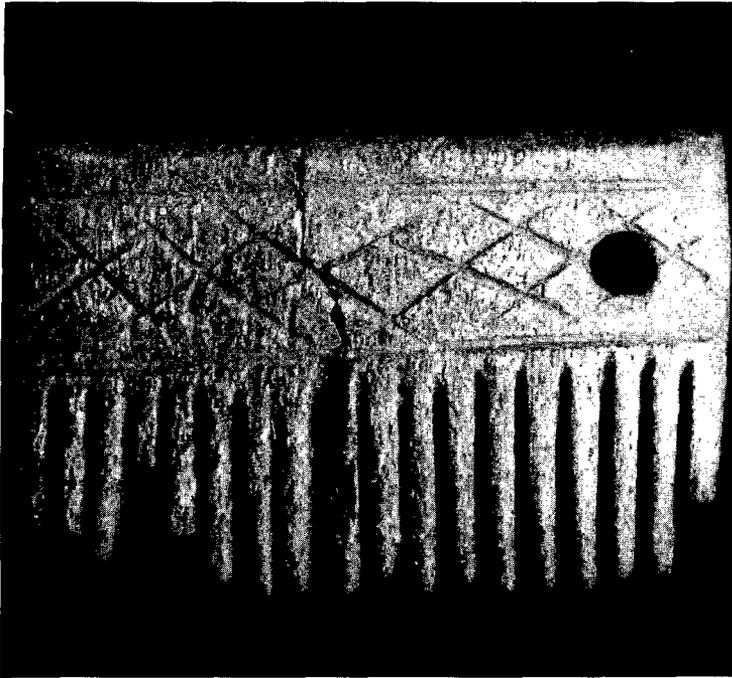
The development of metalworking, and especially iron-working, had a greater impact on the economy of Phase 7 than the two preceding phases. Evidence survived not only of iron artefacts but of iron smelting furnaces and at least one smithing hearth. The **NE** building during part of Later Phase 7 was used exclusively as a smithy (*illus 55*) and the broch tower was also used for iron-working activities before the end of the phase. A contemporary iron-working shed was also located and partly excavated immediately S of the settlement entrance. In the earlier part of the phase, iron-working processes were less formalized or possibly less specialized, and furnaces were found within the houses, implying also the use of the domestic hearth for iron production.

The amount of evidence for iron-working which survived on the site may have been disproportionate, in comparison to the regularity of the activity and the number of iron objects produced. Iron-working processes produce much enduring and tangible evidence of the activities performed, such as slag and furnace lining from iron smelting, while numbers of iron artefacts (including iron lumps) from Phase 7 amounted to only 108 pieces. From the surviving evidence, artefacts which were produced were small (*illus 90b, 90e*) such as knife blades, blanks and nails, suggesting that only an immediate, but important, local demand was satisfied by the domestic production on the site. It is suggested (8.7 Slag Report) that the production was not continuous, that it was probably somewhat inefficient. Very few of the iron artefacts were decorated, indicating the possible low standard of technological skills available at the settlement.

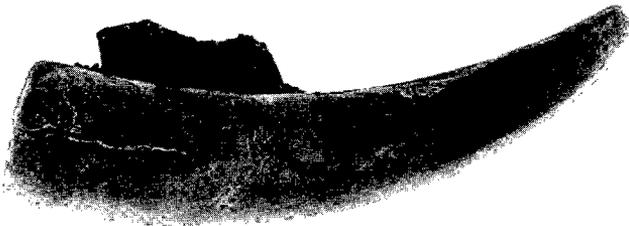
A consequence of iron-working was the development of an accompanying tool kit, this included elongated stone polishers, whetstones and one possible granite anvil (8.3 Stone Artefacts Report). Coinciding with this was the demand to house iron blades in bone and antler handles. The numbers of handles found in Later Phase 7 in the S buildings and related to the last floors of the broch tower, indicated possible work places for their manufacture, but no bone-working debris was traced. Iron production also allowed the development of specialized tools such as saws and files. Although not found on the site, evidence for their use was noticed in hair combs which made their first appearance during Phase 7. In spite of the new iron tools, bone objects were rarely decorated.

The production of pottery was also an important aspect of the economy of the site during Phase 7. Using the available local resources as in the previous phases of the site, the production of pottery vessels was at its most sophisticated in Early Phase 7. Evidence from the **E** building and later from the broch tower indicated that pottery was (made and) fired in these two buildings. Decorative vessels which were apparent in Phases 5 and 6 developed and continued alongside plain pots, but with more elaborate designs (*illus 90d*). From the state of the present research it is not known how important insular development was on vessel design and style, or how much they were influenced by the common Iron Age culture in the north of Britain.

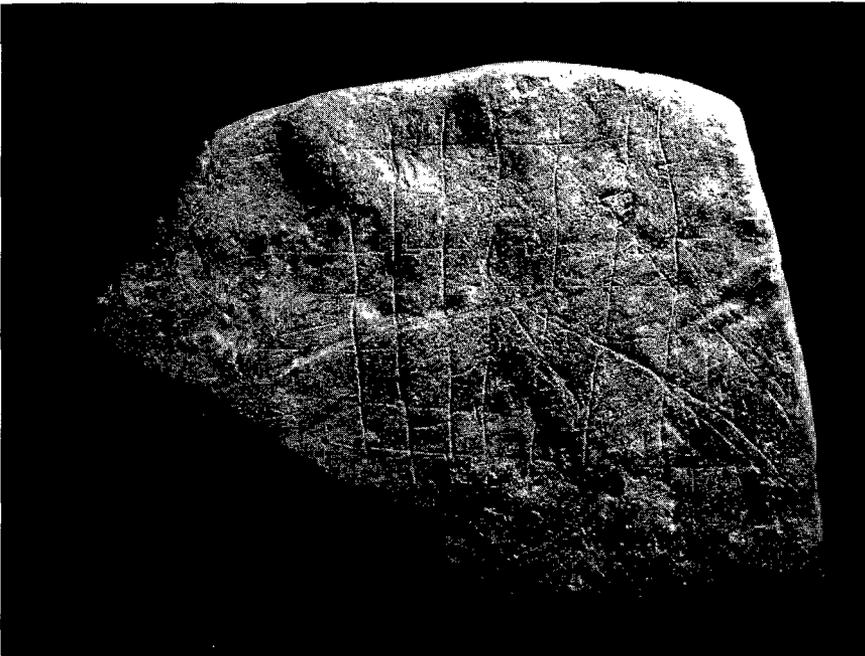
Outside economic and cultural influences were more noticeable in artefacts of copper-alloy and glass. The paucity of copper-working debris and equipment seen in the previous phases continued throughout Phase 7, and the majority of copper-alloy artefacts are considered to be imported. The artefacts, mainly jewellery,



a



b



c

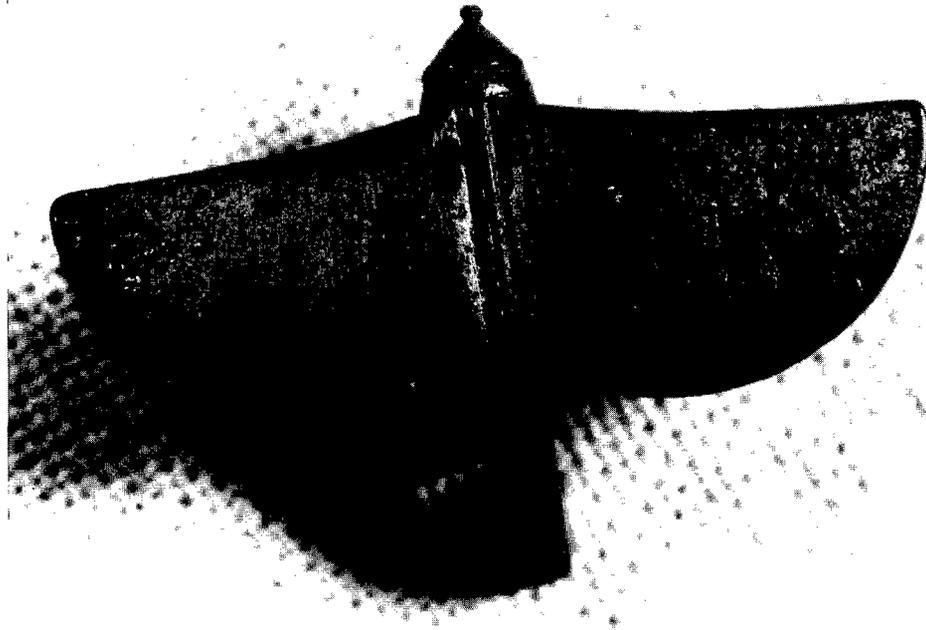


d



e

Illus 90  
 a) Antler comb (SF 4907), Phase 7, scale 1:2; b) iron razor in a bone sheath (SF 5319), Early Phase 7, scale 1:1; c) incised stone gaming board (SF 700), Phase 8, scale 1:3; d) incised vessel, (SF 5241), Phase 7, scale 1:2; e) iron-shanked glass-headed pin (SF 5502), Early Phase 7, scale 2:1.



Illus 91  
Insect brooch, Later Phase  
7. Reproduced  $\times 235\%$ .

came from as far afield as Ireland, Wessex and the Celtic West and eastern coastal areas of Scotland. Trade contacts which began as early as Phase 5/6 were maintained during Phase 7 and continued into Phase 8. Also imported, presumably at the same time as the copper-alloy pieces, were glass beads, which made their first appearance during Phase 7. These too came mainly from the east of Scotland, along coastal routes ways.

The expansion of maritime trade routes in the early centuries AD, especially along the E coast of Scotland, allowed the passage of both Roman and Roman-influenced goods to the N. This accounted for fragments of glass vessels (from Early Phase 8), and Romano-British style pins and brooches found at Howe (illus 91). Although numbers of both copper-alloy jewellery and glass artefacts were small, they indicate that the inhabitants of Howe had access to the markets, goods, fashions and ideas of the day. They had sufficient wealth, and or status, to contemplate these luxury items and presumably surpluses in meat, grain or other goods in order to pay for them.

### LATER IRON AGE • PHASE 8

Initially the material culture of the inhabitants of the Phase 8 settlement differed little from that of Phase 7. However, the outward appearances of economic prosperity, as seen in the buildings, changed dramatically during the final few centuries of occupation.

The introduction to the Iron Age environment (7.1 above) discussed the gradual change in farming practices during this phase, in particular from red deer to sheep, believed to be due to economic factors. The material culture of the settlement during Phase 8 does not indicate a population in stress, nor a contraction of available resources. The basic raw materials for the production of bone and stone artefacts, iron and pottery continued to be exploited in much the same way as the earlier phases. Numbers of artefacts were however significantly reduced, and only 11.7% of all the small finds (2143 artefacts) were found in this phase. Many of the earlier stone artefact types were maintained in Phase 8, although some were lost to the assemblage such as grinders, mortars, shovels and mattocks, but others were added including whetstones and strike-a-lights. These changes indicated developments in food processing, with the gradual availability of hulled six-row barley (7.2 Plant Remains), which demanded different processing methods, and the continued influence of

iron technology. 11 flints were also found, but as mentioned above, their use is somewhat dubious, and may represent residue from disturbed Neolithic deposits.

Iron production continued into Phase 8, specifically in two areas of the site, to the E and in a single shed on the W which may have been a smithy. The latter building was the only manufacturing place identified from the whole of Phase 8. The overall amount of slag and ore from this phase was comparable to that found in Phase 7, but smithing slag was halved and furnace/hearth-lining and cinder massively reduced. This may imply that some iron-working activities took place beyond the area of excavation. The evidence suggests either very few intermittent firings, or a single episode, took place producing small items such as nails, bars and blanks.

Sometime between the 4th and 6th centuries (the end of stage 7 of Phase 8) iron-working disappeared completely from the site; this may suggest that from stage 7 iron artefacts were brought in from elsewhere. There was no apparent change or improvement in the state of iron technology from Phase 7 to Phase 8, but iron-working may have become an uneconomic occupation in a declining settlement.

In contrast, evidence from the pottery assemblage indicated that technological changes took place from Early Phase 8, with the development or introduction of wheel-thrown vessels. This may have been a natural development of wheel-finished vessels found in Phase 7, suggesting that the technology existed at the settlement for wheel-thrown vessels to have been made there. However, traditional coil-built vessels continued to be made to the end of the settlement occupation. Another technological change to have occurred, was the development of more efficient firing and higher temperature techniques as seen in the fabric of some of the pottery. It is interesting to speculate on how far the inhabitants at Howe were influenced by outside forces, such as merchants or traders in the development of these technological changes, and to whether some pottery was actually imported to the site during this phase. The standard of pottery manufacture improved considerably beyond that of Phase 7, but in contrast, decorated vessels were conspicuous by their absence.

Imported goods during this phase tended to be decorative, whereas domestic goods were normally plain. This was true of bone combs, where two decorated, composite hair combs and one long-handled weaving comb with a groove, have been recently identified (Birthe Weber pers comm) as possibly having been manufactured from reindeer antler originating in Norway. It is significant that the proportion of antler artefacts remained roughly the same in Phases 7 & 8, approximately one third of the total number of artefacts for those phases. The recorded shortfall (7.3 Animal Bone Report) between numbers of red deer and antler artefacts could be explained by importation of antler from Norway, but only further research will be able to produce a more detailed explanation.

Other imported wares found in Phase 8 were glass beads and copper-alloy jewellery and other artefacts. It is apparent that trade along the E coast of Scotland was maintained throughout this phase, as it was in Phase 7, but with the suggestion of increased trade from the west, especially from Ireland. Whatever the state of the settlement at Howe, it was possible for the inhabitants to obtain fashionable and contemporary jewellery such as zoomorphic pins and brooches, which were supported by the economy of the site. Such goods also indicate that the settlement was either culturally part of the Pictish society of the time or had access to it.

The economic and technological basis of Phase 8, as discussed above, show continuity and some advances beyond those of the previous phase. The material wealth and associated living standards remained largely unchanged, and may have even improved considering the small size of the settlement, but the condition of the community and its organization, as evidenced by the radical change in its structures, had changed beyond all recognition from Phase 7.

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## 8.2 • BONE ARTEFACTS

with bone identifications by Josephine Constantine

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Although bone preservation was good, fewer bone objects than stone were found at Howe. This difference may be accounted for by the clearance of organic debris and possibly broken artefacts from domestic floors, especially during Phase 7, and the preferential use of metal tools for some functions. Bones of the

domesticated farm animals, cattle, sheep/goat and occasionally horse, were used as were the bones and antlers of local herds of red deer. The rare and perhaps accidental findings of cetacean species provided bones for larger tools and utensils. In contrast, smaller species such as birds provided bones for the occasional delicate artefact.

This report is concerned only with recognizable artefacts and not with fragments which have been worked, used or cut pieces of bone or bone debris. For these see the Mammal Bone Report (7.3 above). The catalogue of artefacts is available in fiche, 8.2.1 (3:A3–D2).

### LOCATION AND DISTRIBUTION (Table 51)

Bone artefacts survived from all phases except Phases 1–3. Most of the bone artefacts, some 71, were located in the early part of Phase 7 from building walls and in particular the broch tower. Clearance of the Early Phase 7 domestic floors allowed little accumulation of stray bone tools and the **SW** and **S** buildings were almost completely devoid of bone artefacts. From Early Phase 7 there follows a gradual decline in bone artefact numbers to the end of Phase 8.

A surprisingly high number of unfinished and broken tools were located within holes and niches of the interior wall of the broch tower. Antler handles and bone points were the most numerous items found, although the iron blades from these tools were most likely to have been kept and reused. These artefacts derived from the industrial activities within the tower during its later use in Phase 7. The fourth and last industrial floor within the broch contained more bone tools than its predecessors and suggests that production may have taken place there. High numbers of

tools were found within the reused S and NE buildings during Early Phase 8 and reasonable numbers in Later Phase 8 contexts.

The occurrence of whalebone objects is grouped: Phases 3, 4 and 5, later in the **E** and **SE** buildings of Early Phase 7, from Later Phase 7 and Early Phase 8. Phase 8 stage 6 and the abandonment horizons provided the rest. The distribution of antler artefacts is more constant, occurring in every phase from Phase 4 onwards. Higher numbers occur in the S buildings of Late Phase 7 and early in Phase 8. In Late Phase 8 antler combs are some of the most numerous objects.

Interesting contexts to yield artefacts, apart from the broch tower wall already mentioned, were the Phase 4–6 well silts which produced a complete antler pick and the ditch fills of Phase 5 and 5/6 in which several whalebone vessels were found.

Table 51: Distribution of bone artefacts by phase

Artefact type	Phase		4/6	5	5/6	6	E 7	L 7	7/8	E 8	L 8	8/9	9	Total
	3	4												
<b>BONE</b>														
Birdbone tubes								2		1	1			4
Counters							1							1
Toggles								3			1		1	5
Beads					1			1	1	2	1			6
Spindlewhorls		2					1	2		3			1	9
Pierced bone					1		3	1		3	4		3	15
Needles					1			2		1	2			6
Pins		1			1	1	3	9	3	4	4		2	28
Points	3				4	1	12	8		7	4		2	41
Awls	1					1	8	2		1				13
Handles							1	2			2			5
Spatulas							3	2						5
Scoops					1		1	2	4	3	2			13
Scrapers						1		3		1	1			6
Shovels							1	1		3				5
Miscellaneous					1		4		1		4	1	4	15
Others							1	3	1	2				7
<b>ANTLER</b>														
Combs		1					5	1		1	8		1	17
Pierced antler							1	3		3	2			9
Points						1		1		1	1			4
Handles							6	3	1	1	1		3	15
Picks			1				2	1		4				8
Miscellaneous			1				1	2	1	1	1			7
Used tines					1		10	9	3	8	4		2	37
<b>WHALEBONE</b>														
Vessels					1		1	1			1			4
Lids, rims	1	1		2				2		2				8
Mattocks		1					4			4				9
Miscellaneous		1	1				2			1	2			7
Totals	5	7	3	2	12	5	71	66	15	57	46	1	19	309

## THE ARTEFACTS

## ARTEFACTS OF BIRD BONE

Four fragmentary bird ulnas have been identified by Dr Bramwell as being worked (7.4 Bird Remains above), from Late Phase 7 through to Late Phase 8. Two of the artefacts are of gannet and two of (?) greylag goose. The bones are delicate, light in weight and have been sawn across both ends. They have also been hollowed out and rubbed or polished smooth, especially SF 1958 (illus 89). The two most complete tubes measure 70mm long and 9mm in diameter. Another tube which could be discussed with these of bird bone is a sheep/goat tibia SF 3006 (illus 92), catalogued as a miscellaneous bone artefact. It is also a cut and hollowed bone with a smoothed and polished surface, but of slightly larger dimensions to the above.

These tubes could have had at least two functions. One being that of a blow pipe, although not very long in length, and using bird bone radius shafts as darts (pers comm Dr Bramwell). Their other and more likely use could have been as end-blown flutes. Bird bone flutes of a similar length have been recorded from Sweden, where the length of the shaft was used to resonate air blown across the top of the tube and to create a sound (Lund 1984, 13). A bird bone tube was also found at Midhowe Broch, Rousay (Callander & Grant 1934, 489, fig 29, 3), two fragmentary tubes came from the East Broch, Burray (Hedges 1987c, 100) and two from Birsay (Curle 1982, ill 38, 240 & 241) both with holes, the largest being 162mm in length.

## MAMMAL BONE ARTEFACTS

## COUNTERS

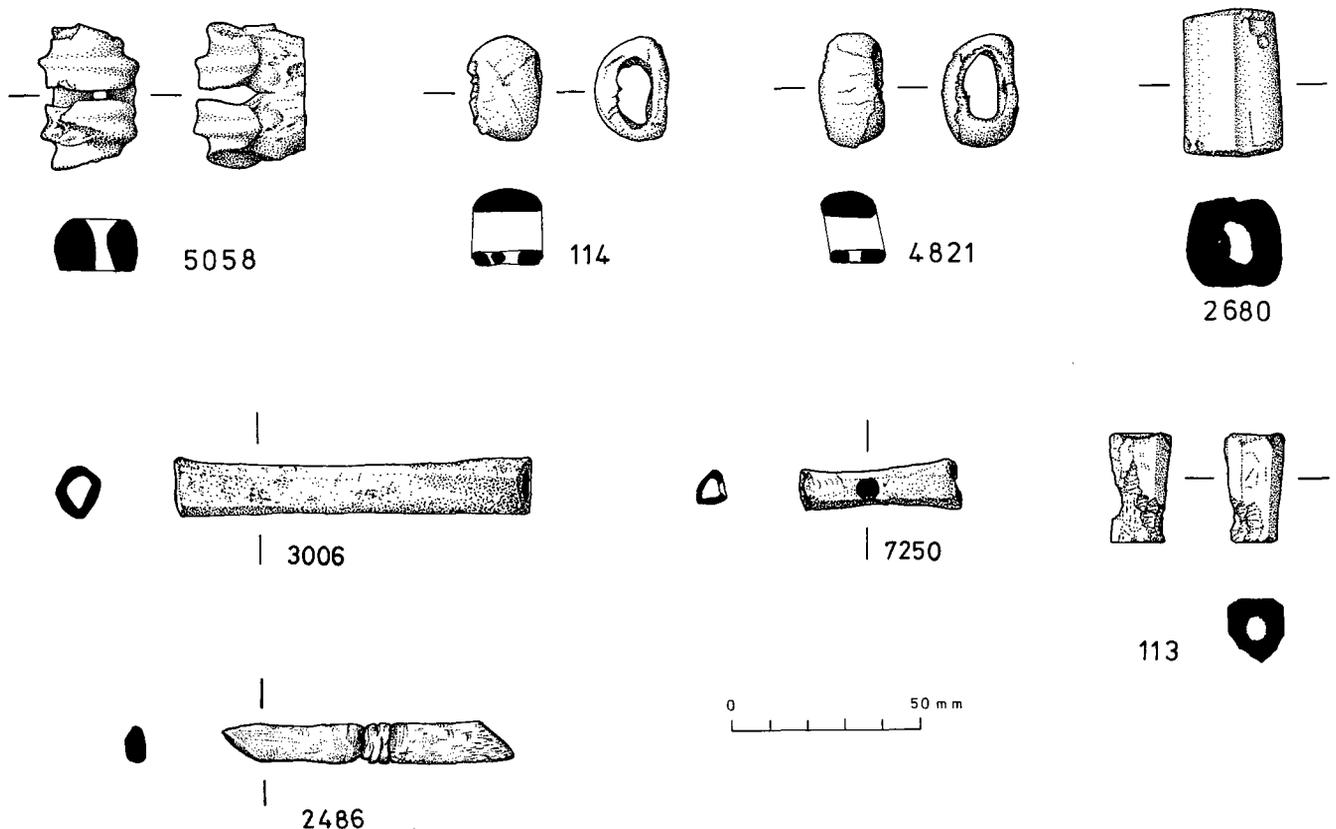
One counter, SF 2137 (illus 106), was recognized. It came from the broch tower in Early Phase 7. It is an irregular flattened roundel, scored on the upper surface by five horizontal lines, overlain by an incised cross. It was probably used on a gaming board like SF 700 (8.3 Stone Artefact Report below).

## TOGGLES

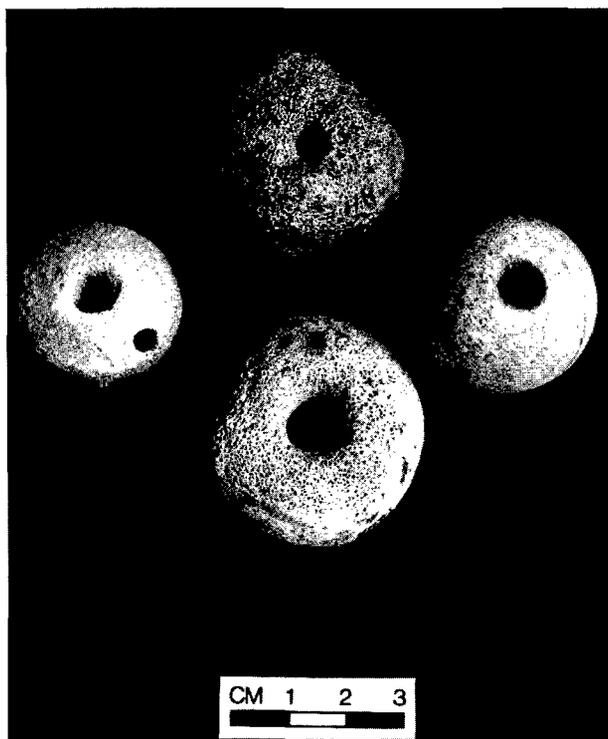
There are five examples made primarily from cattle long bone shafts, three of which came from the the Late Phase 7 S buildings. Two examples are hollowed pieces of shaft (eg SF 2680, illus 92), and two others are broken but have one or two grooves across the middle. From the Iron Age wheelhouse at Clickhimin, Shetland, examples like SF 2680 are referred to as bone cylinders or collars (Hamilton 1968, fig 60, 9 & 10). The most complete example is SF 2486 (illus 92) from the S buildings in Late Phase 7. It is highly polished with opposing diagonal cut ends and a central notched and grooved band.

## BEADS

Most of the beads are from Phase 5/6 and from Later Phase 7 onwards, and made from mammal long bones, sawn from the



Illus 92  
Miscellaneous bone artefacts, pin heads and gaming pieces.



Illus 93  
Perforated bone bead (SF 2011) (right), and spindle whorls (SF 7316) (upper), (SF 5293) (lower), (SF 4523) (left).

shaft with the bone cortex hollowed out. They are either long beads as in SF 845 or 5841 or small thin slivers of bone like SF 7264. Two other fragmentary beads are semi-circular in section but have remains of a hole on their flat side (eg SF 2516). SF 2011 (illus 93) is made from a cattle femur head and so shaped that it is almost octagonal in section. It is bored through its centre and again on one edge. It is too light in weight to be a spindlewhorl and may therefore be a bead or a fishing line float (pers comm Anne Brundle).

### SPINDLE WHORLS

The earliest spindle whorls are recorded from Phase 4 with others from Late Phase 7 and Early Phase 8. All (illus 93) are made from large mammal femur heads, epiphyses of cattle or deer bored centrally. The holes are usually splayed externally and measure between 6–15mm in diameter. SF 4523 has a narrow hole and the body is polished, while the surface of SF 5293 is almost completely worn away. Femur head spindle whorls were common at the Broch of Burrian, North Ronaldsay (MacGregor 1974, 88, fig 17), Midhowe, Rousay (Callander & Grant 1934, 490, fig 40, 6), Bu Broch (Hedges 1987a, 99) and from several of the other Orkney brochs.

### OTHER PERFORATED BONE

One of the earliest pieces from this category is SF 7250 (illus 92) from Phase 5/6. It is a cut and polished piece of hollowed pig metapodial. It is pierced by a hole 6mm in diameter in one surface and may be a flute or whistle. Instruments of a similar size, 43 × 12 × 12mm, have been found in Sweden (Lund 1984, 15, 12; 19, 21).

### Bone plates

Bone plates or mounts are also included here, although all are very fragmentary. Only SF 5097, from the *E* Building Early Phase 7,

with its three aligned perforations, is illustrated (illus 94). The mounts are made of mammal long bone shafts or ribs and others are made of antler (see below), with bone pegs for the holes. Similar mounts have been found at Buckquoy, Birsay but antler mounts seem to be more prolific (Ritchie 1977, 194, fig 6 45 & 46). SF 1169 from Late Phase 8, comprises two small and narrow bone plates held together by iron rivets. There is also a single isolated bone peg, SF 5353, which is included here, as it is probably from a perforated mount.

### Bobbins

Other types of perforated bone are bobbins, usually made from sheep/goat metapodials. In these artefacts the shaft of the bobbin is usually polished and pierced by a centre or off-centre hole such as SF 4956 and 3671 (illus 94) from Early Phase 7 and 8. The holes lie in a range between 4.5 and 6mm, but in the example of SF 4956 prolonged use may have enlarged this to 13mm. SF 5728 is an unfinished object with large splayed hole (illus 94).

Bobbins have been found in the Iron Age and later levels of several sites from the wheelhouse at Clickhimin, Shetland (Hamilton 1968, fig 60, 1), the late wheelhouse at Jarlshof, Shetland (Hamilton 1956, fig 37, 6), and from Gurness (Hedges 1987b, 2.34) where the bobbins closely resemble those from Howe. At the excavations at Glastonbury, England, earlier this century, the find of a wooden shuttle with a bronze spindle gave credence to the use of these bobbins as spools for weaving (Bullied & St George Gray, 1917, vol 2, 426).

### Needles

Perforated and elongated bone points have been interpreted as sewing needles, and they have all been formed from pig fibula. All are smoothed but only one still retains its point. Other types of needles are made from mammal long bone shafts or ribs and are variously described as netting needles or fish gouges (illus 95). These are flat slivers of bone, pointed at both ends with a central splayed hole (eg SF 3580 & 2850), and can also be made of antler (see below). Two bones with a similar description were found at the Crosskirk broch in Caithness (Fairhurst 1984, 121, fig 72, 670 & 622), and more functional larger netting needles notched at both ends from Staple Howe, Yorkshire (Brewster 1963, 122, fig 69, 1–4), may indicate that the Howe examples are fish gorges and not needles.

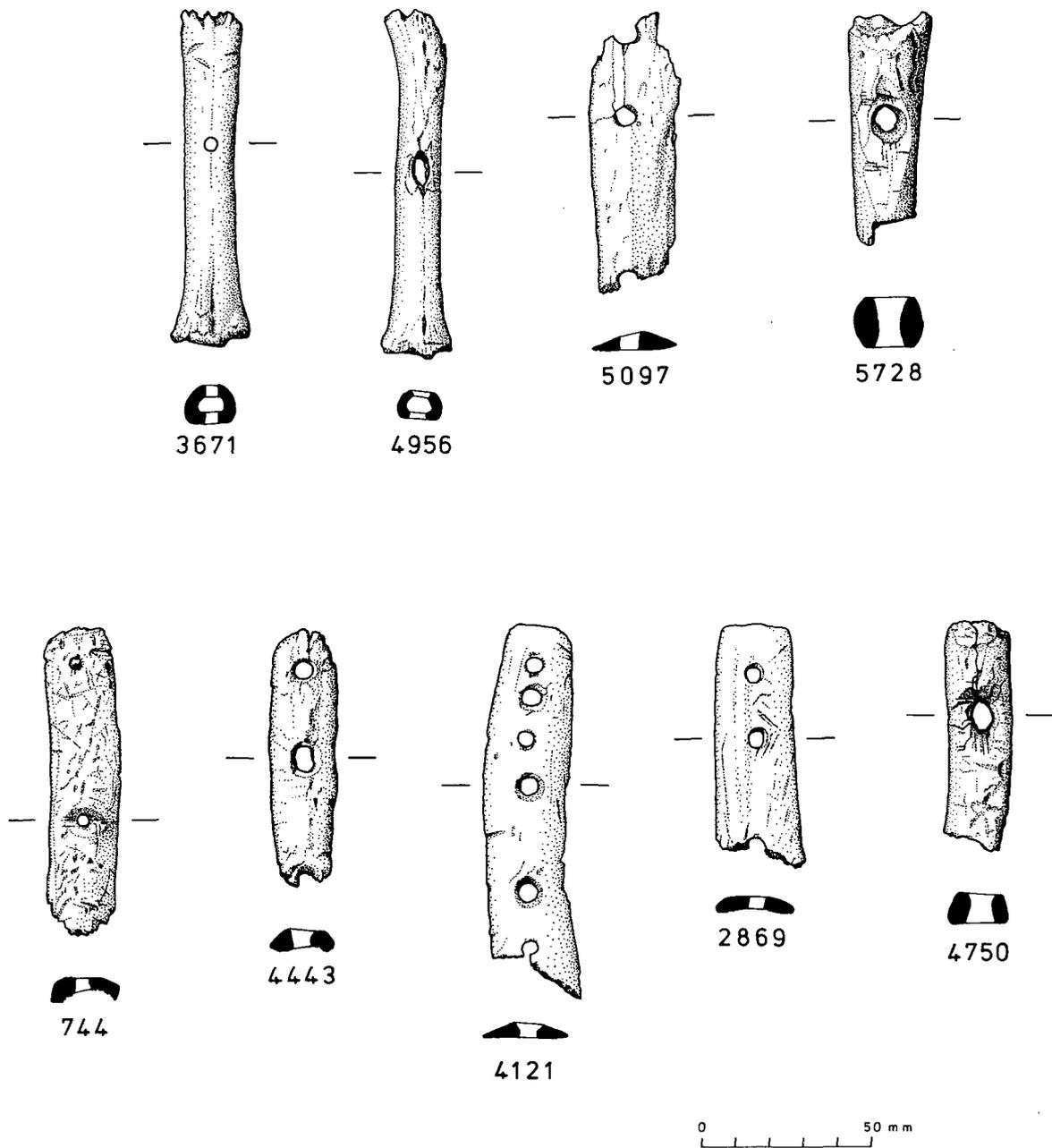
### PINS, POINTS AND AWLS

There seems to be little archaeological consistency of opinion on the definition of pins, point and awls. Although these categories are used here, little is certain about their function.

### Pins

Pins were found in nearly all phases and are plain thin cylinders of bone with a point at one end and a highly polished and smoothed body. They are usually made from pig fibula, although cattle long bone shafts and other bones have been used. Many pins are incomplete, with the top of the pin lost. SF 4890 (illus 95) from the Phase 7 ditch in the S, is one of the largest and most complete artefacts of this type, and may be a dress pin. Examples similar to this have been found at Midhowe, Rousay (Callander & Grant 1934, fig 28, 1–3) and Birsay (Curle 1982, ill 48, 96). SF 7100 and 7108, from Phase 5/6 and Early Phase 7, have a small hole at the distal end which perhaps helped to secure the pin if these too were dress pins. The form, but without the perforation, seems to be common at most Iron Age sites, such as examples from the Broch of Burrian, North Ronaldsay (MacGregor 1974, fig 7, 82–89).

Plain pins, such as SF 5340 and 4772 from Phase 6 and Later Phase 7, have likewise been found at many Iron Age sites in the Northern Isles such as Burrian (*ibid*, fig 6, 48–54) and



Illus 94  
Perforated bone bobbins and bone and antler mounts.

Clickhimin, Shetland (Hamilton 1968, fig 38, 8-12 & fig 49, 3-4). In comparison with the slightly later sites at Birsay, Howe yielded no decorated or hiped bone pins.

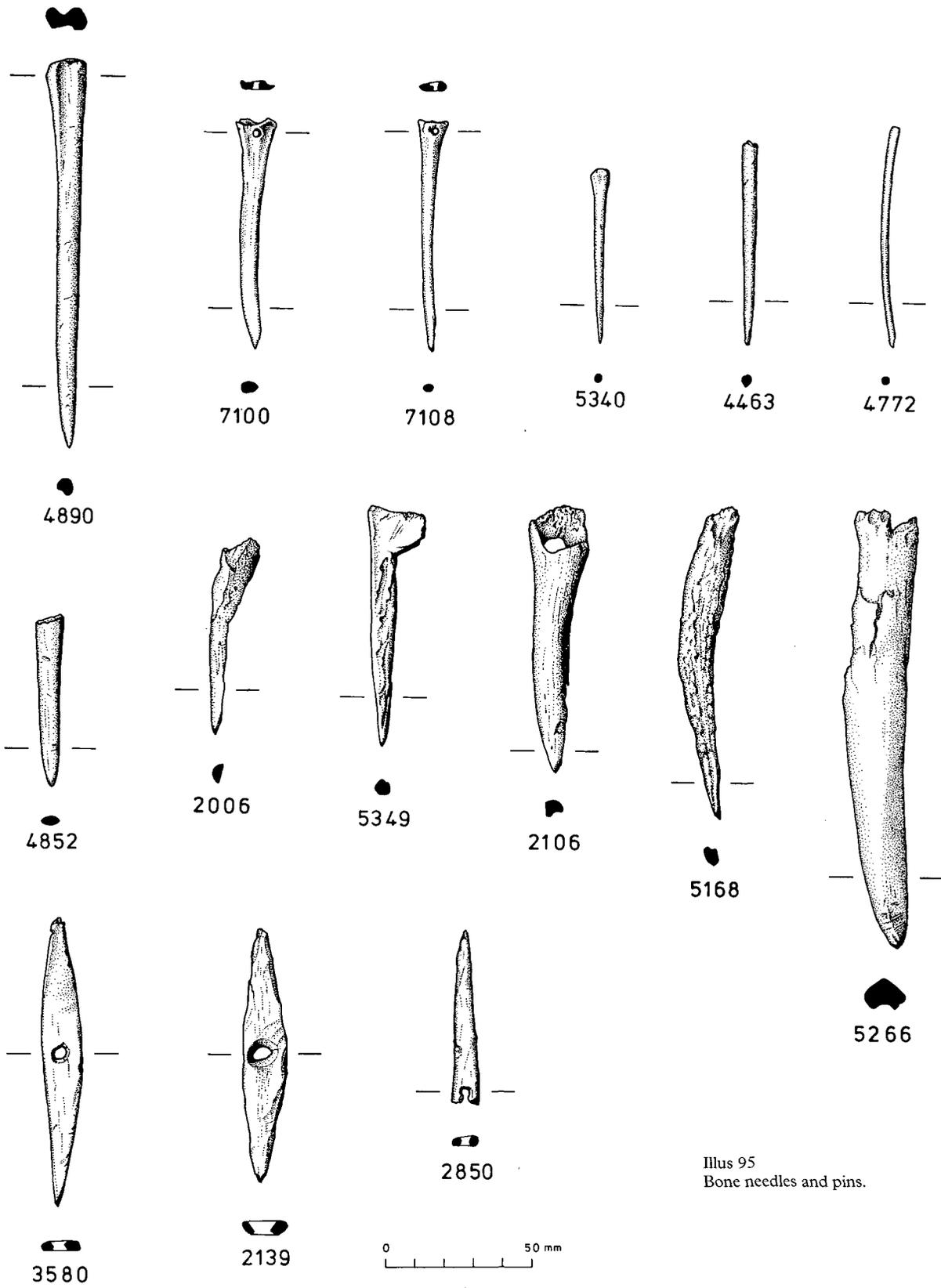
**Points**

Bone points were made from any cattle or sheep/goat long bone, including ribs, and were found throughout Phase 7 and Early Phase 8. The objects are rough and unfinished with only the pointed ends showing any signs of wear or sharpening. All the examples are broken or damaged as if their use was short and they were quickly discarded and replaced. This also seems to be the situation with antler points (see below). SF 4852 (illus 95) in contrast is burnt, polished all over and shows little further evidence of wear.

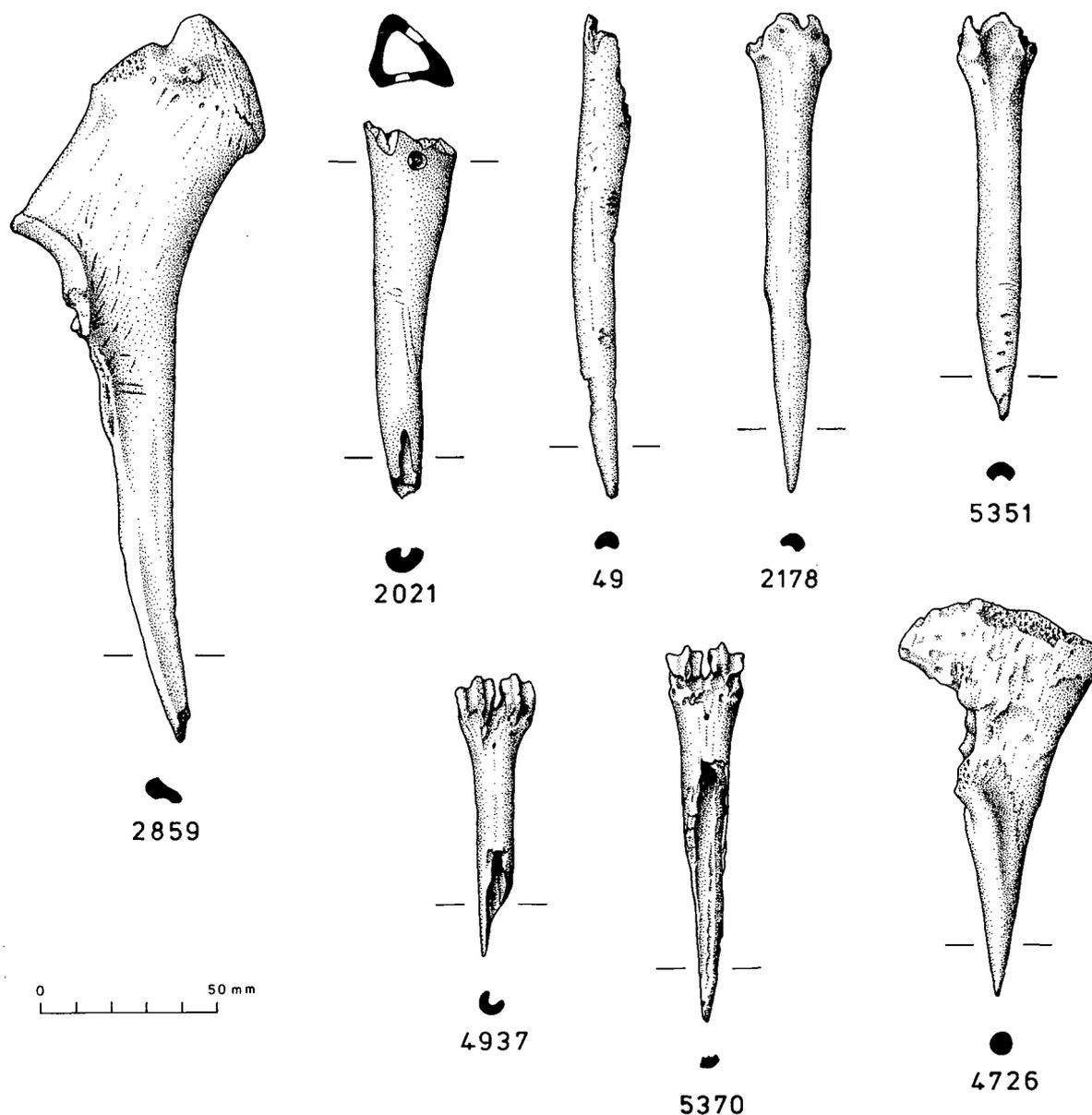
**Awls**

In contrast to the above, awls exhibit signs of more deliberate finishing and prolonged use. These tools, mainly from Early Phase 7, have a sharply pointed end and have been made, usually but not exclusively, from cattle ulna and sheep/goat tibia. SF 2021 (illus 96) has a broken point but it is the only example which has two holes pierced through the object at the distal end.

SF 2178 and 5351 are of sheep/goat tibia with smoothed bone surfaces and SF 2859 and 4726 (all illus 96) have utilized the natural shape of the ulna from which they are made as a handle. This type of awl has been noted at Clickhimin (Hamilton 1968, fig 38, no 1, 3, 6, fig 49, 6-11), Gurness (Hedges 1987b, fig 2.27), and Burrian (MacGregor 1974, 78, fig 10, 139). One of the commonest awl forms is represented by the sharpened



Illus 95  
Bone needles and pins.



Illus 96  
Bone awls.

sheep/goat metapodials (eg SF 4937 and 5370, illus 96), where the edges are rounded and worn smooth.

#### HANDLES

Antler was the most used material for the manufacture of knife handles, but several bone ones were found in Late Phase 7 and Late Phase 8. The most interesting in this section is SF 752 (illus 130), a small handle with a fragment of its iron blade still in position and held in place by a silver trim (8.6 Metal Artefacts Report below). This was found in stage 6 of Late Phase 8.

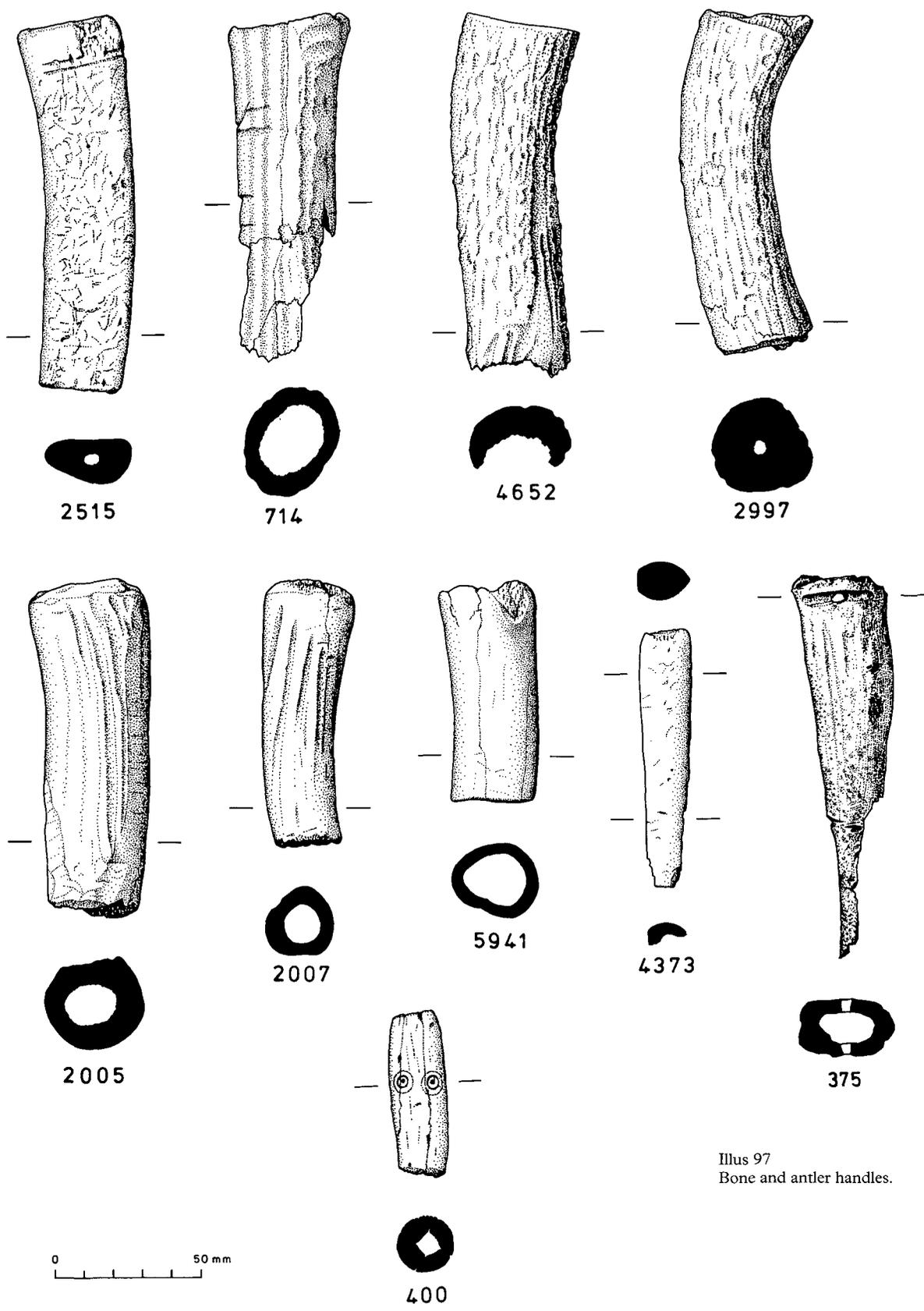
The other handle worthy of note is SF 2515 (illus 97), also from Late Phase 8, which is very similar to its antler counterparts (see below). At its widest end it bears a linear groove, and is similar to a grooved handle, with three lines, found in a Norse grave at Buckquoy, Birsay (Ritchie 1977, 194, fig 6, 44).

#### SPATULATE TOOLS

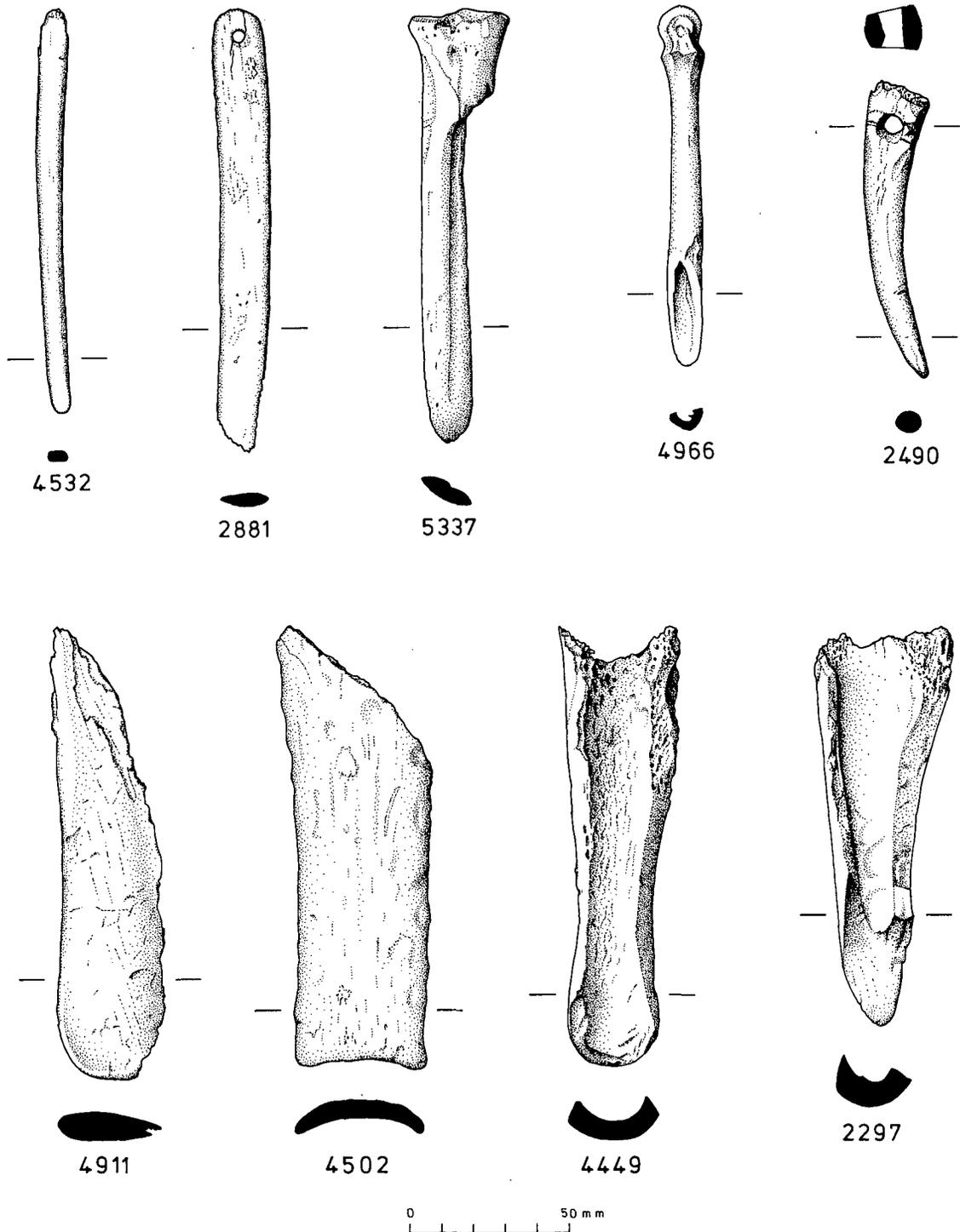
Several tools, which could be described as spatulas, were found in Phase 7, made from cattle ribs and metapodials. SF 2881 (illus 98) has one worn and broken end, the other rounded and containing a small peg hole. SF 4532 (illus 98), 7029 and 7821 are highly polished pieces with one rounded and flattened end and the other broken.

#### SCOOPS AND GOUGES

These tools were made from various split and hollowed bones of cattle and sheep but mainly from tibia. They have one rounded end which is smoothed with evidence of wear by scraping or scooping. The edges of the tools (eg SF 2297 and 4449 from Late Phase 7 and Early Phase 8, illus 98) are smooth and comparable examples have been noted at Jarlishof in Shetland (Hamilton 1956, fig 8, 4-6).



Illus 97  
Bone and antler handles.



Illus 98  
Bone spatulate tools, scoops and gouges.

SF 4966 (illus 98) is a sheep tibia with the worked end cut, rounded and polished and it was found in the Late Phase 7 broch abandonment. It forms a common type of Iron Age tool found at Dun Mor Vaul, Tiree, (MacKie 1974b, 145), Burrian, North Ronaldsay (MacGregor 1974, 78, fig 10, 143), Jarlshof (Hamilton 1956, fig 29, 12), Gurness (Hedges 1987b, fig 2.29 150, 151) and Midhowe (Callander & Grant 1934, 487, fig 27). At the latter site these tools are described as chisel-ended implements, but no bone

chisels such as those from Clickhimin, Shetland (Hamilton 1968, 114, fig 49, 1) were identified at Howe.

#### SCRAPERS

Several types of bone from cattle and red deer were used as scrapers probably for skins and leather working from Phase 6 and

Late Phase 7 onwards. SF 5337 and 4911 (illus 98) are long thin-bladed tools with a rounded end, worn edges and polished surfaces. SF 4911 had wear marks along one edge and SF 5337 along both edges.

### SHOVELS

The domestic and non-domestic levels of Late Phase 7 and Early Phase 8 produced shovels made from cattle and horse scapulae. The edges of the blades show signs of wear and the spine of the scapula has been cut away for ease of use. SF 4940 (illus 102) from Late Phase 7, is polished with use above the socket and its blade edges are rounded.

### MISCELLANEOUS BONE ARTEFACTS

#### Gaming piece

SF 113 (illus 92) from Late Phase 8, although gnawed is a trimmed and cut piece of bone which might have served as a gaming piece.

#### Rib bone knife

Although only one bone knife, SF 7826, Phase 9, was identified from Howe, several of this type have been found at Dun Mor Vaul, Tiree (MacKie 1974b, 145, fig 11, 35, 45; fig 18, 429) and Jarlshof, Shetland (Hamilton 1956, fig 29, 10). The Howe example is notched at one end and on both edges.

#### Pin heads

Three examples of bone pin heads for iron or bronze pins have been found from Phase 5/6 and from Late Phase 8 and 9. SF 5058 (illus 92) is made from a trimmed red deer metapodial with a central hole to receive the pin shaft. The other examples are of a common type found on many Iron Age sites. SF 114 and 4821 (illus 92) were cut from animal long bones with the core removed. Both pin heads have a 4mm diameter hole, SF 114 had two, cut into the centre of the base. These pins and pin heads have been described by Stevenson (1955, 292–293) as a native Scottish type, and several have been found at Birsay (Curle 1982, 21), at Burrian, North Ronaldsay (MacGregor 1974, 76, fig 8, 114–117), where the globular head had been polished, and at the brochs of Gurness, Ayre, Lingro and East broch, Burray (Hedges 1987b, fig 2.27 120, 121; 1987c, 77, 82, 100), (see also below).



Illus 99  
Polished pig canine (SF 4593).

### ARTEFACTS OF TEETH OR HORN

These include cattle and pig incisors, where the root or tip has been sharpened to a point, often with signs of wear. A possible pig canine, SF 4593 (illus 99) from Late Phase 7, has been trimmed and polished to produce a very smooth tool. SF 4469 is a dome shaped roundel cut from a seal or walrus tusk and has a very highly polished surface. There is evidence of a fragment of iron pin set into its lower surface which suggests its use as a pin head. Pin heads such as this have been referred to by Stevenson as being "confined to Orkney" (1955, 292) and have been found at Midhowe (Callander & Grant 1934, 490), and Oxtro (Hedges 1987c, 57).

### ANTLER

Almost 100 items of antler were found and the majority of these were used tines. The other antler artefacts fall into six categories.

#### ANTLER HAIR COMBS

There are two distinct groups within this category: a) single-and b) double-sided.

##### Single-sided combs

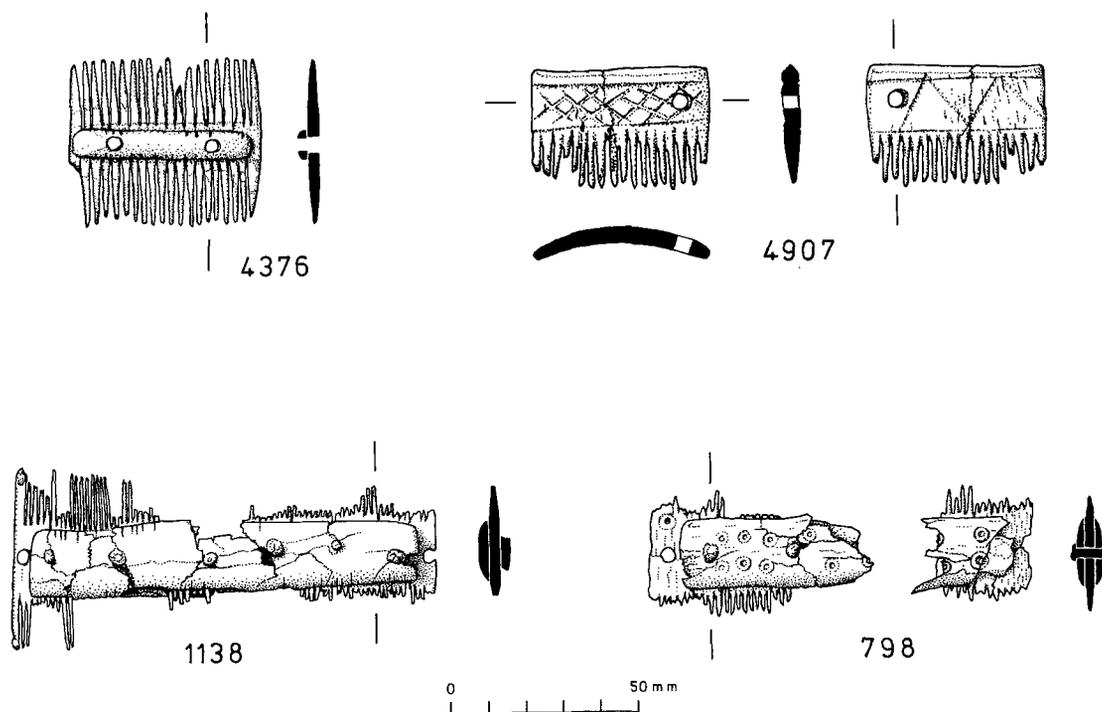
SF 4907 (illus 90a; 100) was found in ditch deposits in Phase 7. It is a small curved comb of one piece with a single edge of teeth, and both sides of its plate are decorated. On one side is a band of incised cross-hatching and the other has a band of diagonal zigzag. The comb is perforated at one end with a suspension hole and is largely complete. A similar comb was noted from Midhowe, Rousay (Hedges 1987c, 115); it is cited as possibly being immediately pre-Roman Iron Age (Stevenson 1955, 287).

##### b) Double-sided composite combs (illus 100)

Three combs are represented with fragments of others. They are all from Late Phase 8, from stages 6, 10 and 12. Two of the combs, SF 798 and 1138, are made of three pieces. A central piece contains an upper and lower row of teeth, reinforced on either side by a plate held in position by iron rivets. Both combs also have a suspension hole at one end. SF 798 is decorated on both its plates by two rows of small dots with circles and SF 1138 is plain.

Combs from Birsay have been catalogued and studied in detail by Mrs Curle, where she found that all the available space on Pictish combs was decorated (Curle 1982, 21–22, ill 10, 197). The early Norse combs, although of the same construction as the Pictish, were found not to have graduated teeth at the ends. Howe SF 1138 is of this type with a narrow band containing the non-graduated teeth at both ends of the comb and is similar to the Birsay combs 202 and 203. The Howe comb was found in a secure Late Iron Age context and suggests that there may be considerable overlap between the two types suggested by Curle or that there is a gradual development of one type from the Late Iron Age into the Norse period.

The last comb in this section, SF 4376 (illus 100) is a small but distinct rectangular comb. It has long teeth cut into either side of the central piece and originally had two narrow central plates with rounded ends. One plate is lost, but the remaining one is semi-circular in section. The comb is pierced centrally by two holes for bone rivets or pegs which would have held the plates in place. The comb is undecorated and does not have a suspension hole. It is stratigraphically the latest comb from the site, from stage 8 of Phase 8, and similar combs are depicted on Class 1 symbol stones (Curle 1982, 95–97, ill 58).



Illus 100  
Antler hair combs.

### WOOL- OR LONG-HANDLED COMBS

Of ten combs, five are very fragmentary, either broken across the teeth or the handle. The remaining five combs are illustrated (illus 101). They were found from Phase 4 through to Phase 9 with the majority occurring in Phase 7. Two of the combs SF 2670 and 4178 have long and slightly waisted handles with eight teeth. The teeth of SF 2670 are very short and curved across the width of the tool, the whole of which is polished. Comparable combs were found at Burrian, North Ronaldsay. In contrast SF 4178 has long teeth which are again curved in section and also paralleled at Burrian broch (MacGregor 1974, fig 12, 169; fig 13, 181, 182).

SF 5157 is an incomplete comb which has broken longitudinally. Its handle is shaped into a rounded fishtail and is worn smooth, but only two teeth remain. This extreme waisted or fishtail body has also been seen at Burrian. SF 7018 has a slightly waisted short handle with a swallowtail end, and broad teeth with a flat section. On the smoothed surface of the comb, a broad arrow is incised into the bone.

Handled combs are commonly found at Iron Age sites and are predominantly made of antler, although some are of whalebone. MacGregor (1974, 84) proposed that the handled combs may have had several functions such as carding or teasing wool as well as beating the weft fibres in weaving. It is interesting to speculate whether in fact the slightly different comb characteristics do reflect different functions. Decorated handled combs have been again recorded from Burrian and Midhowe, Rousay (Callander & Grant 1934, 485–6, fig 6, 7), but the decoration is normally in the form of an incised cross or saltire, although other motifs are known from the broch of Burgar, Evie (Hedges 1987c, 59). Bone combs have also been published from the brochs of Crosskirk, Caithness, Gurness and at least eight other sites in Orkney.

### PERFORATED ANTLER

This category includes shaped and pierced antler plates or mounts and perforated tines. Six perforated plates are from Early Phase 7

onwards, and four are illustrated – SF 744, 2869, 4121, 4443 (illus 94). All are broken pieces cut from antler beams and are therefore curved in body and section. They are pierced by two to six holes which would have contained bone or antler pegs.

Some of the holes in the antler plates are up to 8mm in diameter and recessed (eg SF 4443). SF 4121 may have been reused because it contains a series of both large and small holes. It is not known whether these pieces were mounts for handles, fragmentary comb plates or parts of horse harnesses, but smaller pieces were found at the brochs of Gurness Midhowe, Ayre, Borwick and East Broch, Burray (Hedges 1987b, fig 2.18, pt 3), (see also *Perforated Bone artefacts* above).

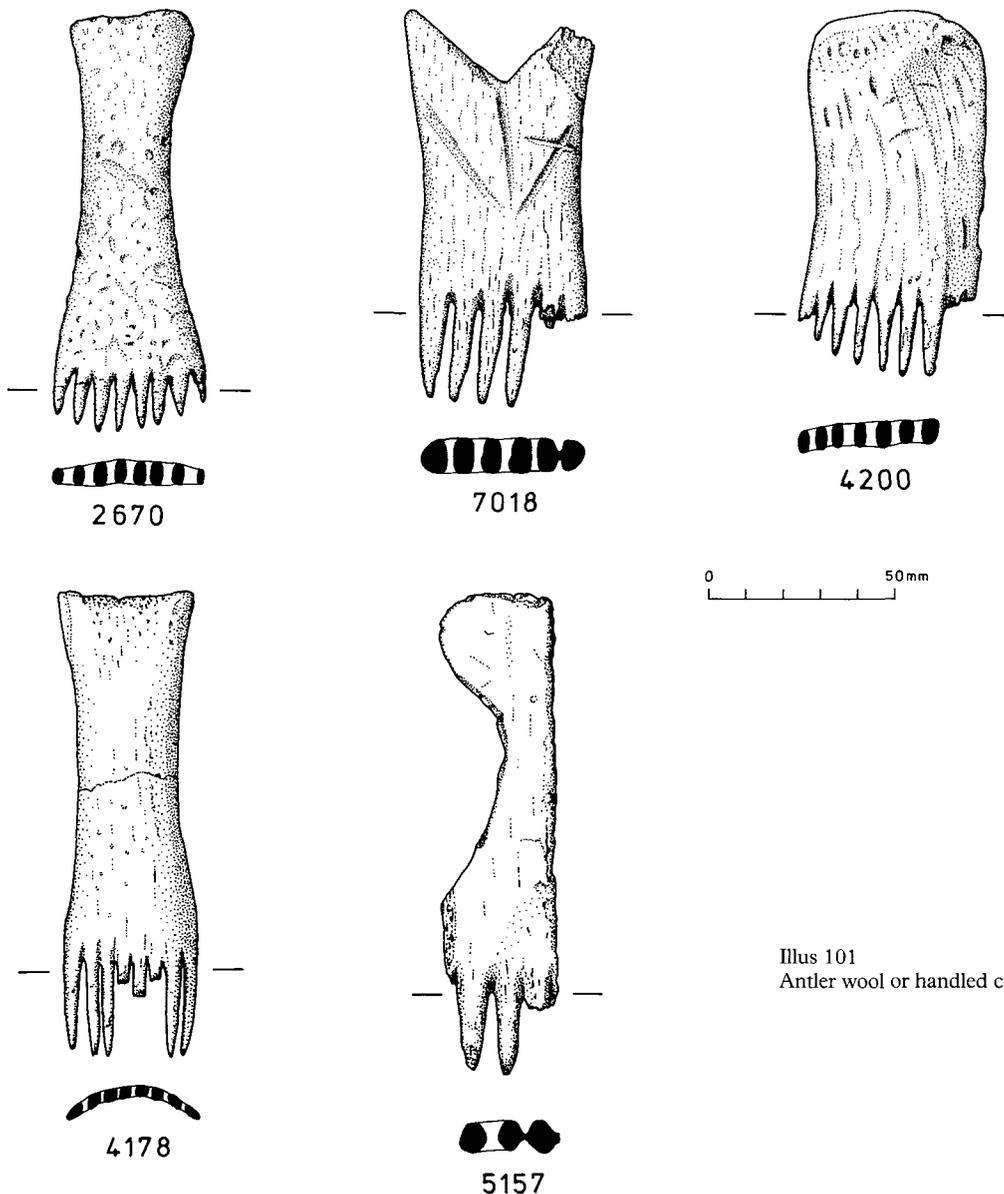
Most of the pierced antler tines from Phase 8 are fragmentary with only SF 2490 (illus 98) from Early Phase 8, being complete. This is a polished tine with a hole at the base. Items similar to this have been described as horse cheek-pieces (MacKie 1974b, fig 17, 326) and others from Midhowe, Gurness (Hedges 1987b, fig 2.23) and Burrian, North Ronaldsay (MacGregor 1974, 78, fig 10, 144) may have had similar functions. Other perforated antler pieces from Howe are either eroded or roughly manufactured (eg SF 4750) and give no clue as to their function. SF 4791 may be a fragment of a perforated peg with a hole bored through beneath the head.

### ANTLER POINTS

These are pieces of antler that have been sharpened at one end to form a point. SF 5168 (illus 95) from Late Phase 7, is a worn and smoothed piece but is not polished at the point. A more finished example is SF 5349 which seems to have a partial handle or stop at the end opposite the point.

### ANTLER HANDLES (illus 97)

Handles are prominent in Phase 7 with five found within the broch tower walls. All but one are undecorated, and they have been found



Illus 101  
Antler wool or handled combs.

in various stages of manufacture. Handles are made of pieces sawn from the beam of the antler and have been hollowed at one end for the reception of an iron blade. SF 2005, and 2007 have smoothed and well polished surfaces. In contrast SF 2997 and 4652 are unfinished as the cortex has not been hollowed out. Handle SF 4373 from Late Phase 8, is the most altered piece of antler with its outer surface completely smoothed and both its ends worn.

SF 375 from Early Phase 8, had two holes bored at the socket end which lie in an elongated groove, and may have been used for riveting its iron blade in place. Although smaller than the rest, SF 400 from Phase 9 is a cylindrical handle, decorated on its polished surface by two circle and dot designs. Comparable but undecorated handles to this have been found at Gurness (Hedges 1987b, fig 2.22) and at other Orkney brochs but do not seem to be as common as supposed.

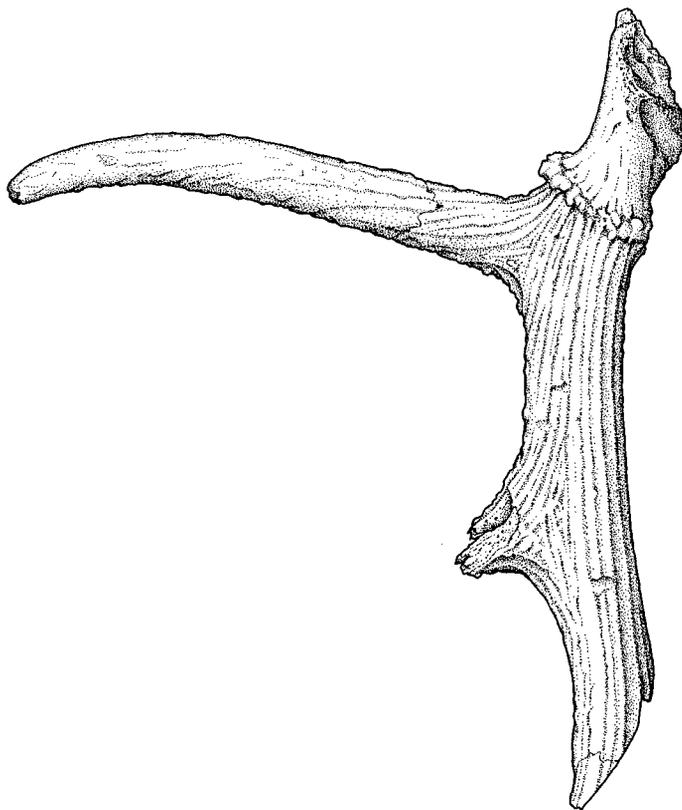
#### ANTLER PICKS

An interesting group of artefacts are the eight picks, both whole and fragmentary, found from Phase 4/6 onwards. They are made

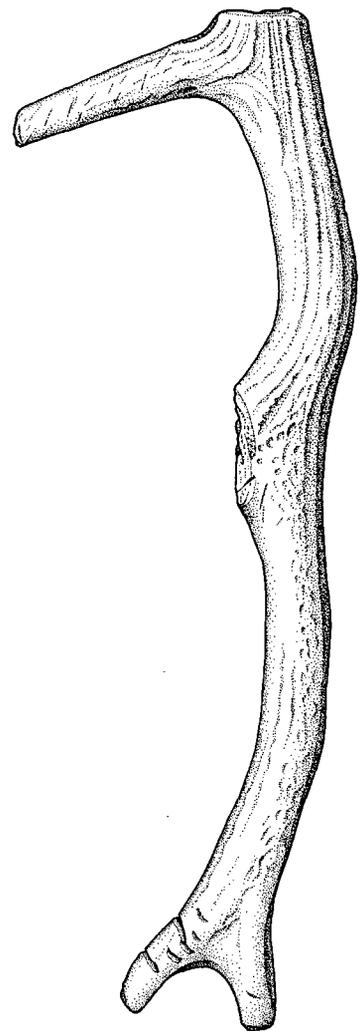
from complete antlers with all but the brow tine (the pick) removed from the beam which served as the handle and lever. Half the picks are from shed antlers, while the rest are from slaughtered deer (eg SF 2646 from Early Phase 8). The picks are generally smooth with wear, with the brow tine showing evidence of severe wear and even hollowing, eg SF 4959 (illus 102) which was found in the *E* Building in Early Phase 7. The best example, SF 7134 (illus 102), is the earliest found in the Phase 4/6 well in the *E* part of the site. It is complete with a well-worn and polished brow tine, the second tine being cut away. The antler stump has been completely sawn off and the whole tool has been smoothed artificially or with use. Antler picks are rare from other Iron Age sites, but other examples are known from Midhowe, Rousay (Callander & Grant 1934, 495, fig 38) and Staple Howe, Yorkshire (Brewster 1963, 127, fig 71).

#### MISCELLANEOUS ANTLER PIECES

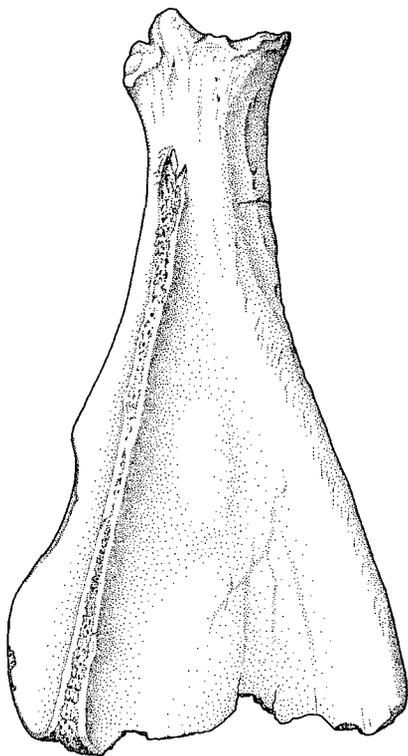
Of seven artefacts in this category only one is worthy of special note. This is SF 2139 (illus 95) from Phase 7/8, a possible fish gorge with a central circular perforation.



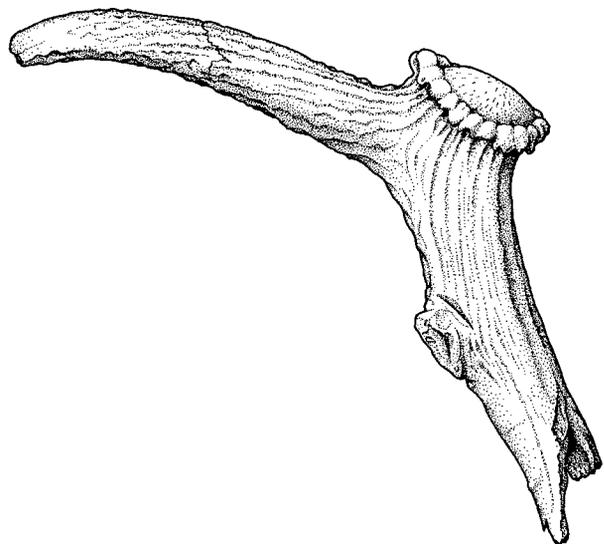
2646



7134



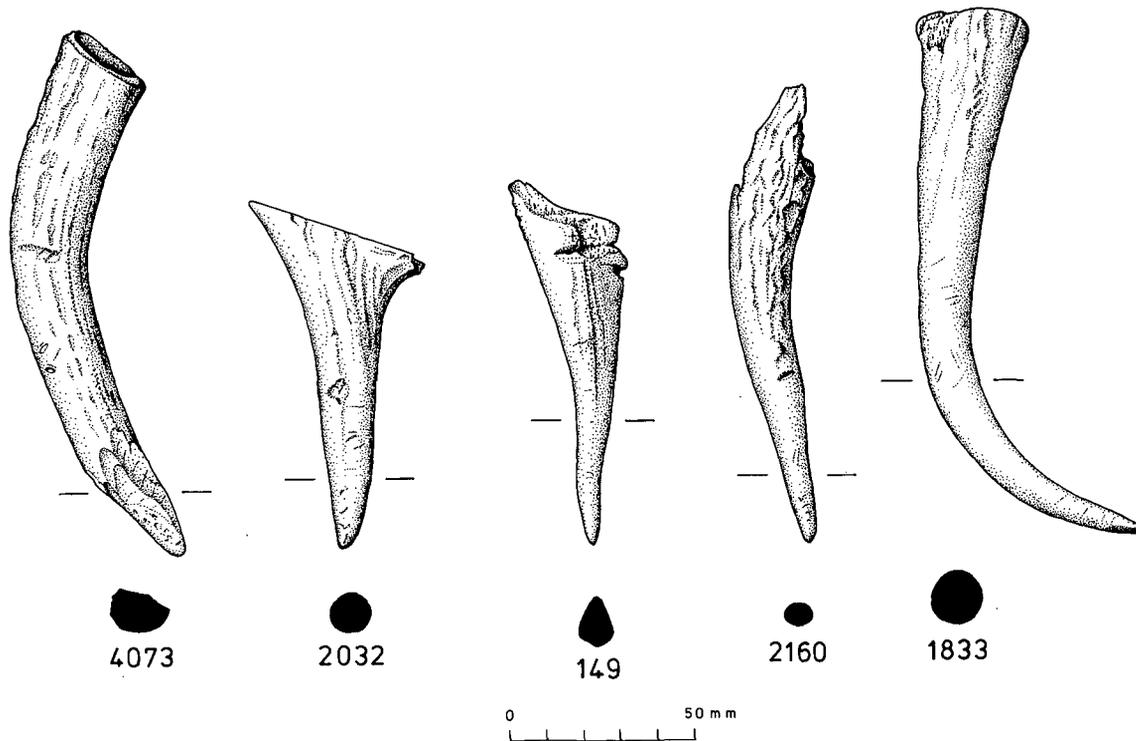
4940



4959



Illus 102  
Antler picks and bone shovel.



Illus 103  
Used antler tines.

#### USED TINES

This is the largest category of antler artefacts from Phase 5/6 onwards, consisting of antler tines broken or cut from the beam with well-shaped or extremely worn points. Illustration 103 shows the range of size and shape of these used pieces. Some of the tine points have been artificially sharpened as in SF 4073 and 1833, and others bear surface cut marks and polishing. As can be judged from the numbers of tines found at Howe (Table 51), they must have been common at other sites, and have invariably been described as points, cut pieces, awls and handles ((MacKie 1974b, fig 16, no 285) (see also 7.3 Mammal Bone report, above, for natural polishing).

#### WHALEBONE

Only 28 whalebone artefacts were discovered, but this report does not include whalebone debris or cut pieces which are discussed in the mammal bone report (7.3 above). Four categories of artefacts are described.

#### WHALEBONE VESSELS

The very fragmentary nature of these pieces has only allowed four vessels to be recognized from Phase 5/6 to Late Phase 8. All were constructed from whale vertebrae after the vertebral spines had been cut away. The bones were hollowed out to produce a thick based but relatively thin walled container. The lack of epiphyses on two of the vessels indicates that the remains of young whales had been used. The porosity of the bone suggests that their use was for dry storage rather than for wet.

#### VESSEL RELATED FRAGMENTS

Most of these artefacts were formed using vertebral epiphyses. Vessel lids and rims were identified, and the latter may have

become detached from the main body of the vessel. The epiphyses formed flat lids ranging from 12–27mm in thickness. SF 2054, found in Early Phase 8, has a central circular hole which may have been for lifting the lid from its vessel. The vessel rim fragments are largely reconstructed and show cut marks where the bone core has been hollowed away.

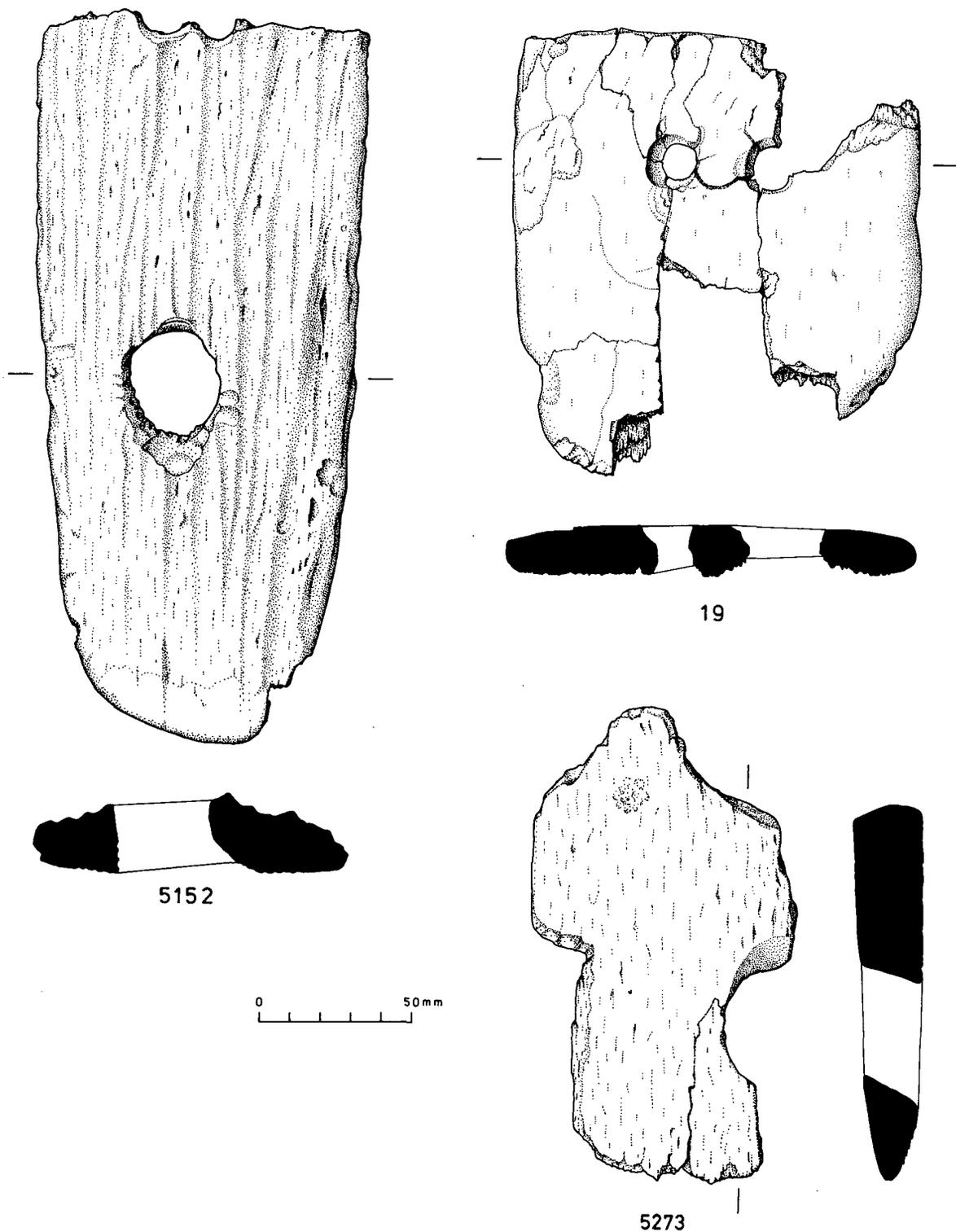
#### WHALEBONE HOE AND MATTOCKS (illus 104)

These socketed tools form a uniform group, mainly from Early Phase 7 and 8. They are large flat pieces of whalebone cut longitudinally from the bone. Other common factors are that they are blade-shaped with evidence of worn edges (eg SF 19 from Early Phase 8). All the tools are pierced with up to three holes, by which they were hafted and tied to a handle. The central hole is usually large, elliptical or round, and cut through the bone at an angle. SF 5152 and 5273, from the *E* Building and the broch wall in Early Phase 7, show this characteristic. These holes are c 23–60mm long and 22–23mm wide. Most of the artefacts are broken at these holes where a weakness in the tool had been created.

The three illustrated examples show evidence of other holes cut through the tool. SF 19 (illus 104) and 5152 have two waisted holes c 16mm in diameter aligned side by side, presumably for tying the tool to the handle, or, as in SF 5152, for extra support and rigidity. SF 5273 has a further larger hole above its elliptical central one, suggesting that a stick and thonging may have secured it to the handle at an angle. All these tools show excessive wear and trimming along their lower edges, some with the addition of grooves or cut marks on their smooth surfaces.

#### MISCELLANEOUS WHALEBONE

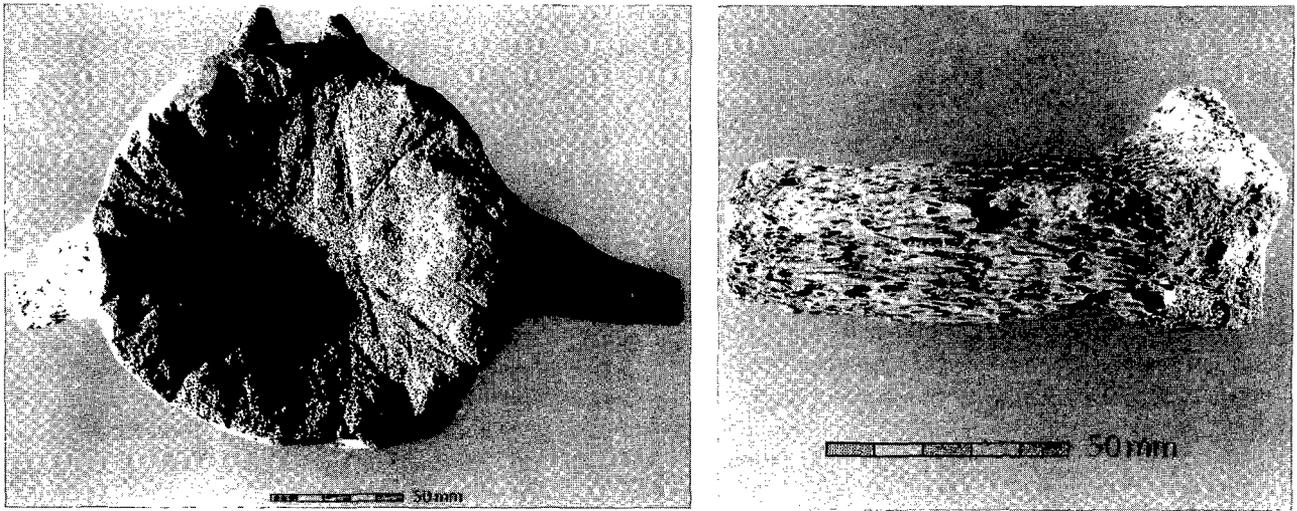
Few pieces are worthy of special mention. Apart from vessels, whale vertebrae were also used as chopping blocks. SF 2523 (illus 105a) from Late Phase 8, shows slight concavity of both surfaces



Illus 104  
Whalebone hoe and mattocks.

where the core of the bone has been exposed by cut marks. SF 850, also from Late Phase 8 (illus 105b), is a roughly square-sectioned peg cut from a vertebra. The head is formed from the epiphyses and the shaft is of cortex. Other artefacts in this category include a toggle, scoop or scraper SF 4502 (illus 98) and a grooved bone.

Whalebones may have been used as structural elements in buildings for roofing etc, but no evidence has survived from Howe. Two perforated whalebone vertebrae were found at Dun Mor Vaul which could have been sockets for posts (MacKie 1974b, 146, plate 3). The majority of whalebone artefacts from Iron Age sites are vessels, lids, cups and chopping



Illus 105

a) Whalebone vertebra chopping block (SF 2523), Phase 8; b) whalebone peg (SF 850), Phase 8.

blocks. Clickhimin produced whalebone lids, chopping blocks and a perforated peg (Hamilton 1968, fig 38, 18, 22, fig 48, 3–4), whereas Jarlshof, also in Shetland was almost devoid of whalebone. Vessels have been found at Bu, Gurness, Ayre and the East Broch, Burray (Hedges 1987a, fig 1.16, 1.17; 1987b, fig

2.30–2.33; 1987c, 77, 100), while perforated tools or mattocks similar to those from Howe have been recognized at Burrian, North Ronaldsay (MacGregor 1974, 86, fig 15, 199–201) and Birsay (Curle 1982, 77, ill 31).

## CONCLUSIONS

The preservation of bone and antler material, some of the more durable organic substances at Howe, was good and all sizes of artefacts were recovered. It is obvious that bone was a primary local resource as bone from wild as well as domesticated animal species was used. Bone-working at Howe is seen as a by-product of meat consumption and the gaining of pelts and hide. It was a material which was in reasonable supply, could easily be worked and the artefacts could be readily replaced. From the artefactual evidence bone-working also required no special skills or tools and was a craft that was in the main non-specialist. On the whole, bones were simply modified to produce the required tool, such as the cutting off of the central rib on a scapula to make a shovel. Knives were probably the most common tool used to make artefacts from bone, by cutting, splitting, boring and scraping. Pumice may have also been used for smoothing and polishing. The exceptions to this are the composite combs found from Phase 7 onwards requiring the use of saws, possibly files, and the use of another medium, metal, for rivets.

From Table 51 it can be seen that bone artefacts were ubiquitous throughout the Iron Age period, and even when the settlement was in decline during Later Phase 8, bone artefact numbers remained fairly high. During phases 7 and 8 there was a preference for antler for delicate artefacts such as combs and for tools with more demanding use such as for handles for iron knives and as picks. The durability and relative hardness of antler over that of bone, was put to good use.

Only two places on the site indicate that bone and antler working took place there. The first, being the more definite, is that of the broch tower during Phase 7/8. There, 27 items were found on the floor and in recesses in the broch wall, mainly unfinished and finished antler handles. The second place is that of the S workshop in Late Phase 7 where 35 artefacts were recovered. However, in neither area was bone-working debris recovered. The items in the broch may alternatively represent a cache of handles which were prepared ready for the fixing of new iron knife blades.

The standard of bone-working at Howe was basic and simple, reflecting the dominance of functional items in the assemblage. Only five items were decorated using incised straight lines or incised dots and circles, two composite combs, a long-handled comb, and two handles, all made from antler. Only in the antler composite combs was an attempt made to manufacture an item from more than one piece, thus producing an item which looked very different from the material from which it was made.

All the artefacts of bone at Howe, reflect a domestic production for immediate local need. There is nothing in the artefact assemblage to suggest that any of the artefacts were imported or came from elsewhere on Orkney. The use of whalebone reflects a local stranding of whales, and from the numbers of artefacts, the strandings were possibly as infrequent as they are in Orkney today. New work has thrown up one possibility of imported material: reindeer antler from Norway. A note at the end of this section reviews the evidence.

The categories of bone artefacts (Table 51) are based on their function as well as form. It is also possible to analyse the material from a purely functional aspect. What activities are typified by the range of artefacts, what activities took place at Howe using bone as a tool? Of importance are agricultural and heavy duty tools such as picks, shovels, and mattocks. There is a paucity of stone mattocks at the site, where perhaps whalebone was the preferred material. Agricultural tools may have been kept outside the settlement which may explain their generally low numbers.

Other bone artefacts indicate domestic activities within the settlement such as cooking, food preparation and storage with the use of spatulas, scoops, scrapers, knife handles, whalebone vessels with lids and a chopping block. Leather working is indicated by knife handles, awls needles and scrapers, and woollen cloth production with the survival of spindlewhorls, needles, pins, long-handled combs and pierced bone bobbins. Personal items are represented by toggles and pins for fastening leather and woollen garments, and composite combs and pins for grooming and adornment. Other activities indicated are recreational, bone counters or playing pieces used with stone gaming boards, and finely finished bird bone flutes or whistles for music making and possibly hunting. From approximately 300 bone and antler items, it is possible to get a little closer to the people at Howe.

It is difficult to compare the assemblage of bone items from Howe with other similar contemporary sites because of their rarity, the incompleteness of their excavations and problems of stratification. The excavation at Bu, a roundhouse within sight of Howe, produced similar but very few bone artefacts. The Broch of Gurness, a much larger Iron Age settlement than Howe, yielded fewer bone artefacts but of more varied types. The later and extensive high status Iron Age or Pictish dwellings at Gurness, and the possible Norse habitation, are reasons for the slight differences in the assemblage types. In comparison with other sites perhaps it is the similarities which are important rather than the differences. Sites such as Pool, Sanday, excavated in the 1980's should produce more of a useful comparison. In this respect Howe has a bone artefact assemblage which is probably typical of Iron Age sites in Orkney. The artefacts produced were those which were needed for the smoother running of life, made and used within the community. The finer and better crafted bone and antler goods produced at Pictish and Norse Birsay, for example, are not to be found at Howe. By that time, the settlement at Howe was over or reduced to a single farmstead.

## POSTSCRIPT TO BONE ARTEFACTS REPORT

Since the completion of the above report, research by Birthe Weber, Oldsaksamlingen, University of Oslo, Norway, has produced some interesting new results on some of the combs.

Mrs Weber has had long-handled and hair combs analysed from Late Iron Age/pre-Norse sites in both Orkney and Shetland. These sites include Howe; Skail, Deerness; Birsay Brough; Buckquoy, Birsay; Saevan Howe, Birsay, on Orkney and Jarlshof and Sandwick, Unst, from Shetland. The raw material of the combs was identified by Rolf Lie of the Zoological Museum, University of Bergen, Norway. Several of the combs have been identified as made from reindeer antler and not red deer antler as originally thought.

Six antler combs from Howe were re-examined. One long-handled comb, SF 3648 from Phase 8, is definitely of reindeer, and two composite hair combs, SF 307 and 308, both from Phase 8, are probably of reindeer. The antler of the latter two combs is, however, in poor condition denying positive identification.

The evidence Mrs Weber has accumulated, indicates that reindeer antler was imported into, and distributed widely within the Northern Isles, before the Viking period. The Phase 8 composite combs from Howe are dated to before the 7th century AD, with the long-handled comb to possibly as late as the 8th century AD, as it was found in a late abandonment horizon. The lack of comb-making debris on the site may suggest that the combs themselves were made elsewhere, perhaps at a distribution centre in Orkney, as composite combs were not made in Norway until the 13th century (B Weber pers comm).

As mentioned in the conclusions above, the number of antler artefacts remained high during Phase 8, even when the numbers of red deer were in marked decline (7.3 Animal Bone Report above). This discrepancy between numbers of antler artefacts and red deer may well be accounted for if artefact numbers were supplemented by reindeer antler from Norway.

It is hoped that future research will provide further evidence of trade between the Northern Isles and Norway, during Late Iron Age times (Weber 1992 and forthcoming).

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### 8.3 • STONE ARTEFACTS

#### including geological identifications and report

by the late Geoffrey Collins

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The excavation at Howe yielded over 800 individual stone artefacts. At the time of excavation, it was the largest collection from a well-stratified site in the Northern Isles. It forms an interesting and comprehensive group. The catalogue, 8.3.1, is available in fiche (2:A3–G14).

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#### GEOLOGY AND LOCATION

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The almost homogeneous geology of Orkney is to a large extent reflected in the tool petrology, emphasizing that the prehistoric Orcadian used the available natural resources to the full to fulfil the need for a range of different tools (Table 52). Most of the tools are derived from the local Stromness Flags, which are a fine grey sandstone or siltstone. Stones were collected as pebbles from the beaches less than half a kilometre away, to the S and E of the settlement, or quarried from the shallow coastal cliffs where outcrops of bedrock are easily accessible, or more rarely from the bedrock of the ditch surrounding the site. Beaches close to Stromness also yielded granite-gneiss pebbles and dyke rocks derived from Orkney's Basement Complex (Mykura 1976, 40). These are mainly camptonites, monchiquites and bostonites and have been described elsewhere (Flett 1935, 173–187). All three rock types are found within 10km of the site, mainly along Orkney's west coast at Stromness, Warebeth, Graemsay and Yesnaby. All these beaches provide pebbles and stones in suitable shapes and sizes for easy transformation into required tools.

Coarser grained yellow and orange sandstones are probably of the upper and middle Old Red Sandstones of Hoy, while the bright coloured yellow sandstone matches the Lower Eday Sandstone, found in Eday, South Ronaldsay and on the N coast of Scapa Flow. Both Hoy and Scapa Flow rocks were within easy reach of the settlement at Howe and loose stones could have been transported to accessible beaches by tides and currents.

Many of the felsites, schists, quartzites, quartzose sandstones and granites can be matched with material from the glacial till of the Mainland (Mykura 1976, 113), and some of the brick-red siltstones, which are probably derived from the Eday Marls, may have also come from the glacial till. The granite outcrop at Stromness and the marly sandstone Passage Beds of the SE coast of Hoy may also have been exploited when necessity dictated.

Rocks have also been identified that are obviously foreign to Orkney, imported as the manufactured articles such as jet armlets and spindlewhorls, probably from Brora, and steatite from Shetland. These rocks reflect trade in small personal items which were easily transported, of some value and demand.

Table 52 displays the types of stone used and the tools formed from them. Fine and medium grained sandstones were used for most tool types, as the stones were well suited for objects that could be shaped by pounding, pecking, grinding and chipping. Sandstones could also be fairly easily bored to produce whorls and beads, and smoothed to form counters and balls. Pivot-stones, although collected as small finds, were part of the structural fittings of the buildings of the settlements and were all produced in sandstone. In contrast, objects and tools like potlids and mattocks were shaped on siltstone which could be chipped or split. All but one of the 98 potlids were made on siltstone. Large objects such as querns and pecked and hollowed stones were made on coarse sandstone.

The hard basement complex rocks of bostonite, monchiquite and camptonite were used for two Neolithic axes, some hammerstones/pounders, polishers and collections of pebble caches. These seem to be isolated uses of these rock types. Granite was used for a number of hammerstones, pounders and polishers, while other rock-types, including felsites, quartzites, granite-gneiss and hornblende granite-gneiss are only represented by a very few items.

Represented in the stone artefact assemblage are structural items, domestic and work tools, objects, as well as personal items. This reflects to some extent the versatility and skill of the craftsman and the paucity of other available raw materials.

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#### LOCATION AND DISTRIBUTION (Table 53)

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##### EARLY PHASES 4–6

From the early phases of the site, 106 tools (8%) were retrieved, but only Phases 4 and 5/6 produced stone items in any quantity. Pounders, hammerstones, polishers and their variations formed the main groups of small hand tools. Rotary as well as non-rotary querns were noted from these Phases with the earliest from Phase 3, and another four from Phase 5/6. In this latter phase the different types of querns were

found together for the first time. Mattocks, potlids and pecked and hollowed stones formed some of the other numerous items.

Many of the finds were scattered in post-Neolithic ditch fills as well as within floors in Phase 4 and the Phase 5/6 roundhouse village. Pivot-stones found both in situ and in rubble horizons emphasize the structure and planning of some of these Early Iron Age phases.

Table 52: Geology of stone artefacts

Artefact Type	Simplified Rock Types																				Total			
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T		U	V	
Incised stone	1		2			2																		5
Armlets						2									2									4
Counters			3			2																		5
Stone balls			1			2									1									4
Sm. miscellaneous		1	3			1									2	2	1							10
Beads					1	4									1									6
Spindlewhorls			7		2	23	1								2	1								36
Perforated stones			1			2	3		1															7
Axes										1	1													2
Skaill knife																								1
Hammerstones			9	2	1	36	5					2	1					1	10	1				68
Grinders						20	1																	21
Pounders						22	6			3		3								3				37
Pestles			10			18	1	1													3			30
Grinder/h'stone			11			15	1			1	1							1	1	1				32
Pounder/h'stone			5	2		32	3					1						1				1		45
Pestle/h'stone			20			10												1	2	1				34
Pebble polishers			4			3						1						1	2					11
Elong. polishers			12			4																		16
Worn polishers	1					4	11	1				1									1			19
H'stone/polisher			2			1	2																	5
Pounder/polisher			5		2	17	11	2	1									1		1				40
Grinder/polisher			2		1	2																		5
Pestle/polisher			5			11	3					1										1		21
Whetstones			17			4																		21
Cleavers			1			3																		4
Mattocks			4																					4
Shovels			9			2																		11
Strike-a-lights					2	2																		4
Pebble caches			8			11	5	1	2				9									2		38
Potlids/bakestones			97		1																			98
Non-rotary querns						8	48	1	2															59
Rotary querns						6	19	1														1		27
Unclassified querns							1	4													1			6
Querns rubbers							6	2													1			9
Mortars							3	5																8
Pecked & hollowed			2		1	18	18		2															41
Pivot stones						15	8																	23
Pecked & decorated						1	1																	2
Reused stones							3		1															4
Miscellaneous	1		1	1	1	5	9		4						1						2			25
Unworked										1		5									1			7
Total																								855

Table 52: Key to simplified rock types

A – unknown	I – coarse-grained sandstone	P – hornblende mica schist
B – carnelian	J – camptonite	Q – quartzite
C – siltstone	K – monchiquite	R – felsite
D – silt/sandstone	L – bostonite	S – granite
E – sandstone	M – porphyritic felsite	T – granite-gneiss
F – fine-grained sandstone	N – steatite	U – hornblende granite-gneiss
G – medium-grained sandstone	O – jet/shale	V – tuffaceous acidic conglomerate
H – medium/coarse-grained sandstone		

Tools missing from these assemblages but found in later phases are grinders, large sub-rectangular querns, whetstones, cleavers and strike-a-lights as well as more personal items such as beads, armlets and stone balls.

#### EARLY PHASE 7

This phase produced the majority of stone tools (41%) with 353 items found. The **SE** Building produced the fewest (17), and the

broch produced the most (35). There were large numbers of combination tools but few elongated polishers. Non-rotary querns out-numbered the rotary and sub-rectangular querns, although in some buildings such as the **SE** and **SW** all types occurred together. Potlids were the most numerous individual items.

Most of the tools were found in rubble contexts or reused in a fragmentary form as packing for structural features such as orthostats and hearth kerbings. Some of the broch tower artefacts were located within the interstices between the wall stones. Some

Table 53: Distribution of stone artefacts by phase

Artefact Type	Phase														Total					
	1/2	2	2/3	3	3/4	4	4-6	5	5/6	5-7	6	6-9	E 7	L 7		7/8	E 8	L 8	8/9	9
Incised stone														1			3		1	5
Armlets													2	1		1				4
Counters				1									2	2		1	1			5
Stone balls													1	1					2	4
sm miscellaneous				1									2		1	4		1	1	10
Beads													3			2	1			6
Spindlewhorls				1		1							7	9	3	7	4		4	36
Perforated stones						1			1				3	1					1	7
Axes	2																			2
Skaill knife	1																			1
Hammerstones				1	1	2			6		2	1	18	10	2	6	14		5	68
Grinders													13	6		2				21
Pounders	1		2			2	1		5				15	4		3	2		2	37
Pestles				1					1	4			16	6		1			1	30
Grinder/h' stone					1					1		1	19	6	1		3			32
Pounder/h' stone			1			2		2	2				21	10	2	3			2	45
Pestle/h' stone						1			5				18	7					3	34
Pebble/polishers													3	6	1	1				11
Elong polishers				1									8		5	2				16
Worn polishers								4					8	2	1	2	2			19
H' stone/polisher											1		1			1	2			5
Pounder/polisher	1		1						1				21	12	1	1			2	40
Grinder/polisher									1			1	1	2						5
Pestle/polisher									2				10	3	1	1			4	21
Whetstones														2	1	5	6		7	21
Cleavers													3	1						4
Mattocks								1	2				1							4
Shovels									1				9	1						11
Strike-a-lights																1	2		1	4
Pebble caches						8							30							38
Potlids & bakestones		1			1	1		1	3	1			38	12	4	22	9		5	98
Non-rotary querns									3				27	12	4	6	4		3	59
Rotary querns				1					4				10	6		1	1		4	27
Unclassified querns									1				1	2			1		1	6
Quern rubbers									1				1	1	2	1	2		1	9
Mortars									2				3	3						8
Pecked & Hollowed						2			4		1	1	12	8	1	4	3		5	41
Pivot stones								1	1				15	1		1	2		2	23
Pecked & decorated						1								1						2
Reused stones													4							4
Miscellaneous						1			1	2			7	6		1	4		3	25
Unworked													1	2	2		2			7
Totals	5	1	4	7	3	22	1	6	55	3	4	5	353	147	30	80	68	1	60	855

domestic floors were very productive, such as the primary floor of the *NE* Building, which yielded everyday tools of potlids and spindlewhorls.

There seems not to be a pattern in the distribution of tools between the buildings of this phase, nor in the distribution within each building. Only pounder/hammerstones and potlids are common to all the buildings. Many of the tools, and especially broken querns, were reused in masonry features. Only floors that seem to have been in use for a long time produced more than a dozen items, but in general both floors and yards of the structures were kept clean and contemporary ditch deposits were largely devoid of stone tools. It was not possible from the evidence to deduce work areas within the individual buildings during this phase.

Groups of tools, worked and unworked, identified as pebble caches, hint at the deliberate placement or collection of tools, such as a group found within the broch wall, or a collection within a small stone setting in the *S* Building, and two isolated groups within floors of the *SW* and *E* Buildings. Sparsely represented are

personal items and tools such as some types of polisher, mattocks, whetstones and identified quern rubbers.

#### LATER PHASE 7

Approximately 17% of all tools came from this phase. The second workshop floor within the broch tower contained 18 tools including shovels, grinder/hammerstones, combination tools, polishers, a non-rotary quern and a pebble cache, which suggests both industrial as well as domestic activities and perhaps stone tool manufacture. The *S* workshop contained 78 tools mostly found in demolition and levelling rubbles and incorporated into walls. Sub-rectangular querns were numerous, but both rotary and non-rotary querns were also present. In contrast, the *E* Building yard workshop produced only rotary querns. Only the *NE* Building and yard yielded more than a dozen tools, while tools from the other small workshops were only found as part of walls and within rubble areas. Items in small numbers or missing from this phase are beads, quern rubbers, mattocks, shovels, whetstones and cleavers. There were no tools common to any of the workshops.

## PHASE 7/8

The third and fourth secondary, workshop, floors within the broch tower are characterized by the lack of rotary querns and a declining number of tools with no common item apart from potlids. Only 16 tool types are represented during this phase, which forms only 3.5% of the total collection.

## EARLY PHASE 8

Excluding rubble contexts, only three areas are represented by tools from this phase, the *SE* and *E* yards which produced only one pounder, and the *NE* and *S* complexes produced 50 and 26 tools respectively: in all, 9.3% of the total. Most tools were found in rubble contexts, including most of the querns, these being mainly non-rotary. Only the floor of the *NE* Building produced any quantity of tools, nine, while the other floors throughout this phase were sparsely productive. No pestles or pestle types, perforated stones, mortars, mattocks, shovels, cleavers and pebble caches were found, nor were they located in any of the succeeding buildings.

## LATER PHASE 8

This phase produced 8% of the tools, with only Stage 5 yielding more than 6 finds. Finds from this phase were sparsely scattered throughout the stratigraphy and predictably the rubble abandonment horizons produced the most finds. Potlids, whetstone and double-ended hammerstones were the most numerous articles. Only one miscellaneous quern was found in a stratified context apart from those in abandonment rubbles. Again there was no discernible pattern to the tool distribution.

## PHASE 8/9

Only 1 find, a jet pin.

## PHASE 9

60 unprovenanced tools (7%) came from the topsoil and unstratified contexts, encompassing nearly all categories of finds.

## ARTEFACT TYPES

From the total assemblage of stone artefacts 41 categories have been identified, with one category of unworked stone. The tools were divided according to their main characteristics of morphology, tooling and patterns of use and likely function. In the categories below the general characteristics of the tools are described as well as comparisons with other sites, but the comprehensive catalogue of all the stone artefacts is not included as this can be found in microfiche (2:A3-G14). The catalogue contains a detailed description with measurements of each find and the phase to which it belongs.

The rubbly nature of the site and the amount of stone chippings weathered and broken from larger stones, even on domestic floors, prevented any serious research into areas where stone tools could have been manufactured. Areas of chipped debris from tool making were either not present or could not be determined from the general scatter of stone chippings. It would seem likely that most tools, of local rock types were made at or near the settlement but evidence to support this could not be retrieved.

## INCISED STONES

Both quarried and flat beach pebbles were used for five stones which have incised marks. Two flat siltstones have been interpreted as gaming boards with measurements of 150-190mm long by *c* 150mm wide and *c* 30mm thick. SF 700 (illus 90c; 106) has both vertical and horizontal lines with small circles at some of the intersections. The other, SF 4933, is unfinished. Gaming boards have been found at many other sites. A whalebone board from Birsay (Curle 1982, ill 50, 274), is very similar to SF 700 with circles at the cell intersections, likewise are the ones found at Buckquoy, Birsay (Ritchie 1976, 199, fig 9, 10), which are described as from mid-Norse levels, and another simpler one from Birsay, probably of the same date (Morris 1989, 215-217). A larger stone from Jarlshof, Shetland, has games on both sides and seems more complex in its execution than the one from Howe (Hamilton 1956, 145, 48, pl 31), while a large but fragmentary stone from the Broch of Gurness seems less formalized (Hedges 1987b, 127).

Although the gaming boards from Howe are from rubble layers and are therefore unstratified, they probably came from dwellings during Late Phase 8, probably from the 6th and 7th centuries and possibly as late as the 9th, whilst comparable finds from other sites are said to be of mid-Norse date.

The three other stones in this section have incised designs cut into

their faces and come from Late Phase 8 and Phase 9. One has a fragmentary fan design, another has an incised double bow and the third has the initials 'A M' which are underscored.

## ARMLETS AND BRACELETS

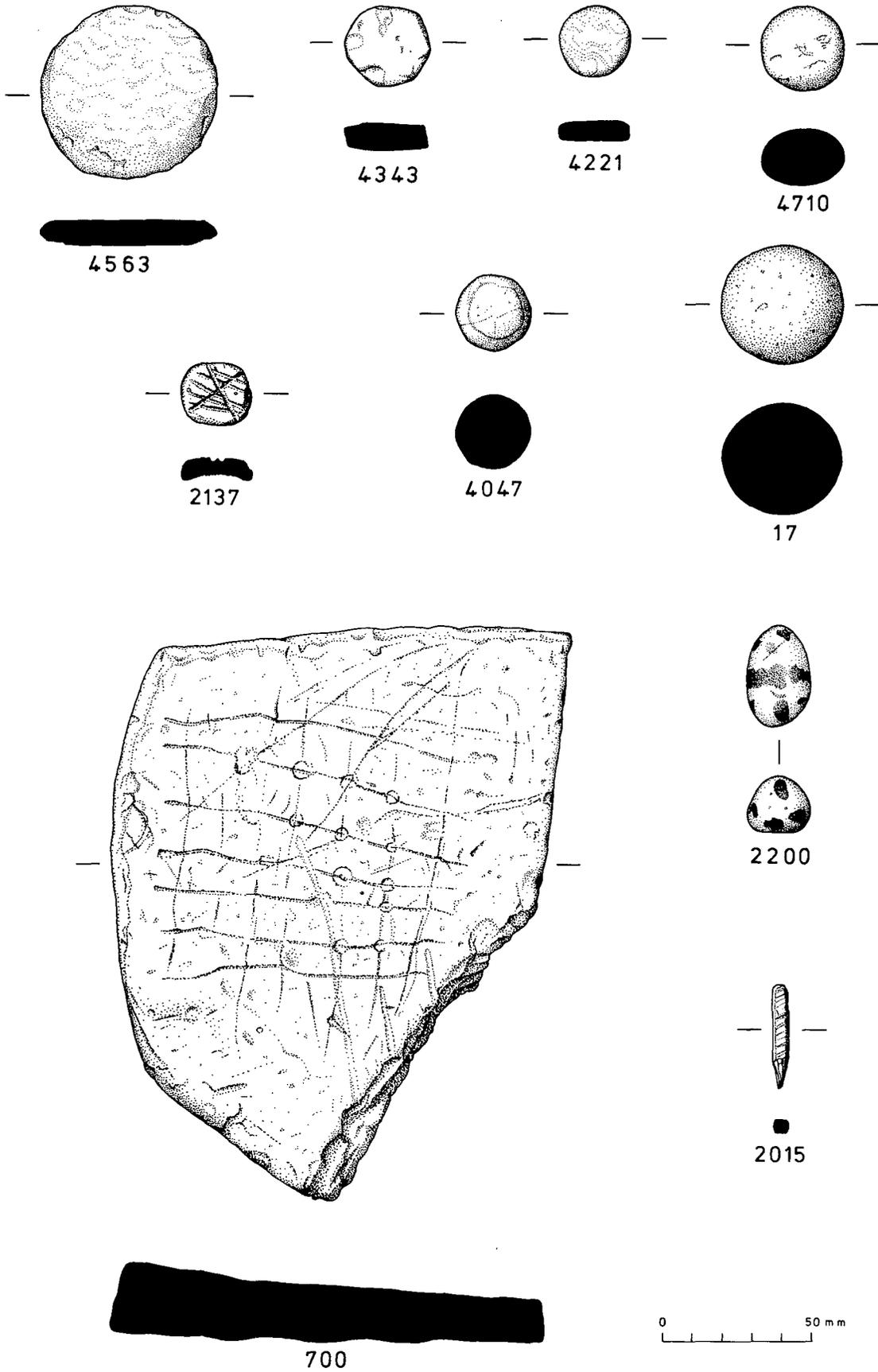
Four armband fragments were found, with diameters of 60-90mm. Two, SF 4594 and 7236 (illus 107), are of polished jet or jet/shale and two are of fine-grained sandstone, SF 7082 and 2087. The sandstone armband SF 2087, is from Phase 8 and is coated with a black substance which has taken a polish (see below). All these pieces are roughly semi-circular in section and very fragmentary.

Most comparable armlets from other sites such as Dun Mor Vaul, Tiree (MacKie 1972, 135, fig 15, 223) and Birsay (Curle 1982, 67, ill 42) are normally broader in section. Armlets from Jarlshof (Hamilton 1956, 36-37, fig 17), are of polished steatite and again wider than those from Howe, whereas the eight steatite fragments from Mavis Grind, Shetland, are more comparable (Cracknell & Smith 1983, 27, fig 9). A shale armband was noted from Midhowe Broch (Callander & Grant 1934, 496), and Curle remarked that the 24 armband fragments found at Traprain Law, East Lothian, were from the lowest level but had passed out of fashion by the second half of the 2nd century AD (Curle 1920, 98).

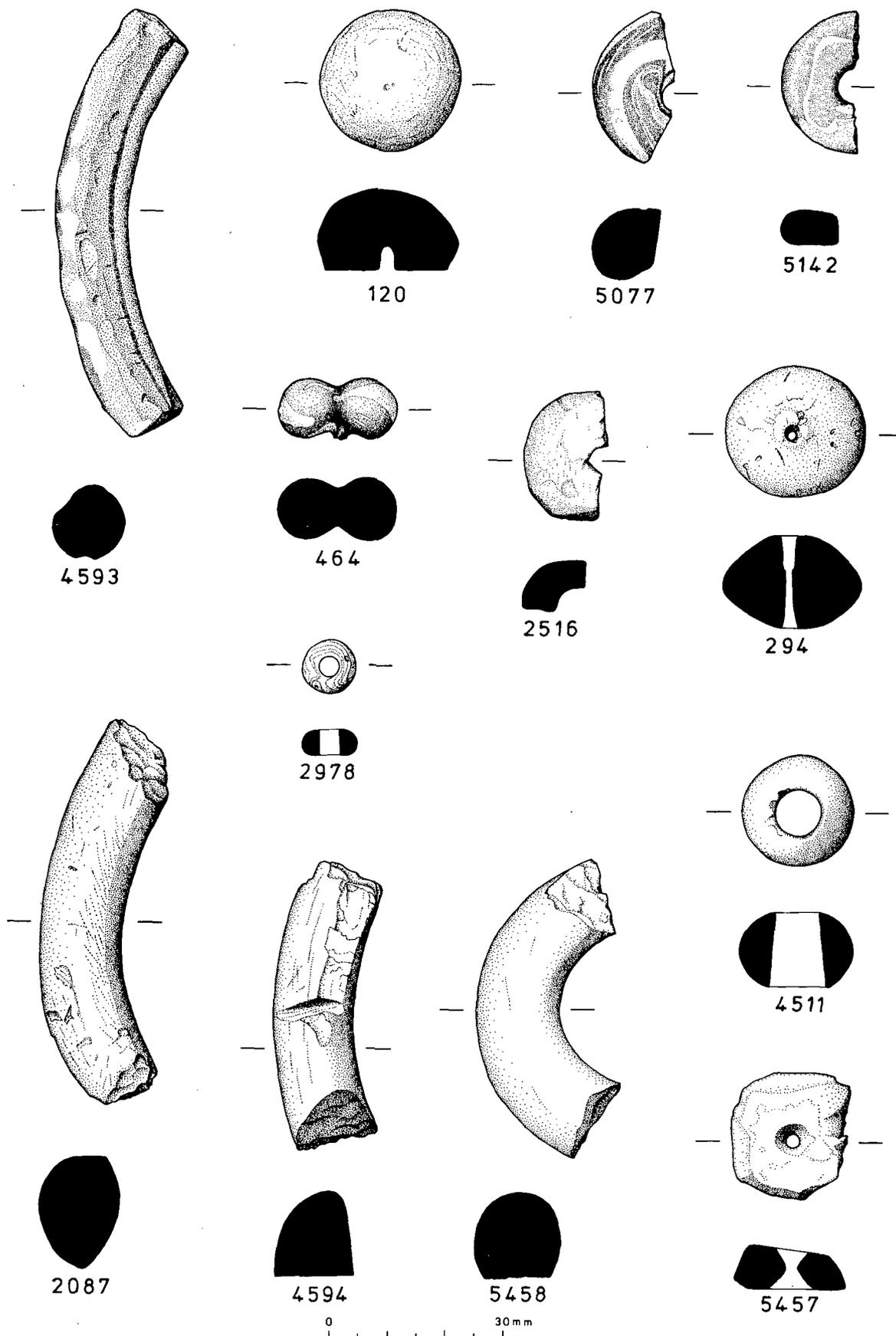
## COUNTERS AND PLAYING PIECES

Five rounded and flattened discs of silt and sandstone were identified as counters. They predominantly have flat surfaces and ground sides or edges. SF 4221 (illus 106) is highly polished and SF 4343 has irregular sides. SF 7391, from Phase 3, has, however, only one flat surface. The counters are less than 27mm in diameter and less than 10mm in thickness.

Counters are numerous from broch settlements on Orkney and Shetland (Hedges 1987a; 1987c), although contemporary stone and bone playing boards are rare (see Incised Stones above). Other boards may have been of more perishable material such as leather or wood, or scratched into an earth floor, and as such have not survived to be added to the archaeological record. Jarlshof (Hamilton 1956, 64) produced two counters from the Iron Age settlement and Clickhimin (Hamilton 1968, 80, 84, fig 35, 114; fig 147, 142), had more than 12 disc counters or playing men.



Illus 106  
Stone gaming board, stone & bone counters, slate pencil and painted pebble.



Illus 107  
Polished incisor, stone armlets, perforated stone, and glass beads.

## STONE BALLS

Only four stone balls were found, two from the topsoil and two from Phase 7. They are only roughly spherical with diameters ranging from 22–37mm, and are made of steatite, siltstone and fine-grained sandstone. SF 17 (illus 106) is of sandstone and has a high polish on an artificially blackened surface (see below). Several stone balls of a similar size to these were found at Clickhimin and described as steatite and sandstone 'slingstones' (Hamilton 1968, 80, 86, 120, 143).

A partly drilled sandstone ball came from Burrian, North Ronaldsay (MacGregor 1972, 95, fig 20, 275), but few are noted from other Iron Age settlements although a larger serpentine ball was found at Howe of Hoxa (Hedges 1987c, 104). The paucity of stone balls from Iron Age sites precludes their use as slingshots: specialized counters or even amulets are preferable alternative uses.

## SMALL MISCELLANEOUS

### POLISHED JET

SF 120 (illus 107) is probably an example of a globular pin head, made of polished jet with a basal hole for an iron shank. Stevenson (1955, 293) suggests that 'they may derive ultimately from the considerably larger 'jet' heads, also with iron pins, datable to the Roman Iron Age at Traprain and Crichtie, Aberdeenshire'. SF 120, with a diameter of 23.5mm was found within some of the later stratigraphy on the site, in Phase 8/9.

### ROMAN INTAGLIO – Martin Henig

The intaglio SF 609, from Phase 9 and therefore unstratified (illus 108a), is a carnelian with agate banding, conical in form and evidently intended to stand proud of the surface of the ring in

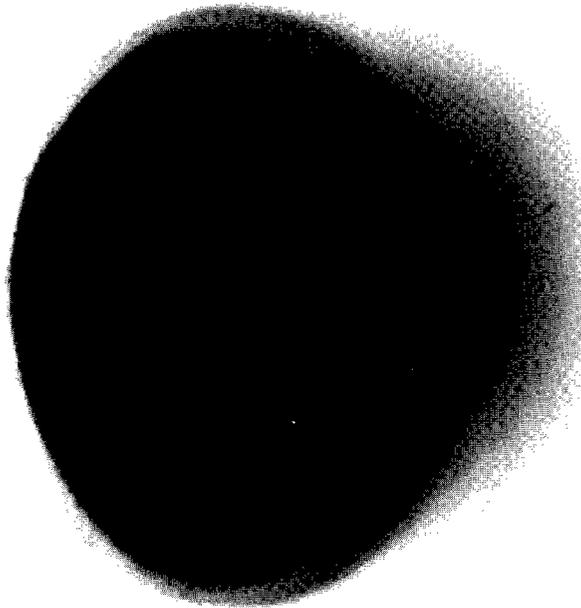
which it was set, (for the shape see Henig 1978, 35, fig 1 shape as F3 but edges of upper surface slightly curved). There is some surface wear and the impression is described in accord with the usual practice.

An eagle (108b) stands with its body three-quarters towards the left and looks back to the right. The wings are partly displayed and there is no sign of the usual wreath in the beak or of the ground line. The image is nevertheless an attractive one with the texture of the bird's plumage suggested by groups of parallel wheel grooves. The style of cutting is that of the small-grooves style portrayed in Massant-Kleibrink (1978, 251–84) where No 798 is an agate cone with a fish engraved on the upper surface and No 795, a carnelian with a much broader surface, displays an eagle as here. Both reveal a comparable delight in texture, executed with short strokes of the lap-wheel.

Eagles are shown on a number of gems from Britain including a yellow jasper one from Bath, probably late first century in date (Henig 1978, 269, pl 21, 689), and another on onyx from London set in a second century ring (*ibid* 314, pl 31, App 188). From Scotland is noted a nicolo paste from Newstead showing two eagles and a legionary standard (Elliot & Henig 1982, 297, 12). The intaglio is the most northerly yet found in the British Isles. As it can be dated in all probability to the middle of the second century it could have reached Howe, perhaps on the finger of a merchant from the south at a time of considerable Roman activity in Scotland, or, like the glass gem from Cairnhill, Aberdeenshire (Henig 1978, 208, 178; Stevenson 1967, 143–5, pl 25, 2a, 9), it might have been valued by its native owner as a charm and have been lost a long time after its date of manufacture.

### SILTSTONE PENCIL

SF 2015 (illus 106) is a slate pencil, 35mm long and slightly rectangular in section. One end has been trimmed to a point. It was found in the broch tower early in Phase 8.



Illus 108  
a) Roman intaglio; scale  
9:1;

b) detail of eagle design.



### PAINTED PEBBLE

This small quartzite pebble SF 2200 (illus 106), with measurements of 32 × 20mm, was found in the fourth workshop floor of the broch tower during Phase 7/8. It is divided into two by a brown central band of colour. At one end are five dots and three at the other in the same brown colour. They have been applied however over a faded but earlier and different pattern of dots.

Several painted pebbles have been found at other Iron Age sites and the designs range from all-over circles at Buckquoy (Ritchie 1976, 199, fig 8, 87), a pebble with involuted lines at Clickhimin (Hamilton 1968, 86, fig 37, 1) and one with all-over dots and one with line and dots at Jarlshof (Hamilton 1956, 64, pl 15c, fig 39, 1). A combination of dots and lines can be seen on painted pebbles from the Broch of Keiss, Caithness (Hamilton 1968, 86), and two quartz pebbles from Burrian which have wavy lines and open circles respectively (MacGregor 1972, 95, fig 20, 276, 277).

The actual content of the colour has not been determined nor has a plausible explanation been found for the differences in decoration. The pebbles could have been amulets with magical or medicinal properties, or used in games. Although their use is obscure this type of pebble is well represented at Iron Age sites in the north of Scotland.

### HORNBLENDIC-MICA-SCHIST DISCS

Two thin polished discs, SF 4397 and 4563 (illus 106), were found within the **NE** building during Early Phase 8. Their diameter is 59mm and the thickness 5.5mm, with edges which have been ground smooth.

Similar discs and plaques of garnetiferous-schist have been found in the Iron Age settlements at Clickhimin, numbering 18 in all (Hamilton 1969, 79, fig 35, 19–21; pl 22a, 114; fig 115, 5, 135, 138, 142). In contrast to this high number at Clickhimin, none were recorded from Jarlshof. A micaceous disc was found at the East Broch of Burray (Hedges 1987c, 100) which may be of the same type. Their uses may, like the painted pebble, have been associated with folklore. An interesting property of these discs is that when wet, the colour is highlighted and the mica becomes shiny and mirror-like.

### AMULET

A small irregularly shaped stone, SF 4965 (illus 109), with a hooked narrow end and a polished body. It was found in rubble in the Early Phase 7 **E** building yard.

### JET RING

SF 5458 (illus 107) was found in the **NE** building in Early Phase 7. It is a polished jet ring fragment, circular in section, and estimated to have been *c* 53mm in diameter. It is too small to be an armband or bracelet with its central hole only *c* 24mm in diameter, and its function is unknown. Jet rings similar to this have been found at Dun Mor Vaul (MacKie 1974b, 135, fig 15, 222) and in the third level at Traprain Law (Curle 1920, 96, fig 22, 14).

### STONE POINT

SF 6985 (illus 109) is a stone point of siltstone 91mm long and 10mm wide. Its edges have been smoothed and its pointed end had been worn. It was found in Phase 3.

### SANDSTONE MOULD

SF 4302 (illus 109) is a fragment of a stone mould, which has part of a ring cut into the upper face of the block. It was probably used for the manufacture of ring-headed pins as its diameter of

16.5mm is comparable. It was found within the **NE** building early in Phase 8.

Moulds for ring-headed pins have been found at both the Broch of Gurness and at Birsay, but made of fired clay, whereas stone moulds were normally used for producing metal bars (Curle 1982, ill 28). It would seem that the Howe mould is earlier than those of fired-clay and was probably used to bend the copper-alloy wire to form the simple ring-headed pins found at the settlement.

### BEADS AND SPINDLE WHORLS

There is an overlap in size between small spindle whorls and large beads, each being stone rings with a central perforation. An attempt has been made to differentiate between the two by weight. Whorls of 10 grammes or less have been identified as beads. The beads have diameters ranging from 17–38mm and their holes have diameters from 6 to 11mm. The diameters of spindle whorls range from 23 to 59mm, with clustering around 34–38mm. Their perforations measure between 6 and 21.5mm, with two clusters between 9–13mm and 15–18mm. An attempt has been made to differentiate between the two by weight.

Most of the beads, five of the six, are of sandstone and very fragmentary. Some are irregular in shape and are presumed unfinished (eg SF 7031) and all are from Phases 7 and 8. In contrast, the steatite bead, SF 4511 (illus 107), is a highly polished flattened sphere with a hole that is not splayed or waisted. The incidence of a steatite bead from Early Phase 8 indicates contact and trade with Shetland, where steatite beads were quite common in the Roundhouse and Iron Age settlement levels of Jarlshof (Hamilton 1956, 37, fig 17, 54, figs 31 & 36).

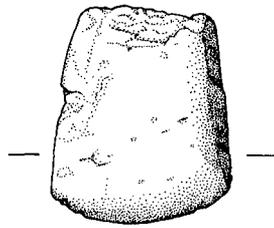
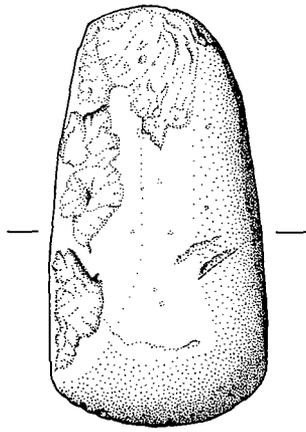
36 spindle whorls were identified (by weight), mainly from Phases 7 and 8, with occasional ones from Phases 3, 4, and 9 (illus 110). Most of the sandstone and siltstone spindle whorls have a flattened appearance with either straight or rounded sides. Some are probably unfinished with rough surfaces and irregular sides, while others have off-centre perforations. Many of the whorls show signs of wear around the central hole where the spindle would have fitted, producing an elliptically splayed or waisted hole. Three of the whorls are made of jet and steatite, and have been introduced to Orkney. As spindle whorls were the only means of thread production during the prehistoric period, they were commonly recognized objects from other Iron Age sites on Orkney and Shetland. As many as 38 whorls were recorded from Clickhimin (Hamilton 1968, 84, 120, 135, 139, 142, pl 24), and 23 from Burrian (MacGregor 1972, 88–89, 92, fig 18) and several from Birsay (Curle 1982, 118–119, ill 68) where steatite whorls were recorded from Norse levels.

### LARGER STONE TOOLS

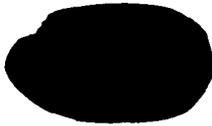
#### PERFORATED STONES

These are mostly flat rounded cobbles, pecked to shape, each with a waisted central hole (biconical), and made on fine and medium grained sandstones. There are seven tools in all in this category from Phases 4 to 9, but excluding Phase 8. The holes have generally been pecked, but also show signs of wear (eg SF 7246, illus 111 and 5154, illus 111). Although SF 7311 (illus 111) is a much smaller example than the others, it may be related to the perforated discs found at Jarlshof (Hamilton 1956, fig 29, 7). However, their shape and wear patterns do not give a clear indication of their function. Their use as loom weights, especially SF 4176 (illus 111), or as other weights might seem practical. SF 5400 (illus 111) has been chipped at one end, suggesting that it may have been reused as a hammerstone, and SF 4176 may have originally been a quern rubber.

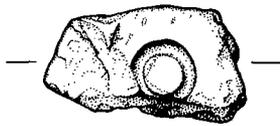
Perforated stones have been found at Clickhimin (Hamilton 1968, fig 58, 2 & 3), Jarlshof (Hamilton 1956, 63), Crosskirk, Caithness



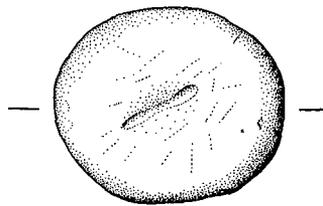
7407



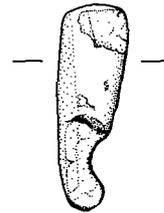
7392



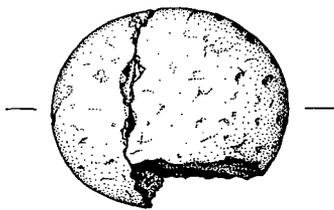
4302



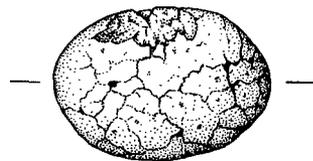
4321



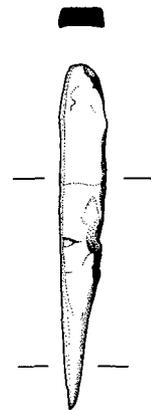
4965



3832



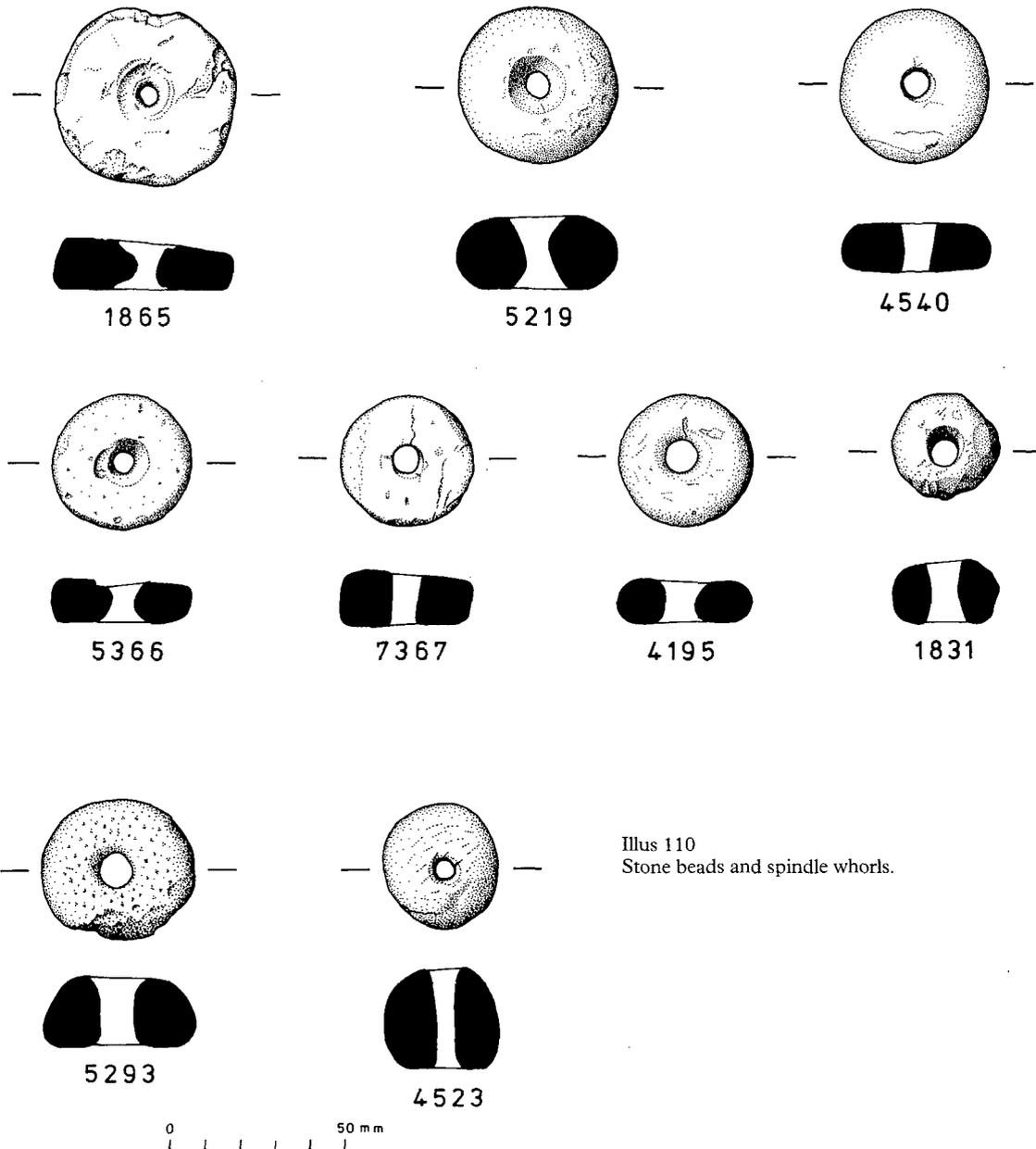
7049



6985

0 50 mm

Illus 109  
Stone axes, amulet, mould, strike-a-light,  
point, and pot boilers.



Illus 110  
Stone beads and spindle whorls.

(Fairhurst 1984, 132) and at several of the Orkney brochs (Hedges 1987c), where they are described as tether stones or line sinkers. These from Howe seem too light in weight to have functioned as animal tether stones, and any form of fishing tackle was probably left nearer the coast. Their use as weights for looms and counter-weights for doors, or even as upper pivot-stones for the door posts may be plausible alternative choices.

#### AXES

From over the Neolithic levels came a stone axe SF 7392, of monchiquite and a fragmentary one, SF 7407 (illus 109), of camptonite. Both are oval in section, with ground cutting edges and highly polished surfaces. Both show evidence of secondary damage by chipping and flaking.

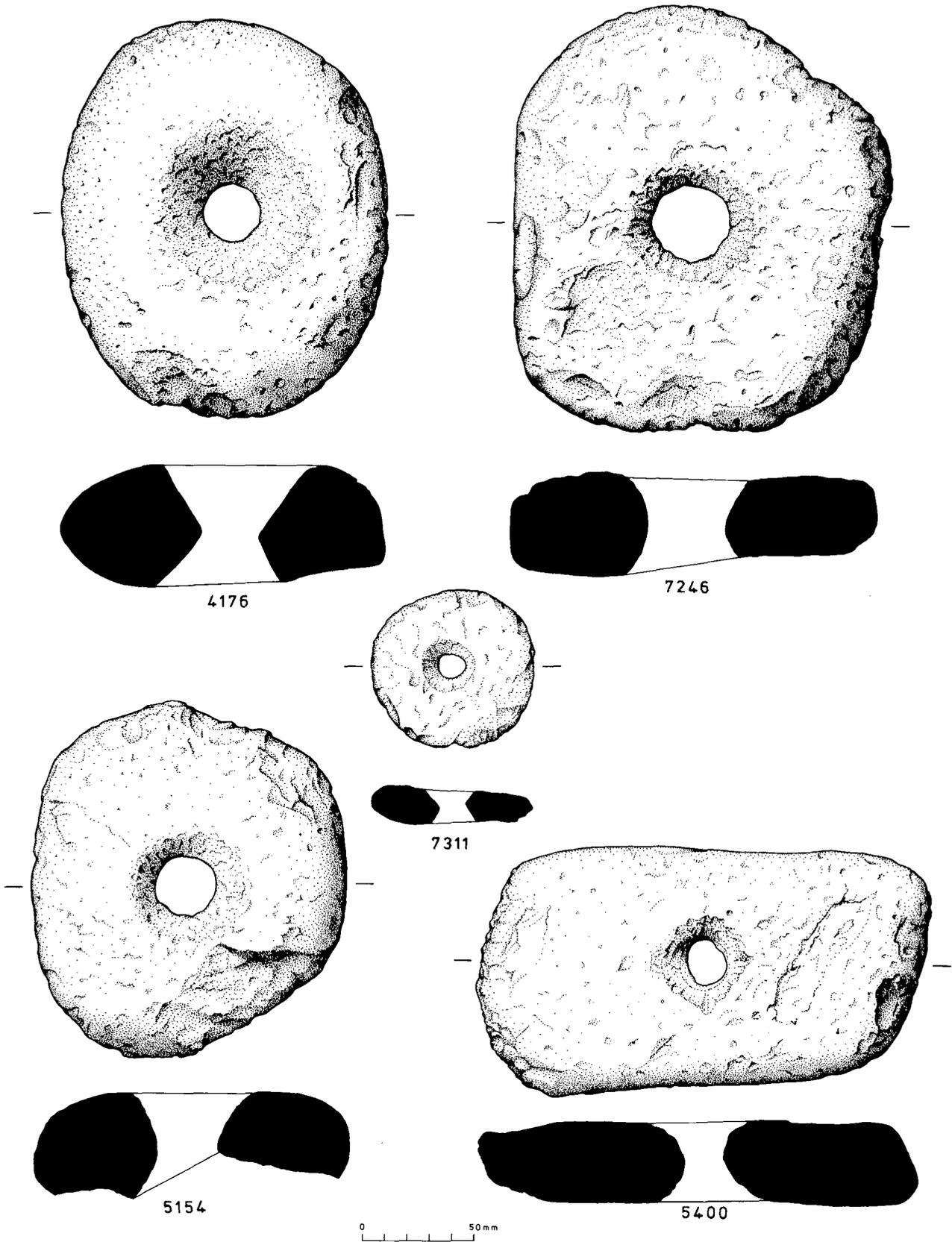
There are numerous Orcadian examples of stone axes similar in size and shape to these, from Neolithic deposits at Knowe of Laird, Calf of Eday (Long) and Blackhammer (Henshall 1963, vol

1, 111). The type of material used for the manufacture of these artefacts has not been studied in detail, but other axes from Huntersquoy and Calf of Eday (SE) have been identified as sandstone.

Three axes which correspond closely in size to those from Howe were found at Isbister, South Ronaldsay (Hedges 1983, figs 29, 66, 92 & 93), indicating that such stone axes formed part of the Neolithic funerary ritual and suggesting a similar function at Howe.

#### SKAILL KNIFE

Only one knife from a split sandstone cobble was found at Howe, from a disturbed Neolithic context. Its edges show signs of wear and it is very similar to those from Skara Brae (Childe 1931, 114) and Pool, Sanday (pers comm John Hunter). Many split pebble knives were found in the earliest levels at Jarlshof (Hamilton 1956, 12, fig 5, 1), indicating the use of an easily available resource.



Illus 111  
Perforated stones; loom weights.

An attempt has been made to identify different tool types from the copious numbers of cobble and pebble stone tools, by their wear patterns. However, their precise functions are still the subject of conjecture. Many reports group together these tools, including polishers, paying little attention to their wear patterns or to the multiplicity of functions for which they may have been used. There is obvious scope for further study and analysis. The 405 tools in the following 15 categories comprise almost half the total number of stone tools found at Howe. Their high numbers and their distribution suggest that they represent common everyday tools for the Iron Age.

## HAMMERSTONES

The commonest use put to the rounded and elongated beach cobbles was that of a hammerstone. 68 tools of this type were identified from all but the two earliest phases. They were usually made on fine grained sandstone with some on granite and siltstone. The cobbles were hand-sized, averaging *c* 147.5mm long, *c* 68mm wide and *c* 42mm thick, and were used for violent action, producing severe fracture scars or massive shattered areas. The wear could be at one end (eg SF 5350) or at both ends of the tool (eg SF 7080, illus 112). Prolonged use in some cases produced a faceted appearance of the worked end, where the tool had been used from different directions (eg SF 155 and 4275, illus 112). Other examples, including SF 4275, show that the body of the tool and occasionally the sides were fractured by hammering. Hammerstones in all probability were used in building works and other non-specialist activities.

## GRINDERS

The 21 tools of this type were mainly confined to Phase 7, with none occurring in earlier phases, and there are fewer of them than the other common types of cobble tool (hammerstone, pounders and pestles). Most of the grinders are made on fine and medium grained sandstones which are the most suitable rocks for this type of tool. One or both ends of the tools were made smooth by a grinding action which could produce a single faceted edge eg. SF 4361 (illus 113) or multiple facets (eg SF 2461 and 5484, illus 113). SF 4361 has also been used along both edges. The paucity of identified quern rubbers may indicate that grinders, or some of them, were used with querns, and that they were used for food processing and especially that of the cereals.

## POUNDERS

Pounders are of rounded or elongated pebbles and made predominantly on fine grained sandstone. They were found from the early phases throughout the life of the settlement but most were from Phase 7, and there were 37 in all. These tools were used for, and formed by, continuous pounding to produce a pecked or pockmarked surface, usually at both ends, or, as in SF 7006 (illus 114), all around the circumference. The latter is an extreme example where nearly all the stone surface has been removed by pecking, and concavity of the ends has occurred. The pounding action is gentler than that of hammering and does not produce severe fracture scars, although some faceting of the ends can be produced.

## PESTLES

*These are tools with two sets of characteristics. They can be ground at one end and pecked at the other (eg SF 1839 and 7336, illus 113). Other pestles have combinations of both actions at both ends of the tool (eg SF 4730, illus 113). Some tools have body and edge pecking and grinding as well, but they are all predominantly made on siltstone and sandstone.*

Pestles, 30 in total, appear from Phase 3 and decline at the end of Phase 7. They may have been used with mortars for food preparation. The late occurrence of grinders at Howe may imply differences in food preparation that necessitated the use of a

separate tool with a single function. The lack of surface deposits on any of these tools prohibits any constructive suggestion as to their definite uses at this stage.

Hammerstones, pounders and polishers are common tools at all the major Iron Age sites in Orkney and Shetland and are often found in large numbers. Hammerstones with various wear patterns were found at Dun Mor Vaul (MacKie 1974b, 136), and over 100 stones were found at the Broch of Midhowe, Rousay, Orkney (Callander & Grant 1934, 500). These tools from earlier excavations were rarely discussed, simply listed, and numbers of specific tools cannot with any certainty be compared with those from Howe.

The following three categories are variations of hammerstones with other main patterns of ground and pecked areas indicating use. They were made on the same type and sizes of cobble stones as the above categories and they were mainly found in the Phase 7 settlement. The combination of wear patterns was distinct enough to subdivide these tools from those already described and in addition approximately half of the tools also have slight polish marks. This is usually in the form of a dark shiny stain on the body of the tool. Tools such as these, and some of the polisher variations described below, could be termed combination or multiple-use tools.

## GRINDERS/HAMMERSTONES

32 stones were found from Phase 3/4 and onwards with hammering scars on one or both ends but also with pronounced wear marks produced by grinding. The ends of SF 4874 (illus 114) are both worn by grinding and shattered by hammering. Some of the tools have evidence of earlier pecking at the ends or contemporary superficial pecking and grinding on the body. These tools are made predominantly on sandstone and siltstone.

## POUNDER/HAMMERSTONE

SF 2257 (illus 114) is pecked at one end and shattered at the other, and SF 5429 (illus 114) is pecked and shattered at both ends and pecked down the body. These two variations characterize the large numbers of tools (45) in this group.

## PESTLE/HAMMERSTONE

As with the above, pecked and ground areas at the ends of the tools are combined with later wear patterns from hammering. Some tools also have pecked and ground marks on the side or body. 34 tools were found from Phase 4 to Late Phase 7 but in contrast to the other tools, two-thirds of these are of siltstone.

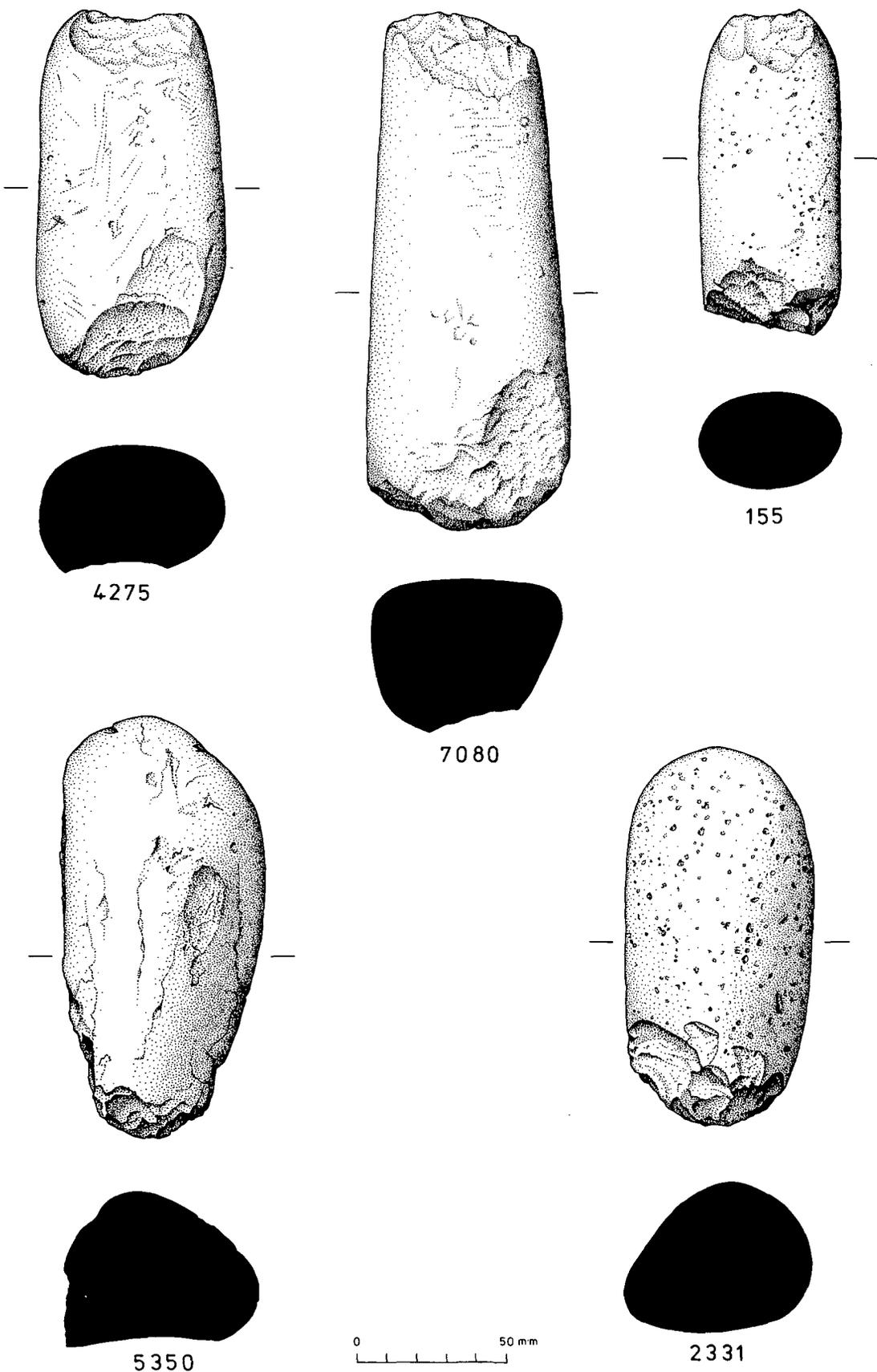
Further research may help to define the variations of tool use as well as the acquisition of wear patterns. The longevity of use and status of a single function tool may be important compared to tools which have had up to three uses. There are also questions concerning which tools were for domestic use and which were for outdoor or industrial use, if indeed there was a distinction. Comparison with other contemporary and well-stratified sites might, in the future, lead to further information about these ubiquitous tools which to now have been neglected in artefact studies.

## POLISHERS

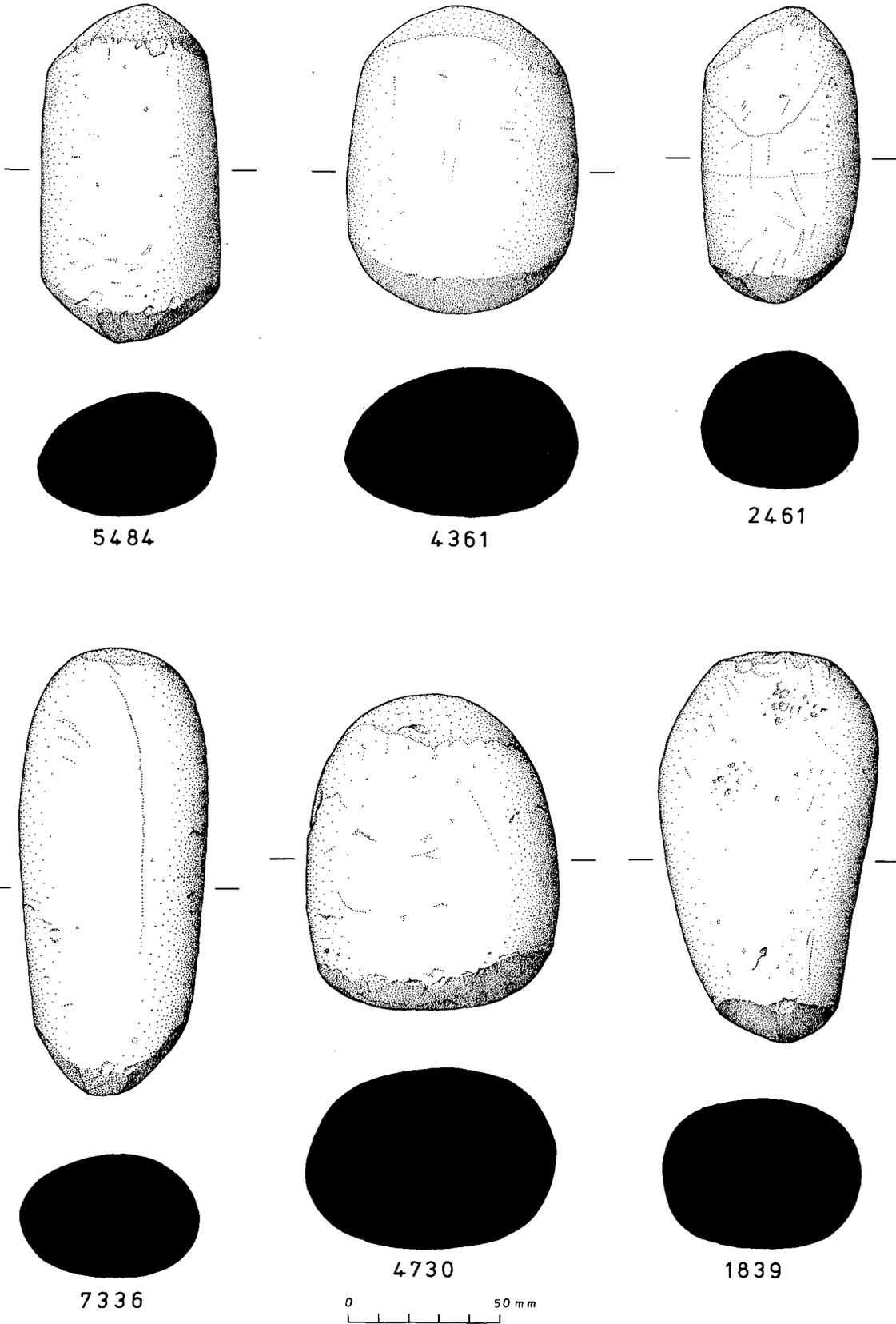
The word polisher might be a misnomer, as we have no clear idea of the uses to which these tools were put. Their uses might be several, such as burnishing pottery and knife blades (as opposed to sharpening), smoothing bone tools, etc. These tools exhibit highly polished surface areas often with a thin dark-brown deposit (see below).

There are three types of plain polisher:

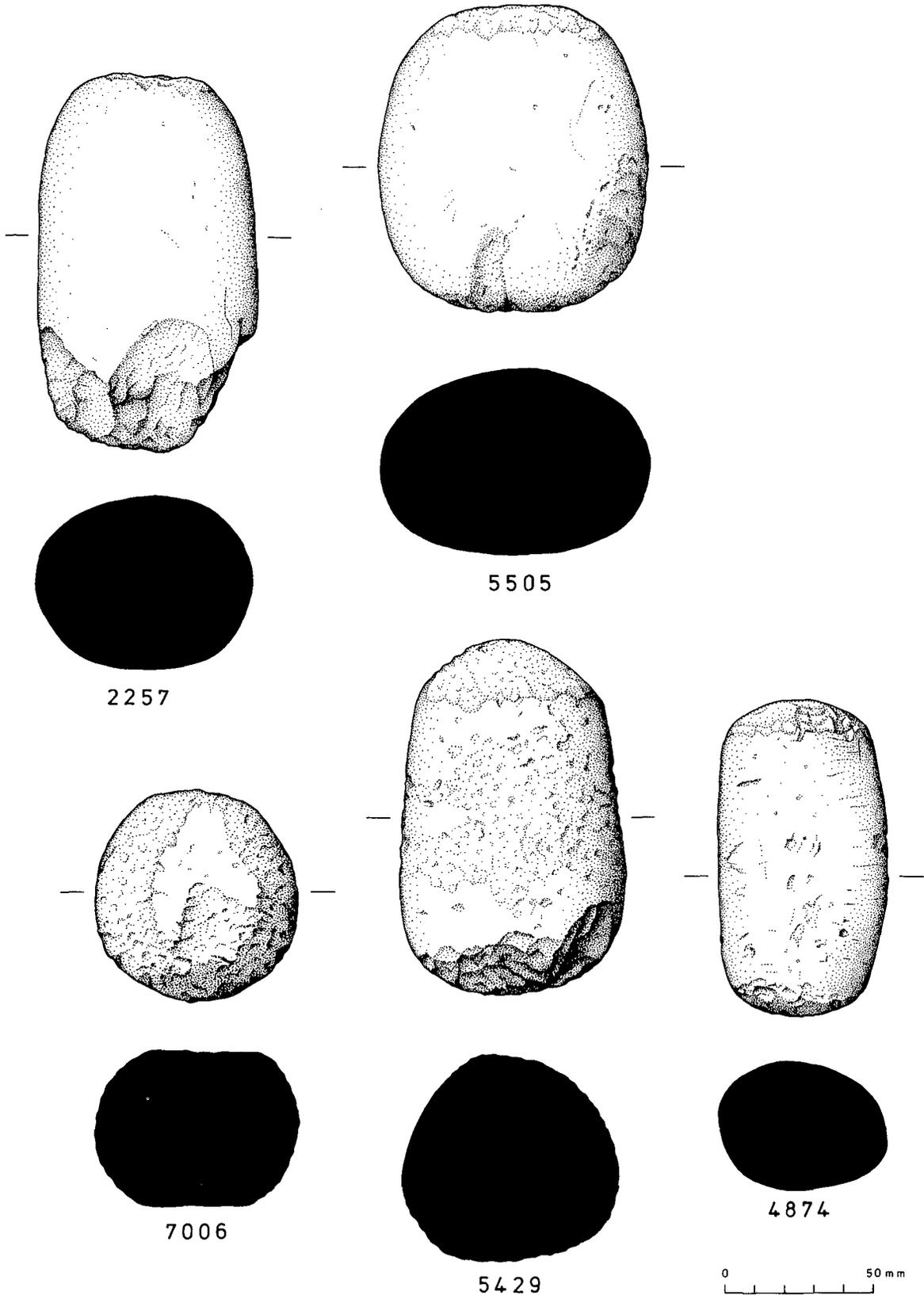
Small pebbles used as polishers (pebble polishers) less than 110mm in length, whose shape has not been altered by wear. The



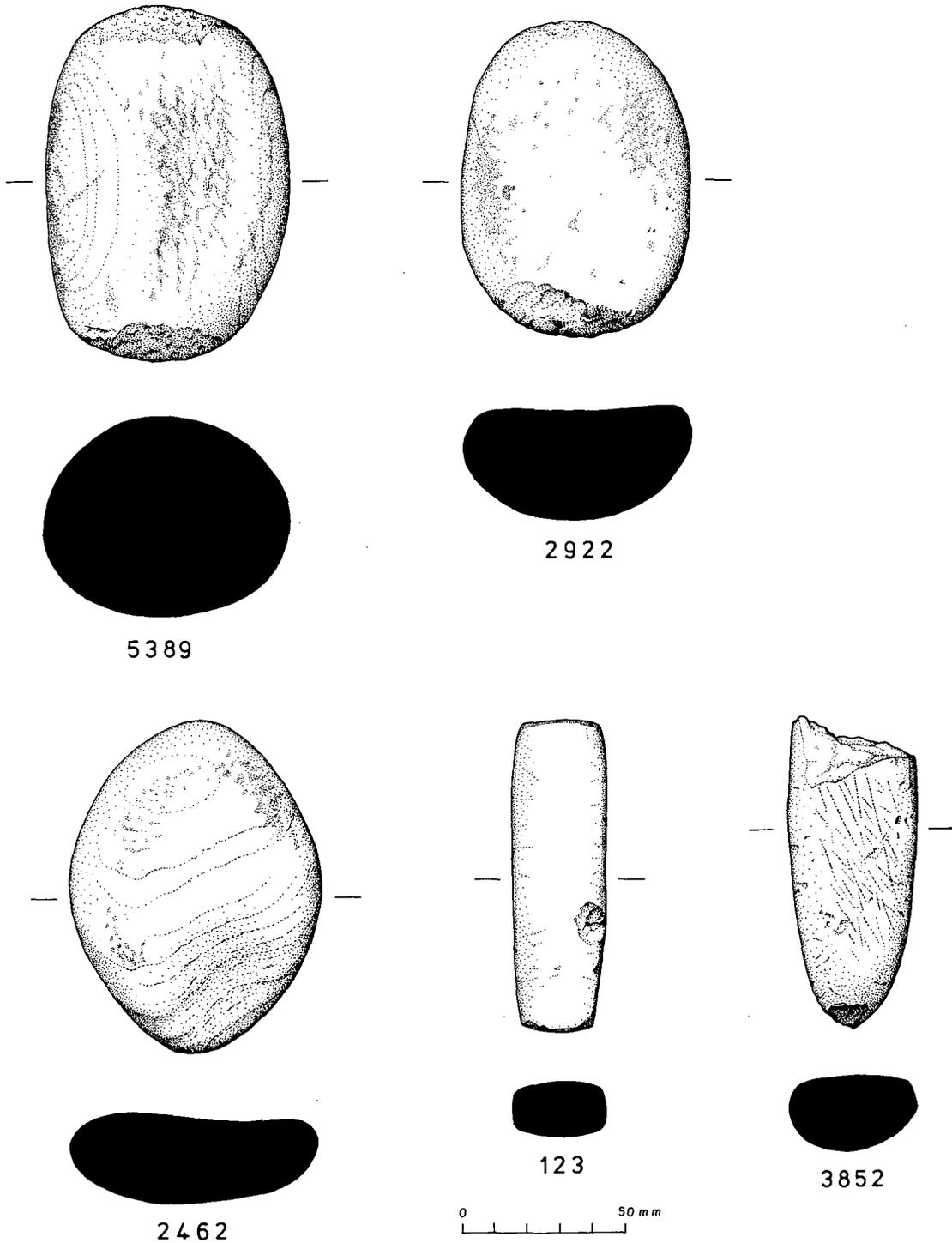
Illus 112  
Single- and double-ended hammerstones.



Illus 113  
Stone grinders and pestles.



Illus 114  
Stone pouncers, pouncer/hammerstones, grinder/hammerstones and pestle polisher.



Illus 115  
Stone polishers and whetstones.

polished surface of some tools has been developed by a circular or side to side motion. 11 tools form this category from Phases 7 and 8 and they are made on siltstone, sandstone and some granite.

Elongated pebble polishers may be related to whetstones. A total of 16 tools were identified mainly from Phases 7 and 8, and mainly of siltstone with some on fine-grained sandstone. These tools are slightly modified by use with polish marks on or around

the body. They fall within a range of 68–130mm long and the majority have a rectangular section.

Worn polishers are tools whose shape has been altered by use. These are rounded or irregular shaped tools mainly of medium-grained sandstone, with convex or concave worn surfaces and faceted ends. Some tools have ends or edges which have been flaked by hammering. SF 2462 (illus 115) exhibits these

characteristics, but with polish marks on both surfaces and one end is hollowed with use. 19 tools of this type were found from Phase 5/6 onwards.

## COMBINATION POLISHERS

### Hammerstone/polishers

These are single or double-ended hammerstones with noticeable polish marks on the body. Of the 5 examples, mainly from Phase 8, some have secondary superficial pecking and grinding along the sides.

### Pounder/polishers

These tools, 40, are mainly of fine- and medium-grained sandstone, with some of siltstone, found predominantly in Phase 7. The cobble tools have peck marks on one or both ends and occasionally down the edges, but with polish marks on the body (eg SF 5389, illus 115).

### Grinder/polishers

These are small beach cobbles of silt and sandstone, which are ground at both ends with polished surfaces and edges. 5 examples were identified from Phases 5/6 and 7.

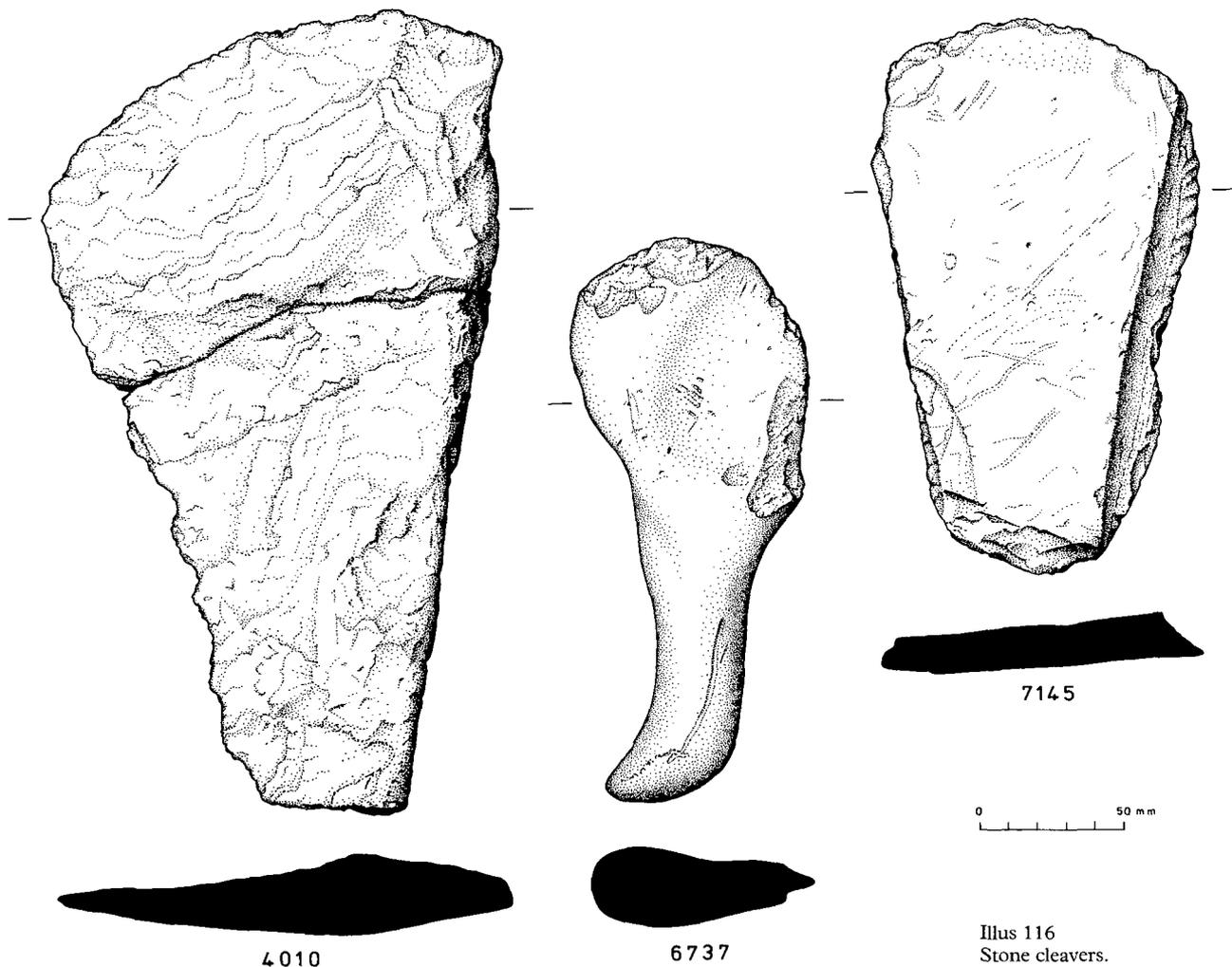
### Pestle/polishers

Several tools (21) exhibit characteristics of grinding and pecking with polish marks on the surface or edges (eg SF 5505, illus 114). SF2922 (illus 115) is more altered, with wear patterns on its polished surfaces which are concave and convex in appearance.

## WHETSTONES

Rectangular or elongated stones identified as whetstones and made predominantly on siltstone were identified from Late Phase 7 onwards to the end of Phase 8. There are 21 tools in this category. The tools have smooth edges and surfaces but exhibit no polish marks. Cobbles such as SF 3852 (illus 115) have score or cut marks on the body and the main working face has been made level with use. SF 123 (illus 115) is a compact tool from an unstratified context whose surfaces are slightly convex with wear. This tool shape is characteristic of whetstones found at many other Iron Age and later sites.

There is a difference in the distribution of polishers and whetstones. Whetstones, as already mentioned, did not make their appearance till Late Phase 7 and were in use throughout Phase 8. The polishers, especially the elongated and worn, were in evidence from Phase 5/6 and into Late Phase 8, and amongst other uses could have functioned as hones/whetstones. The occurrence of brown staining on these tools may be accounted for by burnishing and polishing tools under manufacture.



The other polisher types were used between Phase 5/6 and Early Phase 8 with pounder/polishers originating in the Neolithic and being the most common tool of this type. Grinder/polishers were confined to Phases 5/6 and Late Phase 7 and hammerstone/polishers to Phase 6 and Early Phases 7 and 8. These tools obviously had several functions but this might be accounted for by the use of existing tools for other and later activities such as polishing. Few polishers are noted from other excavations, but one from Midhowe (Callander & Grant 1934, 497) has been described as a polisher or whetstone and a pebble polisher was identified from Lingro (Hedges 1987c, 82).

Whetstones have been commonly reported from Iron Age levels at Clickhimin and Dun Mor Vaul, including 26 from Crosskirk (Fairhurst 1984, 125) and several from Gurness (Hedges 1987b, 79, 85). Howe did not produce any perforated whetstones that are indicative of Norse levels, found at sites such as Jarlshof and the Brough of Birsay.

### CLEAVERS

Only four examples of cleavers or chopping tools exist from Howe, all from Phase 7, of which one is of siltstone and the rest of fine-grained sandstone. They are crudely chipped into handled tools (or a tool which could be gripped along one side), with a sharp cutting edge. SF 4010 (illus 116) is the largest of these tools with a cutting edge formed by bifacial chipping, which shows signs of use. Another example of a handled cleaver is SF 6737 (illus 116) where a natural shaped beach pebble has been utilized as a chopping tool. In contrast, SF 7145 (illus 116), is more crudely finished but has sharp edges along three of its sides. A handled slate chopper had been noted from Jarlshof from Bronze Age levels (Hamilton 1956, fig 12, 4).

### MATTOCKS

These four siltstone mattocks are the only agricultural tools found at Howe (apart from nine whalebone fragments – see 8.2 Bone Artefact Report). Two were found in Phase 5/6 and one each in Phase 5 and Early Phase 7. The Later Phase 7 mattock was located in a pit in the **SE** building. These tools were formed by chipping the siltstone around the sides and at the ends to produce a working edge. Three of the tools may be broken and SF 7385 (illus 117) is notched on both edges, producing evidence that it was hafted to a handle. SF 7150 (illus 117) has a worn rounded end, and that of SF 7346 (illus 117), a pointed end.

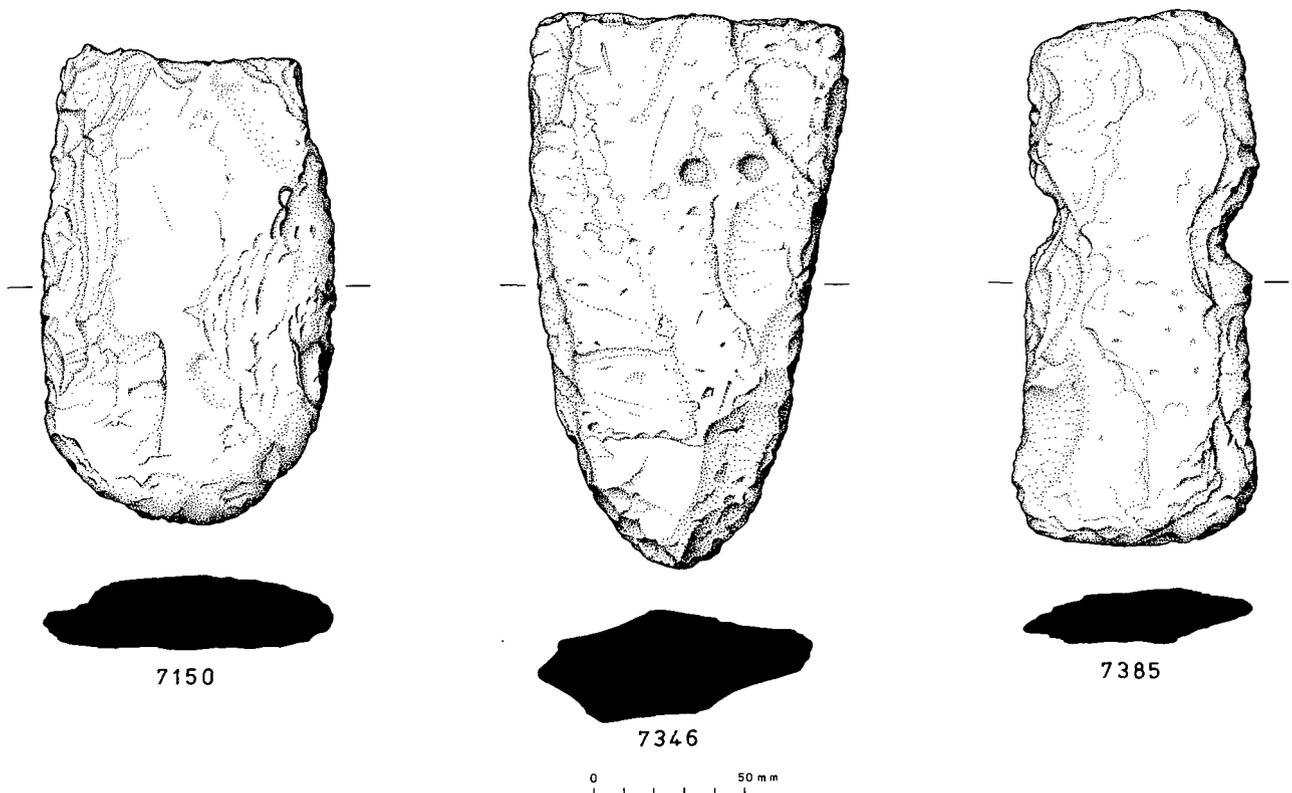
### SHOVELS

Shovels are differentiated from mattocks by their size, thinness (less than 20mm) and location, although they are largely made from siltstone. In total 11 were found. They occurred in Phases 5/6 and 7, and several were located in earth floors near hearths. The shovels have edges formed by bifacial chipping (from opposite sides) but the surfaces of the tools, like those of the mattocks are largely unworked. The examples in illustration 118 show the three forms – SF 4270 oval, SF 2459 pointed and SF 4107 round-ended.

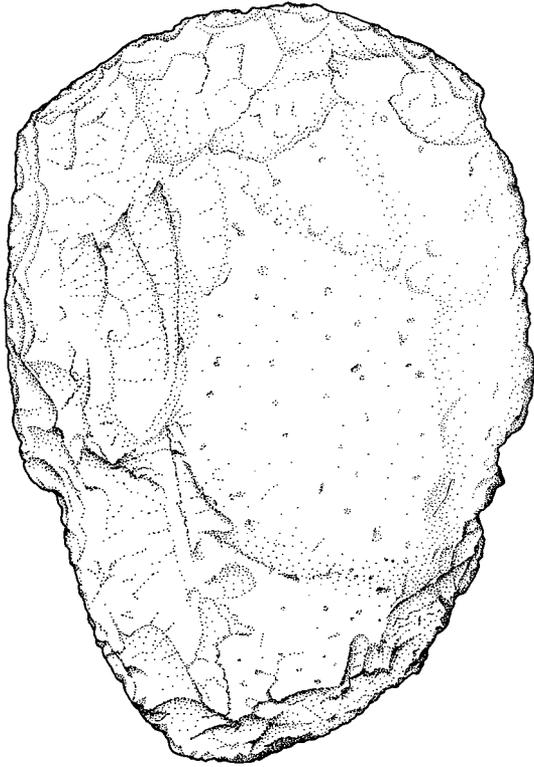
The location of four of the tools near hearths suggests that their function may have been to clear ashes and debris away from the hearth. Howe did not produce any perforated shovels, although rare examples in slate were found in the Late Bronze Age farmsteads at Clickhimin and Jarlshof (Hamilton 1968, 31; 1956, fig 12, 7).

### STRIKE-A-LIGHTS

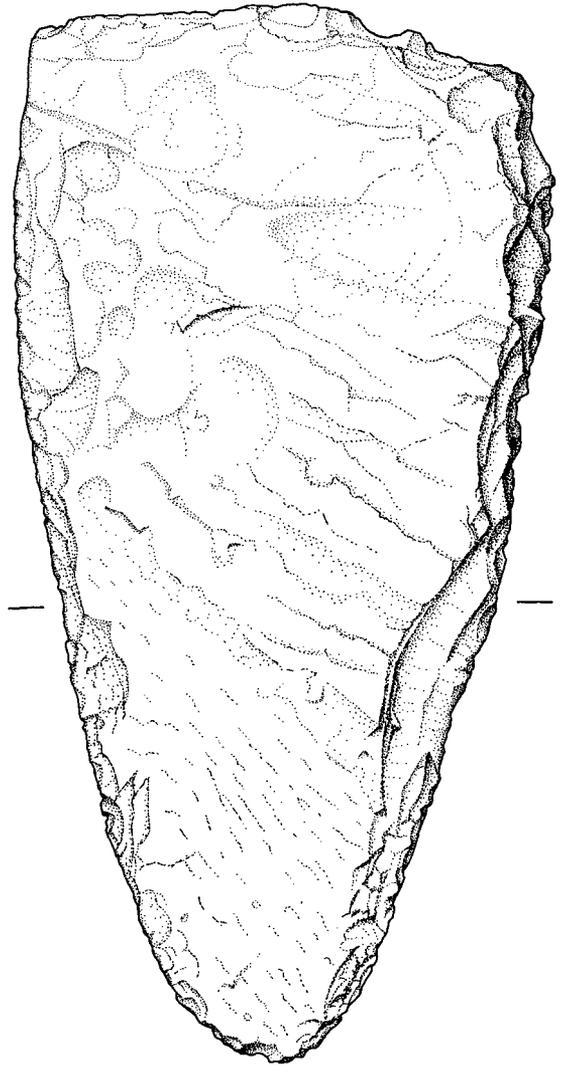
The only stratified examples of strike-a-lights are from Phase 8. These are small rounded and smoothed pebbles of sandstone



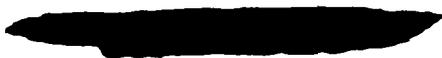
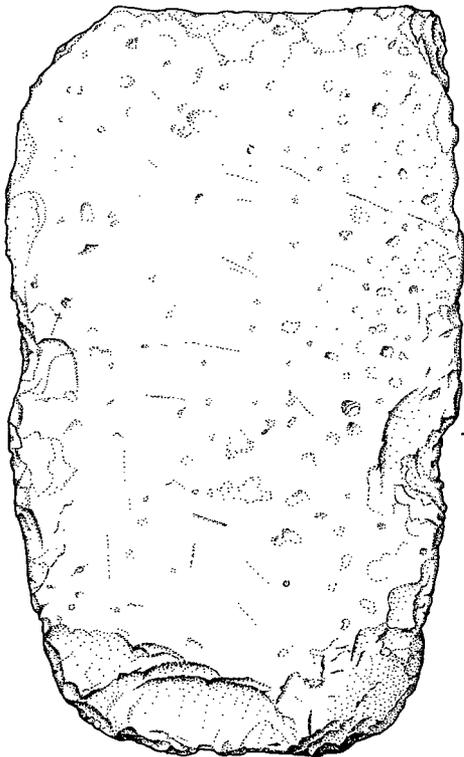
Illus 117  
Stone mattocks.



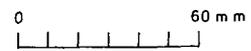
4270



2459



4107



Illus 118  
Stone shovels.

(reflecting the paucity of quartz in Orkney), with a broad linear groove on one face. SF 4321 (illus 109) is of quartzose sandstone and has indentations on both faces. It also has ground edges. These examples do not have any iron staining within or around the grooves, but it was traditional to strike with an iron bar or point in the centre of the surface to create a spark to light a fire.

Strike-a-lights made of quartz or quartzite the more common materials, have been found at Gurness (Hedges 1987b, 152) and Dun Mor Vaul (MacKie 1974b, 140) among other sites.

### PEBBLE CACHES

This category includes 7 groups of small tools, numbering from three to eight in each group, which were found together within earth floors, stone settings or the broch wall, mainly in Phase 7, with one group from Phase 4. These tools are predominantly of rounded or elongated stones covering a wide spectrum of rock types (Table 52). For example, SF 2503 from the second workshop floor in the broch tower consists of 8 tools; one is of granite, two of medium and two of coarse grained sandstone and three of siltstone; and encompass polishers, pounder/polishers, hammerstones and worn polishers. Other caches include small unworked pebbles.

The individual tools within the caches are not worthy of special note, what was important however was the finding of the tools together and their locations. At the time of writing these well-stratified Iron Age tool caches are quite unique and may represent small tool-kits for metalworking, or even children's toys.

### POTLIDS AND BAKESTONES

Formed from thinly bedded shaly siltstone, potlids have been found in nearly all phases of the site. They are of rounded, thin and flattened (discoid) beach pebbles (illus 119) that have been chipped along the edges (eg SF 7216, illus 119a). In all 91 discs were found as well as 7 unfinished forms and two with a handle. These artefacts range from 55mm in diameter to the largest at 760mm, and compare well, except at the highest extremity, to the sizes of the pottery vessels which they were used to cover (see 8.9 Pottery Report below); one Phase 7 example was found in position on top of a broken pot.

The largest discs, above 330mm in diameter, are probably bakestones and would have been used on the hearth as a griddle for the baking of bannocks or bread. There are nine discs in this category and all but one are from Phase 7; they are all broken and show evidence of being burnt.

The two potlids with handles were both found in Phase 8, where the lids have a chipped extension which forms a handle, (eg SF 2115, illus 119a).

Potlids and handled discs are among the commonest artefacts found on Iron Age settlements. Handled potlids were more numerous at the excavations of Jarlshof and Clickhimin (Hamilton 1956, fig 30, 54; 1968, 78, fig 33, 6, 7), where they were found together with circular potlids. A similar range of potlid sizes and bakestones to those from Howe was found at Crosskirk, where they were made on different stone types (Fairhurst 1984, 126–128).

### QUERNS

Two distinct types of querns were found at Howe, non-rotary (saddle querns) and rotary. The non-rotary querns are formed on a single oval, rectangular or sub-rectangular stone, used as a platform onto which a smaller upper stone (the rubber) is placed and dragged back and forth to grind an intervening layer of meal into flour. Rotary querns comprise two circular stones of similar diameter, placed one on top of the other. The upper stone revolves around a spindle fitted into the centre of the lower stone, and the meal is again ground between the two. Both types of

quern would have been set on the floor on a piece of leather or cloth to catch the flour.

Table 53 shows the distribution over time of the two main types of querns and quern rubbers. There is a considerable overlap in the types of querns used during Phase 7. Rotary querns are the earliest type found on the site, and both types decline throughout Phase 8. There is however, a lack of quern rubbers for the non-rotary type and this indicates that other tools such as grinders and pounders were probably used instead. A total of only nine recognized quern rubbers for a total of 92 querns gives weight to this argument.

### Non-rotary querns

There are four different but contemporary varieties of the non-rotary quern described below, and the majority are made on medium grained sandstone boulders and have distinct characteristics that suggest their differences are not due solely to morphology, but to differences in use. The sub-rectangular querns have been traditionally called 'trough querns' and their use for grinding meal is not questioned. They were sufficiently hollowed before or during use to be efficient tools for producing flour. The other three categories are more puzzling with flat or plano-convex and plano-concave faces. They are too large and too heavy to be considered as quern rubbers in terms of being used by one person, and examples with chipped and flattened bases would have been detrimental during use. Two of the concave-faced stones were found *in situ* close to hearths, and all were well worn, with examples with heavy wear in the centre or at the edges.

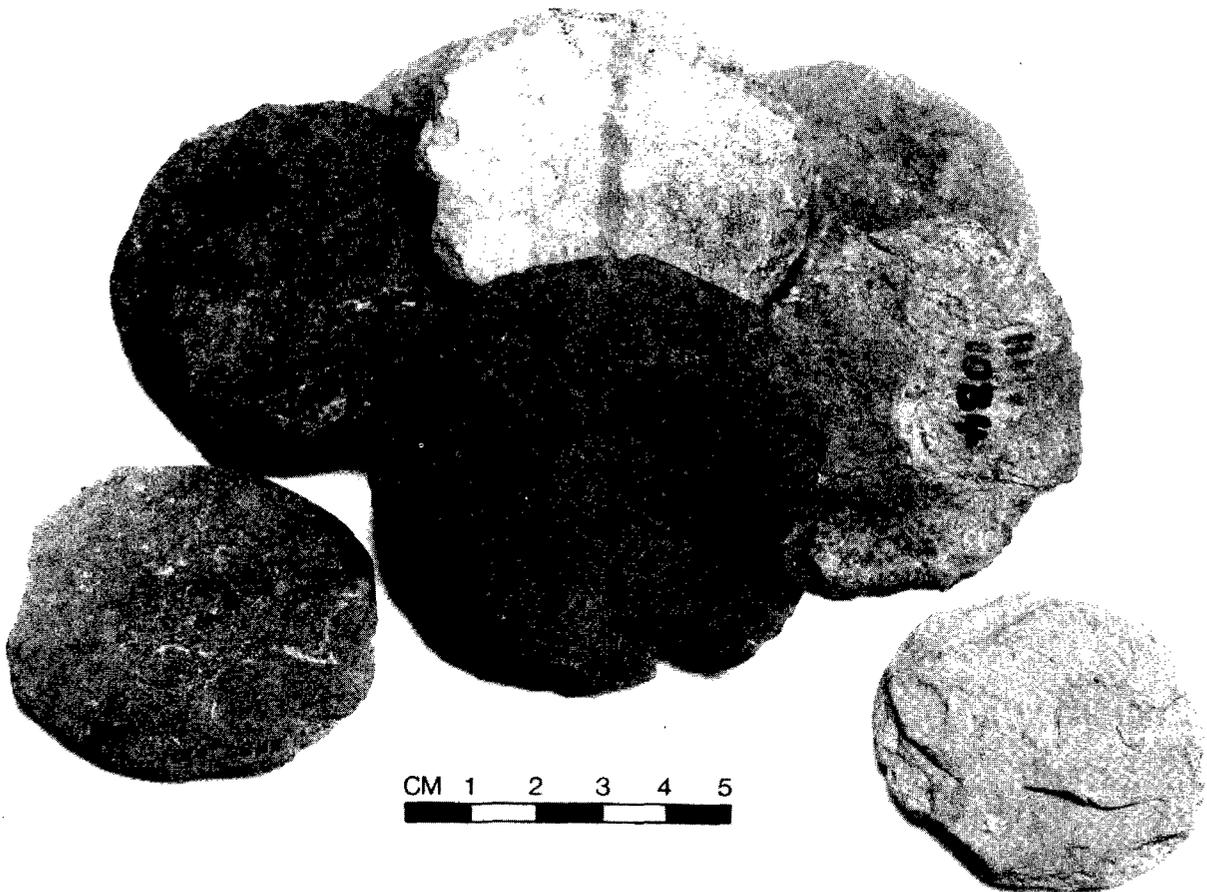
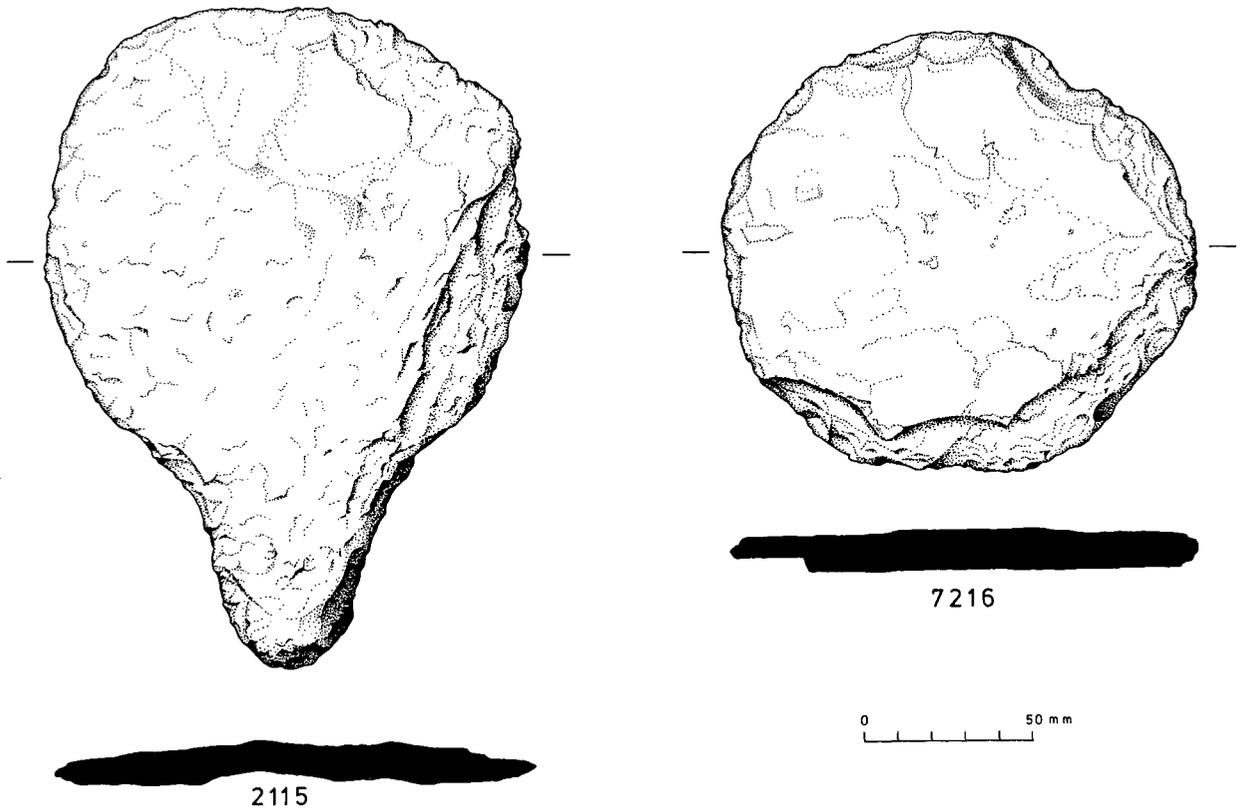
As all these stones were roughly contemporary in the archaeological record, their differences could reflect experimentation with suitable sizes, shapes and weights for the most efficient production of meal. Alternatively their differences might well be attributed to increasing specialization of meal production. Experimentation and more analysis of their wear patterns could lead to a better understanding of these stones and their use.

**Flat-faced:** The majority of the 6 querns in this category were found from Early Phase 7 rubble contexts, with others from a clay floor or reused as hearth kerbing. The querns are oval – round boulders with a flat upper surface and rounded bases which were formed by extensive pecking, or they were roughly chipped to shape (eg SF 7172). Only half were complete examples but they are c 390mm long, c 250mm broad and 120–160mm high.

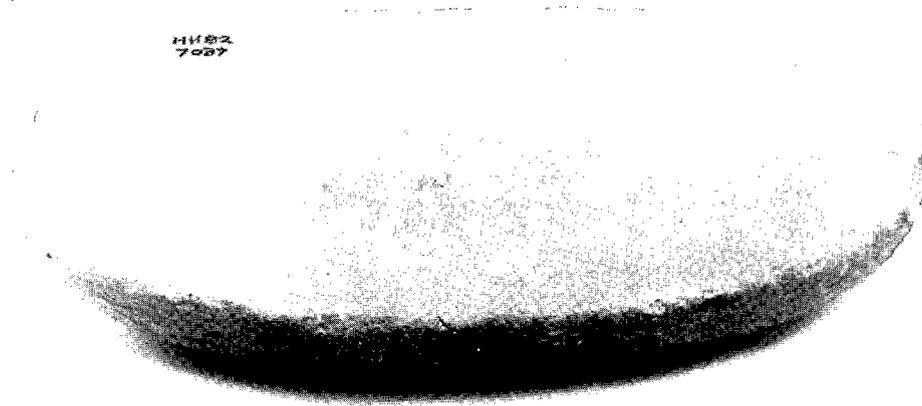
The querns' upper surfaces are worn to a slight plano-convex or plano-concave shape and have areas worn smooth on what was originally a pecked surface.

**Convex-faced:** Found from Phase 5/6 to Early Phase 8 with the majority in Early Phase 7, these 19 stones came mainly from rubble contexts or part of stone features, which explains their fragmentary state. None of these were found *in situ* on floors. These stones are kidney-shaped, rounded or an elongated oval, with curved bases which were pecked to shape, or smoothed. The upper surfaces are plano-convex and were initially pecked. There is also some evidence of re-pecking of areas which have been worn smooth (eg SF 2737). From the four complete examples their measurements are fairly standard – 300–418mm in length, c 232mm wide and 80mm high.

**Concave-faced:** The 11 querns were scattered throughout all phases from Phase 5/6 onward mainly in rubble contexts. Only two were located *in situ* in earth floors and another two were found reused in hearth kerbing, both in Early Phase 7. These querns are elongated-ovals in shape with predominantly flattened bases, which were roughly hewn or pecked. There has been additional pecking around their edges and the upper surfaces which were originally pecked to shape are plano-concave. All the stones show signs of wear with some examples being heavily worn (eg SF 7037, illus 120). There seems to be no obvious re-pecking as in the convex-faced querns. These querns vary more in their

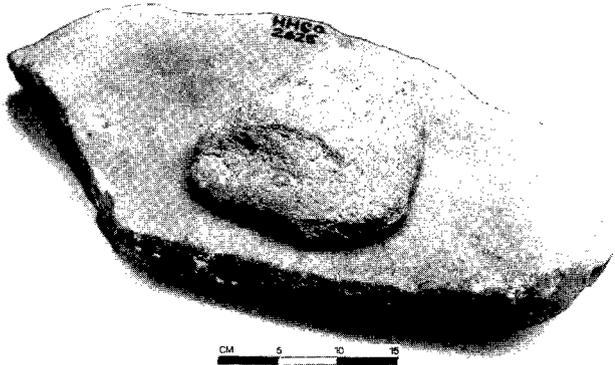


Illus 119  
a) Stone pot lid and handled lid; b) stone pot lids, Phases 5/6-9.

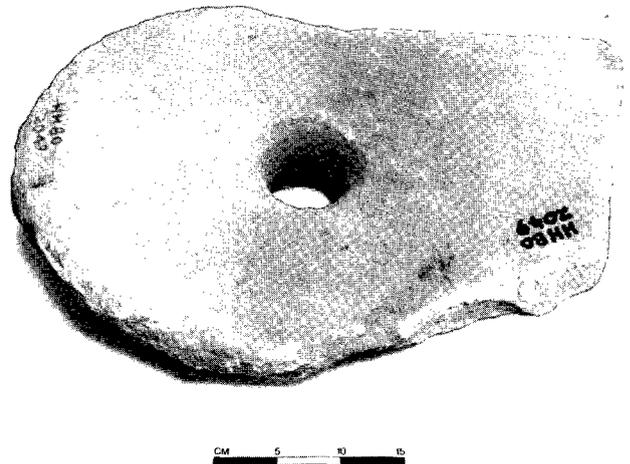


Illus 120 (left)  
Concave-faced quern  
(SF 7037), Phase 7.

Illus 121 (below left)  
Sub-rectangular quern  
(SF 2625), Phase 7/8, with  
stone rubber (SF 2822).



Illus 122 (below)  
Perforated sub-rectangular  
quern (SF 2049), Phase 8.



measurements but their lengths lie between 364 and 530mm, their widths *c* 248mm and their height from 62 to 138mm.

**Sub-rectangular:** In contrast to the above, these 22 querns are mainly of quarried stone, all are fragments and were found from Early Phase 7 to Early Phase 8. They are large, 536 × 331 × 153mm (measurements from stones with 80% or more surviving), lozenge-shaped stones with rounded ends. Their bases are roughly flattened or rounded by pecking of chipping, and their sides are pecked. The upper surfaces are mainly concave with evidence of re-pecking over well-worn areas (eg SF 2625, illus 121). SF 2049 (illus 122), from Early Phase 8, is unusual in that it has a central hole drilled and pecked through the stone, from its reuse as a soakaway lid.

#### Rotary querns

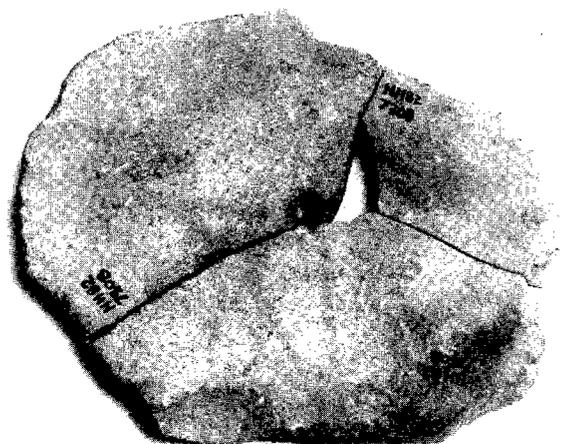
There are two types of worked face represented amongst these stones, the concave and the flat, with 4 unclassified fragments. There are no convex rotary querns present and no two stones fit together as a working pair. In contrast to the non-rotary stones, two stones of equal proportions would have been used together. A central collared hole through each stone allowed the grain to fall down and be ground between the two work surfaces. The top stone would have either a second hole for a wooden or bone handle or a horizontal handle slot, to enable the top stone to be rotated on the stationary lower one.

**Concave-faced:** As with non-rotary stones these are made predominantly on medium-grained sandstones, but they are of quarried stone and mostly incomplete. They occurred from Phase 3 through to Early Phase 7, and only seven stones survived. Four of these are identified as upper stones, which have been pecked to a flat or lightly rounded shape with off-centre handle holes (eg SF 4434) or with rectangular handle recesses (eg SF 2197). The central holes show evidence of pecking and wear, while some of the holes are waisted. The worn surfaces are concave with grooving and polishing due to wear but originally these surfaces were pecked. SF 7308 (illus 123) is the most complete upper stone. The lower stones have similar characteristics with pecked and flattened bases.

**Flat-faced:** These 16 were located from Phase 5/6 to Early Phase 8, and are again predominantly of medium-grained sandstone but are very fragmentary. They have similar characteristics to the concave-faced querns, but have flattened worked faces. Mostly upper stones survived such as SF 7009, which has a handle hole, and SF 5385, which is one of the most complete and substantial bases.

#### Discussion

Only 27 rotary querns, half the number of non-rotary ones, were found at Howe, but their appearance in early contexts at Howe runs contrary to the belief that they are a separate later development (Caulfield 1980). None, however, were found *in situ*.



Illus 123  
Upper stone of rotary quern (SF 7308), Phase 5/6.

From the distribution and location evidence (Table 53), both types of querns were in use together throughout Phases 5/6, 7 and Early Phase 8. Rotary querns almost cease in Late Phase 8, where they were still out-numbered by non-rotary ones, again contrary to expectations. Changes in crops and crop production, or in crop processing may account for this distribution and the occurrence of both types of quern together, and perhaps for differences in their use.

The evidence of different quern types from earlier excavations is scant and not reliable. Both large saddle and rotary querns were found in the Iron Age settlement at Jarlshof (Hamilton 1956, 50, 51, 61), and from Crosskirk, where they were made of coarse sandstones and schists (Fairhurst 1984, 128–131), and from Midhowe (Callander & Grant 1934, 500). Querns are sparsely represented at Clickhimin, with a single trough or saddle quern from the Late Bronze Age settlement and one rotary quern from the Iron Age wheelhouse (Hamilton 1968, 31, 141). Three types of rotary quern were discussed from Dun Mor Vaul: bun-shaped, disc-like and flat, but few of them were found and none of the non-rotary types; no bun-shaped examples were found at Howe. One rotary quern was noticed to have been found in contexts that predated the broch tower at Dun Mor Vaul (MacKie 1974b, 138).

Both flat and concave rotary stones came from Gurness and three types of non-rotary from Bu. Hedges (1987b, 77–78) discusses the problem of the introduction of the rotary quern when it, too, was one of the earliest stratified objects at the Broch of Gurness. It is, however, obvious that these stones from early excavations have not been studied in sufficient detail for any firm conclusions to be drawn.

### QUERN RUBBERS

Predominantly of fine-grained sandstone, these stones are from Phase 5/6 onwards. There are only nine, which, compared to the number of non-rotary querns, suggests that other stone tools may have been used with the querns. The rubbers are beach stones which have had their upper surfaces roughly shaped and their lower grinding surfaces pecked. Half the stones have a convex grinding surface (eg SF 2822, illus 121), the rest being plano-concave, and one is flat. They are small enough, 230–290mm long × 134–186mm wide × 62–122mm thick, to have been easily manipulated by hand on a non-rotary quern.

Quern rubbers are rarely mentioned from other Iron Age sites. At Jarlshof, where several were found, some of the stones identified as quern rubbers may in fact be non-rotary querns as they are large and well-shaped (Hamilton 1956, 50).

### MORTARS/KNOCKING STONES

The distribution of mortars lies between Phases 5/6 and Late Phase 7. They are made on, and hollowed from, medium- and fine-grained sandstone boulders. All the mortars are fragmentary, and were found in rubble contexts and at least one had been reused as a pivot-stone (eg SF 4101). They have either roughly rounded or flattened bases with rims that were rounded or squared-off by pecking. The body of the vessel contains a shallow but wide pecked hollow. In some examples, such as SF 7045 (illus 124), the base of the hollow is worn smooth.

SF 2839 from Phase 7, is a slightly more extreme example, in that the hollow is very deep and sub-oval. The large, coarse, boulder has a flattened top and base which were pecked. It is a slightly crude stone but may be related to the 19th century Orcadian knocking stones, where a wooden mallet was used, in recent history, to separate the chaff from the kernel of bere barley, (Fenton 1978, 396). Stone tools, such as pestles, grinders and pounders, (described above), could have been used with mortars to separate the husk from the grain before further milling on a quern.

Hollowed stone vessels have been identified from earlier excavations, but few have been described as mortars. Hollowed stones could also be tanks or troughs, a category not found at Howe. One unstratified mortar was however found at the Broch of Gurness (Hedges 1987b, 79).

### PECKED AND HOLLOWED STONES

The 41 stones in this category can be separated into three types according to their characteristics but not necessarily function: small stones with smooth interior depressions – lamps, those with rough interiors – lamps and unclassified stones, and large anvil stones. Nearly all the pecked and hollowed stones are of fine- and medium-grained sandstones and were found from Phase 4 to Early Phase 8.

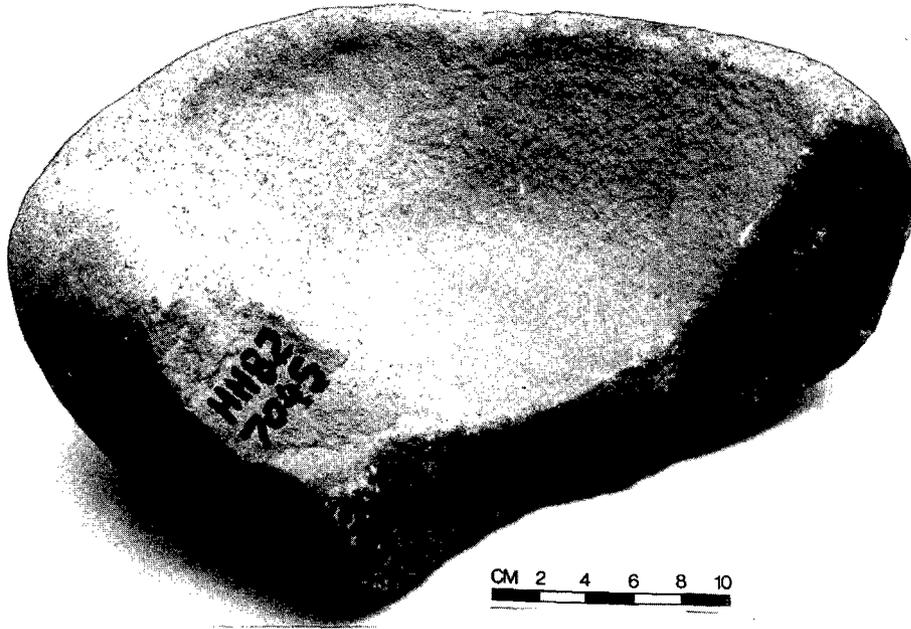
#### Hollowed stones with smooth interiors

There are 14 in this category, which are small rounded boulders with rounded or flattened bases, pecked to shape, and predominantly from Phase 7. Their single shallow internal hollows, centrally placed in the upper surface, are rounded or flat bottomed, pecked to shape and smoothed. Their average measurements are – 130 × 92 × 80mm with their hollows c 90mm in diameter and c 43mm deep, although only three of the stones are intact. Half the stones in this category are burnt both inside and out, and are thought to be lamps. SF 2584 (illus 125) is a burnt, round-based lamp.

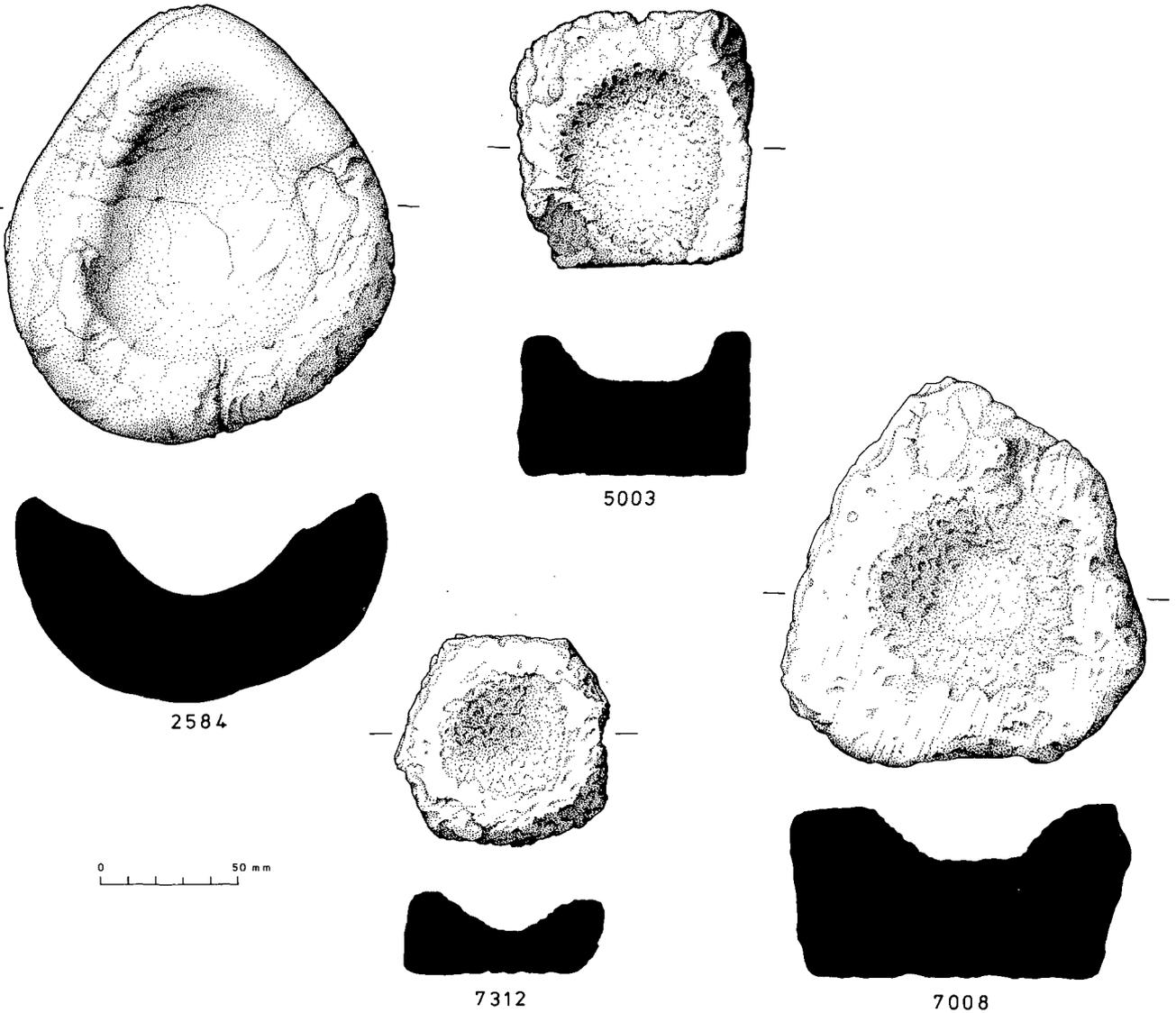
#### Hollowed stones with rough interiors

These appear earlier than the above category and were more frequent in Phase 8. The 11 stones in this group are irregularly shaped or squared blocks of sandstone and the majority are complete. Their bases are flat and their shallow pecked hollows have prominent peck-marks. The stones are in general smaller than the above type and average c 122 × 66 × 49mm, with average hollow dimensions of c 64mm diameter × 18mm depth. SF 7008 (illus 125), possibly a lamp, has a single flat-bottomed hollow with scorch marks and may have an unfinished wick-rest, while SF 7312 (illus 125) is the smallest in this group, and has an almost conical-shaped depression. SF 5003 (illus 125) has a suggestion of a wick-rest, while the rest of the hollow is burnt, thus indicating its use as a lamp. Two of the examples in this group have two hollows, either in the upper face, on in both faces.

Some of these stones were probably unfinished or crudely executed lamps, but with their flat bases would have been more versatile than the round-based lamps. There is an overlap in the distribution of these two categories, which might imply that their differences in shape and appearance were functional rather than developmental.



Illus 124  
Stone mortar (SF 7045),  
Phase 7.



Illus 125  
Pecked and hollowed stones and stone lamp (SF 2584), Phase 7.

### Large hollowed stones

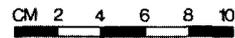
These are a mixed group of nine large stone blocks with pecked hollows. They are from a number of phases but are almost absent from Early Phase 7 and Later Phase 8. These stones are irregular in shape and their holes vary from single large shallow depressions to 18 small, deep hollows, between 50–90mm in diameter to 10–35mm in depth. The latter is typified by SF 4644 which has many deeply pecked hollows, both round and linear as well as cut marks, and may indicate that this is an anvil stone. Other stones with single large hollows might be upper pivot-stones, but their functions are uncertain.

Many of the sandstone lamps found at Jarlshof and Clickhimin (Hamilton 1956, 76, 79; 1968, 83, 113, fig 59) are similar to those in the first category of hollowed stones from Howe, as they are rounded boulders with shallow depressions, but they were often found with lugs or handles with thumb grips. This variation was not found at Howe, but was noted at the Broch of Lingro. Other simple lamps are known from the brochs of Oxtro, Ayre, Gurness, the East Broch of Burray (Hedges 1987c), Midhowe (Callander & Grant 1934, 498) and from Crosskirk (Fairhurst 1984, 125) where they are not clearly distinguished from mortars or stone troughs.

Pecked and hollowed stones are recorded from Bu, as unclassified stones, or shallow mortars (Hedges 1987a, 42, 67, 68) and from Gurness. At this latter site, anvil stones were found from the broch settlement as well as lamps, and other pecked and hollowed stones, described as “being of unknown use” (Hedges 1987b, 78, 79, 130–137). Some of the pecked and hollowed stones which are recorded from the brochs of Jarlshof and Clickhimin, could represent pivot-stones (see below) or anvil stones as at Dun Mor Vaul (MacKie 1972, 135).

### Pivot-stones

Although formed by pecking to produce a hollow, 2/3 of these stones were found in situ, on the inside of doorways, with hollows smoothed by use as swivel stones for door posts. In all 22 pivot-stones were found from Phase 5 onwards. All are fine- or medium-grained sandstone boulders and usually finished



Illus 126  
Pivot-stone (SF 7144), Phase 7.



Illus 127

a) Pecked and decorated cup-marked stone (SF 7309), Phase 4; b) pecked and decorated stone (SF 4043), Phase 7.

externally to produce a smoothed and rounded surface. In their upper surface, usually single hollows were pecked and probably ground smooth through use; an example, SF 7040, from the Early Phase 7 *E* Building, has an extremely smooth hollow. Although mainly of small diameter, 77–90mm, and shallow, 15–60mm, some of the hollows are large, up to 180mm in diameter (eg SF 7144, illus 126, from the *SE* Building in Phase 7). SF 7152 from a rubble context, has an elliptical and deep hollow which implies that it was in use for a considerable period of time.

Four of these artefacts have two holes, one usually on the lower surface, suggesting the reuse of suitable stones. Pivot-stones are also known as swivel or socket stones, and 23 of them were recorded from Midhowe Broch (Callander & Grant 1934, 500). However, they seem curiously absent or unidentified from both Jarlishof and Clickhimin, but one was found *in situ* at Dun Mor Vaul with two others (MacKie 1974b, 137) and eight were found at Crosskirk (Fairhurst 1984, 131). Some from the latter site were reused rotary stones, and this reuse also occurred at Howe (see Catalogue 8.3.1mf 2:A3–G14). Many of the pivot-stones at the Broch of Gurness remain beside their doorways, and several others were noted from the brochs of Lingro and Ayre (Hedges 1987c, 77, 82).

#### Pecked and decorated stones

Only two stones can be classified as decorated by pecking. SF 7309 (illus 127a), from Phase 4, has small but grouped pecked hollows, and SF 4043 (illus 127b), from a rubble context in Late Phase 7, is an end fragment of a larger block with a pecked zigzag design. The latter is reminiscent of Neolithic chambered tomb motifs, such as that depicted at Papa Westray (S).

#### MISCELLANEOUS STONES

There are a number of unique pieces, both large and small, which fit into none of the above categories. They derive from nearly all phases, and from a range of different rock types. The lid from the Phase 4 well in the *E* of the settlement, SF 7271

(illus 128) is placed here. It is an irregular sandstone piece which has concentric arched grooving on its lower surface formed through use.

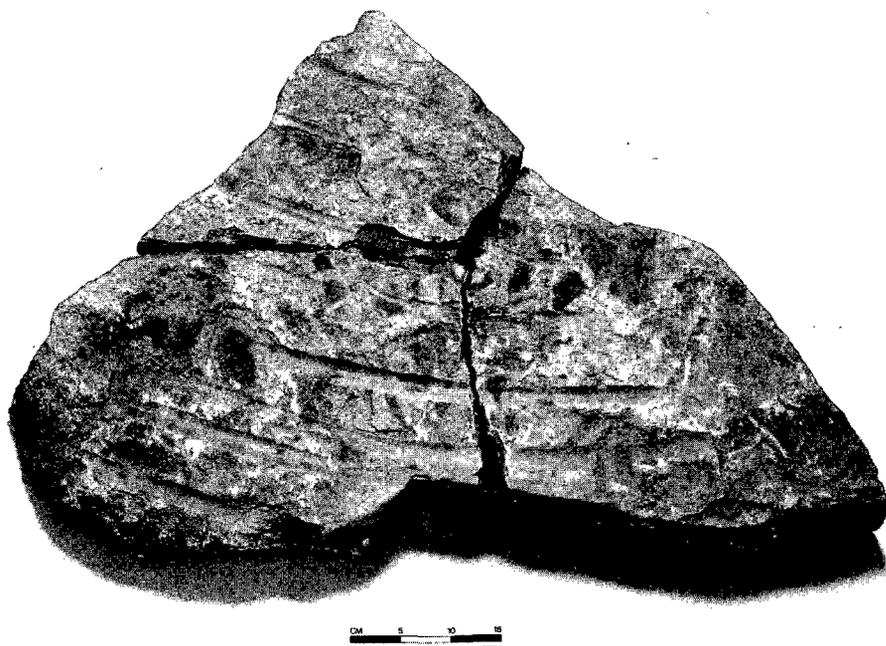
#### UNWORKED STONES

This category contains five rounded stones, egg-sized and egg-shaped in appearance from Phase 7 and Late Phase 8. They are of hard igneous rocks of bostonite and granite and have been burnt and cracked (eg SF 3832 and 7049, illus 109). They are probably pot boilers: small stones that would have been heated on a domestic fire and then dropped into pottery vessels to heat the liquid contents. Alternatively these stones were heated and then possibly used to dry cereal grains as corn-driers (Fenton 1978, 375).

#### COATED STONES

Several artefacts were identified (by the late Geoffrey Collins) as being coated with a black oily substance: armlet SF 2087, from Phase 8, an unstratified stone ball SF 17, two pebble polishers, SF 1840 and 372 from Phases 7 and 8, a worn polisher SF 6527 from Phase 5/6 and a Phase 7 pounder/polisher SF 7056. Only one, the last, has been analysed and found to contain a high percentage of iron oxide although there was no trace of any organic substance present. (Analysed by Dr RA Nicholson of the Analytical Chemistry Unit of the Geochemistry and Petrology Division of the British Geological Survey, London). It seems likely that the polishers were used with the iron-working activities, as the mineral coating on SF 7056 is similar to the composition of the iron slags and ores (see 8.7 Slag Report below). Dark stained polish marks on other artefacts might be a similar substance.

Alternatively, the substance coating the armlet fragment and the stone ball may be of different composition and based on organic compounds. They have not been analysed but the fine-grained sandstones of these two artefacts was deliberately coated; in the case of the armlet, this was done after breakage, perhaps for aesthetic reasons.



Illus 128  
Grooved well lid (SF 7271).

## CONCLUSIONS

More stone tools have been found at Howe than at most other comparable sites in the Northern Isles because of the preservation, recognition of artefacts and techniques of excavation which included the demolition of the Iron Age structures, for the first time at an excavation of this type. This demonstrated that many stone tools were either pushed into wall cavities or built into the matrix of the stone walls. More categories of tools have been identified from stratified contexts than was previously possible.

Over 98% of the artefacts were made on, or of, stone available from coastal locations less than 6km away from the site. This does not however, exclude the possibility that some artefacts were made of stone quarried from the bedrock underlying the site, when the Phase 3 well and the Phase 5 defences were excavated. Apart from one possible area within the broch tower during its later use, there was no other evidence to suggest that stone tools were manufactured on the site. In contrast to sites such as Bu, floors with chipping debris were not found or recognized, because of the stony nature of the site from Late Phase 7 onwards. However, it is not inconceivable that the majority of artefacts were finished at the settlement from being roughly shaped at beaches and cliff locations, but few roughouts were found at the site, and other evidence is negligible.

In general the artefacts found at Howe were the everyday tools – spindle whorls, pestles, polishers, querns etc. These were objects which could be made easily and which required the minimum use of other tools and technology to produce. In contrast there are a small handful of imported artefacts, made on stones not found within Orkney. These include steatite, hornblende mica schist and quartzite from Shetland and jet or shale probably from the NE coast of Scotland. One other exotic stone, carnelian, was imported as a gem stone from a Romano-British source. The numbers of these imported goods are so small that a regular trade is not implied. They were most likely acquired occasionally with other goods, from as early as Phase 3, through Phase 7 till Early Phase 8. The manufacture of jet armlets and the carnelian gem stone required the use of a lathe and a lap-wheel, the use of which was not seen on any other stone artefact at Howe, indicating that this machinery was not available in the settlement.

The artefacts can be divided into categories related to: building and structural items, food processing, industrial activities, and personal and recreational items. There are problems of identification of the main characteristics of some of the artefacts in these groups and more especially defining their main function. For example, there is an under-representation of whetstones, especially in Phase 7, when considered in relationship to the settlement's iron-working activities. It cannot be ruled out that other tools, such as polishers, functioned as whetstones before true whetstones came into use. There is, perhaps, also the problem of recognition of stones which may have functioned as industrial tools in the iron-working processes. Another problem exists with querns and the general lack of quern rubbers. Are some querns very large quern rubbers? Were other tools such as grinders used with querns or were all querns used for food processing? These are problems which may only be solved with detailed analysis of artefacts from previous as well as more recent excavations which covered a similar time scale to Howe.

Occupations which have not been possible to define further from the stone artefact assemblage, are fishing and agriculture. No stone was identified as a line-sinker, tether stone or ard. It is highly likely that fishing gear was left close to the shore and not transported to the settlement. Compared though to sites such as Bu, and the excavations in Deerness by the late Peter Gelling, there is a total lack of ard points. There were only 4 stone and 9 whale bone mattocks found on the site, from Phase 4 to Phase 8, which may suggest either they were the main agricultural digging tool, or alternatively they were used around the settlement with the agricultural tools kept elsewhere, perhaps close to the fields. It is not inconceivable that from Phase 7 onwards, iron digging tools, and plough shares had replaced those in stone.

Over the life of the settlement there was little variation in the types of stone used for specific tools. The changes seen in the distribution of artefacts normally occurred around Phase 7 with the increasing use of iron-working, and due to better preservation. New tools that came in in Early Phase 7 are grinders, cleavers, pebble polishers; in Later Phase 7, whetstones; and strike-a-lights in Early Phase 8. The introduction of iron necessitated a development in the use and working of some stones: fine grained sandstones made into linear

whetstones for the sharpening of knives and razors, and the use of quartzite with an iron striker for fire lighting.

Artefacts which declined in use during the settlement life are mortars, pebble caches, shovels, mattocks and cleavers, which end during Late Phase 7, and grinders which end in Early Phase 8. Grinders are not found prior to Phase 7, although the action of grinding was known from Phase 3 on pestles. This distribution of grinders has been noted on other sites such as Jarlshof (the late RBK Stevenson pers comm) and may, with the use of mortars, reflect changes in food processing. The introduction of hulled six-row or bere barley, with naked barley, seen from Late Phase 7 (see 7.2 Plant report above), may in part be responsible for the change in equipment, but does not account for the non-appearance of both grinders and mortars after Early Phase 8, when naked barley was still present.

The early appearance of rotary querns from Phases 3 and 5/6 runs contrary to other sites, but is unequivocally determined by the stratigraphy of Howe. So too, is the simultaneous use of rotary and non-rotary querns during Phases 7 and 8. The higher numbers of non-rotary querns, even in Late Phase 8, may reinforce the idea that some of them were used for non-food-processing activities or for different grain processing such as grinding malt or burstin (Fenton 1978, 393–396).

The numbers and types of stone artefacts at Howe compare well with sites such as the Brochs of Gurness, Midhowe, Clickhimin and the Iron Age levels at Jarlshof. In fact, the greater number of stones from Howe indicate the potential which is still available at the larger, guardianship, site of Gurness. The slightly higher numbers of querns and anvil stones seen at Gurness may simply reflect the larger size of the settlement. Other differences are detectable between the Howe assemblage and the collection of stone artefacts from the roundhouse at Bu (equivalent to Howe's Phase 5). At Bu, artefacts and chipping debris survived on and above the floor level, but this was not the case at Howe where the roundhouse was reworked in Phases 6 and 7. Stones such as ards, roughouts for ards and mattocks, together with the chipping debris found at Bu, but not at Howe, imply differences due not only to survival but also to location, as discussed above.

Stone artefacts are not easy to date accurately, either individually or as a collection, but at Howe a sequence has been established relative to the stratigraphy. The stone artefacts from Howe, together with those from more recent excavations, can be used as a base collection to help the interpretation and understanding of Iron Age sites previously excavated in the north of Scotland and in the islands.

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## 8.4 • PUMICE

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Only 29 pumice pebbles came from the site, with one piece lost. A catalogue is available in fiche (3:D3–D4); the pieces are not illustrated.

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### DISTRIBUTION

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The pebbles occurred from Phase 1 onwards with a small concentration from Neolithic levelling layers (see Table 54 below). In Phases 7, 7/8 and 8, pieces occurred in earth floors as well as

rubble horizons and walls. The pumice distribution, is however very scattered and most likely reflects chance coastal finds, during the Neolithic and Iron Age periods.

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### THE PIECES

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The pieces are of grey-brown vesicular pumice, with little variation in colour or composition. Most of the pebbles, 24, show signs of being worked and smoothed, while the four remaining pieces are unworked and irregular in shape. It is possible that some of the smoothed pieces have been worn naturally in the

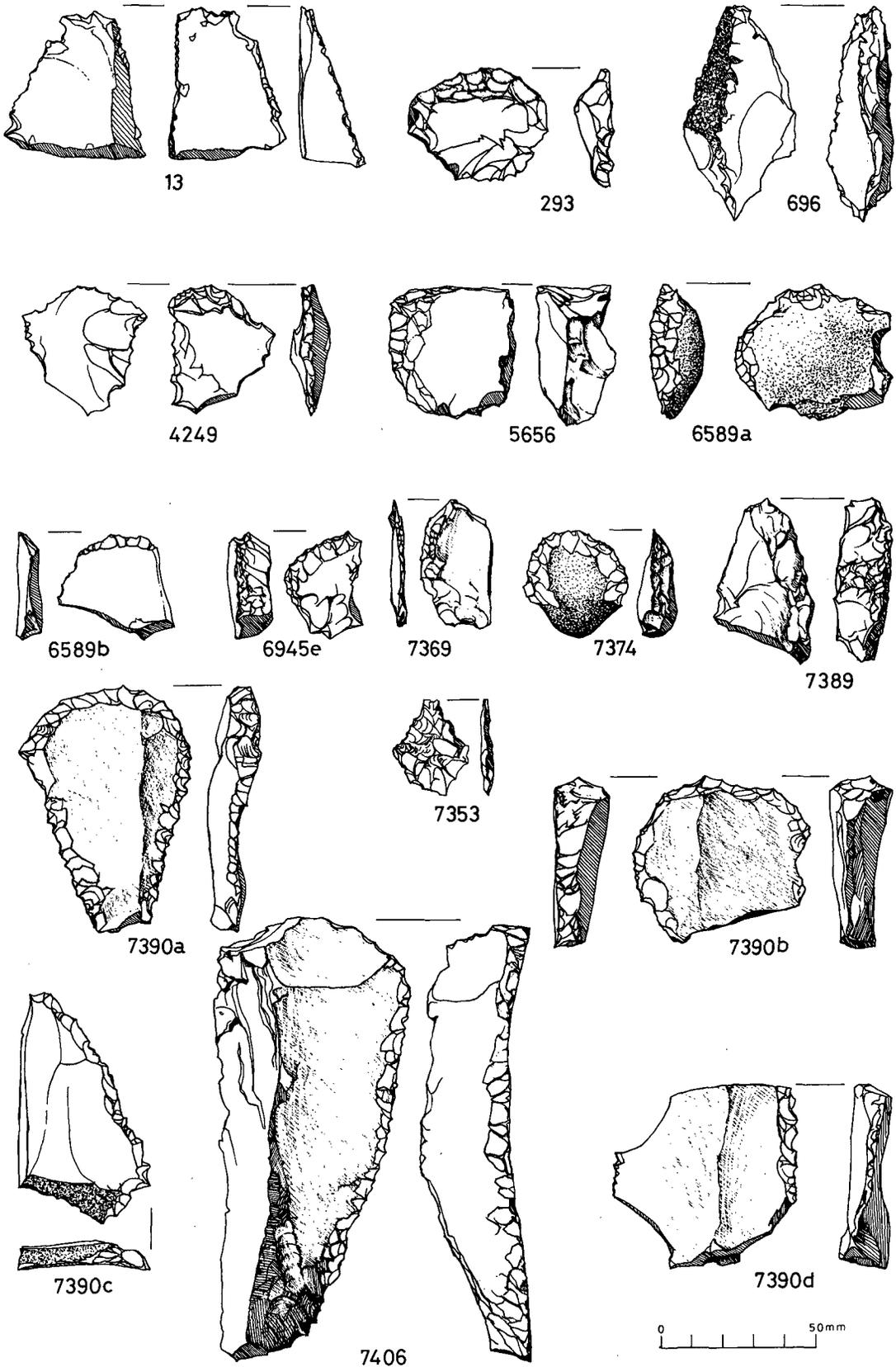
process of being water borne, but most of them are faceted by wear eg SF 5402. Six pieces, as well as being rounded have been worn by various degrees of intensity into hollows. SF 4250 was broken through the middle by hollowing on both sides. Three pebbles SF 7408, 7541 and 7883, have linear hollows that lie across the width or at one end of the piece.

Table 54: Distribution of pumice by phase

Phase	1	1/2	2/3	4	7	7/8	8
No of pieces	1	3	1	2	12	2	7

The hollowing and faceting suggests that the pebbles have been used for specific purposes such as smoothing bone and wood. Pieces from SF 4072, 3814 and 2556 have their faces smoothed which indicates their use as polishing tools perhaps for burnishing leather-hard pottery. The other worked pieces have only single worked edges, sides or faces smoothed.





Illus 129  
Worked flint.

## COMPARISONS

Most prehistoric sites in Orkney have produced flint and some chert artefacts, but comparison of the Neolithic artefacts (14) from Howe with the assemblages from Neolithic domestic sites such as Skara Brae (Childe 1931), Rinyo (Childe & Grant 1939) and Knap of Howar (Ritchie 1983) showed a marked difference. This difference was in the lack of debitage and cores found. Instead, the assemblage from Howe was much closer to those found in the chambered tomb of Yarso, Rousay, and the Calf of Eday (Long). Both these sites produced quantities of flint including scrapers, knives, flakes and chips, but also large arrowheads (Henshall 1963, 95, 110). This comparison is not surprising considering the derivation of the Howe tools from mostly disturbed Neolithic tomb contexts.

More recently, the excavation at Pierowall Quarry, Westray, yielded nearly 600 flint pieces, mostly scrapers and edge or retouch flakes (Wickham-Jones 1984, 95). In common with the Howe pieces, many of these retained some of the cortex which, according to Henshall (1963, 111), is frequently seen on the majority of Orcadian scrapers due to the small size of the flint pebbles used.

Another cluster of tools, especially scrapers and struck flakes, is seen in the Iron Age Phases 7 and 8 from Howe. It is not clear whether, as with other artefacts, contamination from the reworking and cleaning down to earlier contexts accounts for this occurrence, or whether it represents a revived interest in the Iron Age for chert tools for specific purposes. In spite of four of the Phase 8 tools being found in floor levels, it seems unlikely that flint working was ever undertaken at this time. The occurrence in Phase 9 of a thumb-scraper and knife fragment from recent disturbances and top soil reflects the movement and deposition of possibly Neolithic or Early Bronze Age finds into more recent contexts.

Flint artefacts have been found at other Iron Age and later excavations in Orkney but in varying numbers, Gurness with 34 pieces (Hedges 1987b, 248), 67 pieces from the Brough of Birsay (Hunter 1986, 192, 195–6) indicating deliberate collection and use especially in the Norse period and two pieces from Bu Broch (Hedges 1987a, 108). The numbers of artefacts from these sites do not significantly aid our understanding of the occurrence and use of chert and flint in the Iron Age. Iron Age sites in Shetland are also of little use for comparison as quartz was more readily available there than flint or chert.

## 8.6 • METAL ARTEFACTS

The number of metal artefacts appears scant compared to the amount and duration of metal working activities in the Late Phase 7 and Early Phase 8 settlements. In all, 205 items were recovered, the majority being of iron and the rest copper alloy, apart from one lead artefact (see Table 56). This ratio accords well

Table 56: Types of metal objects

Description	Iron	Copper-alloy	Lead
Ring/chain link/coil	4	11	
Projecting ring-headed pins		6	
Decorated pins	2	3	
Pins/points	3	8	
Pin heads		3	
Decorated brooches		5	
Tweezers	1	1	
Bodkin/needle		2	
Wire	2	3	
Razor	2		
Key		1	
Metal plate	1	6	
Knife/blade	7		
Chisel	2		
Strap/bar/blank	12		
Nails	30		
Miscellaneous	5	5	1
Waste/unconserved fragments	63	18	
Ore	1		

with the evidence of metal working on the site. In Phase 7 and 8 there was both iron smelting and smithing which served the domestic needs of the settlement in knives, nails and blanks. The community's iron-working skills may even have led to the production of more elaborate articles, but of this there is some uncertainty, as the site yielded very few iron-working tools.

Copper-alloy working is shown by the rare fragment of crucible (8.10 Other Fired Clay below) but there were no clay moulds to suggest copper smelting and only one possible stone mould (8.3 Stone Artefacts above). A catalogue of metal artefacts, 8.6.1, is available in fiche (3:D9-E8).

## DISTRIBUTION AND DESCRIPTION OF ARTEFACTS

A summary of the distribution by phase can be found in Table 57.

The earliest metal artefact is a lead stud from Phase 4/5. Both the copper-alloy and iron artefacts make their first appearance in small numbers in Phase 5/6 and from Phase 7 onwards there is an increasing number of objects. Rubble contexts contained many of the pieces of metalwork, but others were found on floors of the Phase 7 houses and in the broch tower, including a disc-headed pin, SF 2688. Small pieces of iron and copper-alloy were scattered throughout walls and floors suggesting the working over of earlier building material and debris as well as the contemporary loss and discarding of objects.

The rubbles and building floors of Late Phase 7 produced quantities of irregularly shaped lumps of iron as well as nails and copper-alloy pins and plate fragments. Finished, and sometimes

dateable, artefacts have been found in floors, yards and in building debris throughout Phases 7 and 8. Early Phase 8 was characterized by more nails and irregularly shaped lumps. Although artefact numbers declined in Later Phase 8, a more diverse range of artefacts was produced, reflecting the late iron smelting activities of the settlement. A number of interesting artefacts were also found unstratified in Phase 9.

### LEAD ARTEFACT

Only one fragmentary lead object, SF 69, associated with some small pieces of iron, was found in rubble in Phase 4/5. Reconstructed, it resembled a rounded stud and may have been the head of an iron pin shaft. Lead objects are known from other sites but are comparatively rare. A lead whorl was found at Dun

Table 57: Distribution of metal artefacts by phase

Artefact Type	Phase		6/9	E 7	L 7	7/8	E 8	L 8	8/9	9	Totals
	4/5	5/6									
<b>LEAD</b>											
Miscellaneous stud	1										1
<b>IRON</b>											
Ring, chain, coil					1			1	1	1	4
Decorated pins				1				1			2
Pins, points				2			1				3
Tweezers					1						1
Wire					1		1				2
Razors				1			1				2
Metal plate										1	1
Knife blades				1	1		1	3		1	7
Chisels				1	1						2
Strap, bar, blank				2	3		4	2		1	12
Nails		1		6	3	2	4	12		2	30
Miscellaneous					1		2	1	1		5
Waste frags		1		9	40	2	7	2	1	1	63
Ore								1			1
<b>COPPER ALLOY</b>											
Ring, chain, coil			1	3	1			4		2	11
Ring-headed pins		1		2	1	1		1			6
Decorated pins				1			1			1	3
Pins, points				3	2		2			1	8
Pin heads		1			1		1				3
Decorated brooches					1		1	2		1	5
Tweezers								1			1
Bodkin, needles					1					1	2
Wire				3							3
Key								1			1
Metal plates				2	2		1			1	6
Miscellaneous				1	1			1		2	5
Waste frags				8			2	4		4	18
<b>TOTALS</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>46</b>	<b>62</b>	<b>5</b>	<b>29</b>	<b>37</b>	<b>3</b>	<b>20</b>	<b>208</b>

Mor Vaul (MacKie 1974b, 132, fig 16, 297) and several lead and tin objects came from the Meare Lake Village where preservation of this material was good (Bulleid & St Gray 1953, 249–252).

A coastal lead vein is known at Warebeth c 7km NW of Howe where the surface deposits can be easily worked. This ore could have been exploited during the life of the settlement at Howe, but no other lead objects have survived to be recognized from the site. At Birsay, lead whorls and discs were identified but these were mostly confined to Norse levels (Curle 1982, 65).

### IRON ARTEFACTS

131 iron objects were recovered from Phase 5/6 onwards (see Table 52). Conditions were not good for preservation and most of the iron objects are small and fragmentary. The most numerous pieces were strap, bars or blanks – indeterminate oblong pieces, and iron nails. Many lumps of iron were distinguished from the iron-working slags by their strong attraction to a magnet and their high density (identified by Dr Gerry McDonnell) but X-radiography could do little to further their identification.

### RINGS, CHAIN-LINK AND COILS

Only four items belong to this category. The earliest, SF 2709, from the Late Phase 7 S buildings, is so badly corroded that a positive identification has not been possible. SF 212 through X-radiography has been identified as an elongated oval chain-link from Late Phase 8. A heavily corroded ring, SF 216, was found in Phase 8/9, and one of similar size but distorted, SF 148, came from the topsoil. It has been suggested that rings of this size, 30–40mm, could be vessel handles or parts of harness mounts (Curle 1982, 65).

### DECORATED PINS

Both the pins in this category are unusual examples. SF 5502 (illus 90e; 130) was found within a yard wall of the Early Phase 7 **NE** Building. It is a simple iron pin, which may have a T-bar at the top, around which a glass paste bead has been applied. The paste is cracked, whitish and partly discoloured. No immediate parallel has been found for this, but it may be an adaptation of the native bone or jet-headed iron shanked pin (see below).

SF 284 (illus 130) is a long pin surmounted by a decorated drum head found in stage 6 of Late Phase 8. On both faces of the drum are stamped discs of gilt metal with a dot-in-ring design. On either side of the head is a milled strip of the same metal which may have originally encircled the drum. On the shaft of the pin is a narrow gilt strip on either side of which is a 5mm band of slanting incisions, originally filled with copper inlay. The pin is unusual for the amount of decoration on an iron base.

From the East Broch, Burray is a very similar pin but in bronze which was found and recorded by Anderson in the late 19th century (Anderson 1883, fig 210, NMA no GC 45). It has milling around and beneath the head and a decorated shank with incised lines in bands around the middle, below which the pin was octagonal. The diameter of the head is almost identical with SF 284, although the head of the latter is thicker. Stevenson dates these pins to no earlier than the 7th century but radiocarbon dates from the Howe stratigraphy place the type between the 4th and 7th centuries cal AD (Stevenson 1955, 286, fig A, 17).

### PINS AND POINTS

From corroded bits of iron it is difficult to distinguish between nails and pins and only three pins have been positively identified, two from Phase 7 and one from Early Phase 8. Two are rounded in section and one is square, but none are complete, with points or tops missing. SF 4924 is the longest at 81mm and may have been a dress pin, but it has no visible characteristics or decoration.

### TWEEZERS

A single pair of tweezers, SF 2442 (illus 130), is the only iron find from the second broch tower floor in Late Phase 7. Made of one piece of metal, the tweezers have a central suspension loop and splayed square ends (for discussion, see copper-alloy artefacts below). They are similar to copper-alloy tweezers found at Howe and Staple Howe in Yorkshire (Brewster 1963, 13, fig 61, 4).

### WIRE

X-radiography helped to identify two pieces of thin wire from the S buildings in Late Phase 7 and Early Phase 8. One piece, SF 2500, is looped, squashed and bent and may have been a coil of wire. The other piece, SF 2031, has a curved end suggesting an elongated hook.

### RAZOR AND BLADE

SF 5319 found in the earliest floor of the **NE** Building during Early Phase 7 is an almost complete iron razor in a polished bone handle (illus 90b; 130). The plain handle is grooved and the blade, presumably curved, would have pivoted on an iron rivet or pin at the wide end of the handle, very much like a cut-throat razor.

The Early Phase 8 S buildings produced another small crescentic blade, SF 2065 (illus 130), identified as a similar razor.

### KNIVES AND KNIFE BLADES

The poor preservation of the metal has made the identification of some of these pieces difficult. Four fragmentary blades were distinguished from straps and blanks by virtue of having a pointed end, a sharp edge or a wedge-shaped section and all are thin, narrow blades. SF 725 (illus 130) from Late Phase 8 is similar, with the part of the tang present but the tip of the narrow blade is missing. A complete tanged knife blade, SF 4257 (illus 130), is from the abandonment levels of Late Phase 8. It has a slightly tapering angled blade and the tang may have been square in section, but is now corroded.

A longer and more complete knife blade with tang is SF 5165 (illus 130), from the **NE** Building during Late Phase 7. The tang is long, with a shaped bone piece at its end. The blade is curved and thin towards the point.

### CHISELS

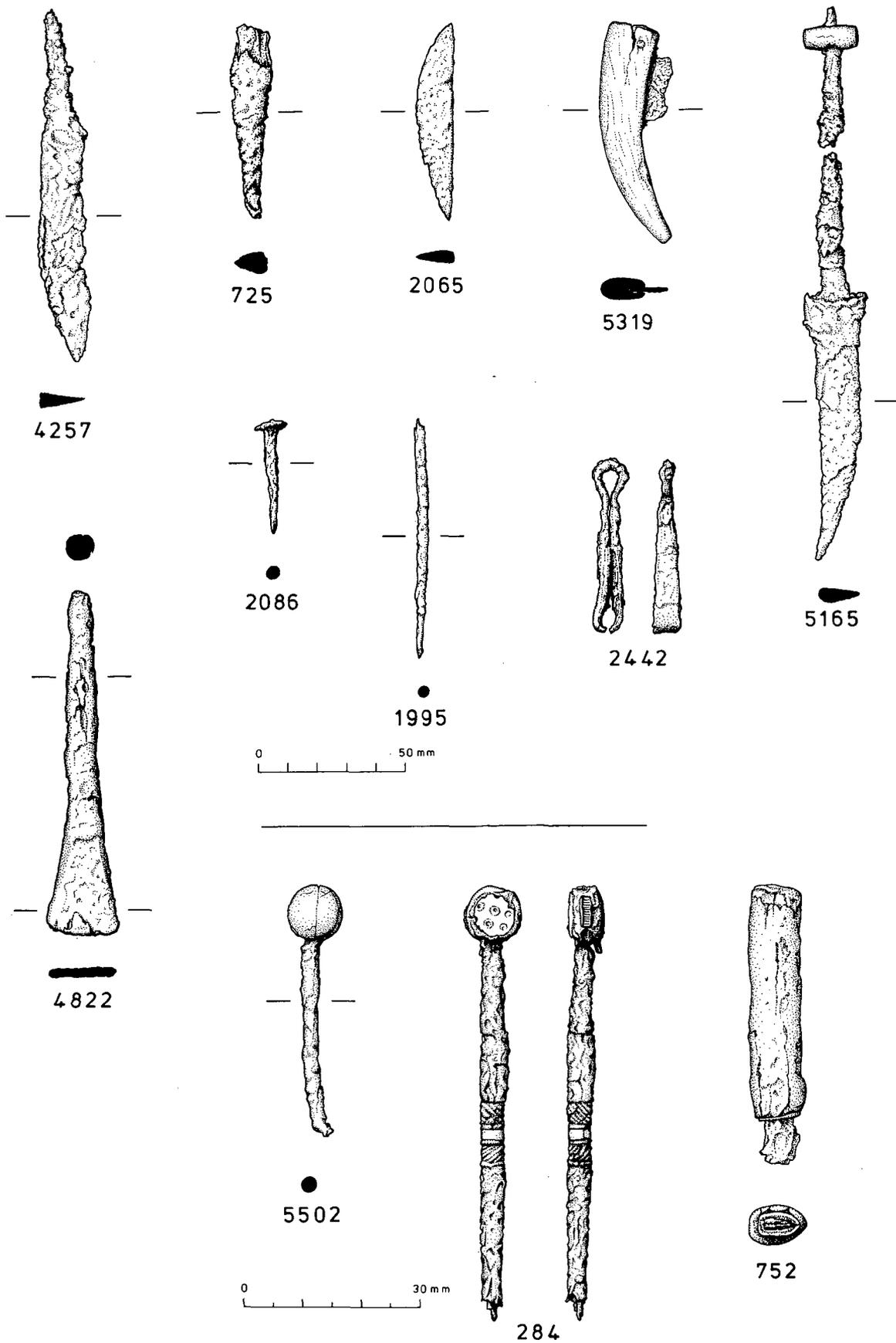
From the Early Phase 7 **E** Building yard is a metal tool which has been identified as a chisel SF 7001. Another chisel or chaser SF 4822 (illus 130 & 131), which has rounded ends to the blade, was found in the yard to the **SE** Building in Later Phase 7. This latter object may indicate that the production of decorative metal objects took place on the site.

### STRAPS, BARS OR BLANKS

These small pieces of iron were numerous from Early Phase 7 to Late Phase 8, and 12 pieces were recovered. Their length varies from 40–117mm and from 4–7mm in width. SF 2135, found in Phase 9 is 23mm wide and may be a fragment of a bar clasp. The presence of straps, bars or blanks is indicative of a smithy from evidence found at York and Helgö (Holmqvist, Lamm & Lundstrom 1978, pt 2; Gerry McDonnell pers comm).

### NAILS

Nails form the most numerous type of artefact, with 29 found from Phase 5/6 onwards. Their fragmentary and corroded state has hindered any firm conclusions about their size and form. There does however, appear to be two size groupings, 20–31mm in length with a



Illus 130  
 Iron knife blades, pin, wool comb tooth, tweezers, decorated pins, bone and iron razor and knife.



Illus 131  
Iron chaser (SF 4822), Phase 7; scale 2:3.

width of 10–16mm, and a second group, 30–39mm long with a width of 2.5–7mm. Larger nails have been found, including SF 50. This is 78mm long, and although bent, it has a broad rounded head and a square shaft and was found in the Phase 7 ditch.

Most of the best preserved nails have square sectioned shafts and are mainly from Phase 7. Only two nails have been recognized as having a round shaft and both of these are from Phase 8 (eg SF 2086, illus 130). Few of the heads of the nails have survived, but those that do are small rounded and flat like SF 2086. SF 50 has a 24mm diameter round head and is the largest recovered. Included in this section is a large spike or nail 93mm long, with a square shaft also found in the Phase 7 ditch fills.

#### MISCELLANEOUS

Included here is a large, thin blade or sheath with a narrow turned end, which might be part of a plough culter or turf cutter. The object SF 4164, was found in Late Phase 7. SF 48 is a strip of metal with a loop at one end, and SF 43 may be a small fish hook. Both were found in Phase 8 abandonment horizons. SF 1995 (illus 130), from the S buildings in Early Phase 8, is a long pointed tooth of a wool comb.

#### Waste and unconserved fragments

Many fragments of magnetic iron were found from Phase 5/6 to Phase 8/9. These were predominantly small irregular or rounded lumps 28–61mm × 17–57mm found mainly in Late Phase 7 and Early Phase 8 in association with the settlement's iron-working activities and deposits of slag. They may represent smelted iron ready for secondary processing and smithing.

#### COMPARISONS

Several of the Orkney brochs have produced iron objects and slag, but corrosion and lack of conservation has precluded their further investigation. Metal work identified as spear- and arrowheads from the Brochs of Ayre and Burrian, North Ronaldsay (Hedges 1987c, 77, 108) are a category not found at Howe. Pins, spikes, knife blades, chisels, nails and rings have been found in small numbers at the latter two sites, and also at the East Broch, Burray. At Gurness not only were there slag samples but also a few iron finds which were mostly associated with the Norse period (Hedges 1987b).

The amount of ironwork from the 1930's excavations at Birsay was also small, although this included several nails of Pictish and Norse origin. More metalwork was produced from the 1972–4 excavations (Curle 1982, 117, 127–32) but again mainly nails and unidentified fragments. Evidence for iron-working was produced at Gurness and at Crosskirk, Caithness, but the latter site produced few iron objects (Fairhurst 1984, 118–9). This is a pattern that occurred at Ingashowe and Midhowe where no iron finds were recorded (Hedges 1987c, 67, 116). In contrast, at Traprain Law iron objects were found in nearly all levels of the site, including chisels, knife blades, bars or blanks, rings and flat-headed square-sectioned nails (Curle 1920, fig 9; Burley 1955, 204–219). The numbers of iron finds in Orkney and Shetland seems to be limited by the burial and preservation conditions.

## COPPER-ALLOY ARTEFACTS

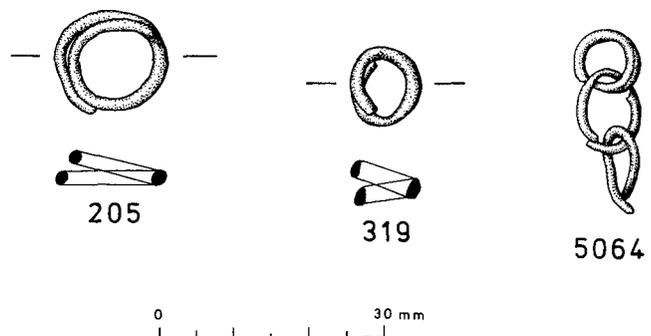
Two types of copper-alloy artefact have been recognized although their mineral content has not been analysed. The majority are of a hard, dark green-blue or dark green metal which has been cast or worked from wire. A few items are made from sheets of a soft golden copper-alloy which have been rolled or bent to produce items such as the spiral ring, SF 205, and the key, SF 603. This difference in bronze types may indicate different production centres, imported objects or locally produced artefacts whose metal composition has varied with time. All of the sheet metal artefacts are from Phase 8 or later. Table 56 shows the number and types of artefacts.

#### RINGS, CHAIN-LINK AND COILS

This group of small rounded objects, eleven items in all, forms one of the largest categories of copper-alloy artefacts found at Howe. It includes artefacts that have been made of wire and cast or tooled from thin sheeting. Several small fragments of chain-link rings were found in stages 5–9 of Late Phase 8. The largest piece, SF 5064 (illus 132), is from an Early Phase 7 floor in the E Building. It consists of two misshapen rings and a smaller double coiled terminal, all made of cast wire. A short length of bronze double chain link of this type was found in the Iron Age fort at Clickhimin, Shetland (Hamilton 1968, 90, fig 40, 3). Another piece of coiled wire, SF 319 (illus 132), is unstratified and may also have come from a chain.

Other pieces in this category come from Early and Late Phase 7. SF 4704 is half a plain cast ring and SF 5099 may be the same. The largest piece SF 205 (illus 132) is unstratified, but is a coiled ring of sheet metal with cut ends. The ring may not be complete as its diameter is very small. Hamilton refers to these as finger or toe rings and one with a slightly larger diameter than SF 205 was found in the broch levels at Clickhimin (1968, 116, fig 50, 3).

A silver spiral ring came from Dun Mor Vaul and two from Traprain, but bronze seems to be the more common medium. Three coiled bronze spiral rings were found at Gurness on skeletal hands with other rings but Hedges has suggested these are of Norse date (1987b, 87, 116). Several bronze rings of 2–3 coils were recovered from all levels at Traprain Law (Curle 1920, 65–67, fig 7, 14; Burley 1955, 173–4). This type of ring has been ascribed by Clarke (1971, 22) from the mid Bronze Age to c 5th century AD, indicating the problem of dating, a problem which the Howe ring does not solve.

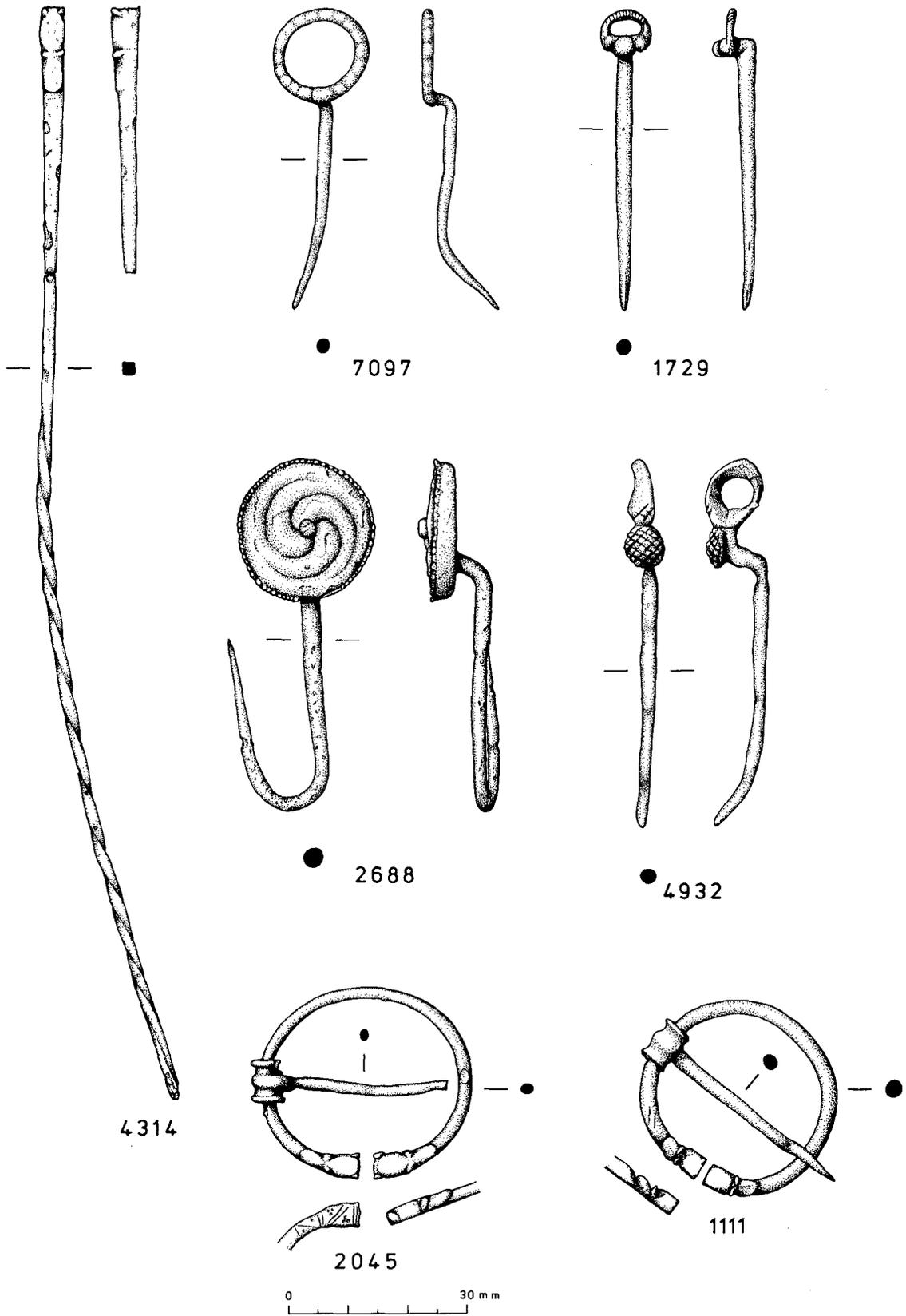


Illus 132  
Copper-alloy rings and chainlink.

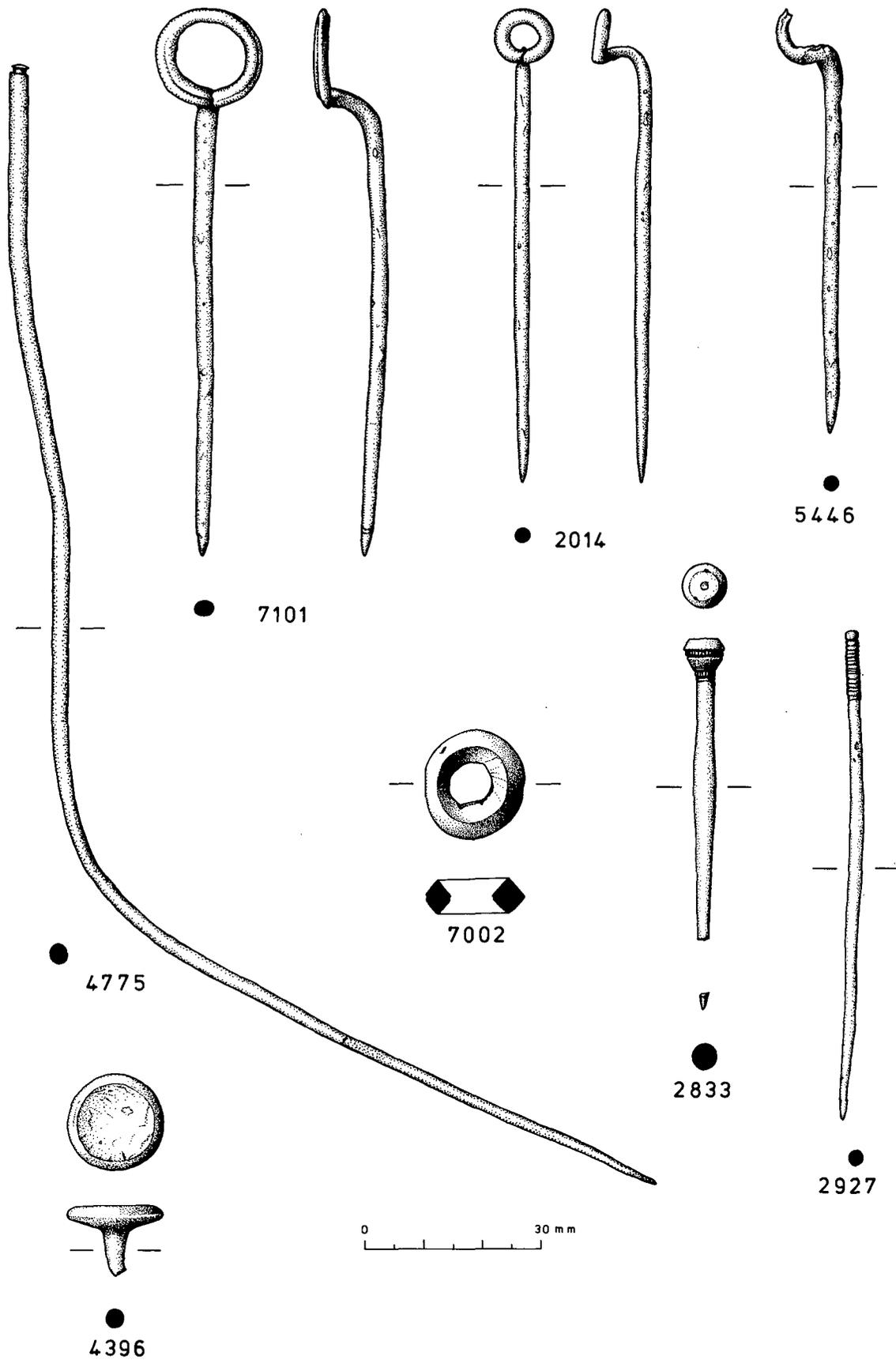
#### PINS

##### Projecting ring-headed pins

Several projecting ring-headed pins were found, from Phase 5/6 to the broch abandonment of Early Phase 8. They were used in fastening garments and were secured in the fabric by a thong or thread wound around the pin and tied to the head. Four of the recovered pins are complete and the other two fragmentary. Only two are cast in one piece, SF 7097 and 1729 (illus 133), the others



Illus 133  
Copper-alloy decorated pin, projecting ring-headed pins, disc pin, elbow studded pin and two zoomorphic penannular brooches.



Illus 134  
Copper-alloy long pin, projecting ring-headed pins, decorated pins and pin heads.

are of copper-alloy wire which has been bent and cut to form the circular head.

Stratigraphically the earliest pin is SF 7101 (illus 134) from Phase 5/6; it is also the largest at 91mm in length. Two other pins SF 2014 and 5446 (illus 134) are similar but have respectively a smaller and a fragmentary head. All are plain apart from a ridge around the head of SF 7101.

Of comparable dimensions to these is a plain pin from Gurness (Hedges 1987b, fig 2.39, 236) made of bent wire and one from Jarlshof from the Iron Age settlement (Hamilton 1956, 64, fig 34). Several pins found at other sites are similar to SF 7101, such as one with a bevelled head from Midhowe (Callander & Grant 1933, fig 4, 1), one from the Mackenzie Collection (Close-Brooks & Maxwell 1972, 288, fig 1) and one supposedly from Anglesey (BM Guide 1925, fig 109).

Projecting ring-headed pins are common, but not exclusively, to Scotland, where they have been found at many Iron Age sites from Dun Mor Vaul in the west to Crosskirk in the east and as far north as Shetland, and can be made of iron as well as copper-alloy. Clay moulds for cast pins have been found at Traprain Law (Burley 1955, 219) and at Gurness (Hedges 1987b, 158). It is possible that this type of pin is a native development as Stevenson remarked (1955, 288), but from the influences of the Late Bronze Age sunflower pins and the Early Iron Age British ring-headed and swan's neck pins, producing the ring-headed pin which is projected (Coles 1958). Stevenson puts these pins at a date between the 2nd to 3rd centuries AD but also suggests that an earlier date is possible (1966, 20–22). All the Howe pins, so far described, are from Phase 5/6 and from Phase 7, from c 2nd century cal BC to the 4th century cal AD.

#### Beaded ring-headed pins

Another type of projecting ring-headed pin from Howe is SF 7097 (illus 133). It was found in a wall in Early Phase 7, and its ring head is decorated with large flattened beads. One beaded example similar to this was found at Traprain Law which Stevenson (1955, 290, fig B, 3) dates to the 3rd and 4th centuries AD, and another from Tentsmuir, Fife (Kilbride-Jones 1980a, fig 59, 11). An unstratified example with a slightly longer pin was found at Gurness, with incised lines on its face (Hedges 1987b, fig 2.39, 235). These pins may be earlier than thought and developed along side and not from the plain projecting ring-headed pins.

#### Proto ibex-headed pin

The last pin, SF 1729 (illus 133), in this category is the latest stratigraphically, from stage 5 of Late Phase 8. It is a small pin with a squat decorated head. At the base of the ring are three beaded projections and the rest of the ring is ribbed. Several silver examples of this type of pin were found at Covesea, Morayshire, each with three beads and a ribbed head (Stevenson 1955, fig B, 6–11), and another at Haddington, North Berwickshire (BM Guide 1925, fig 111). Stevenson also cites an unpublished example from Swandale, Rousay, but suggests that the Covesea pins are 2nd–4th centuries AD. The Howe pin does not have wedge-shaped beads and is not a true ibex-headed pin for which a 4th century date had been suggested (Stevenson 1955, 290–1), but it is quite likely that SF 1729 is an import derived from the eastern seaboard of lowland Scotland.

#### Decorated pins

Five pins are decorated, each with different characteristics and possible origins.

**Disc-headed pin:** The earliest stratigraphically is a projected disc-headed pin with a bent stem, SF 2688 (illus 133), found in the earliest floor of the Phase 7 broch tower. It is a very unusual pin and so far a unique example. It comprises a circular beaded dish into which is set a repoussé or beaten copper-alloy disc, held

in place by a central pin. The disc is decorated by three swirls which radiate from the centre. The plain pin shank tapers to a point and is bent back upon itself. The head of the pin does not fit centrally into the dish, but lies below the centre.

According to Hattatt (1982, 31–41, 145) this is a rare class of pin and has what he refers to as 'beautiful swirling native Celtic designs'. The technique of repoussé may have been introduced in the 1st century BC, and the earliest examples of brooches of this design date from the 1st to 2nd centuries AD. The Howe pin could be earlier and imported. It has also been indicated (Valerie Rigby pers comm), that the pin is related to the Late Bronze Age–Early Iron Age swan's neck sunflower or disc-headed pins found in Yorkshire, Scotland and Ireland, but with a design using Celtic traditions. She also thought the repoussé disc may originally have been highly decorated.

**Elbow studded pin:** From the Phase 7 broch wall came a pin SF 4932 with a non-projecting ring head, but with a decorated elbow stud beneath it (illus 133). From the 3rd and 4th centuries BC, La Tène brooches are known with a solid head loop and a stud on the bow (Hattatt 1982, 74–79). A variation of the La Tène brooch is known from Gotland, Sweden, dated to c 2nd century BC with a cross-hatched stud below the spring (BM Guide 1925, 84, fig 77).

Ring-headed pins with bent shoulders have been described from Britain during La Tène 1, c 4th century BC, and pins with a coral-studded elbow have been found in Yorkshire and London dated to the 3rd century BC (Dunning 1934, 274, 282, 284). Ring-headed pins have been found along the east coast of Scotland and also in the Antrim district of Northern Ireland. The pins from Ireland are highly ornate and many of them support an enamelled shoulder stud such as the Lisnacroghera example, from late La Tène 1 (Dunning 1934, fig 8, 3; Raftery 1984, fig 86). An example similar to SF 4932 was found in Clough, Co Antrim, now in the British Museum. It has a cross-hatched decorated ring head and elbow stud, and is dated from the 3rd or 2nd centuries BC to the 1st century AD (Raftery 1984, 171, 173). Whether the Howe pin is a native copy of an Irish example or an import from Ireland, the dates would fit in well with its location in the broch wall, presumably derived from reworked material.

**Swollen shanked pin:** The only pin of this type is SF 2833 (illus 134) from the NE Building yard in Early Phase 8. Its shaft has a slight central swelling and its decorated hexagonal head has a flat and circular top. Around the centre and base of the head is a line of incised dots. Stevenson (pers comm) suggested that this is not a hipped pin but bears similar decoration on an example akin to Roman period pins. In his opinion it could be late Roman in date, c 5th–6th centuries AD but no direct parallels have been found.

**Ribbed pin:** Another pin in this category is SF 2927 (illus 134) found in ploughsoil overlying the Phase 7 ditch in the SW. It may also have Roman origins as similar pins have been found in the S of England. It is composed of a plain, slightly tapering shaft with a ribbed top which is slightly narrower in diameter. Two similar, but slightly longer pins were found at Shakenoak, Oxfordshire, from Roman levels dated to the first half of the 3rd century (Brodrick *et al* 1968, fig 30, 35; 1971, fig 49, 84), and another comparable pin was found during the excavation of Roman Winchester in deposits of the mid to late 2nd century AD (Hull 1964, fig 24, 19). A similarly described pin came from the second level at Traprain Law (Burley 1955, 170, 121) and an unprovenanced and undated example from Birsay, now in the National Museums of Scotland, Edinburgh. These latter and northerly examples, together with the Howe pin, could perhaps be explained by coastal trade along the east coast of Britain, during the 2nd and 4th centuries AD.

**Long zoomorphic pin:** Last in this category of decorated pins is an unstratified pin SF 4314 (illus 133), 183mm long. It has a twisted square-sectioned shaft which terminates in a zoomorphic head with eyes, ears and a snout on one of the faces. The decorated head is very similar to the zoomorphic terminals on the penannular brooch SF 2045 described below. It is not known whether this type of pin developed in parallel with zoomorphic

brooches, which seems most likely, or developed separately and prior to the brooches.

Zoomorphic pins are an almost exclusively Scottish development concentrated in the highland area. In 1963 Elizabeth Fowler (1963, 103, 121–2), noted 26 pins, some with rounded zoomorphic heads and 10 with square heads. The latter she dates to the 4th–5th centuries AD; these are very similar to her E type zoomorphic brooch terminals (see below). It is thought that pin SF 4314 is of this type.

Several of the zoomorphic headed pins from Traprain Law have incised lines on the stem which is a feature not found on the Howe pin, but also SF 4314 is most like the pins from the highest levels (Curle 1920, figs 13, 23, 1, 2; and Birley 1955, 168–9, 108, 109). A fragment of a headless long pin partly twisted towards the top of the shank was found in wheelhouse levels at Clickhimin (Hamilton 1963, fig 61, 2). Kilbride-Jones (1980b, 31) remarked that zoomorphic pins and brooches have only been found together at one site, the factory site at Traprain Law, but they both occur together at Howe. No other Orcadian site has produced a zoomorphic pin nor has any site produced one of this length. If the pins and the brooches are contemporary then a mid to late fourth century date cannot be ruled out for this artefact (see below).

### Pin heads

Three pin heads come from Phase 5/6, Late Phase 7 and Early Phase 8. The latest piece is a corroded fragment SF 4665, which through X-radiography seems to be a circular pin head with part of the shank still in place. SF 7002 (illus 134) is a heavy ring from Phase 5/6 which is slightly flattened on part of its surface where the pin shank may have been attached. The ring diameter is small and a terminal to a pin seems a fitting interpretation for this object.

From the Late Phase 7 *E* yard came a circular pin head SF 4396 (illus 134) broken from the shank close to the head. Cup-headed pins of which this is possibly an example, have been found mainly in Ireland with isolated examples in Scotland and England. Pins with shallow cup heads have either a straight or bent pin and were developed in central and northern Europe and may have reached Ireland in the 7th century BC (Eogan 1974, 99, 101). Most of the Irish examples are straight stemmed but SF 4396 may have had a bent or swan's-neck type shaft, like the example in the British Museum from Late Iron Age Gotland, Sweden (BM Guide, 1925, fig 78). Alternatively the late Robert Stevenson suggested (pers comm) that it might be a 2nd century AD dress fastener which has lost its loop.

### Pins and points

This category includes plain pins as well as brooch pins which have become detached and other bits of pointed copper-alloy. Four are brooch pins, including SF 2028 which may be a hinged pin from Early Phase 8. These pieces vary between 33–57mm in length and between 1.5–4mm in width. The other pieces are from the Phase 7 ditch, Late Phase 7 and Late Phase 8. All are plain, but SF 4598 from Late Phase 7 is hollow and is probably formed from sheet metal.

Long pin: Included here is a plain tapering pin SF 4775 (illus 134) of 250mm in length, found in the Phase 7 deposits of the ditch in the SW. It does not have a formal head, only a small terminal knob, and gives the appearance of once having a metal, bone or jet pin head. Long dress pins are not uncommon in the Iron Age (see above), but normally have a zoomorphic terminal. This pin may belong to the Irish type of disc-headed pins of the Late Bronze Age, where very long straight pins are surmounted by a horizontal, plain or decorated metal disc-head. The disks are held in place by a central conical boss fitting on top of the shaft. SF 4775 could have supported a disc-head which would have fitted on top of

the terminal knob. This type of pin developed from the middle Bronze Age in central and northern Europe, but no examples have been found in Britain except Ireland, where they are dated to the Late Bronze Age (Eogan 1974, 75–77, figs 2, 3). The Howe pin fits well into the size and length range of these Irish pins, the longest being 477mm.

## DECORATED BROOCHES

### Insect brooch

Stratigraphically the earliest in this category SF 2347 (illus 91; 135) is a most unusual brooch found in the brooch tower in Late Phase 7. It is in the shape of an insect, with a zoomorphic head, a raised body and hinged pin, resting on a substantial catch-plate. The tinned wings, the nature of the catch-plate and the hinged pin initially suggest a Roman derivation or manufacture under Roman influence. Brooches representing animals, to some extent reflect the native Celtic beliefs and religions, and many of these brooches were made in Britain, Gaul and Belgica from AD 50–150 (Hattatt 1982, 158).

The following report was supplied by the late Richard Hattatt.

The more common types of brooches are the trumpet-headed fly brooches, usually enamelled, some with silver, which are a variant of the native British trumpet brooch and belong to the 2nd century AD (1985, 459, 460). These all have a perfectly thin flat body, or rather no body between the flat wings, the trumpet head being a non-zoomorphic appurtenance. The rarer type have a distinct body under the wings, with the abdomen curved downwards and a more realistic head, or at least a more detailed head, sometimes with a thorax. These seem to be wasps rather than flies.

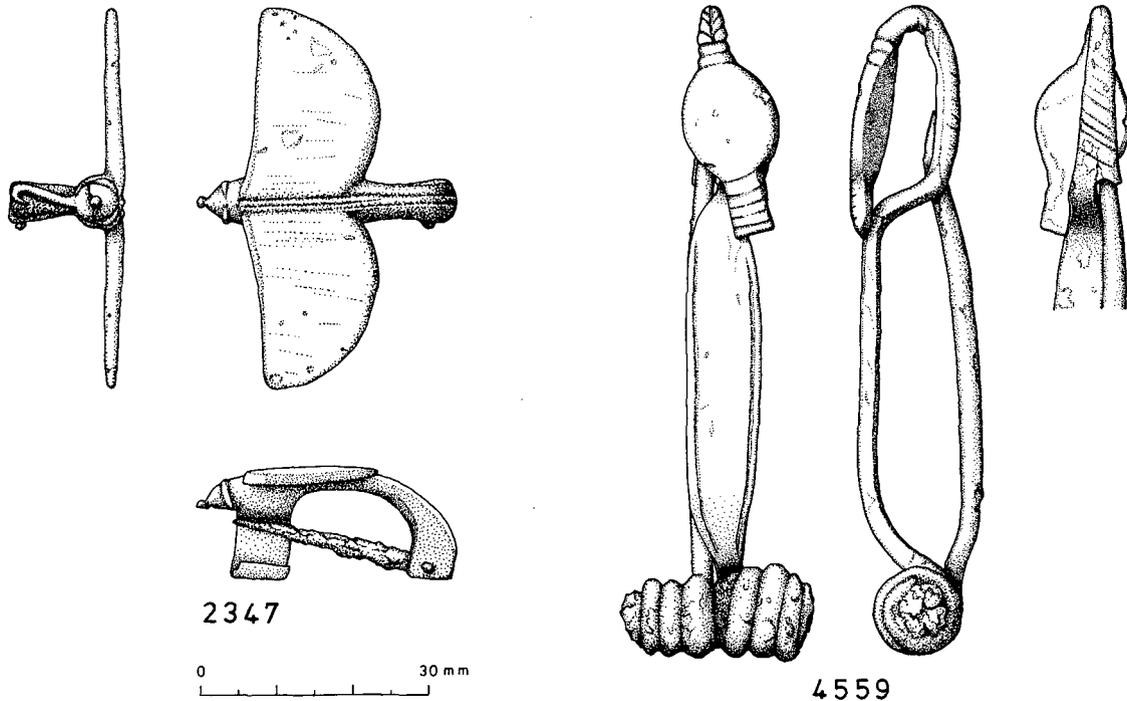
Two other examples of the wasp-type are known from Oxford, found at Kidlington. One is hinged at the tail with wings in a backward triangular position and was enamelled. More interesting is the second, notwithstanding that the pin is sprung, because the wings are distinctly widespread as if in flight and they are tinned (Oxoniensis Vol 17–18, fig 26, 6, 7). Their eyes are clearly defined also and the downward tail has lateral grooving representing the wasp's striped abdomen. Another example is from South Shields in the north of England. This has the downward turning abdomen, with a hinged pin at the tail, a clearly defined thorax, wings half spread outwards and tinned, and it has a rib running the length of its back (Miket 1983, fig 72, 87). These brooches will probably be of a 2nd century AD date as, prior to that, plate brooches were only just being developed and were of tinned flat metal.

Brooches in the round, animal type, all belong to the 2nd century AD when tinning was giving way to enamelling; as the Howe brooch displays both processes, it is probably of the early 2nd century AD as such brooches had ceased entirely by the 3rd century. Too few have been found to indicate with any certainty a probable area of manufacture, but they are most likely of native British production (as are the trumpet variants), because a search through continental references reveals not one from Gaul to Pannonia.

### La Tène 1 brooch

From the abandonment in Late Phase 8 came a fibula, SF 4559 (illus 135), identified as a La Tène 1 brooch. It is a flattened brooch with a sprung pin. The bow is incised with a parallel line at either edge and bent to form a moulded catch-plate and a 'cobra-head' foot. The catch-plate and foot are decorated, the former with incised lines and the latter with feathering and incised ribbing.

The following information was supplied by the late Richard Hattatt.



Illus 135

Copper-alloy insect brooch and La Tène fibula.

La Tène brooches are extremely rare north of the English Midlands, except in the burials of the Arras Culture in N Humberside, and only three fragmentary brooches are known from Scotland. SF 4559 is of the native British 'Swallowcliffe' type which might also be classed as a sub-type of the La Tène 1 brooches, similar in practically all respects except for the bow being lengthened and straightened. Dating of La Tène brooches is extremely vague and the best estimate is probably around the 2nd century BC.

The Howe fibula is probably the most northerly 'Swallowcliffe' yet found. Until recent years all known brooches were from the Wessex area, a considerable proportion being of iron, but some of bronze. Since the excavation of the graves of the Arras Culture in N Humberside, an appreciable number have been found there also and they are nearly all of iron (Dent 1982, fig 4; Stead 1979, fig 24; Stead forthcoming on the Burton Fleming excavations). There seems to have been two centres of manufacture, Wessex and N Humberside, but SF 4559 must have travelled to Orkney and from its features it most probably came from Wessex.

Only the external chord is missing from SF 4559, but although no two are quite alike, it conforms generally with the characteristics of the type. A number have the disc foot with the small extended finial (cobra-head foot), and as in the case of La Tène 1 fibulas, a number have an apparently non-functional axis bar. However, some with the axis bar are of the mock spring mechanism where the pin is not continuous with the coil, but has one turn round the axis bar and is free to move independently. SF 4559 may well be like this.

The brooch has two unusual features. The 6-coil spring is rare on Swallowcliffe brooches. On the two or three which are known, nearly all have the usual four coils. Second the comparatively wide bow. Nearly all are rod-like and therefore with minimal decoration. One or two are known which have a single median incised line along the bow, but only one is similar to SF 4559, from Charnage, near Meare in Wiltshire, in the Devizes Museum. One further oddity is the incised decoration

each side of the disc on the foot. The decoration is more usually punch marks or dot in circles. Nearest examples are from Maiden Castle (Wheeler 1943, fig 81, 3-5) and from Ham Hill, Somerset (Fox 1958, fig 13g).

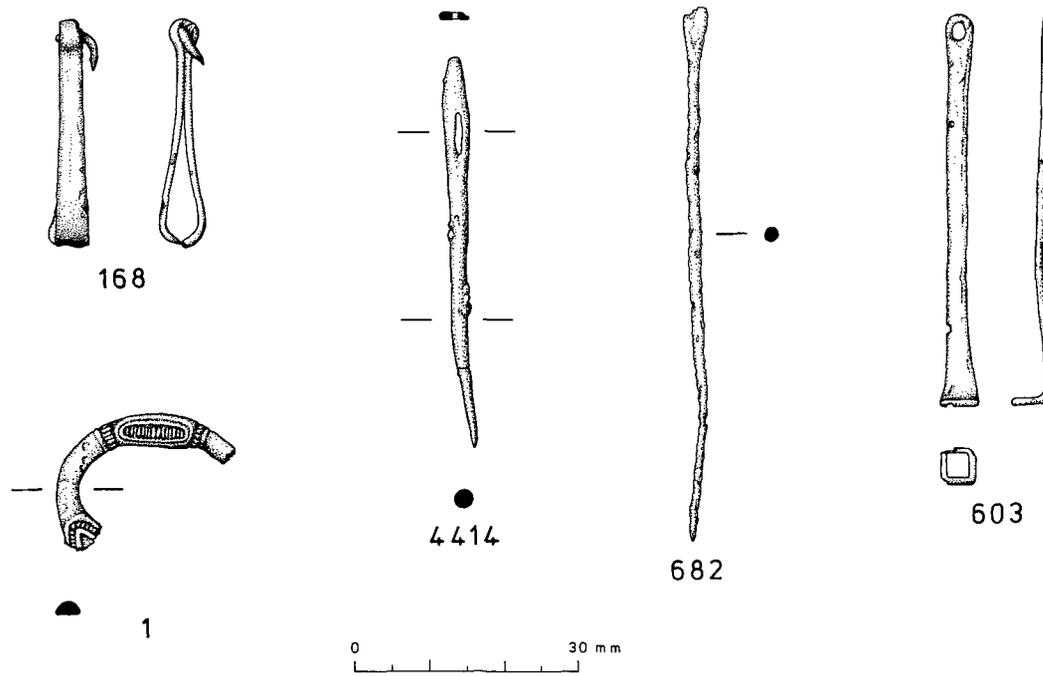
#### Zoomorphic penannular brooches

The last two brooches in this section SF 2045 and 1111 (illus 133) are complete penannular brooches with zoomorphic terminals and pins. SF 2045 has decoration beneath its terminals and a well moulded pin. It was found in a ground surface associated with the NE Building in Early Phase 8 and SF 1111 was found in stage 5 of Late Phase 8.

Penannular brooches developed in areas bordering the main centres of La Tène culture in Britain, Iberia and northern Europe. The Fowler E and F type zoomorphic brooches probably developed during the 4th and 5th centuries AD in the highland zone of Britain, because of the occurrence and distribution of zoomorphic pins (Fowler 1960, 150, 169). The zoomorphic pin, SF 4314 (illus 133), has already been described and as far as is known only Traprain Law and Howe have produced both zoomorphic pins and brooches (Kilbride-Jones 1980a, 131).

According to Fowler's classification, both brooches can be likened to her Type E which are small zoomorphic penannular brooches c 25mm in diameter (Fowler 1963, 101), and early, dated to the mid to late 4th century. SF 2045 has an elongated snout with well defined ears and eyes, and a well moulded barrel-type pin head. It is slightly smaller and lighter in appearance than its nearest parallel, a brooch from the native British site of Traprain Law (Kilbride-Jones 1980b, fig 20, 4). The decoration on the reverse is interesting, and most like a larger Irish brooch from the Roman site of Kirkby Thore, Westmorland, and brooches from Terwerd Terp, Netherland and an unprovenanced brooch of type F1 from Ireland (Kilbride-Jones 1980b, 93, fig 23, 24; Fowler 1963, fig 3, 2, 4). The latter are however dated to the 5-6th centuries.

Discussion of these brooches is not straightforward because of



Illus 136  
Copper-alloy brooch fragment, tweezers, needles and key.

conflicting ideas on dating and origin. Suffice it to say that SF 2045 could have been made any time during the late 2nd to 5th centuries AD. If it is of Scottish origin it might have Irish influence in the decoration of its terminal reverses. Its deposition during the 4th–7th centuries AD would accord well with a manufacture date no later than the 5th century AD.

Brooch 1111 is a slightly heavier and smaller brooch than 2045. It has a shorter zoomorphic snout on the terminal, almost bead eyes and no ears and the pin head is only roughly moulded compared to SF 2045. Although later stratigraphically, it may be a copy of the earlier brooch and might date to the 5th–6th centuries AD.

#### TWEEZERS

From stage 8 of Phase 8 came a small pair of flat ended tweezers SF 168 (illus 136). The enclosed loop at the top holds a fragment of ring from a suspension chain and the tweezers are not dissimilar in shape, but slightly smaller than the iron pair found in Phase 7 (see above).

Although these are probably of native origin, several examples exist from Roman Britain. A pair of large tweezers with a nail cleaner in bronze was found in Roman levels in London (BM Guide 1964, fig 5, 10), and at least two comparable pairs were found at Shakenoak, Oxfordshire dated to the late 3rd and late 4th centuries (Brodrigg *et al* 1968, pt 1, fig 29, 18; 1971, pt 2, fig 46). Copper-alloy tweezers and other toilet articles were found at both Traprain Law and Covesea. At the latter site examples of a similar shape and size to SF 168 have been noted (Benton 1930, fig 17, 1, 3, 5, 6). At Traprain Law the tweezers occurred in the later levels and Burley (1955, 131, 181–2) thought that these personal objects were imitations of Roman ones. It seems that tweezers were not particularly common during the Iron Age in the Northern Isles and this might suggest that SF 168 was imported. Alternatively, as the iron tweezers SF 2442 are in the same style, it might be suggested that they are both of local manufacture or the iron ones are a local copy.

#### BODKINS OR NEEDLES

From the topsoil was found a long needle broken at the eye, SF 682 (illus 136), and from the *E* building in Late Phase 7 another example was found, SF 4414 (illus 136). These everyday objects must have been fairly common and similar items are illustrated from Gurness, from the broch settlement (Hedges 1987b, fig 2.39). A damaged bronze needle similar to SF 682 was found at Kingdon's Workshop, Winchester, dated to the 3rd century AD (Hull 1964, fig 24, 18).

#### KEY

This artefact, SF 603 (illus 136), is made of folded copper-alloy sheeting with a punched rounded hole at one end of the shaft and a square hole in the other angled end. It has been identified as a key and was found in stage 10 of Late Phase 8, where contemporary stratigraphy produced a radiocarbon date of cal AD 560–655. Larger examples in bronze and iron are common from Roman sites, and these keys were used with a spring, barrel or barbolt padlock. Few examples have been found from native sites in the north of Scotland, but the Sculpture's Cave, Covesea, Morayshire produced both a key and a lock (Benton 1930, fig 15, 3, 4). A key formed of folded sheet bronze was found, also with a lock at Traprain Law (Burley 1955, fig 7, 461) and indeed these examples may be of Roman rather than native origin because of their design (Caroline Donaghy pers comm).

Recent research by Caroline Donaghy suggests a 7th–9th century AD date for keys of this type. 15 keys of similar size and form have been found in the Early Christian Irish crannog sites such as Lagore, Lough Faughan, Moylurg and Creevenamanagh or from the ring forts of Garryduff and Cahercommaun. She indicates that the padlocks are very similar to Romano-British types but the Irish bolts have an insular development which have no comparisons in Britain at this period. The closest parallel to SF 603 is one from Talon, Ireland, unfortunately unprovenanced, but the site was important in the Early Christian period (Caroline Donaghy pers comm).

## WIRE

Only three small pieces of copper-alloy wire were identified and from their curved appearance it is suggested that they formed part of a ring or chain-link. They were found in the settlement entranceway in Early Phase 7.

## METAL SHEETING

From Early Phase 7 onwards, several bits of thin copper-alloy plate or sheeting were found. Most were less than 1mm thick and some were obviously bits of metal folded over such as SF 4610 and 5034.

SF 4120 is the largest piece, rectangular in section and punched through by holes along the edges and through the middle, as if it had been nailed or sewn onto a backing sheet. It was found in the **SE** Building during Late Phase 7. Two other examples, SF 2132 from topsoil and SF 2358 from the Late Phase 7 S buildings, are of two broken pieces, squared along their edges, but broken across the middle. They might have formed parts of hinges or strapping.

## MISCELLANEOUS

In this category are five objects from Phases 7 to 9. A small perforated disc was found in the Phase 7 broch walls and a

fragmentary small boss found in stage 6 of Late Phase 8, need no further discussion. From the Late Phase 7 S buildings was a fragmentary plain staple or buckle, but Phase 9 produced two items of slightly more interest. One is a badly corroded coin, identified as a Charles II bawbee with a thistle on one face.

## Decorated brooch

The second item from Phase 9 was the first item found on the excavation: SF 1 (illus 136). This is a fragment of a decorated brooch, semi-oval in shape with incised decoration in an enclosed and bordered cartouche on the main part of the piece. It also has a bordered dot design on the surviving arm. This was latterly identified by Stevenson (pers comm) as a post St Ninian's Isle Pictish brooch and comparable to one thought to come from Rogart in Sutherland (Wilson 1973, pl 37a). Stevenson suggested a date of the mid 9th century AD for this artefact.

## Unconserved pieces

Several very small pieces of fragmentary and unidentifiable copper-alloy were found, eight from Early Phase 7, two from Early Phase 8, five from stage 7 of Late Phase 8 and four from Phase 9.

## CONCLUSIONS

Only three main metals are represented at Howe, from which all the objects have been made, these are iron, copper-alloy and lead. Lead is accounted for in only one object, whereas there are almost twice as many iron artefacts as there are of copper-alloy. Some copper and a little silver has been identified on two items, but these were incidental occurrences.

The distribution of the metals (copper-alloy and iron) changes over time as described above. Iron remained the dominant metal during Phases 7 and 8, with a high point in Late Phase 7 when iron production at the site was at its peak. In contrast, copper-alloy artefacts gradually declined in numbers during Late Phase 7 and Early Phase 8 to rise again in Late Phase 8. Copper-alloy was exclusively used for personal items, which survived in remarkably good condition. The majority of iron finds are of artefacts – nails, blank pieces and waste or partly processed iron. The use of iron for personal objects remained constant at 2 to 4 pieces throughout Phases 7 and 8, but in general their preservation was poor.

Of the iron artefacts, 60 items are identified as waste fragments and ore, and combined, with the evidence of smelting and smithing on the site, this suggests that almost all the iron objects were produced at the site. The iron-working evidence (see 8.7 Slag report below) indicates a small, intermittent production which was technologically not very advanced, using locally available ores in small furnaces, producing iron for purely a domestic market. The Later Phase 7 industrial hearths in the **NE** building indicate a smithy (although no smithing tools were found), which probably produced the knives, chisels and nails found on the site. All the items were relatively small, which may indicate that any larger, heavier and therefore more costly items had to come from elsewhere.

The decorated pin, SF 284 (illus 130), is probably the only iron item which was not made at the site. The techniques of milling and the application of stamped gilt discs and inlay, are unlikely to have been carried out at Howe as all the other iron objects were undecorated. As a similar pin was found at the East Broch of Burray, it is highly likely that the Howe example was imported.

Although items such as the iron pin with a paste head, SF 5502, and the razors are of local production (both from Early Phase 7), they are extremely difficult to date accurately within the Iron Age period, largely because of insufficient parallels and related C14 dates. Therefore the iron artefacts can be of little use in dating events at the site.

The circumstances of the copper-alloy artefacts is the reverse of the iron finds. The copper-alloy items are

well-manufactured, but there is little evidence to suggest they were produced on the site. Only four or five pieces were identified as crucible fragments (see 8.10 Other Fired Clay below), used for the melting of copper-alloy. Only one of these was from Phase 7, when the highest number of copper-alloy artefacts occurred. Waste fragments of copper-alloy from both Phases 7 and 8 only amount to 14 pieces, and may represent corroded and fragmentary objects rather than actual waste copper or bronze. The total absence of clay moulds, in contrast to the later phases at the Broch of Gurness or the Brough of Birsay, indicates that few, if any, of the copper-alloy pieces were manufactured at Howe. The exceptions are the simple projecting ring-headed pins which could have been produced with the aid of the stone mould, SF 4302, found in an Early Phase 8 context.

A wide range of copper-alloy jewellery was recovered from Howe even though the numbers in the individual categories were small. The collection compares well with comparable sites such as the Broch of Gurness, Dun Mor Vaul, Clickhimin and Jarlshof, where manufacturing equipment was present, in particular at the two former sites. The range of both copper-alloy and iron artefacts from Howe is in fact more varied than at Gurness, although the differences may be due to excavation techniques and preservation rather than the site economy.

The earliest dated copper-alloy artefacts from Howe are the La Tène brooch, SF 4559, and the La Tène type elbow studded brooch, SF 4932. The former is possibly Irish or a copy of an Irish design and the latter is probably from Wessex. Both are attributed to the 3rd and 2nd centuries BC, but were found in rubble contexts in Phase 7 and 8. It would appear that these, as well as one of the projecting ring-headed pins from Phase 5/6 (also dated as early as the 2nd century BC), indicate an importation to the site of foreign jewellery from the beginning of Phase 7, if not from as early as Phase 5/6.

From Early Phase 7 (*c* 1st–2nd century cal AD) are two items, the beaded projecting ring-headed pin, SF 7097 (illus 133), and the disc-headed pin, SF 2688. The former is placed in the 3rd or 4th centuries cal AD or earlier and from its context within a wall of Early Phase 7, it is probably earlier. The disc-headed dated to the 1st century BC–2nd century cal AD, was found on the earliest floor of the broch tower. The dates complement each other but what is of equal importance is the influx, or continued influx of jewellery from Celtic areas (of Scotland or Ireland) and from coastal Eastern Scotland.

In Later Phase 7 (*c* 2nd–4th centuries cal AD), the western and eastern coastal trades are maintained with both jewellery of Irish origin (long pin, SF 4775, and a pin head, SF 4396 (illus 134)) and Romano-British (ribbed pin, SF 2927 (illus 133), and the insect brooch, SF 2347 (illus 91, 134)). Both the ribbed pin and the insect brooch are mainly confined within the 2nd century AD (certainly no later than the mid 3rd century for the pin), and dated stratigraphically to earlier than the 4th century cal AD.

The simple rings, chain links, a spiral ring and projecting ring-headed pins found throughout Phase 7 (and from as early as Phase 5/6) indicate the links with a common Iron Age culture from the Late Bronze Age to the 5th century AD. These probably were some of the most ubiquitous copper-alloy artefacts in the Northern Isles and Scotland with their fashion persisting for a long period of time.

Late Roman influence persisted into Early Phase 8 (from the 4th century cal AD onwards), with the occurrence of the swollen shanked pin (SF 2833, illus 134) of the 5th–6th centuries AD. One of the two zoomorphic penannular brooches (SF 2045, illus 133) was also found in Early Phase 8, dated from the late 2nd to the 5th centuries AD from the Highland zone of Scotland.

Roman type tweezers of the 3rd–4th centuries AD and the East Scottish proto ibex-headed pin SF 1729, of a 2nd–4th centuries AD date, were found in Late Phase 8 (7th to possibly as late as the 9th century cal AD), along with the second Scottish zoomorphic penannular brooch, SF 1111, dated to no later than the 6th century. A related zoomorphic pin SF 4314, also from Scotland, although unstratified is dated to the 4th–5th centuries AD, and was no doubt in use during Phase 8.

Two last items, a key SF 603, and a post-St Ninian's Isle Pictish brooch fragment SF 1, can be assigned respectively to the 7th–9th centuries and to no later than the mid 9th century AD. The key was found in a context dated to the mid 7th century cal AD by C14 which does not help in the decision as to whether this is

a contemporary Irish artefact or a slightly earlier Romano-British one. The post-St Ninian's Isle brooch came from Phase 9 and suggests a date for the final occupation of the site.

The copper-alloy artefacts are remarkably consistent with the site stratigraphic phasing and the C14 dates, given the problems of finding realistic comparable examples from other sites with good stratification and datable events. The artefacts indicate that, from as early as the 3rd century cal BC to possibly as late as the 9th century cal AD, the inhabitants of Howe came into possession of pieces of jewellery which were in current circulation. These pieces entered Orkney from the west, from Ireland and the east and south from Scotland (and England), presumably along coastal routes. The iron drum-headed pin, was however probably made in Orkney, but not at Howe. During Phase 8 when the apparent wealth of the settlement was in decline, the movement of jewellery into the site was maintained from the same areas.

## 8.7 • SLAG REPORT

JG McDonnell

with an additional note by D Ferguson

Evidence of iron-working at Howe was found in the form of slag, ores, hearth and furnace lining, fuel ash and cinder as well as iron objects. Almost 200kgs of this material was found mainly from Phases 7 and 8 (Table 58). The bottoms of furnaces, were located on the site in both domestic buildings and workshops, and one smithy was positively identified (illus 55).

All the slag material was weighed and identified (Table 59); certain samples were selected for further scientific examination. Although slag and iron residues have been found on other Iron Age settlement sites in the north of Scotland and the Northern Isles, the excavation of Howe represents one of the best stratified and longest sequences of iron manufacture in the region.

Table 58: Slag Distribution by Phase (weight in kgs)

Phase	Smelting Slag	Smithing Slag	Ore	F/H Lining	Cinder
4					0.600
4/5					0.001
5		0.425	0.050	0.020	0.015
5/6	0.020	0.155	0.030	0.010	0.020
6				0.020	
Broch Phases					
7	36.811	31.310	14.226	30.620	14.950
7/8	0.050	0.090	0.300		0.625
8	34.365	15.169	14.235	1.040	3.402
9			0.030	0.350	0.015
Total	71.246	47.149	28.871	32.060	20.528

Table 59: Slag residue classification

Residue type	Weight (Kg)
Smelting Slag	68.7
Slag Cakes	11.0
Ore	28.0
Smithing Slag	32.3
Hearth Bottoms	6.4
Furnace/Hearth Lining	32.1
Cinder	10.8
Fuel Ash Slag	9.7

## IRON-WORKING PROCESSES

Before looking in detail at the material from Howe, it is important to look at the nature of the processes from which it would have derived. The action of obtaining iron from its ore and manufacturing artefacts can be divided into two processes. Firstly the extraction of the metal from the ore, the smelting process, and secondly the production of artefacts and their subsequent repair, the smithing process.

### THE SMELTING PROCESS

The smelting process is the reduction of the iron ore by a reducing medium, carbon monoxide, to form a bloom of metallic iron. During the process the iron never becomes fully liquid, but remains in a pasty state. The non-metallic content of the ore – the gangue – forms slag which becomes fluid with a varying degree of viscosity, and is removed during the process. Three components are required for the smelting of iron: ore, fuel and furnace building material. Ore sources are widespread in Britain, and in the upland zone, bog ore may have been the primary ore source. Hardwood charcoal was the principal fuel, although peat charcoal could have been used. Furnaces were normally built in either clay or stone, or both. Various furnace typologies have been proposed (Cleere 1972, 8–23), but none have proved fully satisfactory. The common furnace type was a shaft 0.3–1.0m in diameter, and up to 2.0m high, with variations in methods of slag removal and air input, via tuyères. The furnace would have been charged with a suitable fuel and ore mix, and air was blown in at the base of the furnace. The slag may have been removed periodically until a large enough bloom of iron had formed, c 10–20 hours after commencing the smelt. The bloom was removed and was then subjected to primary smithing to remove entrapped slag. The refined bloom could then be either used to produce artefacts directly or traded, perhaps as bar-iron.

### THE SMITHING PROCESS

The secondary process, that of smithing, was the manufacturing of artefacts from the bloom or bar-iron. The process was carried out in an open smithing hearth which could be a simple ground level domestic hearth, or a purpose-built forge. The iron was worked at various temperatures depending on the work being carried out, from simple forming to high temperature fire welding at 1100°C. The smithing process encompasses a number of manufacturing techniques: metal forming, welding, heat treatment (quenching and tempering), and carburization.

Smelting and smithing processes can be carried out either on the same site or different sites. Smelting furnaces can occur singly, supplying an immediate local need, or in groups on an industrial scale. Similarly, smithing can be an occasional operation in a simple hearth or a permanent, full time, smithy.

### EVIDENCE FOR SMELTING AND SMITHING

A classification of early iron-working residues has been proposed (McDonnell 1986), and the following discussion outlines the residue types associated with each process (Table 59).

The products from smelting are the bloom of iron and the residues, which comprise the furnace itself and the slags removed from the furnace during or after the completion of the smelt. The bloom is rarely recovered and only the residues survive. The furnace structure rarely survives above the base and normally not more than about 0.5m is found such as Levisham, North Yorkshire (Hayes 1983). Fragments of the vitrified furnace lining are recovered, but much of the structure would only have been mildly fired and may degrade after burial.

The smelting slags occur in a number of forms, most

characteristically as tap slag, lava-like plates, with a ropey morphology. This slag is tapped out at high temperatures of 1000°C plus, and is normally associated with Roman or medieval technologies. The slag could also have been tapped out into small pits in front of the furnace, resulting in plano-convex cakes of slag varying in size from 0.1–0.5m in diameter. Mineralogically smelting slags normally comprise three phases: firstly, iron silicate ( $2\text{FeO}\cdot\text{SiO}_2$ ), occurring as laths or massives; secondly, iron oxide, usually Wustite ( $\text{FeO}$ ) in dendritic form and thirdly a glassy phase containing other gangue elements, principally the alkaline metal oxides. The quantity of free iron oxide is indicative of the efficiency of the smelting operation, the more free oxide present the less efficient the process. Other residues are present including cinder/clinker, partially consumed ore fused with charcoal.

The products of the smithing process were the artefacts, and the residues which are similar to those from the smelting operation. The structural remains depend on the type of hearth used, but vitrified hearth lining is commonly found. The principal residue is smithing slag occurring characteristically as hearth-bottoms, plano-convex accumulations of slag, ranging from 0.05–0.2m in diameter. Smithing slag derives not from the slag inclusions in the metal but from the application of a flux, normally a sand, to the surface of the iron during heating to inhibit oxidation, *burning* of the metal and to facilitate welding. It has a similar chemical and mineral composition to the smelting slags. The second characteristic smithing residue is *hammer scale*. It occurs in two forms, as flake (similar to fish scale) and as spheroidal (spheres 1–5mm in diameter). Hammer scale is formed in two ways, either from oxide layers flaking off the iron during hammering or as slag particles forcibly ejected during hammering and particularly during welding. Hammer scale is often strongly magnetic due to the presence either of small particles of metallic iron or the magnetic iron oxide, magnetite ( $\text{Fe}_3\text{O}_4$ ). Smaller quantities of other residues also occur including cinder and fuel ash slag.

### IDENTIFICATION OF IRON-WORKING ACTIVITY

The recovery of iron-working residues does not in itself indicate that smelting or smithing was practised on the site in antiquity, since there are great problems of residuality and the common use of slag for hard core and similar uses. Slags are commonly found in features contemporary with, but not technologically associated with, iron-working such as pits and ditches.

The identification of iron-working activity relies on the correct identification of the residues, in particular the slags. The slags produced by early smelting and smithing technologies are often difficult to distinguish visually, and may prove equally difficult to identify after chemical and mineralogical analysis. The quantity of slag encountered from archaeological excavations inhibits detailed analysis of a large number of samples. Therefore there is a heavy reliance on visual, morphological analysis with a limited scientific analyses.

The diagnostic slags (Table 59) are the smelting slag and slag cakes indicative of the smelting process, and the smithing slag and hearth bottoms indicative of the smithing process. A number of hearth soil samples were examined for the presence of hammer scale, and the distribution of furnace/hearth lining is indicative of periods when hearths or furnaces were in operation. Vitrified clay lining is not diagnostic of the iron-working process and may derive from other pyrotechnological processes. The distribution is shown in Table 58, where slag types have been added together to show total smelting and smithing slag for each phase.

There were a number of hearths or furnaces that were structurally different to the domestic hearths to suggest that they were industrial. The nature of the smelting process dictates that the greater portion of the furnace was super-structure, above ground, and therefore unlikely to survive in the archaeological record. It is

consequently difficult to interpret a burnt clay base as a furnace, and then to ascribe it to a typology. The smithing hearth is more difficult to identify, as mentioned above, as any hearth can be used to smith iron. A purpose-built smithing

hearth may be waist high (as indicated by documentary evidence, for example representations of Regin and Sigurd (Clarke 1979, 103)), and the difficulties of interpretation arise again.

## THE HOWE RESIDUES

Approximately 200kg of residue was recovered from the excavation and was sorted into eight categories (see Table 59). A general description of the morphology of each is given below.

### RESIDUE TYPES

#### SMELTING SLAG

This was of the raked type, although some of the more typical tap slag was present. The smelting slag occurred as randomly shaped lumps of differing weight and dimensions, and was characterized by its vesicular texture. Some of the pieces had *run* surfaces and charcoal impressions up to 2cm in diameter and 4cm in length.

#### SLAG CAKES

These were plano-convex lumps of smelting slag. Nine cakes were recorded and had mean dimensions of: weight 400gms, maximum diameter 100mm, minimum diameter 75mm and depth 30mm. They were formed by raking out the slag into a pit in front of the furnace. The morphology of the cakes was similar to that of the smelting slag, although the cakes tended to be less vesicular and lacked charcoal impressions, but had run surfaces similar to tap slags.

#### ORE

The material identified as ore occurred as large plano-convex lumps and as individual small lumps. The ore was probably deposited in a water environment, and was generally classed as a bog ore. The source, presumably local has not been identified. The ore had a friable texture and contained black inclusions, possibly manganese, which would accord with a bog ore source.

#### SMITHING SLAG

This is the randomly shaped pieces of slag formed in the smithing hearth that were removed before developing into hearth-bottoms (see below). It has a lower apparent density than smelting slag due to the greater number of vesicles. It may also contain foreign matter such as pebbles and other hearth debris.

#### HEARTH BOTTOMS

These are lenticular accumulations of slag that develop in the

smithing hearth. Only a small part of the hearth is utilized to heat a short length of the iron being worked, hence the accumulation of slag in one region of the hearth. The hearth bottom would be removed when it became too large and interfered with the efficiency of the hearth. The site produced fewer hearth bottoms than was expected, but with average dimensions of: weight 255gms, maximum diameter 90mm, minimum diameter 65mm and depth 30mm. The dimensions are similar to those of the smelting slag cakes, except that they weigh significantly less, confirming their lower apparent density.

#### FURNACE/HEARTH LINING

This was typical vitrified clay lining. It is not possible to distinguish between hearth and furnace lining on a morphological basis. Only the areas of highest hot face temperature became vitrified, and these areas normally occurred only in the tuyère region of the furnace or hearth. The tuyère mouth, the hole through the lining through which the air was blown, was often preserved. It was usually 10–20cm in diameter, and one possible tuyère mouth was recovered SF 7208, from Phase 7 (see 8.10 Other Fired Clay below).

#### CINDER

This was slag which contained a greater silica content and had a lower density than other slags. The majority of cinder probably derived from the smithing process and the quantity which containing unreduced ore from the smelting process, was small.

#### FUEL ASH SLAG

This type of slag derives from a high temperature reaction between the ash content of the fuel and siliceous material such as clay. It may also contain high alkali metal percentages. Fuel ash slag may derive from any pyrotechnological process, including the domestic hearth. It is therefore non-diagnostic of iron-working processes.

#### HAMMER SCALE

This is scale which falls from the iron during hammering. Some soil samples were specifically checked for hammer scale from Early and Later Phase 7 (see archive report) and some possible hammer scale was recovered from sieving of other samples.

## DISTRIBUTION AND LOCATION OF RESIDUES (Tables 58, 68mf)

### PHASES 3–6

From the Early Iron Age, Phases 4 to 6, small samples of iron-working debris occurred. However, a bowl hearth from Phase 3 was excavated but it was of *indeterminate function and could not be ascribed to the iron-working processes*. There was no evidence of iron-working prior to Phase 5, although a significant quantity (600gms) of fuel ash slag was present in a Phase 4 floor. The presence of this slag in a single context suggests that it derived from a single series of fires, hearths or kilns.

Slag residues were also found in Phases 5 and 6. A little slag was

found within the Broch 1 building, but residues were also located in ramparts and ditch fills associated with both Phases 5 and 6. One clay-lined bowl hearth was noticed in Phase 5/7, but again it could not be ascribed to the iron-working processes with certainty. The earliest deposit of smithing slag occurred in Phase 5, in a rubble context. Although it was not a sufficiently large quantity, it shows that iron was being smithed in this period. In Phase 5/6 a small quantity of smithing slag was associated with a hearth in a building in the enclosure, and a large quantity of fuel ash slag with a heavily burnt area. The latter was not associated with smithing activities and was probably generated by similar processes proposed for Phase 4.

Indeed, it is possible that most of the residues were derived from the later activities of Phase 7. The working-over of rubble layers, rebuilding of ramparts, and the clearing of buildings could account for the small amounts of residue and their wide dispersal in Phases 4 to 6.

### PHASE 7

Constructional work in Early Phase 7 with later demolition and levelling, caused slag to be incorporated into contemporary walls, other structural features, floors and ditch and rubble fills. However, there were significant concentrations of slag in certain buildings, usually associated with other related features, which suggested that iron-working took place.

Evidence for this activity mainly survived in the *E* building and its yard of Early Phase 7 where 3.4kg of ore (of which 2.9kg derived from a single, rubble levelling, context) was found. Two furnaces, identified from their burnt circular form, were found in floor levels of the building and in one of its cells, and a number of small stake holes were probably related to the superstructures of these. Both furnaces had been cleaned out completely and no residues were found with them. Their interpretations as furnace bases must, therefore, be conjectural.

A base of a smelting furnace in the *NE* building was found along with its tapping pit, the pit into which the slag was raked out or flowed out of the furnace. The absence of diagnostic slag within these contexts is not unusual as the slag was removed and thrown away. The furnace cannot be ascribed to any type with certainty, but was probably a *shaft furnace* which was raked out or tapped. More substantial remains of similar furnaces have been excavated at Levisham (Hayes 1983) and Ashwicken (Tylecote 1986).

### SMITHY IN THE *NE* BUILDING

In Later Phase 7, the highest amounts of slag residues were found in the *NE* building and the *NE* and *E* yards, with smaller amounts in the *SE* building and the *S* workshop. Many hearths, and indeed some buildings, were exclusively used at certain periods for iron-working. From the evidence presented below, it is certain that the *NE* building functioned as a smithy during most of this phase. A hearth and its ash fill, from the middle stage of occupation of the *NE* building, contained a small quantity of smithing slag and the ash also contained spheroidal hammer scale.

From the last occupation of the *NE* building in this phase, two contexts contained sufficient evidence to indicate the area had been used as a smithy. Smithing slag weighing 8.5kg, hammer scale, hearth lining and cinder were present. Both contexts could have been smithing hearths; although the fill of 1634 did not contain hammer scale, it did have highly magnetic material and a large quantity of cinder (4.35kg) was also recovered. These two consecutive groups of contexts suggest the use of the building as a smithy.

A quantity of smelting slag (45kg) recovered from Late Phase 7 indicates a single smelting operation, rather than a sustained 'campaign' (see evidence from Amersham Mantles Green, Bucks, (McDonnell 1987?)). Seven rubble contexts in the *NE* and *E* yards contained more than 1kg each of smelting slag, the largest quantity recovered was 26.5kg from context 1323. Within the *NE* building yard was a furnace dump which included 13.5kg of furnace lining, 10.5kg of fuel ash slag / cinder and 3kg of smithing slag. It is therefore clear that both smelting and smithing were carried out in the vicinity of this building.

10.7kg of ore was recovered from the rubbles of the Late Phase 7 *S* workshop and from rubble in the *NE* building, which indicated smelting activity on the site and suggested stages in ore processing or storage. It may be assumed that the ore recovered from the rubble, which was associated with slag, was ore that had been rejected.

### PHASE 7/8

Small amounts of slag came from the later workshop floors within the broch tower during Phase 7/8. Also present in the third floor was a clay-lined pit with its bottom layer of cross-laid willow (*Salix*) charcoal still intact (see 7.2 Plant report above). There were, however, no specific residues found with it. It may have been a failed furnace base, but it was not associated with any other iron-working features or residues.

### PHASE 8

Early Phase 8 contexts produced small quantities of slag which was probably residual material from the Later Phase 7 activity in the *E* and *NE* parts of the site. Most of the contexts contained less than 0.5kg of residue, but larger quantities were present in levelling rubbles, indicating the reworking of areas containing slag.

A detached building, on the SW side of the site, may have been used exclusively for iron-working during a second period of activity. Smithing slag was recovered from the hearth and associated levels. It could either have been a smithing hearth or a dump of hearth material within the *W* workshop. However, the evidence may indicate this building was a smithing shed. During this period, the abandoned broch tower was infilled with rubble and other debris, including a 12.5kg quantity of iron ore, which could have been associated with the Late Phase 7 activities in either the *S* workshop or the *NE* building.

The second period of major iron-working activity occurred in Later Phase 8. 25kg of smelting slag was recovered, the major part from a single context within ash during stage 7. Smithing slag, both primary and secondary, was also identified from the same context. There was no large deposit of furnace lining and no ore as there was with the Later Phase 7 activities, but an iron-working shed is probably indicated.

The high amount of slag from this area is probably accounted for by a short period of intense activity related to smelting and smithing, before a dramatic and almost total decline of iron-working on the site. Small quantities of iron-working residues found in later stages of Phase 8 suggest residual material which had been reworked into walls and rubble layers. The quantities are considerably lower than what is expected for phases containing residual amounts of slag from earlier activity. This suggests that there was very little disturbance of the Late Phase 8 deposits by subsequent activity.

A reasonable correlation is found when comparing the amount and distribution of iron-working activities to the location and numbers of iron artefacts (8.6 Metal Artefacts above). Artefacts begin with low numbers in Phase 5/6 and gradually increased to a peak (31 items) in Later Phase 7, associated with the *NE* building smithy. From then on numbers of artefacts declined, but there was a slight surge to a maximum of 10 in Early Phase 8, linked to the *W* workshop. There was not however, a corresponding increase in the number of artefacts associated with the stage 7 iron-working activities, and only one or two more iron artefacts were found before the end of the settlement.

## ANALYSIS

For more positive identification of some of the slags, seven samples were selected for further analysis by a Scanning Electron Microscope for bulk and phase chemical analysis. These were a smithing slag hearth bottom from Phase 5, smithing slag from the

*NE* building during Later Phase 7, smelting slag from the *NE* building yard in Late Phase 7, and a smelting slag from stage 3 of Late Phase 8. The detailed analyses and the accompanying Tables (60-68) are available in microfiche (3:E9-F5).

The bulk analyses revealed that the Howe slags all showed, relatively high levels of MnO (manganese oxide), the exceptions were a sample in the Later Phase 7 **NE** building and the stage 3 Late Phase 8 sample. The results of the latter sample as it came from a Later phase of iron smelting on the site, may indicate that it derived from a different ore source which may not have been as rich in MnO as the ores used in Phase 7.

In general the smithing operation was very inefficient, indicated by the high percentage of free iron oxide present in the smithing slags. Efficient smithing would have used sufficient sand to inhibit the oxidation of the metal.

#### A NOTE ON THE ANALYSIS OF ORE AND SLAG David Ferguson

It is clear from the slag analysis (Tables 60–67mf) that in general the iron ore used had an extremely high manganese content. It is also to be noted that certain of the analyses indicate relatively high NiO, CoO and CuO contents. *Psilomelane* (the principal ore of manganese) is chemically surface active and would act to some extent as an ion exchange medium on any groundwater or ascending hydrothermal fluids containing Co, Ni, and Cu even in trace amounts leading to their concentration in the manganese

phase. Dana (1932, 509–510), describes a suite of minerals which are basically oxides of manganese with enhanced values of Co and Cu. Although not specifically stated it would be expected that Ni would also be concentrated to some extent given its close chemical similarity to Co and Cu.

Although oxides of iron occur with the manganese deposits at the Lead Geo, Hoy, it is clear that the early Orcadian miners found it impossible to separate the two ore types. It is suggested that MnO contents of primary slags are extremely fortuitous and dependent on the chance selection of batches of high and low MnO ores, as the ore body as described by Heddle (1878) seems to be quite variable in composition as regards FeO and MnO. Even with today's sophisticated metallurgical techniques, separation on a purely physical basis would be almost impossible.

#### CONCLUSION

On this evidence, it could be proposed that the iron ore used at Howe was extracted from deposits at Lead Geo, Hoy. So far as can be determined no bog ores high in MnO have been reported in Orkney. It is also suggested that the texture and general appearance of ore recovered (described above) will be identical to that described by Heddle (1878) as coming from the Lead Geo.

### DISCUSSION AND CONCLUSIONS

From the evidence of iron-working discussed above, it would seem that the activities were rather sporadic, domestic in character and rather inefficient. Iron-working was not clearly identified before Phase 5 although some of the Phase 5 samples could be as early as Phase 4, as they were found in rubble connected to rampart construction, or as late as Phase 6 from domestic contexts as well as from the defences. The rebuilding of the defences and the wholesale clearance of the enclosure buildings, as well as the floors of both roundhouse and Broch 1, have left little *in situ* evidence to establish the beginnings of iron-working on the site. Artefactual evidence from Phase 5/6 is slight, two iron objects, and does not help the problem. It is only possible to suggest that iron-working at Howe probably began sometime during Phases 5 or 6, after the 4th century cal BC and before the 1st century cal BC.

Evidence for iron-working is found in Early Phase 7, not from the broch tower but from the original floor in the **NE** building and a secondary floor in the **E** building (illus 34; 36). In total this amounts to probably three furnace bottoms and to the presence of ore across the yards of these two structures. Only 14 recognizable objects were recovered (8.6 Metal Artefacts above), but these included pins, blanks, nails, one razor and one knife. From the evidence of the surviving furnaces, which were largely eradicated and the general tidy appearance of the Phase 7 village, it would seem that most of the presumed evidence for iron-working is missing. It is not inconceivable that the artefacts were manufactured on the site from iron produced in the **NE** and **E** buildings. All other evidence suggests that the **E** building was a domestic structure and although the **NE** building had been largely cleared of its original floors from this phase, its arrangement of furnishings indicated that it was also originally domestic (illus 34). In Early Phase 7, it is suggested that there was no specialized building for iron-working.

After the levelling of the Early Phase 7 village, subsequent rebuilding and occupation of older houses, the evidence of iron-working indicates a change in the character of the settlement. The **NE** building remained at first a domestic structure, but was later turned into a smithy (illus 54; 55). As such, its use may have been intensive but relatively short-lived, as it only experienced one series of alterations including the replacement of its hearth. Most of the iron-working evidence for this building relates to smithing. Evidence for the associated and necessary smelting processes were not found within the smithy but outside in the open yard where a dump of furnace-lining material was found. It would seem that smelting took place there, although no related structures were found.

Finished artefacts for this phase were slightly less numerous than in the preceding half of Phase 7, but more waste metal and lumps of magnetic iron were found. The latter may indicate partly processed iron which was awaiting further working (8.6 Metal Artefact report above). Unfortunately the artefactual evidence is not particularly helpful in determining what objects were manufactured, but nails and bars or blanks were amongst the most numerous finds.

Some ore was found associated with buildings in the S of the settlement. Here, ore processing and storage may have taken place, especially to the immediate E of structure **B** (illus 51) where a hearth, either enclosed in a lean-to structure or open, was located. Possible iron-working was noted in the broch tower on its penultimate floor, but no other locality produced the evidence for a concentration of activity or specialization that was experienced in the **NE** building.

It would appear that iron-working residues from the **NE** smithy were well distributed across the E half of the site in rubble contexts and later walls. These residues were still being disturbed and moved about during Early Phase 8 building activities.

In Early Phase 8, the only structure in which iron-working took place, that of smithing, was in building **W** in the SW part of the site (illus 62). Like the **NE** building, this structure may have been altered to accommodate a smithy with the construction of a larger hearth. From structural evidence it would seem that after its alteration the building was relatively short-lived.

The last definite activity associated with iron-working took place on the E side of the site, in the passage between structures **C** and **F**, in stage 7 of Later Phase 8 (illus 68). To all intents and purposes the structural evidence suggests that this area was open. However, it is possible a lean-to shed existed given the amount of smelting slag which was found. It is unknown whether this material represents a single event or a series of furnaces, but the activity was short-lived. Smithing slag from the same area may indicate iron processing within the other known structures of stage 7 or in an adjoining area, but beyond the limits of the excavation. As with Later Phase 7, the most numerous artefacts found in Later Phase 8 were nails, bars or blanks and waste metal.

The iron-working activities were not continuous at Howe; it is not possible to determine the level of productivity from the number of surviving artefacts. The residues indicate a domestic demand and importance in the economy which was supplied from iron-working within the settlement. As mentioned in both the metal and stone artefacts reports (8.6 and 8.3 above), iron-working tools were not found. The evidence does not indicate the presence of skilled itinerant iron workers or smiths. The only indication of changed techniques lies in some of the residues from Late Phases 7 and 8, where lower manganese oxide levels have been recorded, perhaps indicating a change in the ore source.

From the report and comment it is obvious that more research must take place in the identification of major ore sources. The problem of high manganese in the residues is unresolved requiring further research. The use of bog ore cannot be assumed if residue analysis points to an alternative mineral source. Indeed, the identification of an ore source on Hoy may prove to be extremely important in considering prehistoric iron-working on Orkney. It poses questions about mining techniques and initial processing of the ore, as well as transportation of a bulky material across land and water and suggests the need for comparison with residues from other sites.

At present, comparison of the Howe residues with other published sites is not particularly fruitful. The main Orcadian and Shetland Iron Age settlement sites which have been published are mainly monuments on display to the public, for example, the brochs of Gurness and Midhowe in Orkney and Clickhimin and Jarlshof in Shetland. The small quantity of debris from these sites suggest, not that iron-working was unimportant, but that iron-working residues have either not been recognised and kept, or more significantly, iron-working contexts have not been fully excavated. Hearths indicating iron-working have been preserved at both Gurness and Midhowe but are not analysed. The evidence from these sites does, however, suggest that iron-working took place (Slater 1984, 298–300), and from as early as the roundhouse period at Jarlshof (Hamilton 1956, 61). The roundhouse at Bu however, yielded no identified iron-working slags.

Comparison with the historically slightly later sites (Pictish or pre-Norse and Norse) at Birsay and the Brough of Birsay is also difficult. At the Brough, a similar situation is suggested by the evidence as at Howe. Most of the iron artefacts were corrosion products and only one building was identified as a possible smithy, but with a forge (Hunter 1986, 198–203). The total residue amounts were less than at Howe, but they were interpreted as coming from non-intensive iron-working. At other Pictish and Viking sites within Birsay the most commonly identified iron objects were nails and knives.

Evidence of iron-working in the Northern Isles is woefully inadequate, and leaves Howe in the position of having the largest quantity of slag residues, from the best stratified occupation sequences, to date. It may be interesting to speculate from the Birsay evidence (*ibid*) that iron-working technology did not necessarily improve during the Norse period. The struggle to produce iron from low grade ores with a declining charcoal source was not new but had been an ever present problem throughout the Iron Age at Howe.

## 8.8 • THE GLASS

Julian Henderson

Very few glass objects, seven in total, were found at Howe and most of these were beads; they came from Early Phase 7, Early Phase 8 and Phase 9.

The detailed description of each bead is in the microfiche catalogue (3:F6). The beads from Howe are important because, unlike a high proportion of other Scottish finds, they were derived from mainly secure contexts. Many unprovenanced or poorly provenanced Scottish glass beads probably date within brackets covering the first millennium BC and the first half of the first millennium AD. The beads from Howe fit in well with the established typology by Guido (1978) and their chemical analyses (Table 69mf, 3:F7) have a bearing on the existing chemical analyses of Scottish bead types of probable Iron Age and later Iron Age date (Henderson 1982; Henderson & Warren 1983). Since the Howe beads can be dated, they at least provide a basis against which to compare the same or similar types with no context.

### DESCRIPTION AND LOCATION

#### CLEAR VESSEL GLASS (illus 137)

From an abandonment horizon within the broch passage and extending outside beyond the broch, came two pieces of fine clear glass, SF 36 and 37. The two pale green glass fragments are of a bubbled rather poor metal. SF 36 has an applied trail of glass and would fit in well with other 3rd–4th century AD Roman glass vessel fragments. This fragment is possibly from a bowl. The two vessel fragments have a very similar soda-lime-silica composition with the relatively high manganese oxide content regularly found in Roman glasses. The green colour is caused by the levels of iron and manganese oxide in the glass.

A blue coloured vessel was found at Burrian, North Ronaldsay (MacGregor 1974, 100) and a fragment of a glass bowl in a cist in Westray. Both were thought to have been Roman in origin (Curle

1932, 394). Roman glass was also found in all levels at Traprain Law and at Dun Mor Vaul (MacKie 1974b, 149) indicating its common occurrence on sites which had some Roman contact, no matter how distant.

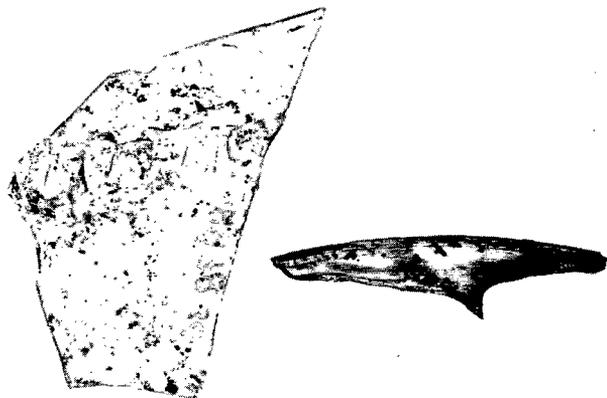
#### BEADS

#### HIGHLY DECORATED MULTICOLOURED BEADS (illus 107; 138a)

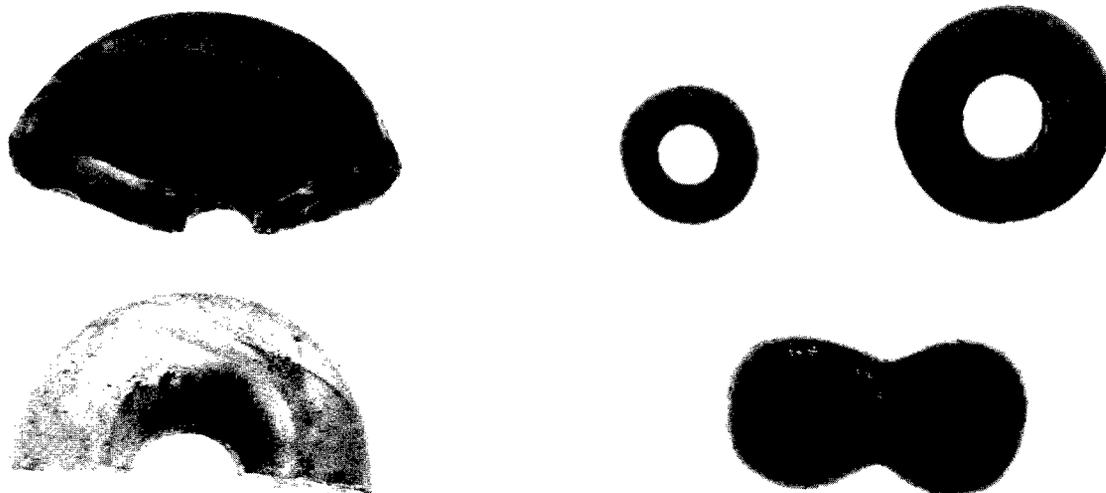
SF 5077 and 5142 both came from the earliest floor of the Phase 7 **E** Building, with the former from within the furnace bottom. SF 5077 is a translucent globular bead fragment with applied surface bands of purple and white, and yellow and white opaque glass. In contrast, SF 5142 is half a flattened bead of colourless and transparent glass with applied surface streaks of opaque white and yellow glass.

Both beads are of Guido's (1978) class 14 and are characteristic products of Iron Age Scotland, involving decoration executed in a style which cannot be paralleled in the rest of Iron Age Europe. These types are so diagnostic that we can argue for local production with some confidence. The distribution of such bead types (Guido 1978, fig 36) supports this interpretation. Although the types are diagnostic, and the beads probably assembled locally, this does not mean that the glass was made locally.

Chemical analysis of prehistoric transparent purple glass from Scotland, including the matrix of SF 5077, can all be separated analytically from the purple glasses apparently traded within the *oppida* system in the Late Iron Age of western Europe (Henderson 1987). This adds support to the hypothesis that, on the basis of the principal colorant elements, manganese and iron oxides, the colorant compounds were added to the glass within Scotland. Since the basic composition of the purple glass is soda-lime-silica, at this stage it is difficult to argue whether the basic glass was made locally within the confines of an established technology or was imported and the colorant added at a secondary stage. With the wide chronological range of radiocarbon dates from Howe which date the Phase 7 contexts producing the beads, it is quite



Illus 137  
Roman glass vessel fragments (SF 36, SF 37), Phase 8; scale 3:2.



Illus 138

Glass beads: a) translucent globular bead fragment (SF 5077) with applied bands of purple and white, and yellow and white opaque glass; one half flattened bead (SF 5142) of colourless and transparent glass with applied surface streaks of opaque white and yellow glass, Early Phase 7; scale 2:1; b) opaque yellow annular beads (SF 2043; SF 2978), Phase 8; scale 3:1; c) dumb-bell bead (SF 464), Phase 9; scale 2:1.

possible that the purple glass used in SF 5077 was slightly later than that used in the *oppida* system of La Tène D of Continental Europe in the 1st century BC.

The Scottish chemically distinct purple glass is also found in Guido's spirally decorated Class 13 beads from Glenbuchat, Grampian (Guido 1978, 194) and Culbin (Black 1891, 508, fig 36). A further example of a Class 14 bead comes from Dun Mor Vaul, Tiree (MacKie 1974b 148, fig 18), as well as single globular beads from the same site, annular beads from Gilmerton, Lothian (Ross 1910, 9) and Dun Ardtreck, Skye, of c 2nd century AD date (MacKie pers comm).

The opaque yellow glass used in the decoration of bead SF 5077 is probably opacified with crystals of lead pyroantimonate ( $Pb_2Sb_2O_7$ ). The presence of 0.17%  $SnO_2$  in the glass may indicate that both antimony and tin glasses have been mixed together or more likely that a raw material containing both elements was used. Other such mixed tin and antimony opaque yellow glasses have been found in 1st century BC glasses, particularly in southern England (Henderson 1987) but at this stage in the research of ancient glasses it does not follow that the Howe glass can be dated to the 1st century BC. The lead oxide levels of SF 5077 (Table 69mf 3:F7) is comparable to many Scottish lead-rich glasses (Henderson 1982), and the manganese oxide (MnO) contents in both the yellow glasses of SF 5077 and 5142 places them in a post 2nd century BC date bracket. The lead oxide content of SF 5142 is unexpectedly low, and opacifying elements have not been detected.

The other colour of opaque glass used in the decoration of SF 5077 is opaque white. The glass is probably opacified with crystals of calcium antimonate. Tin was detected at its minimum level of detection.

#### OPAQUE YELLOW ANNULAR BEADS (illus 107; 138b)

Bead numbers SF 2043 and 2978 are both of Guido's Class 8 and were found in Early Phase 8, one within the floor of the S workshop and the other from a floor in the *NE* Building. Both beads contain manganese oxide levels indicating that they could easily have been products of the reputed bead workshop at Culbin for which archaeological evidence of industrial refuse, as well as analytical evidence, exists (Henderson 1982). The recorded evidence is in the form of a letter dated 1871 which is in the Society of Antiquaries of Scotland from C Innes to Major Chadwick, which mentions 'remains of kilns near Elgin where such (opaque yellow) glass ornaments were manufactured'. Although similar in composition to the Meare Lake beads, and indistinguishable typologically, chemical analysis is in fact able to distinguish the products of the two production areas. The glass working at Culbin is loosely dateable to c 1st–2nd century AD.

Many Scottish Iron Age sites have produced yellow glass beads including Dun Mor Vaul (MacKie 1974b, 147), Traprain Law (Curle 1920, fig 7 31) and the Iron Age fort at Clickhimin (Hamilton 1963, 91, fig 41).

#### TRANSPARENT GLASSES (illus 107; 138c)

The remaining glasses all have a soda-lime-silica composition. The near colourless matrix of bead SF 5142 is decolorised by MnO, counteracting a potential green colour which would be imparted by the iron oxide present. The unstratified (Phase 9) dumb-bell or toggle bead, SF 464 (illus 138c), was dug out of Late Phase 8 material. It is turquoise green and is probably coloured by a lead-tin bronze. The levels of copper, tin and lead in this bead certainly indicate that this is probably the case (see Henderson 1985 for a discussion of the further use of colorants in glass).

## DISCUSSION

Although there is good evidence to suggest that local production of glass took place in Iron Age and Late Iron Age Scotland, very few examples of the glasses derive from dated contexts. The stratified Howe glass objects provide some evidence for the phasing of the bead types concerned within the Iron Age.

When typological and analytical approaches are combined it becomes possible to indicate with some confidence specific features of prehistoric glass production in Scotland. The electron-probe analysis (Table 69mf 3:F7) and KRF analyses (Henderson 1982) provide evidence for a local production of specifically Scottish types of beads. Not only are Class 14 beads diagnostic but so are the chemical composition of the purple and opaque yellow glasses used in their production. The purple glass, in particular, can be distinguished from that used in La Tène D contexts of Continental Europe, where it was used in the manufacture of beads and armlets. Since these glasses are distinguishable from the others on the basis of the colorants used, and adhere to the established pan-European glass tradition of glass technology in other respects, this may mean that the colorant compounds were added to imported colourless, or weakly tinted, raw glass. Conversely, it does not exclude the possibility that the basic glass was also manufactured in Scotland, to which the colorants were added. On the strength of the radiocarbon dates available for Phase 7 which produced both examples of Class 14 beads, their production might have taken place anywhere between the 1st century BC and the 2nd century AD.

Although visually indistinguishable from some examples of opaque yellow annular beads of Guido's (1978) Class 8 from Meare Lake Village, Somerset, the two examples from Howe can be distinguished by their chemical composition and were probably manufactured at Culbin, Grampian.

The unstratified dumb-bell bead SF 464 could date from as early as the 2nd century BC and as late as the 6th–8th centuries AD. A dumb-bell bead from Kiltierney, Co Fermanagh of probable 1st century BC–1st century AD date (Raftery 1984, fig 100, 7), seven from Dun Ailinne, Co Kildare (unpub), a site which is principally of Irish Early Iron Age date, and another from Close ny Chollagh, Isle of Man (Gelling 1958, 95, fig 4, 5, 6) of Iron Age date give us examples from the earlier end of the date range. Further unpublished examples of Iron Age transparent green dumb-bell beads have also been found on the Isle of Man at Braust. The dumb-bell bead from Leckie, Scotland, MacKie (1974a and pers comm) dates to AD 90–140; a possible 6th century example comes from Lagore, Co Meath (Henchen 1950, 141, fig 67, 1471), with other early Christian examples from Ballinderry 2, Co Offaly (Hencken 1942, NMI no 66:641) and a cobalt blue example from Deer Park Farms, Co Antrim (unpub).

## 8.9 • POTTERY REPORT

Andrewina Ross

A very large assemblage of stratified pottery was found at Howe, numbering over 17,000 sherds from nearly all phases, but with the majority found in the broch village contexts of Phase 7 (Table 70).

Table 70: Total\* pottery sherds by type and phase

Phase	Rims	Dec Rims	Bases	Base Edges	Bodies	Dec Bodies	Totals
1/2					2		2
2	2				7		9
2/3	1	1			10	12	24
3	20	2	22	12	239	5	300
3/4	1			1	11		13
4	12		2	3	184	6	207
5	11	1	4	3	61	1	81
5/6	123	7	56	83	1252	6	1527
5/7	3			1	39		43
6	2			1	23	1	27
6/9	8	3	4		48	4	67
7	1080	45	399	442	10544	102	12612
7/8	68	4	16	48	275	8	419
8	275	8	49	102	1423	10	1867
8/9	2			2	6		10
9	29	2	17	12	203	2	265
Totals	1637	73	569	710	14327	157	17473

\* (excluding c 692 very small sherds) • Dec = decorated

This large collection of pottery was quite unique in Orkney at the time of excavation, not only because it was well stratified but because of the long time-span covered. It also represents one of the largest collections of pottery from the prehistoric period in the north of Scotland. It will hopefully serve as a useful base sequence from which to re-examine results from earlier unstratified excavations as well as helping in the research of current and future excavations.

It was not surprising to find within such a sizeable assemblage almost every type of decoration and fabric variation represented at contemporary sites, not only in Orkney, but also further afield on Shetland, the Scottish mainland, the Western Isles, Shetland and some English sites. Where appropriate these have been mentioned in the text.

A complete catalogue of the pottery is available in archive and does not appear here. In this report an attempt has been made to itemize vessels and sherds to illustrate the variations in fabric, vessel shape and decoration. These examples have been mentioned because they are representative of other sherds or because they are unique. In either case the examples serve to produce a comprehensive and overall view of this large collection.

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## MANUFACTURE

including identifications by the late Geoffrey Collins, P Wardle and A MacSween

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Identification of the pottery fabric was made by microscope analysis at 40x magnification. Unfortunately, conflicting results were produced which were not successfully resolved, as identification of the fillers by thin sectioning of the pottery was never completed and a report not produced. Some of the results below must therefore be treated as inconclusive.

### FABRICS

Most of the pottery from Howe is believed to have been produced locally at the settlement, using available local resources. The boulder clay subsoil with stone impurities was used, although purer clay deposits may have been exploited along loch and stream sides. By modern standards, these local clays would be considered of poor quality (Hodges 1989, 23). The fillers or inclusions found in the pottery, to reduce shrinkage and cracking of the clay, with the exception of steatite and iron pyrites from Shetland, were found either in the local clay, or were derived from local rock sources. These include crushed sandstone, granite-gneiss, haematite, quartz sand, micaceous sand and possibly also monchiquite and camptonite from local dyke rocks. Fragmented shells (probably mussels) and vegetable matter were also found, and the latter (see below) was especially noticeable in Phase 8 samples. There was a noticeable absence of reused crushed pottery, grog.

The size of the stone filler is directly comparable to the thickness of the vessels. Fine, thin-walled vessels had small grits, and heavier, thick-walled vessels had larger ones (Table 71mf 3:G1). Heavily gritted wares were never dominant although some sherds contain very large angular inclusions, which have also been noted at other sites. It was unusual for little or no filler to be seen, except in the case of wheel-thrown sherds and the finer slab or coil-built examples of Phase 8.

The use of organic material as a filler was noticed from the surviving impressions of grass and cereal stems. Although grass was probably used as a filler in the fabric throughout most of the phases, many of the impressions have been found only on the surfaces of the sherds. This may indicate that the pots were packed around with turf, straw or grasses before firing.

From analysis, some grass/seed impressions were found to contain heather (*Calluna vulgaris*), barley (*Hordeum* sp), naked barley (*Hordeum vulgare* cf var *vulgaris*), and cereal grains such as oats (*Avena*), both wild and cultivated (Table 8mf 1:D1). Whilst some sherds contained only impressions, others were identified from carbonized grain *in situ*. There is no discernible pattern to the

occurrence of various types of organic filler, but it is noted in the text where grass or hard stems have been used purely as a decorative feature.

On a strictly visual analysis of the pottery, variations have been noted in the fabric mainly related to the size and density of the filling material. Without a more detailed microscopic analysis of significant percentage of the collection, it is suggested that, with the exceptions of the Beaker vessel and the finer wares of Phase 8, the major part of the assemblage constitutes a single fabric. The fabric has undoubtedly varied over time with different sources of raw materials being used, and different amounts of filler, but nevertheless it remains essentially a rough, low strength earthenware or coarseware. The finer vessels produced in Phase 8 may be due to improved clay and filler processing, and firing techniques, rather than a change in resources used.

### FORMING

The predominant methods of manufacture were coil and slab building. Coil building probably developed from basket making (Leach 1940, 65), and clay rolls were coiled around and laid on top of each other to form a vessel. Smoothing of the joins occurred as the vessel was built, by the use of rib bones or spatulas (Hodges 1989, 27). It is probable that some form of turntable was used, whether a mat or a flat stone. Slab building entails the cutting out of shapes, presumably rectangular or triangular, from a flattened and rolled out piece of clay. Coil building was noted in all phases and slab building in Phases 3 and 7 especially, however it may be difficult to differentiate slab building from large flattened coils. Coiling was easily discernible on some sherds along the breakage lines due to the aplasticity of the clay, and the building process can be clearly seen on some of the poorly manufactured vessels (eg SF 4832/4856, illus 142).

One example of modelling, the working of a ball of clay by hand and fingers to draw out a vessel, was noted in Phase 8, but it is in this phase that the first examples of wheel-thrown pottery were specifically identified. A mounted wheel, turned by hand or foot was used to improve the techniques of pottery making. Finer and more varied shaped vessels could be produced by this method.

### SURFACE TREATMENTS

The rough fabric of the vessels required additional treatment to make them more serviceable and to disguise their coarseness. The

most common method found at Howe was the application of a slip, usually on both surfaces. A slip is a watery fine clay poured over the vessel's surface, or into which the vessel is dipped, to produce a smoother surface, normally when the vessel is partly dry or leather hard, and before firing. At Howe it was noted that some of the exterior slips were of a different clay, or different coloured clay from the main fabric. This may have been a deliberate choice as the slip may have lent itself better to burnishing and polishing.

Another method of improving the appearance of vessels was by burnishing. This could be done on either the dried clay surface or after the vessel had received a slip. Burnishing is the action of rubbing the vessel's surfaces with a smooth stone or bone to compact them, to remove irregularities, and to produce a shiny finish (Hodges 1989, 31). A large number of sherds from all phases show evidence of burnishing, but the proportion is higher in Phases 7 and 8. In Phase 8, burnishing may have served to replace the decorative features seen in vessels from earlier periods.

Other treatment of the vessels at Howe included the application of a mineral surfacing, noticeably crushed mica and ?steatite (talc) usually in the slip. This gave the vessels an easily buffed or polished surface, even when handled. Other vessels were lightly combed, sometimes on both surfaces. This has been seen as an additional aid in smoothing the surface of the clay, probably in an attempt to conceal the filler and the coils. On other vessels this can be seen as a decorative feature (see below). Other pots were brushed with rush or grass stems to produce an even surface, and many finger prints were noted as a result of handling and smoothing the vessel before firing. Fetting, the use of a knife to tidy the vessels, was not noted.

### FIRING

The vessels appear to have undergone uncertain firing conditions which resulted in uneven colouration. Firing may have taken place

on domestic hearths or in small kilns as was noted in Later Phase 7. Reducing conditions, or oxygen starvation, in the firing process caused some of the pottery to take on a grey colour. High oxygen content resulted in vessels with bright pink or terracotta colours, whilst a smoke-filled hearth or kiln may have caused some smoke staining and discoloration. Vessels which have a grey interior and a pink exterior may have been fired upside down, with the air supply to the inside of the vessel cut off during firing. Some vessels may have been reburied, and there is one example from Phase 8 of a wheel-thrown vessel which could have been over-fired, SF 142 (Ewan Campbell pers comm). The use of organic material packed around the vessels before firing has already been mentioned. To produce earthenware, the vessels would have been fired at temperatures between 1000–1200°C, but some of the more fragile sherds may have been fired at slightly lower temperatures.

### DECORATION

Even though Howe produced a large collection of stratified Iron Age pottery, the amount of decorated sherds constitutes less than 1% of the total. Most of the decorated sherds are found in Phase 7, but also in Phases 5/6 and a few in Phase 8 (Table 70).

Combing was one of the simplest techniques used at Howe, but, as already mentioned, it can also be seen as an attempt to conceal the manufacturing irregularities of vessels. Other decorative techniques include impressions, incised ornamentation, and the application of cordons and rondels. These decorations were carried out on leather hard vessels after they had been slipped and the techniques, where relevant, are described below. Painted decoration is also noted in the text, but only one or two examples occurred on the site.

## DISTRIBUTION AND DESCRIPTION OF POTTERY

### DISTRIBUTION AND LOCATION

Pottery came from all phases and especially from Phases 5/6, 7 and 8. The greatest number of sherds came from Phase 7, from the S ditch deposits when the defences were filled in, and from dumps from the clearing out of buildings. Levelling of structures at the end of Early Phase 7 accounted for this distribution as well as the occurrence of pottery in rubble layers. In the same phases, high numbers of sherds were also found in the earth and rubble fillings within the building walls. In Early Phase 7, domestic floors produced very little pottery, reinforcing the idea of the generally clean nature of the village. In Later Phase 7, thick ash deposits in both workshop and domestic locations produced pottery it was possible to reconstruct, indicating the manufacture and firing of vessels in these buildings. By Phase 8, more finds were located on domestic floors as well as in wall fills.

Analysis of the pottery revealed that many adjoining sherds came from both rubble layers and dumps, as did sherds from earlier and later phases. This indicated the reworking and disturbance of some deposits during later periods of the site. One example of this was sherds of a Beaker vessel, from the period between Phases 2 and 3, found in a 10m square area in contexts from the end of Phase 2 to Early Phase 7.

### NEOLITHIC POTTERY

Only two sherds of Neolithic pottery were found in Phases 1 and 2; they are not diagnostic of either of the two usual wares, Unstan and Grooved ware, found at Orcadian Neolithic sites.

### BRONZE AGE POTTERY

The earliest cultural connection is to be seen in the decorated rim and body sherds of SF 7377 (illus 139), identified as a Beaker

vessel. These sherds were found in disturbed contexts from Phases 3 to Early Phase 7 in a 10m square area in front of the Phase 2 Neolithic tomb.

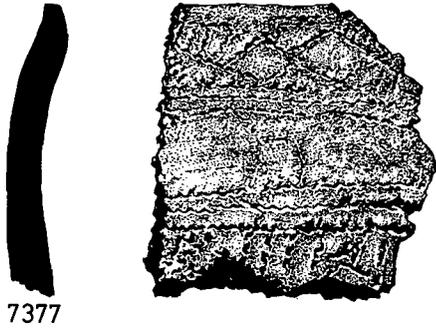
The compact and well-fired fabric contains quartz sand, organic material, possibly also iron pyrites and was coil-built. Thick internal deposits of carbonized material suggest it was used as a cooking vessel. Although incomplete, the vessel fits within the category of cupped-neck late style Northern Beakers (Case 1977, 82). An exact parallel for the rim form is displayed by two vessels from Gullane, East Lothian which are classed as a Late Northern Beaker (N3{L}), of the long-necked variety (Clarke 1970, vol 2, 366, 707).

The flat rim is narrow and has a slight internal bevel. On the outer surface the sherd is decorated with two horizontal panels of open diamonds bordered by groups of three parallel lines. Below this there is a plain band, followed presumably by a repetition of the pattern. The decoration was executed using the edge of a shell of the common cockle (*Cerastoderma edule*, formerly *Cardium*) (illus 10).

The all-over decoration is a typical feature of Beaker pottery, although the use of shells for this is quite rare, and no examples have previously been found on Orkney. The nearest parallel was found at Cletraval, North Uist in the Outer Hebrides (Scott 1935, 500–510, figs 12 & 13). Other cockleshell impressed pottery has been found in Shetland, on the Scottish mainland, and a very similar decoration to that on the Howe vessel was found on a beaker from Thickthorn in Dorset (Henshall 1956, 387, fig 17, 938; 390, pl 43, 939; Clarke 1970, vol 2, 290, figs 79, 80, 82, 83, 288, fig 66).

Although comb-impressed decorative motifs are the more common feature of Beaker design, only two very small fragments,

## Phase 2



7377



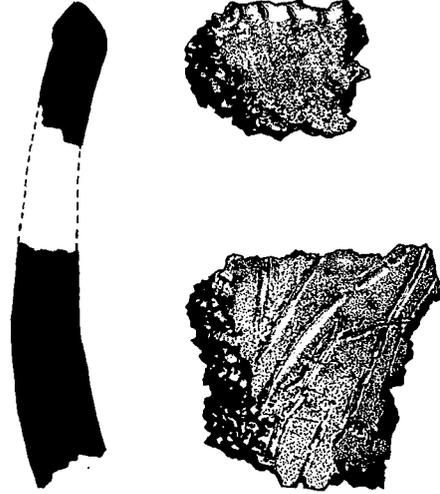
6962

## Phase 4



6951

## Phase 3



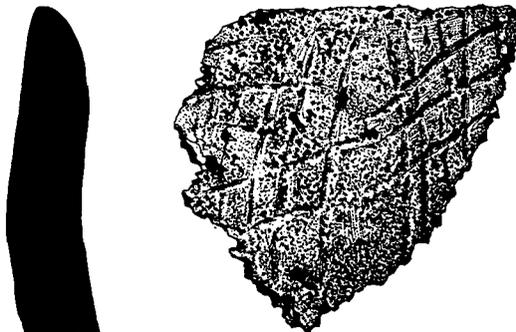
6956



6956



## Phase 5/6



7360

## Illus 139

Decorated rim and body sherds, Phases 2-5.

SF 6962 (illus 139), were found at Howe, indicating the remains of a second vessel. A highly decorated combed Beaker vessel was found at Rinyo, Rousay, Orkney (Childe & Grant 1939, 26, fig 7), which in vessel shape and decoration was, however, more like Howe SF 7377. The Gullane examples, whose rim forms were cited above; also display similar chevrons and cross-hatching in bands between horizontal lines.

Classification by Lanting and van der Waals of tooth-comb and cockleshell impressed beakers for northern Scotland is unsatisfactory beyond the NE England-SE Scotland focus area. This is possibly due to a different beaker development in the North rather than a

stagnation as has previously been thought (Shepherd 1986, 26-28). However on stylistic grounds the Beaker is given a date of c 1800-1650 BC (Lanting & van der Walls 1972, 41, 44, fig 4), but a different development in the north may alter these brackets.

## EARLY IRON AGE VESSELS • PHASES 3-6

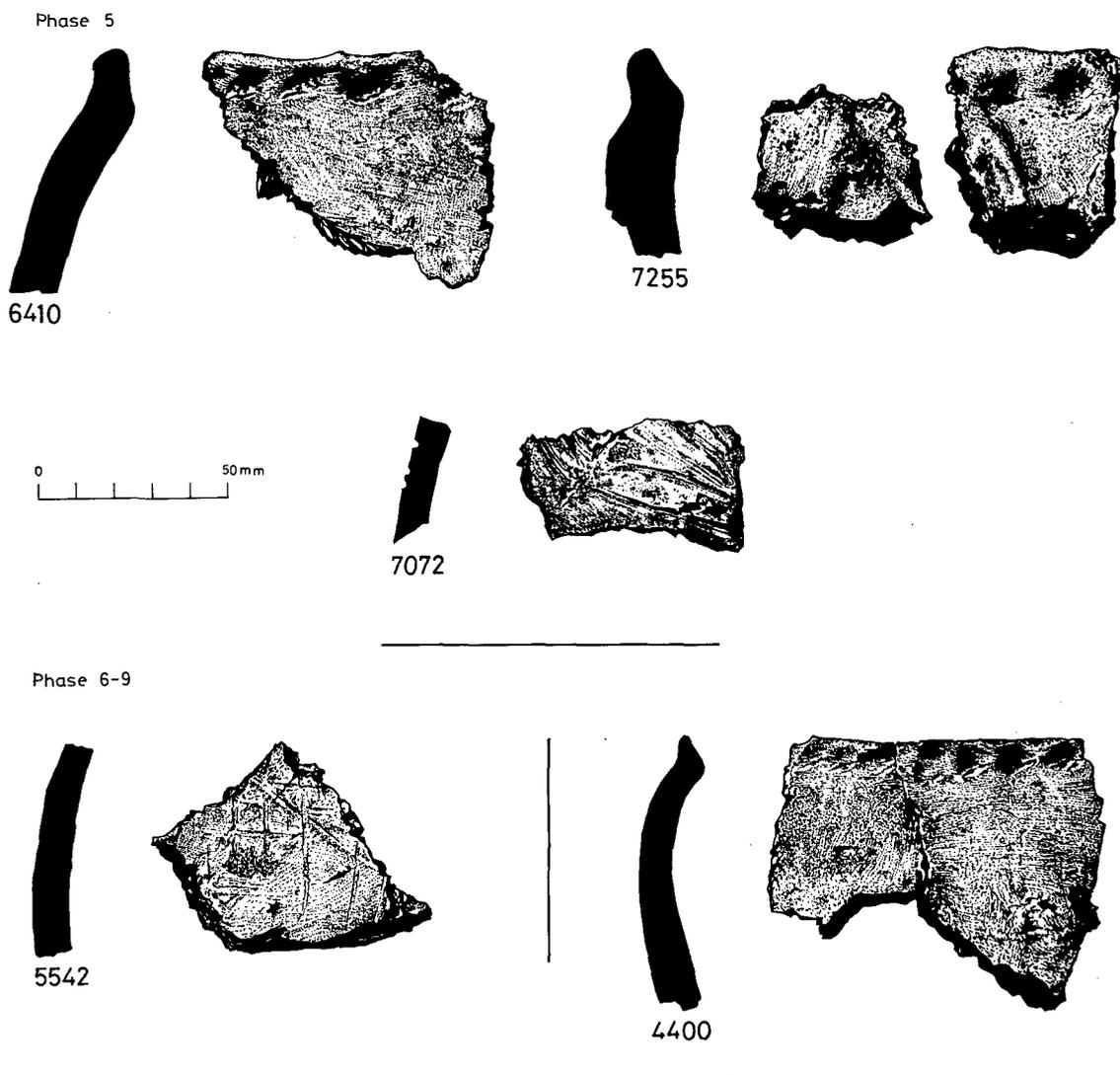
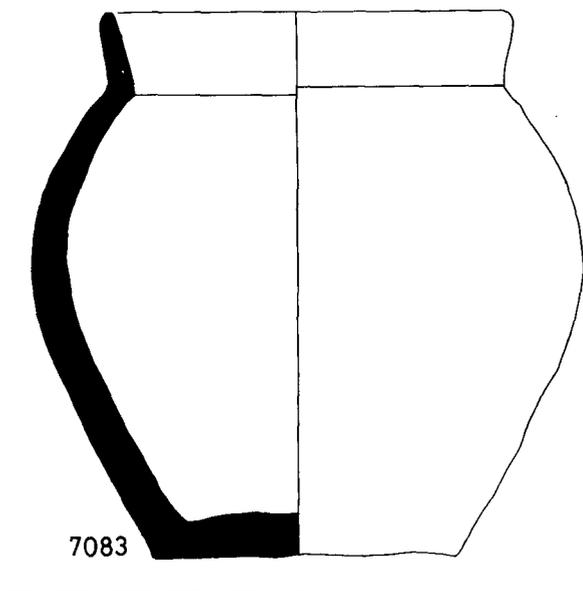
The stratigraphy of these Early Iron Age phases was largely disturbed due to successive levellings and rebuilding. This is reflected in the pottery where joins and associations have been made across phases.

## FABRIC

Most of the fabric is coarse, particularly in Phase 3 (Table 71mf 3:G1). In Phases 5 and 6, fillers of mica and iron pyrites were noticed in the fabric, and also some haematite. All the sherds are slipped, but in Phase 3 mica dust was also included. On one sherd in this phase, SF 6934, the slip ranged in thickness from <1mm to c 2.5mm, and was applied over a heavily filled clay in an attempt to mask the protruding grits. Thin carbon deposits on internal surfaces of sherds from Phase 3 onwards and external soot deposits were also noted.

## VESSEL FORMS

The fragmentary state of sherds from these phases prevented any successful attempts at reconstructing whole vessels, and therefore the knowledge of the shape and size of pots is limited. It was possible for only one complete vessel profile to be reconstructed, SF 7083 (illus 141a). This is an irregular shaped bulbous jar with a slightly narrowed mouth, flat rim and base and a rounded shoulder. Evidence of finger moulding on the base and body of the pot survive. This technique is noticed on sherds from Phase 3 onwards, usually on heavily filled fabrics where difficulties in producing the vessel may have occurred.



Illus 141

a) Vessel form, Phase 5/6; b) decorated rim &amp; body sherds, Phases 5/6, 6-9.

Sherds from Phase 3 indicate almost straight-sided to slightly bulbous vessels, with flat rims containing pronounced internal flanges, T-shaped (illus 140mf, a, 3:F8). Reconstruction of a partial vessel SF 6956 (illus 139) showed a carination at the shoulder and indicated that this pot was a large jar, with a rim diameter of *c* 250mm. Late Bronze Age and Early Iron Age vessels with similar profiles have been noted at Staple Howe, Yorkshire and Mavis Grind, Shetland (Brewster 1963, 88, 2; Cracknell & Smith 1983, fig 19, 7; fig 20, 23). Another sherd in this phase indicated an inward curving or barrel-shaped vessel.

For Phases 4, 5 and 5/6 similar vessel shapes are suggested by the range of everted, rounded and flat-topped rims (Table 72mf, 3:G2; illus 140mf, b–c, 3:F8–F9), although there appear to be more carinated, short-necked vessels from Phase 5. Vessel rim diameters ranged from 125mm to 300mm indicating various vessel sizes and shapes including wide-mouthed bowls. Larger vessels had wall thicknesses of *c* 15mm. Flat bases dominated and some examples have a heel, or clay bulge at the base edge. Although no round-bottomed vessels were reconstructed, it is not inconceivable that they existed, but due to the fragmentary condition of the sherds, they were impossible to recognize. Some of the projected vessel shapes from these early phases are reminiscent of Late Bronze Age pottery found at Jarlshof, Shetland (Hamilton 1956, figs 18, 19) and Neolithic/Beaker pottery from Cletraval, Uist (Scott 1935, fig 23).

## DECORATION

### Impressed designs

SF 6956 (illus 139) from Phase 3, carries a decoration on the inner rim of a line of small stab and drag incisions resembling claw marks, which were made by a sharp tool. The outer surface of the same vessel has seemingly random but deep incised lines which cut into the thick slip. The decoration may have been made by pressing grass or rush stems into the slip or dragging the end of a hard rush across the body. The decoration is not unlike that on a Phase 5 rim sherd, SF 7360 (illus 139). Their association is possible as their contexts were disturbed. Deep score marks, accidental or deliberate, have been found on other sherds in Phase 3, which have also been associated with sherds from later phases.

It is arguable that this pottery is in fact Bronze Age in date. It is pre-roundhouse and its affinities lie with earlier pottery styles rather than those of the Early Iron Age. Close parallels to these sherds can be seen from Neolithic sites in both Orkney and Shetland (Henshall 1955, 388, HD 1374; 1963, 251, 27; Whittle 1986, fig 55) and from A'Cheardach Mhor, South Uist (Young 1966, fig 4, 1). Similar decoration is found among the finds from Yeavering, Northumbria, described as having been 'impressed by a triple ended implement' and of a Late Bronze Age date (Hope-Taylor 1977, 340, 21a, b, c; 344, 21).

Finger nail or finger tip impressions set immediately below the rim, form a decoration on sherds SF 6410 and 4400 (illus 141b) from Phase 5/6 and 6–9. A similar but deeper decoration is found on SF 7255 (illus 141b) probably made by the rounded end of an tool. Both these, and especially the fingertip decoration, are commonly found on Iron Age sites across the north of Scotland and in the island groups, at Crosskirk, Caithness (Fairhurst 1984, ill 62, 63, 701b, 440, 660), at the Aisled Farmhouse, Barra (Young 1952, fig 5, 28, 29), at A'Cheardach Bheag, South Uist (Fairhurst 1971, fig 7, 1, 7) and at Clickhimin, Shetland (Hamilton 1968, fig 66, 1). The occurrence of this decoration on Early Iron Age pottery from England has also been noted (Brewster 1963).

A common feature found at Howe, and other Iron Age sites, is finger tip impressions on the inside of vessel bases, usually 4 in number. Often these can be lightly impressed as well as pronounced. It has been suggested that this form of decoration had its origins in continental Urnfield pottery (Hamilton 1968, 92).

### Incised designs

Incised motifs were found on sherds from Phase 4. SF 6951 (illus 139) has a parallel, horizontally incised broken line motif, which also occurs later at Howe in Phase 7. This suggests a certain continuity of style and a similarly decorated sherd was found on South Uist in the Western Isles, at the Iron Age site of A'Cheardach Bheag (Fairhurst 1971, fig 7, 3).

One rim sherd, SF 3453, has slight incised diagonal dashes cut into the curve beneath the rim. It is also a common motif and appears in the pre-fort settlement midden at Dun Mor Vaul, Tiree (MacKie 1974b, fig 11, 20b; fig 13, 114; fig 17, 332) and at A'Cheardach Bheag, South Uist (Fairhurst 1971, fig 5). Described often as 'stab lines', this decoration also appears in later phases at Howe.

Decorated body sherd SF 7072 (illus 141b) probably forms part of the fan decorated vessel SF 5421, described below in Phase 7. SF 5542 from Phase 6 is also a body sherd (illus 141b), and has lightly incised cross-hatched line markings, which on the outer surface appear to be random. However, on the sherd's inner surface, these are more formal and clearly defined. It is not known whether these lines constitute a finishing of the vessel, before firing, or are decorative.

### Applied motifs

Rim sherd SF 7255 (illus 141), mentioned above has, as well as finger or stab decoration, a lower applied raised v-shaped decoration. Although fragmentary, this probably surrounded the vessel as a large wavy band. This is the first instance of applied decoration seen at Howe, but similar motifs were noted in the Iron Age finds from Mealista in Lewis (Carson 1976, Fig 4, 18, 19), and seem to be a larger variation of a popular design (Sanders 1957, 22, 53, 54, fig 1).

## MIDDLE IRON AGE VESSELS • PHASE 7

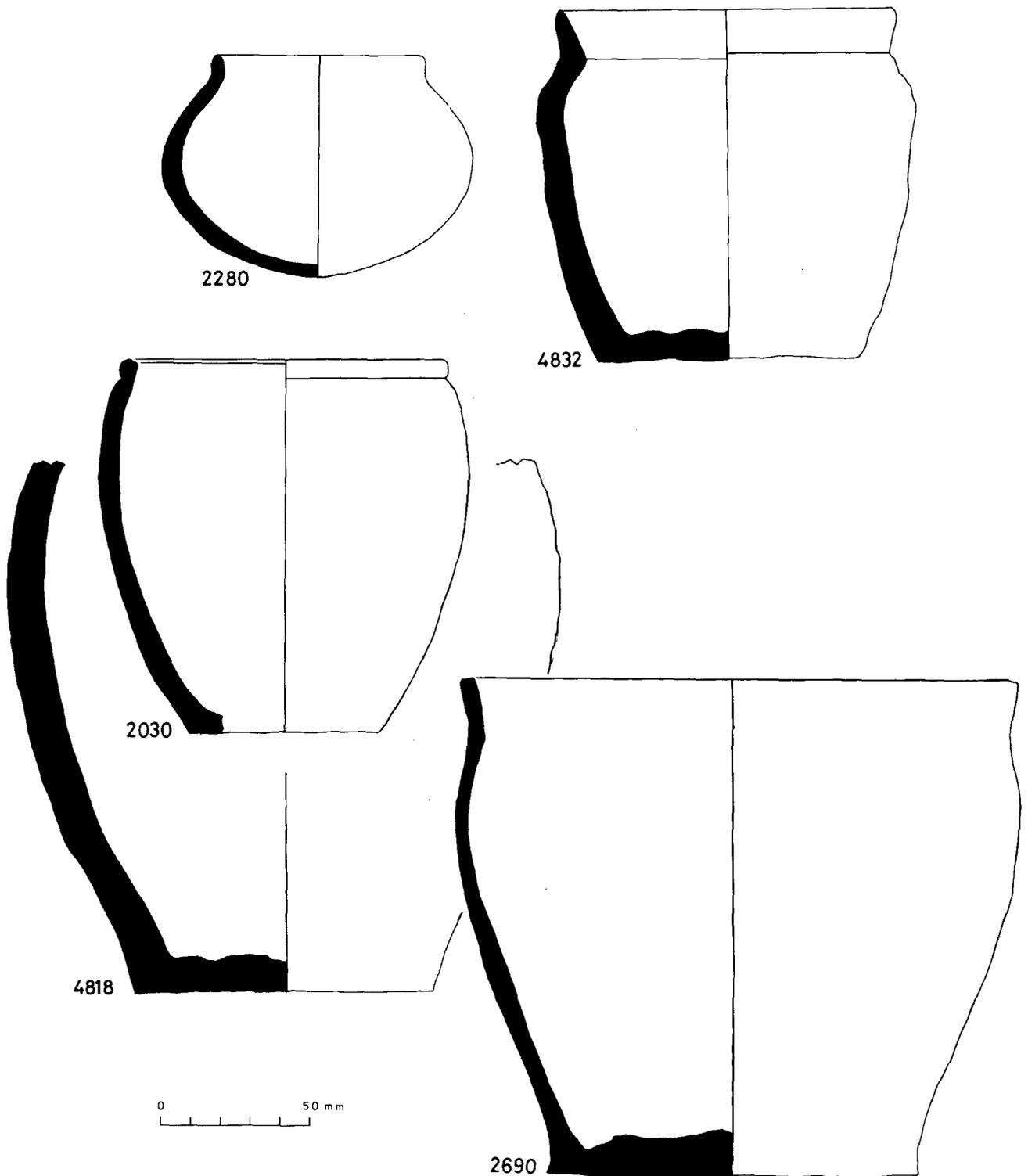
Most of the pottery, including the majority of decorated sherds, occurred in this phase (Table 70), mainly from three midden contexts 981, 63 and 1539; the latter two were S ditch fills. On analysis there were found to be many horizontal joints between sherds from the middens and from levelling layers, and vertically within the middens. From over 12,000 sherds it has been possible to reconstruct almost nine complete vessels and large portions of others in this phase.

### FABRIC

A larger percentage of both finer and finer-medium stone filler was noted in the vessels from this phase (Table 71mf), but bulky and heavily filled vessels also occurred. There was, however, little variation in fabric, other than was noticed in previous phases. Both compact, hard, and soft fabrics were found, suggesting the prevalence of inconsistent firing techniques. All the vessels continued to be coil or slab built, and slipped. The slip varied in thickness depending on the extent the filler protruded out from the surface of the clay. The thickness of the vessel walls varied from 3mm for thin vessels and up to 12mm in heavy pots.

### VESSEL FORMS AND SIZES

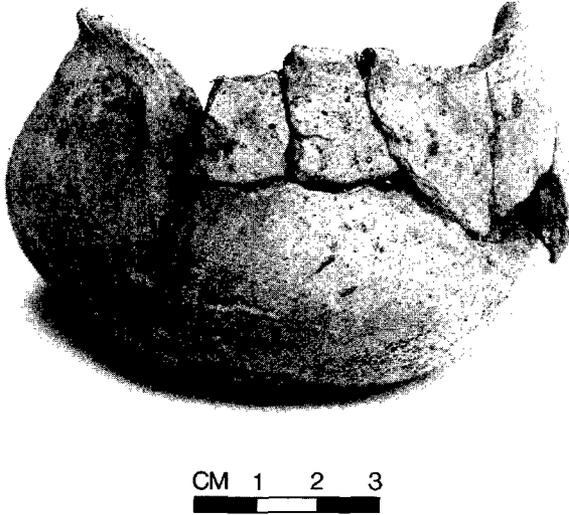
A range of vessel forms was reconstructed (illus 142), from small globular, round-bottomed hanging pots (illus 143), to large straight-sided bucket type vessels and both wide- and narrow-necked jars. Rim diameters varied from the narrowest at 67mm to the widest at 340mm, with bases measuring half to three-quarters of the rim diameters of the vessels. Pot heights ranged from 75mm to *c* 200mm. Cooking pots as well as storage vessels were identified from soot deposits on their outer surfaces and carbonized food remains within.



Illus 142  
Vessel forms, Phase 7.

The dominant rim form in Phase 7 is everted (rounded or flattened), accounting for over 65% of the rims (Table 72mf, 3:G2). Their dominance does not imply that they are an exclusive characteristic of the Iron Age broch tower and village as everted rims were also present in earlier phases. The other rim types were straight, lipped, beaded, T-shaped and inverted, the latter inferring globular vessels with inward curving mouths (illus

140mf, b-d, 3:F9-F11). One aspect of the rim forms is that some became quite elaborate with the addition of applied cordons (illus 144, SF 5378, 2787, 7212), and are discussed below. Also present are very few rims with horizontal internal fluting (eg SF 7716, illus 140mf). This rim type is commonly seen among pottery of other Orcadian sites, including the Stones of Stenness (MacKie 1975, fig 9, 29 & 34), and the brochs of Midhowe, Oxtro, Ayre



Illus 143  
Small pottery vessel (SF 2280), Phase 7.

and Bu, as well as the Shetland Iron Age sites of Mousa, Clickhimin and Jarlshof (Royal Museum of Scotland collections), and suggests finishing on a wheel.

A further comment on the rims is that in some instances, especially, but not exclusively, those sherds of finer fabric, the neck, between the top of the rim and the body of the vessel, is reduced. In some cases the fabric appears to have been folded over and outwards to form a flattened beaded rim (eg SF 2030, illus 142). This rim type appears in greater numbers in Phase 8 (see below). It is possible to suggest, given the limited number of reconstructed profiles, that beaded rims are mainly found on vessels with straighter sides or gently curving bodies. In contrast, the longer necked everted rims are from wider bodied vessels.

SF 5208 (illus 145) is an example of a T-shaped rim, and although this rim type is not numerous, most appear in Phase 7 (Table 72mf, 3:G2). These rims are very similar to those found at Mavis Grind, Shetland, and from Jarlshof, also in Shetland. Their occurrence in contexts dated to the Late Bronze Age and Early Iron Age may be significant (see Phase 3 above and discussion).

## DECORATION

Almost all the decorative motifs, as well as the vessel shapes, bear close similarities to other Iron Age sites on Orkney, in mainland Scotland, the north of England, the Western Isles and Shetland. However, they do not reach the heights of the more elaborate designs found amongst the Iron Age pottery in southern England. The decoration on the Howe vessels, seems to have most in common with Western Isles wares, where often close parallels have been observed.

Methods of decoration used in this phase include linear incisions of various forms, finger depressions, stab designs made by a bone or other sharp implement, and the application of plain and decorated cordons. The cordons were moulded, slashed, stabbed and impressed. Rondels or raised bosses occur as well as ring impressed designs and other types of applied decoration.

Decorated pottery forms less than 1% of the total number of sherds from this phase (Table 70). Although this is a small percentage, it is a sizeable proportion when compared with other

Orcadian sites, and therefore deserves to be discussed in full. It appears that the coarser, mostly undecorated wares were used alongside the finer, more often decorated wares in Phase 7.

## Finger-impressed designs

Used in earlier phases, finger impressions below rims persisted into Phase 7. They were probably the simplest form of decoration, and a means of finishing an everted rim. SF 5496 (illus 145) has formal finger tip impressions neatly placed next to each other below the rim. The design is freer and slighter in SF 5063 and 5208 (illus 145), but is impressed below a substantial T-shaped rim in the latter. These sherds show some of the variation in this design which existed in Phase 7. Some of the impressions categorized as made by finger tips, could also have been produced by the rounded end of a tool, as some of them are too close to the rim to have been made by a finger without actually disturbing its form.

On some vessels, lightly impressed vertically incised finger channels have been noted. They are probably evidence of fabric smoothing on the pot's outer surface rather than actual decoration, but are worthy of mention as the body of the vessel can appear to be slightly fluted or faceted.

## Circular impressions as decoration

Impressions of the heads of ring-headed pins are used as cordon decoration on Howe sherds. SF 7542 (illus 144) has a horizontal row of ring-headed pin impressions at the shoulder of the wide-bodied or globular vessel. The impressions lie 30mm below the everted rim and simple beaded cordon (see below).

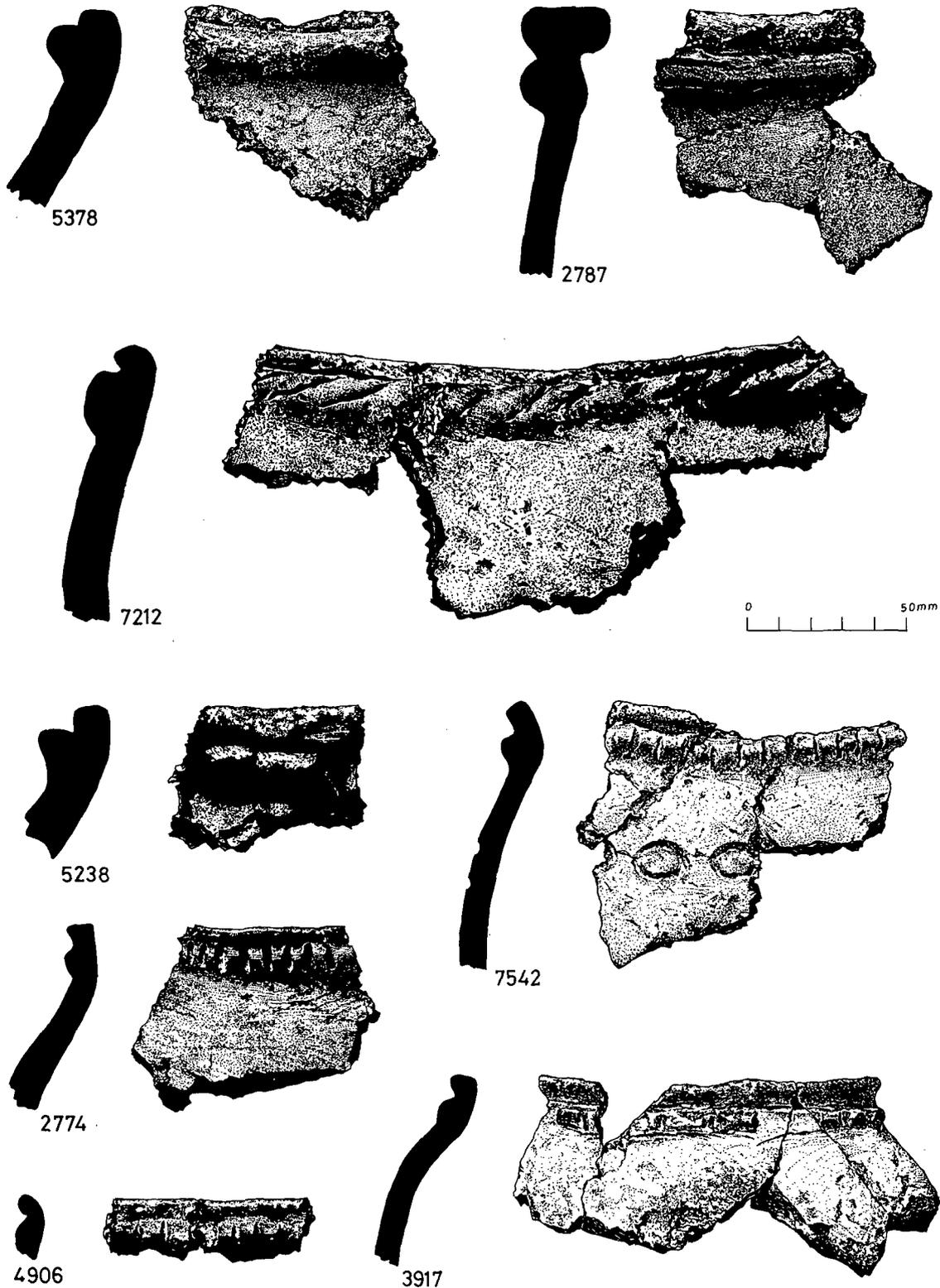
Other rim sherds have similar impressions (eg SF 5672, illus 145) and some body sherds (eg SF 4052, illus 146). In the former the impressions form part of an incised zigzag line pattern encircling the vessel, which is paralleled in pottery from the Broch of Lingro and from Allasdale, Barra (Young 1952, pl 8, 9). Ring pin impressions are seen as a purely Iron Age development due to the occurrence of the copper alloy pins from Phases 5/6 onwards (8.6 Metal Artefacts report above). Other circular impressions, with incomplete circles, have probably been made by hollow rush stems or pieces of bone (eg SF 7677, illus 145).

## Incised designs

One of the most complete pots is SF 5241 (illus 90d, 149) with an all-over decoration of vertical incised lines at *c* 25mm intervals. The design is random, but the lines begin *c* 15mm below the rim for a length of 70mm. A similar decorative motif was seen at A'Cheardach Bheag, South Uist, and on a funerary urn at Unival (Fairhurst 1971, fig 7, 6; Lindsay Scott 1948, fig 7, 1, pl 4, 2).

Vertical and parallel stab and drag lines beneath rims were a common design. They could be short, as in SF 5718 and 7114 (illus 147, 148), or longer as on body sherd SF 5734 (illus 146), and close similarities can be seen at A'Cheardach Bheag, South Uist. Horizontal incised dashes below a rim were also common as can be seen on SF 5162 (illus 147), where they occurred as a single line. They also appeared on the body of vessels, such as SF 5492 (illus 146), as an encircling line.

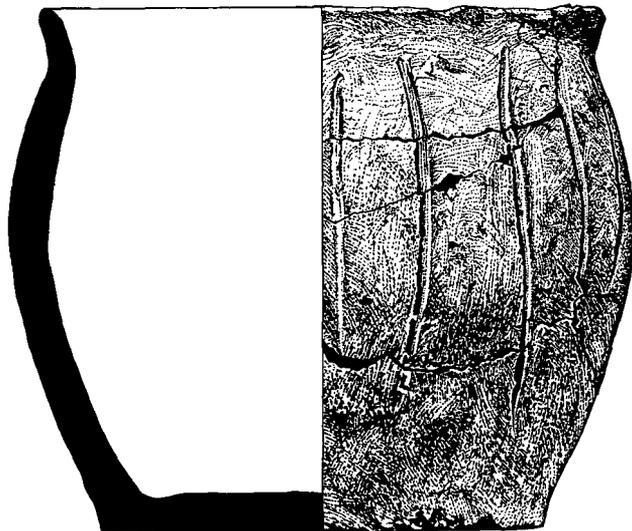
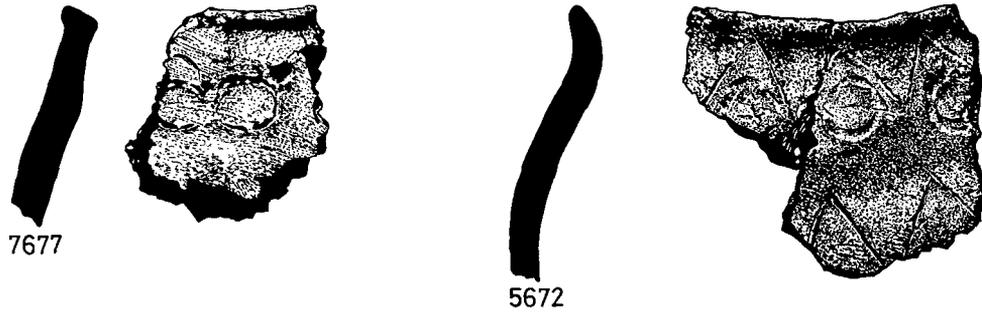
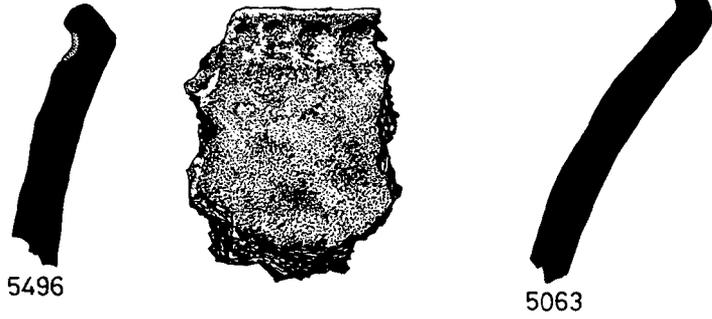
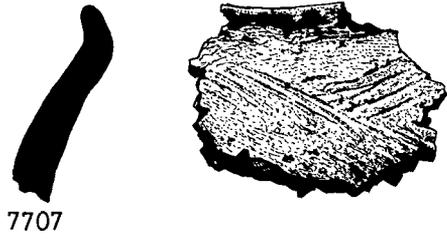
Stab and drag decoration appears on a small globular bowl represented by sherds SF 4877 (illus 147). The slightly everted rim carries an impressed dot or stabbed decoration along its tip, but immediately below set in the curve beneath the rim, is a band of stab and drag chevrons which encircle the vessel. The rim may have been re-formed, as the top row of stab lines is set into a raised portion, perhaps a cordon, as if the incised design bonds a replacement rim onto the body. A similar decoration is found at Dun Mor Vaul from later contexts, but without the rim top decoration (MacKie 1974b, fig 19, 494).



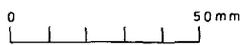
Illus 144  
Decorated rim sherds, Phase 7.

Further examples of the chevron motif are to be seen on SF 7058 (illus 147), where it lies in a horizontal band below the curve of the rim. The pattern is bordered by a row of deeply incised dashed lines, probably made by a thin bone implement. Along the outer tip of the rim, are tiny oblique incisions. A number of vessels, again from Dun Mor Vaul, carry a similar motif.

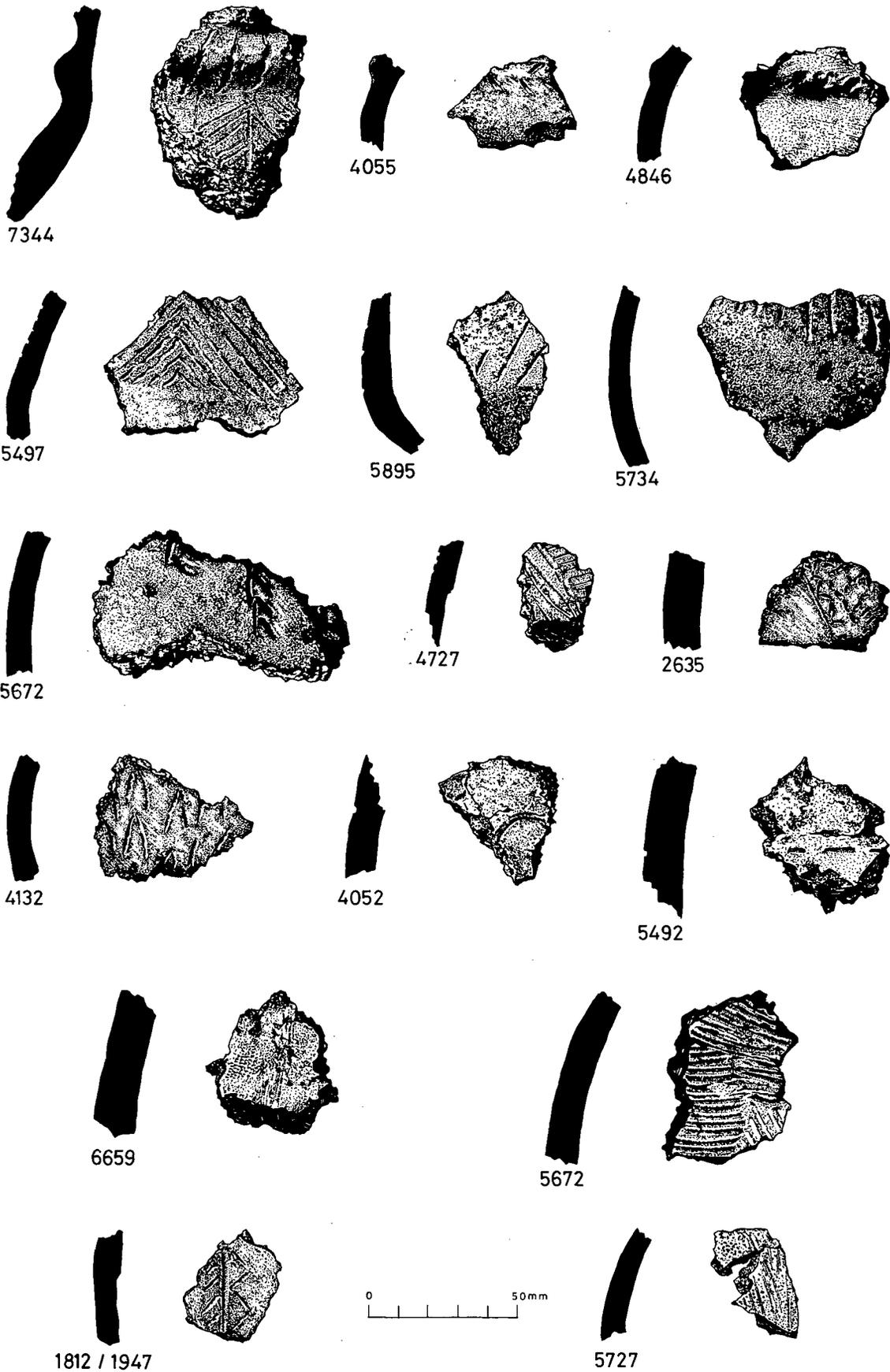
Another variation of the chevron can be seen on body sherds SF 5497 and 5895 (illus 146), where it appears at or above the shoulder of the vessel. The design, executed as close set or wider spaced lines, would have appeared as a band of zigzag. Decoration on pottery found at the Broch of Ayre, Orkney is very similar (Sutherland-Graeme 1913, 46, fig 12).



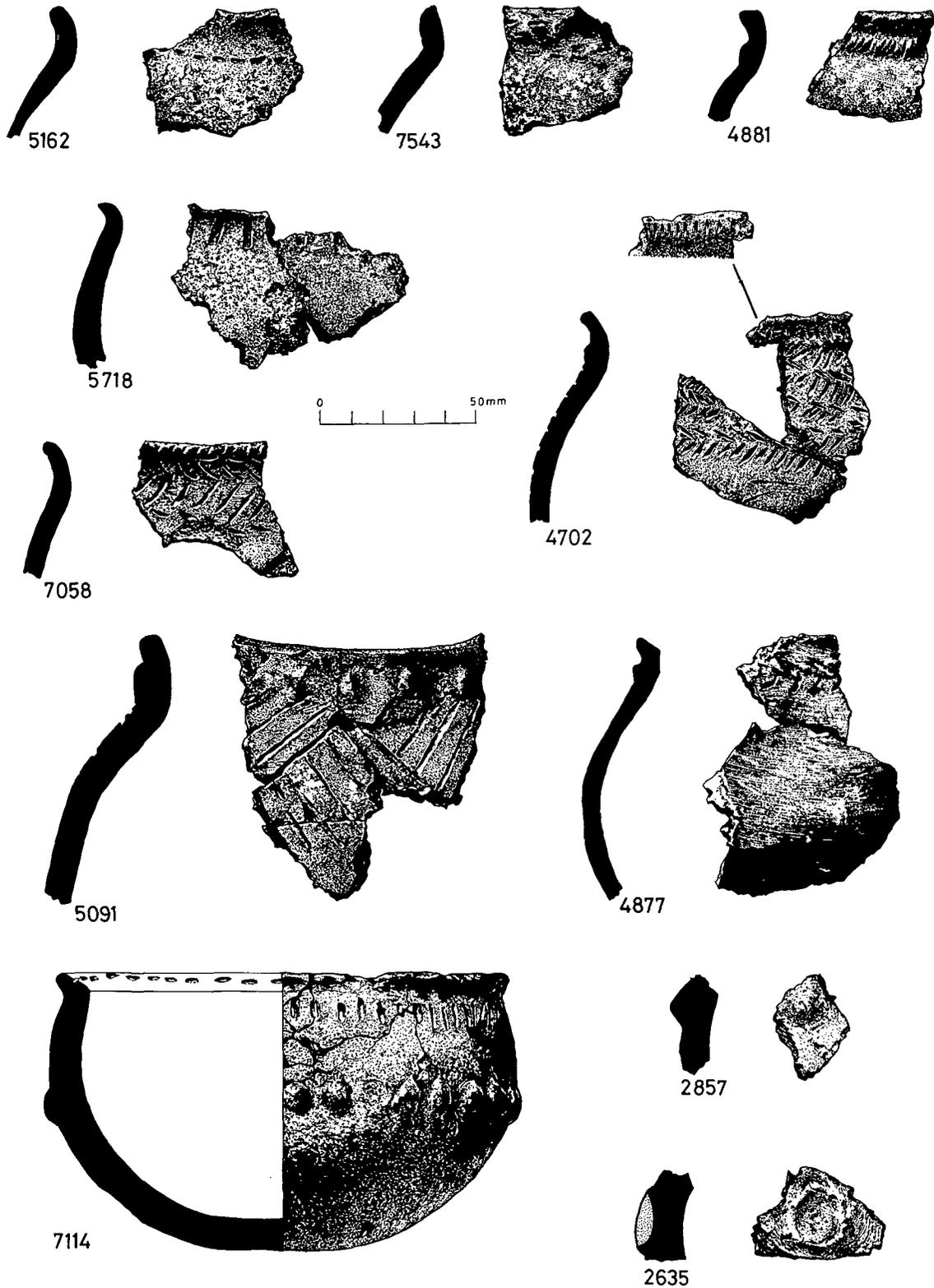
5241



Illus 145  
Decorated rim sherds, Phase 7.



Illus 146  
Decorated body sherds, Phase 7.



Illus 147  
Decorated rim sherds, Phase 7.

Among other partly restored vessels is a group of sherds, SF 7538 (illus 149), which form a large bulbous and burnished jar. The everted rim has an internal decoration of a single incised zigzag line. The external decoration begins at the rim with two rows of horizontal chevrons. More of this motif is then captured in pendant triangles

which encircle the vessel at the neck and shoulder, the lowest part of the pendant ends c 85mm down the body of the vessel at its widest point.

Inner rim decoration was a characteristic of some pottery from the Neolithic and Bronze Ages as well as the Iron Age evident from

such sites as Ness of Gruting, Shetland and Jesmond, Northumberland (Henshall 1956, fig 15, HD 1337). Inner rim decoration is noted on broch period vessels at Clickhimin and Jarlshof, Shetland (Hamilton 1963, fig 54, 9; 1956, fig 35, 2) and in Orkney at the brochs of Ayre and Lingro sherds occur with vertical and horizontal dog-tooth or herringbone decoration (Sutherland-Graeme 1913, figs 12, 13; Royal Museum of Scotland accession No's GE 42-274). Generally it seems that this form of decoration was not uncommon and the chevrons were found in a variety of forms.

Another example of an infilled triangle is a small body sherd SF 2635 (illus 146). The pendant triangle is infilled with random dashes and dots, stabbed into the surface. The closest parallel to this is found on a vessel from All Cannings Cross, the Early Iron Age site in Wiltshire (Cunliffe 1978, 351, appendix 2, 6).

Body sherd SF 4132 (illus 146) has another variation of the many chevron designs. Small inverted V shapes, with slightly curved sides, are incised randomly on the sherd's surface, probably by the use of a cut piece of rib bone. An example similar to this is found on Neolithic pottery from the Knap of Howar, Papa Westray, Orkney (Henshall 1983, fig 8, 44), suggesting the perpetuance or recurrence of certain motifs in the Iron Age.

A number of decorated rim sherds were found, in some examples where no other vessel body decoration was apparent. SF 7543 (illus 147) carries short horizontal slashes on the roll of its everted rim (as has been noted above in more complex designs). Other rims are impressed with rows of dots, and vertical dashes (eg SF 4702, illus 147). This example is from a small vessel which has an all-over herringbone incised decoration. It is comparable to intense, Beaker type decoration seen at Norham, Northumberland, and in Scotland at Hedderwick, East Lothian, at Glenluce, Wigtown, and at Cawdor, Nairn (Clarke 1970, figs 49, 50c, 253, 491). It could be an example of continuity of style from the Bronze Age with favoured designs remaining in use. With its decoration of tiny incised chevrons, this vessel is not unlike one found in a secondary broch phase at Dun Mor Vaul, Tiree, which has a similar motif inside pendant triangles on a tall, barrel-shaped urn (MacKie 1974b, fig 15, 1).

A number of rim and body sherds from Phases 5/6 and 7 joined to form SF 5241 (illus 149 and see also SF 7072 illus 141), part of a bulbous bodied vessel with an everted rim. The decoration consists of curved fan-like incised lines infilling the triangular spaces formed by a large zigzag design. The decoration lies between the rim and shoulder and above it lies a single row of oblique incisions c 25mm long. It is a motif quite reminiscent of that found on a Neolithic funerary vessel at Unival, North Uist, although the vessel shape is dissimilar (Scott 1948, fig 6, 12, pl 5, 2). Other Neolithic sherds from the Calf of Eday, Orkney and an Unstan bowl from Taversoe Tuick, Rousay, have similar designs (Calder 1937, fig 15, 1, fig 16; Fairhurst 1971, fig 5, 3, 4, 6). A further, more striking resemblance, is a motif found on a bowl on Site B at Plumpton Plain, with hatched triangles, which was considered to point to Urnfield or Halstatt influences (Hawkes 1935, fig 11, B4a). Pottery from Warebeth Broch, Orkney has a smaller and more formalized version of the same motif (Bell & Dickson 1989, 114).

Sherd SF 6921 (illus 149) has a fragmentary decoration which might suggest a similar design to the above and body sherd SF 4727 (illus 146) has a more formal close set design produced by combing (see Young & Richardson 1960, 114, fig 5, 4). The design also appears on SF 5091 (illus 147) in conjunction with applied decoration (see below).

Another incised decorative motif is seen on sherds SF 5672 (illus 146). Incised vertical lines encircle the vessel in a large zigzag, and each line has short oblique stab lines on one side. A similar design to this is seen on sherds SF 1812/1947 (illus 146) composed of incised lines with short, oblique stab lines on one side of the line and an incised zigzag on the other. The straight central line may have formed part of a large zigzag motif running round the upper part of the vessel. Many examples of similarly incised vessels exist

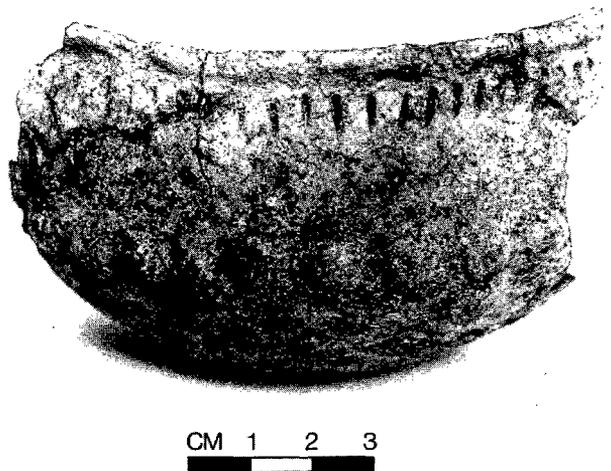
at Dun Mor Vaul (MacKie 1974, fig 11, 36, fig 15, 220, fig 18, 398), and at All Cannings Cross in varying forms (Cunnington 1923, pl 34, 7, 8; pl 35, 11).

### Bosses and rondels

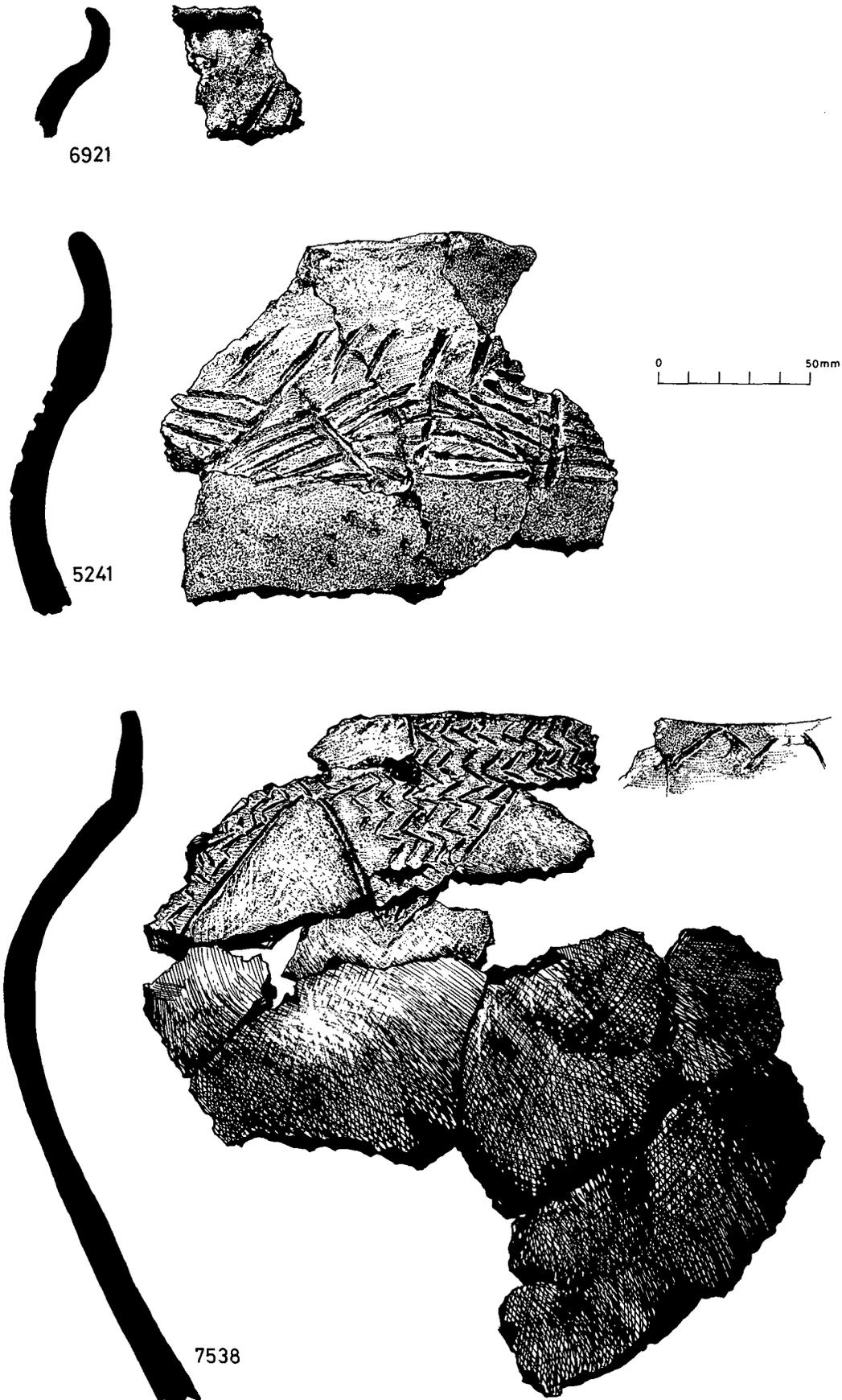
A number of sherds with applied bosses and rondels (depressed bosses) have occurred in various contexts, but mostly from the Later Phase 7 dump 981. Bosses as applied or moulded decorative features are represented by body sherd SF 2857 and rim SF 5091 (both illus 147). On the latter sherd both an incised design of filled triangles and oval bosses appear together. The single row of bosses were pinched out of the body of the vessel in the curve below the everted rim, and immediately below them appears the incised design on the shoulder of the vessel. This sherd is similar to one found at the Broch of Burrian, North Ronaldsay (MacGregor 1972, 98, 99, fig 22), where the bosses were applied rather than moulded. It is suggested that boss moulding was developed from heavily impressed neck cordons used in the broch periods at Clickhimin and Jarlshof and on sites in the Western Isles. However, that particular form of decoration was not found at Howe.

Reconstructed vessel SF 7114 (illus 147; 148) is a shallow wide-mouthed bowl with a broad round base. The decorative features include 5mm long stab lines running horizontally along the interior of the rim. Below the lip of the rim on the exterior are 5mm long vertical stab lines encircling the bowl and 20mm below these is a row of applied raised bosses c 8mm in diameter, which run around the widest part of the vessel. Both at Spettisbury, Dorset and more strikingly among the 2nd century AD hoard found at Lamberton in Berwickshire are examples of bronze cauldrons and bowls of similar shape and carrying beaded rivets (BM Guide 1925, 135 fig 147; Stevenson 1966, pl 2b). Bosses are also to be found amongst the pottery from Clickhimin, Shetland and from All Cannings Cross (Hamilton 1968, fig 44, 7; Cunnington 1923, pl 34, 14).

SF 4388 (illus 153) from Phase 8, may have originated in Phase 7, and is best discussed here as there are few examples of this type of decoration generally and it is rare at other sites. It is a very curved body sherd with an applied and depressed rondel c 20mm in diameter, and another applied and indented rondel (where the tip of the thumb has depressed the clay), is found on SF 2635 (illus 147). Similar examples were found in the pre-broch phases at Crosskirk (Fairhurst 1984, ill 62, 749) and at the Aisled Farmhouse at Allasdale, Barra, and Foshigarry, Uist (Young 1952, 95, fig 8, 75, 76; Beverage & Callander 1930, 342 fig 24, 21).



Illus 148  
Decorated vessel (SF 7114), Phase 7.



Illus 149  
Decorated rim sherds, Phase 7.

This type of motif may have had early origins as it has also been noted on Neolithic pottery from Skara Brae (Childe 1929, 190, fig 28, 1, 2).

### Applied cordons

Several sherds from different Phase 7 contexts carry an applied cordon decoration, either plain, cut or slashed in various ways or as part of a fuller decoration as in SF 7542 (see ring pin impressions). This type of decoration found at Howe, is indicative of the many variations seen at other Iron Age sites.

Examples of vessels with applied undecorated clay bands are SF 5378, 2787 and 5238 (illus 144). SF 5238 and 5378 have a cordon which is applied and finished off as a square ledge immediately below the rim and SF 2787 is an ornate T-shaped rim with a large moulded cord beneath. The closest parallels to this were found at Mavis Grind, Shetland, which have been dated to the Late Bronze Age or Early Iron Age (Cracknell & Smith 1983, 37, fig 23).

SF 7212 (illus 144) has a thick cordon applied below the rim which is slashed resembling a cable. The Iron Age fort and broch at Clickhimin produced a number of examples of slashed cordons on pottery vessels (Hamilton 1968, fig 44, 1–5, figs 53, 54). Young has suggested that this design may 'represent in clay the *thonging*, twisted and attached to the neck of a leather bucket' (Young 1966, 50) and noted that this type of decoration occurs not only in Shetland but in Ireland and other parts of Europe.

Examples also occur at Howe where the slashed cordon motif forms part of a larger decoration. SF 7344 (illus 146) is a broken rim sherd with an obliquely slashed cordon applied below the rim. Below this is a finely incised fern or herringbone design with vertical incisions. A close parallel to this was found at Plumpton Plain and at Foshigarry, North Uist (Hawkes 1935, fig 3; Beverage & Callander 1930, fig 24, 5–12). SF 4881 (illus 147) has a narrow cordon applied below the rim into which short close-set lines have been cut by a knife or sharpened bone.

Eight rim sherds carry a narrow cordon, applied immediately below their rims, which have been cut vertically to form a cushion or bead as in SF's 4906, 2774, 7542, and 3917 (illus 144). On Hebridean wares, applied bands, whether slashed cordons or finger impressed wavy ones, have mostly occurred around the widest part of the vessel, thus disguising necessary thickening. Close parallels to the Howe motifs can, however, be seen from the Aisled Farmhouse at Allasdale (Young 1952, 93, fig 6, 57, pl 7); At Dun Cuier, Barra, an applied and pinched bead is found at the neck of a vessel, making it the closest parallel to the motifs from Howe (Young 1955, fig 11, 99).

Body sherds with applied cordons at Howe were few and only two examples, SF 4055 and 4846 (illus 146), are worthy of mention. The former has a raised band, with incised scoops above and below its ridge, and the latter has parallel diagonal slashes in the cordon, which was applied on the shoulder of the vessel. This type of decoration, as mentioned above was common in the Western Isles, on an applied band at Dun Mor Vaul, as part of a decoration at Allasdale, Barra, and cut into the body of a vessel at Mangersta, Lewis (MacKie 1974b, fig 16, 248; Young 1952, 93, pl 7; Carson 1976, 373, fig 3, 103).

### Vessel grooving

A number of sherds were found with pronounced internal and external grooving. The grooves are randomly distributed and appear to be made by combing, possibly to obscure the coil building. SF 5672 (illus 146) is an example of this type of decoration which has been applied externally over random drag lines. SF 7707 (illus 145) also exhibits a fine example of external grooving. It occurs only on thickly slipped and burnished surfaces, and may have been made by a bone tool.

### Other decoration

SF 5727 (illus 146) appears to have parallel light whip or thong marks on its surface and is the only example from this phase. Painted designs are also very rare at Howe. Only three examples have been tentatively identified from Phases 7 and 8, and can be hard to distinguish from smoke staining (see Phase 8). On the surface of sherd SF 6659 (illus 146), a possible cloth impression has been observed which appears to be of a simple woven fabric. Claw marks from a cat were visible on a sherd of a base to a small bowl, SF 2378.

### BASES

The majority of bases are flat (illus 140mf, e, 3:F12) but the occasional round bottomed vessels have been discussed above in both plain and decorated sections. Most of the bases are undecorated with the exception of the following. SF 2635 (illus 150) has an incised cross on its interior surface and is the only example of its kind at Howe. Many of the bases carry one or more dimple or fingertip impressions (eg SF 5672 a & b, illus 150). Dimples were placed randomly but often centrally, and examples can be seen from the earliest broch contexts at Dun Mor Vaul (MacKie 1974b, fig 11, 31). At A'Cheardach Mhor dimples are accompanied by an incised line decoration (Young & Richardson 1960, pl 11, 4, 7, fig 6, 35, 36). Base sherds with intricate incised patterns were found at Clickhimin from the Wheelhouse period (Hamilton 1968, fig 44, 10, 11).

An unusual fragmented base, SF 4487 (illus 150), with circular internal impressions was found at Howe where the circles were deeply moulded into the fabric of the vessel. Similar decorated bases, where the decoration is on the inner surface, were found in the Iron Age fort at Clickhimin, whilst those found in the Wheelhouse period had close-set grooves applied externally (Hamilton 1968, fig 68, 1–4).

The intact lower part of a thin-walled beaker or small jar, SF 4936 (illus 150), was found. The flat base has a diameter of c 50mm and is paralleled by examples from Meare Lake Village (West Village) (Bulleid & St Gray 1948, pl 4 P48, P10).

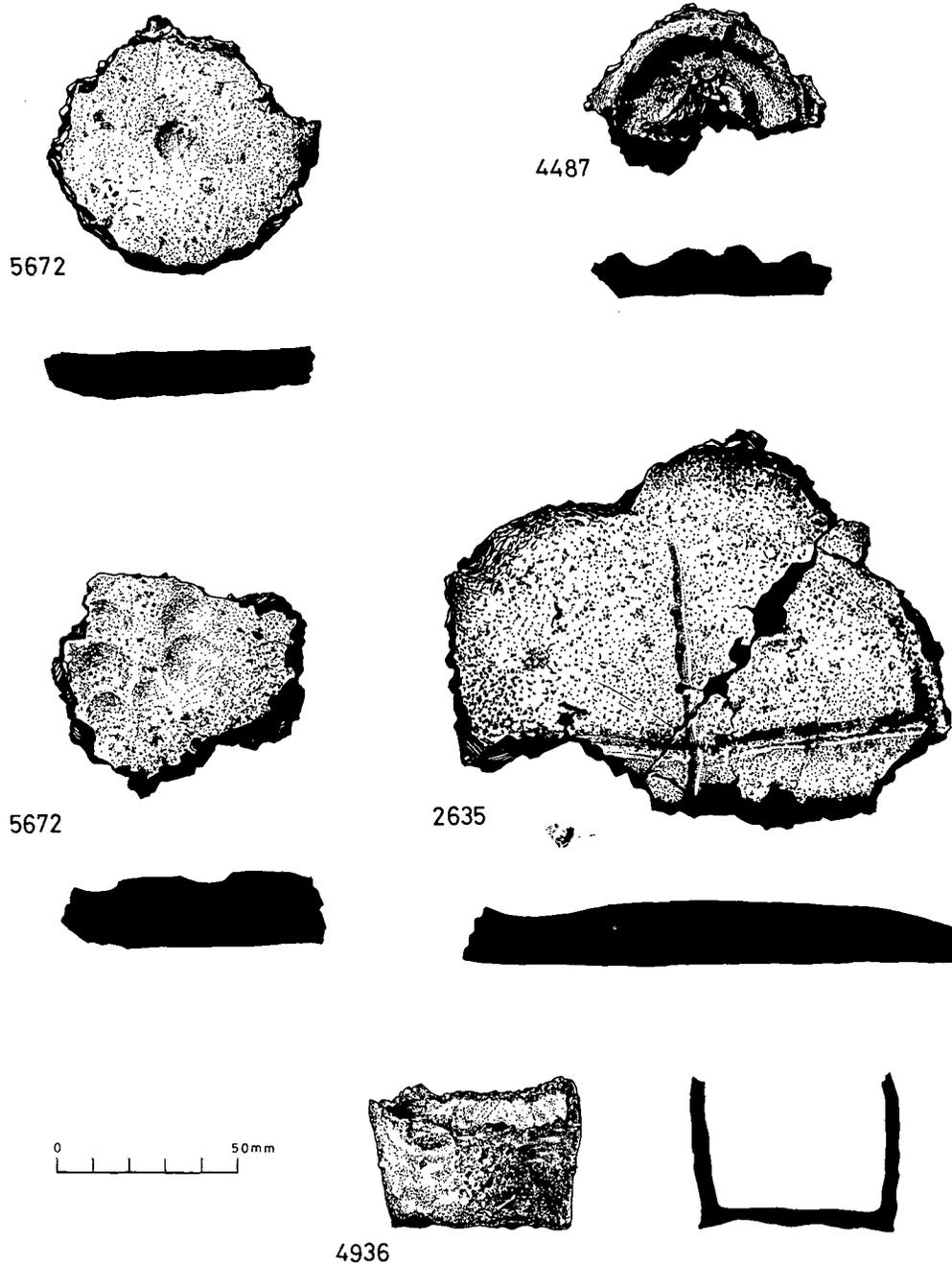
### PRODUCTION

Two pottery working areas were identified, one in the **E** building during Early Phase 7 and one in the broch tower during Later Phase 7. In the former, during a second phase of occupation, was a dump of ash from the hearth. Within the ash was a substantial amount of pottery, 200+ sherds, from which it was possible to reconstruct one vessel, SF 5241. Although the hearth was cleaned of all organic deposits it is presumed the vessels were fired there. Turf may have been used on the hearth as the ash was without any significant amount of charcoal. The vessels reflected both oxidized and reduced conditions.

In the second workshop floor of the broch tower was a feature identified as a kiln in which it is presumed that the 700+ sherds of pottery were fired. The sherds were found in the floor and within a contemporary burnt layer of the workshop. As with the **E** building, the kiln was devoid of organic material, but straw, chaff and turf found in the floor may be indicative of what was used to fire the kiln.

### ROMAN SAMIAN

One very small piece of Roman samian pottery was found in Late Phase 7 in accumulated rubble in the broch entrance. The piece measuring 20 × 9 × 3.5mm is possibly part of a rim. This accords with the other Roman finds from Howe (8.6 Metal artefacts; 8.8 Glass above) as well as other Iron Age sites in Scotland and Orkney (Robertson 1970).



Illus 150  
Decorated base sherds, Phase 7.

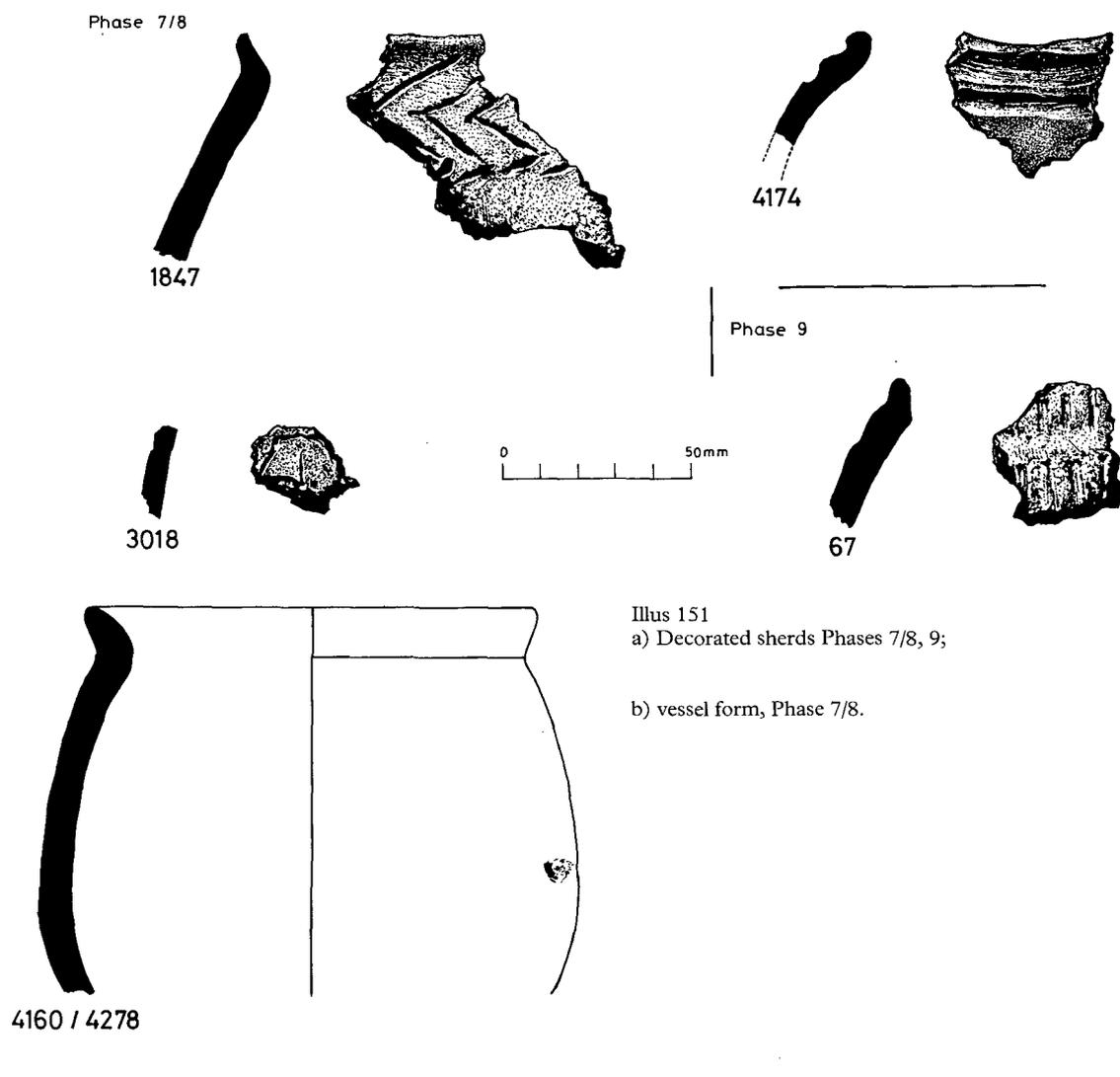
#### VESSELS OF PHASE 7/8

The range of vessels in this transition phase is representative of those found in both Phases 7 and 8, in fabric, form and firing conditions (see Phase 8 below) (illus 140mf, f, 3:F13). A partly reconstructed cooking pot, SF 4160/4278 (illus 151), is typical of Phase 7 wares while fine, well-fired sherds are characteristic of Phase 8 material as are beaded rims on wide or globular bowls or gently curving vessels with narrow bases. The occurrence of beaded rims does not denote an abrupt change of style, but is illustrative of a gradual development of everted rims throughout Phase 7.

At other sites in the north of Scotland, beaded rims occur in the

mid to late stages of the sites chronologies, for example in the Class 2 pottery group in the first wheelhouse at Jarlshof (Hamilton 1956, fig 35, 13-16) and as later broch pottery, Class 3A, from Crosskirk (Fairhurst 1984, ill 66, 58, 234, 469). These rims also appeared at Plumpton Plain, sites A & B, illustrating the gradual adaptation of existing lipped and everted rim forms (Hawkes 1935, fig 10 K).

One unique rim is SF 4174 (illus 151) which has an applied and moulded cordon below its irregular beaded rim. This rim decoration was not found in other examples in either Phase 7 or 8. Other decorated rim sherds are similar to those found in Phase 7, such as SF 1847 (illus 151) with an incised double chevron design. This design is paralleled at Dun Mor Vaul on a



Illus 151

a) Decorated sherds Phases 7/8, 9;

b) vessel form, Phase 7/8.

number of sherds of various forms (MacKie 1974b, fig 12, 69; fig 19, 456). Other examples exist at A'Chcardach Bheag, on South Uist where a parallel zigzag appears as part of a decoration, and from the Broch of Ayre, Orkney (Fairhurst 1971, fig 7, 4; Sutherland-Graeme 1913, figs 12, 13). These examples are typical of many others, as incised decoration was an important feature of British and European Iron Age pottery design.

Decorated body sherds have been associated with Phase 7 material from midden contexts, especially rim pin impressions. SF 3018 (illus 151) is however decorated with two incised lines which are probably grass impressions.

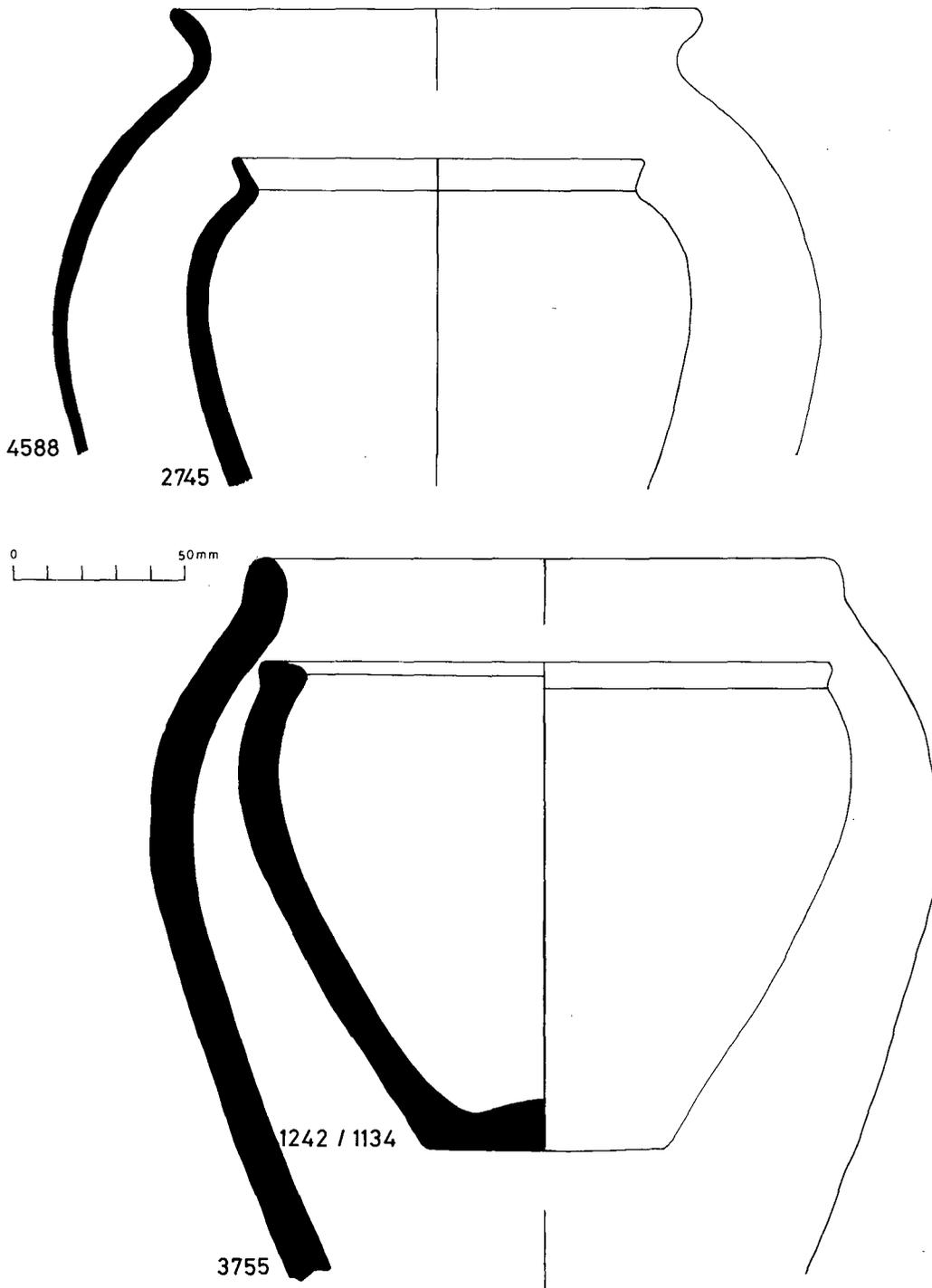
#### LATER IRON AGE VESSELS • PHASE 8

To a degree there is a continuity of style in vessel shape from Phase 7, for example inward curving vessels do not completely disappear, as bowls are represented. Straight-sided and globular vessels with lipped and everted rims appear in this phase with beaded or rolled rims. The occurrence of these rims had previously been a little irregular, but they appear to be a feature of later Iron Age sites in the north of Scotland (illus 140mf, g, 3:F14). 10.7% of the pottery collection comes from this phase (Table 70).

#### FABRIC

In general the fabric is finer, up to 5mm thickness, and thinner and harder than in the other phases facilitating the folding over of the clay to form beaded rims. Although Table 71mf (3:G1) shows a dominance of fine filler, many sherds contain very few or very fine inclusions, and some wheel-thrown sherds have none detectable. Coarser fabric was still used for thicker walled and heavier vessels as in SF 1242/1134 (illus 152). Quartzite and iron pyrites were noted among the filler as was mica in some of the slips. Coil building remained the dominant pottery making technique, although several fine sherds have been identified as wheel-thrown (Ewan Campbell pers comm). Vessels were slipped and burnished whether they were coil built or wheel-thrown, and many showed evidence of being moulded and smoothed. Evidence for grass tempering becomes slightly more prominent on both inner and outer surfaces than in Phase 7.

Reconstructed sherds SF 2103 (not illustrated) form part of a slightly curved vessel with a beaded rim. The fabric is gritty, despite a slip. Similar shaped vessels with gritty fabrics have been noticed at the Broch of Burrian (MacGregor 1972, fig 22, 280), and from the Late Iron Age settlement at Pool, Sanday (J Hunter pers comm). Comparisons can also be made with pottery from the Late Iron Age settlement and Late Wheelhouse periods at Jarlshof, from the Iron Age fort at Clickhimin and from Crosskirk (Hamilton 1956, fig 35, 13-16; fig 41, 12-17; 1968, figs 42, 43; Fairhurst 1984, 114, ill 66, 234).



Illus 152  
Vessel forms, Phase 8.

In contrast to the above, from a workshop floor in the *NE* building in Early Phase 8, is a poorly manufactured vessel, represented by an irregular inverted rim sherd. It is unlike the pottery from this phase, and is so poorly manufactured it is unlike anything else found at Howe in any phase. The fabric is soft, almost loose, with blobs of clay roughly applied and moulded into shape on the surface. The colour is buff, but with a grey reduced core and may be an example of Hamilton's Class 3 buff ware, which he considered a degeneration of the style and technique used in the wheelhouse period (Hamilton 1956, 81-2,

fig 41, 1). There, as at Howe, such pottery existed with more typical wares.

Other atypical sherds (including one unstratified example from Phase 9) are thin, very hard, and over fired. The fabric is almost filler-free and wheel-thrown, and may represent an unrecognized import (Ewan Campbell pers comm). Similar examples to these were found at Crosskirk where they were classified as Roman coarse ware (Hunterian Museum, accession no's CK 99 1979-107, CK 113(2) 1979-102),

## VESSEL FORMS AND SIZES

Straight-sided and globular vessels of various sizes seen in earlier phases are still present as are bowls, but with the addition of lipped and beaded or rolled rims. Vessels tend to have wider rim diameters in relation to their narrower bases.

It was possible to reconstruct a number of vessels (*illus 152*), which reflect the variations in fabric, rim and vessel form. Many of the sherds in this phase are very small, but an attempt has been made to assess them against similar types from other sites.

SF 2745 (*illus 152*) forms part of a bulbous cooking vessel without a base. The fabric is thin and the vessel was coil built, producing an acutely everted rim with a narrow tip. It possessed carbonized deposits on its inner surfaces and was burnt and smoke-stained externally.

Partly reconstructed vessel SF 4588 (*illus 152*) is one of two wide-bodied and globular pots with flared everted rims. Its fabric is hard, well fired and could have been wheel-thrown. Moulding marks on its internal surfaces also suggest this. It is also slipped and highly burnished. This vessel has close parallels with a number of highly burnished sherds from Jarlshof in the Late Wheelhouse period (Hamilton 1956, fig 41, 30). The latter were of a hard buff and black ware, and indicative of round-bottomed vessels. The complete form of SF 4588 is uncertain, but other vessels of similar rim and body shape have been found at Midhowe, Rousay and the Broch of Ayre which had flat bases (Callander & Grant 1933, fig 48; Sutherland-Graeme 1913, fig 14).

Another partly reconstructed vessel is SF 1242/1134 (*illus 152*). It is of coarse fabric, but is a wide-mouthed vessel which tapers to a narrow base. A similar shaped vessel appeared at Crosskirk (Fairhurst 1984, ill 66, 58) from the later broch period. SF 3755 (*illus 152*) forms part of another substantial vessel with coarse and heavy fabric, which lacks its base.

Most of the wide bodied vessels, with everted rims (either flanged or strongly everted) are made of a fine almost filler free fabric. The body of the vessels is *c* 3mm thick, slipped and usually burnished. Vessels with beaded or rolled rims could be of either thinner and finer fabric, or coarse.

Rim sherd SF 4350 (*illus 153*), is more typical of sherds from Phase 7 as it is coarse and heavily gritted. It has a slight shoulder 15–20mm below the rim, which is slightly unusual and would have formed part of a wide-bodied vessel with a flat base with a heel.

## DECORATION (*illus 153*)

In the Phase 8 material, decoration is sparse, with only 15 sherds with any markings or motifs.

SF 3061 is a rim sherd which has decoration in the form of a series of dragged horizontal incised lines below the rim. A similar form of grooving occurs on both surfaces of SF 2695, which is

probably part of a straight-sided vessel. Rim sherd SF 1817 has dragged cord or rush marks and a line of rounded impressions below its irregular everted rim.

SF 325 is the only example of an applied wavy neck band found at Howe. At the Broch of Ayre a wavy cordon was applied around the girth of a vessel, in the manner of Hebridean wares, discussed above (Sutherland-Graeme 1913, fig 12).

A number of sherds, including SF 2338, have fine combed decoration on both surfaces running round the vessel. This form of decoration and the grittier fabrics suggest clear associations with Phase 7 wares. In contrast, SF 2236, from stage 12 of Late Phase 8, has a heavily applied combed decoration, made by a bone comb or other blunt toothed implement, which runs regularly and horizontally around the vessel. Although the vessel represented by this sherd was hand made, it was finished on a wheel (Ewan Campbell pers comm). Iron Age sherds from the Stones of Stenness, Orkney, also exhibit this form of decoration (MacKie 1975, fig 9, 36).

Also from this phase is SF 4236, which carries a light decoration formed by a hard rush stem. The decoration was informally applied and is in keeping with sherds from Jarlshof (Hamilton 1956, fig 40, 2).

SF 4388 with its applied rondel is discussed under Phase 7, above.

A decoration missing from Phase 8 at Howe, but which appears at other contemporary sites, is the applied and incised curvilinear and semi-circular designs on the body of a vessel. The closest example found at Howe is a sooty decoration which forms a curve, and is possibly painted, on adjoining body sherds SF 1829/1880 (*illus 153*). This example may be purely accidental but it is unique in the pottery collection. Another sherd, SF 1746 (*illus 153*), may be an example of a painted design. It is a small body sherd with a burnished and thick mica slip on its outer surface. On the slip is a fine black zigzag line and two little black dots.

## BASES

The majority of bases are flat (*illus 140mf, f, 3:F13*), but several examples have a basal heel which produces a splayed or flared finish to the external appearance of the base.

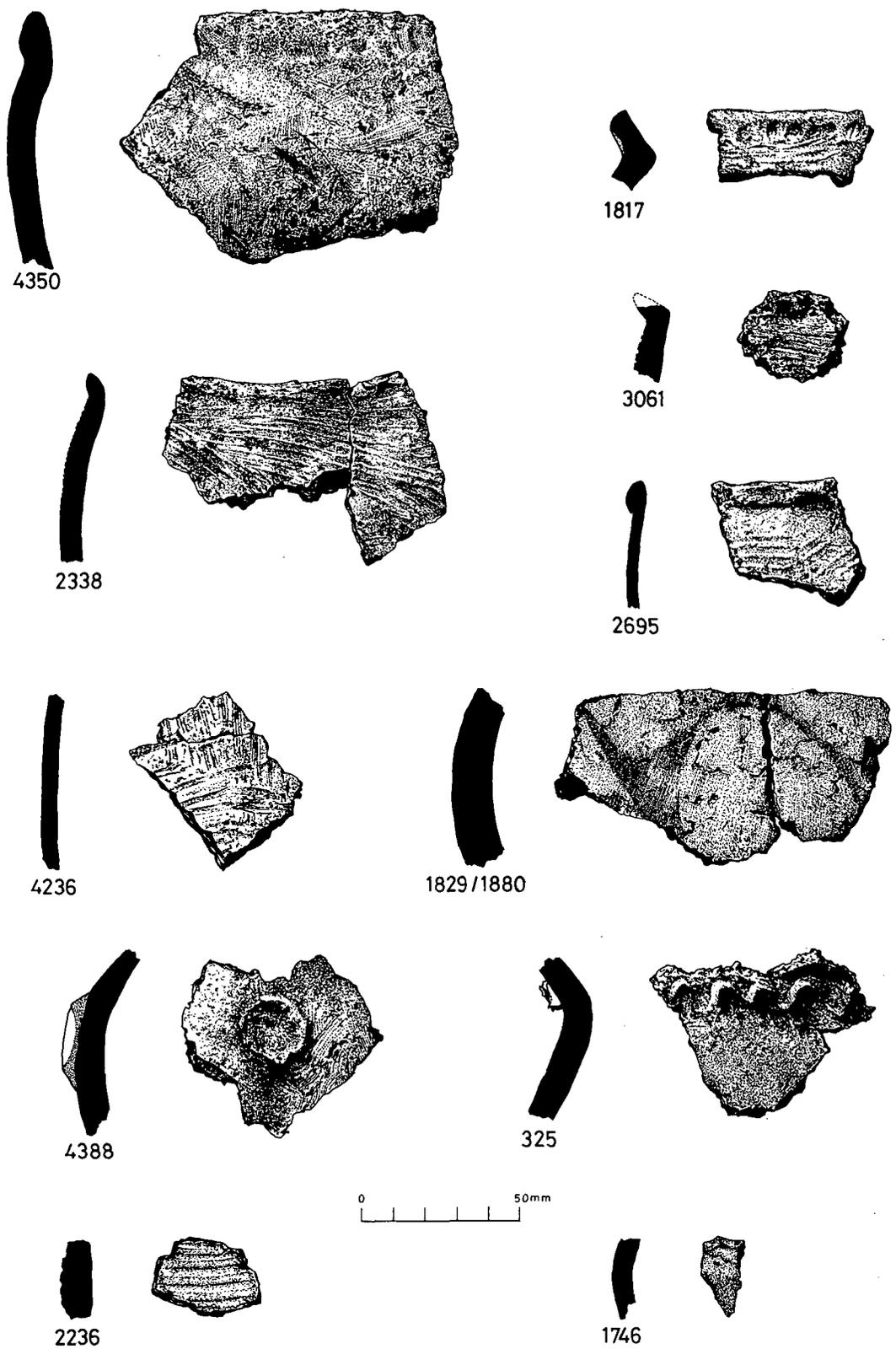
## UNSTRATIFIED MATERIAL – PHASE 9

This phase contains a mixture of modern pottery as well as unstratified broch and post-broch wares. Decorated sherds have largely been associated with Phase 7 wares (eg SF 67, *illus 152*). This sherd has short incised dash-lines *c* 10–15mm long, reminiscent of both horizontal and vertical decorative motives from Phase 5 to 7. The decoration on SF 67 is vertical and was probably made by the end of a rush or other hard stem on gently curved ridges. The closest parallel to this is from A'Cheardach Bheag, in the Western Isles, found in wheelhouse 1 (Fairhurst 1971, fig 7, 3).

## CONCLUSIONS

The assemblage from Howe constitutes a substantial research collection from which at present only limited results have been determined. Further, more detailed, analyses of some aspects of the assemblage is proposed for the future.

Techniques of pottery manufacture remained largely unchanged throughout the history of the site. Only in Late Phase 7 and in Phase 8 is there limited evidence of wheel finished coil-built pottery, seen in fluted rims and in the combing of the surfaces of some vessels. The one securely stratified example of wheel-thrown pottery occurs in Early Phase 8, other examples occur in Late Phase 8, but from rubble contexts. These sherds were of finer fabric, but without detailed analysis it is uncertain whether this fabric was substantially



Illus 153  
Decorated rim & body sherds, Phase 8.

different from the earlier wares. Except for one piece of Roman samian pottery, no other sherd has been positively identified as being an import. It is assumed that all the pottery was made at the site, although the supporting evidence for the Phase 8 wheel-thrown vessels is lacking. It is not inconceivable, considering the numbers of sherds without visible inclusions (a minimum of 68 presumed wheel-thrown), that they represent vessels which could have been manufactured elsewhere in Orkney and brought to the site.

The finishing of some coil or slab-built vessels on the wheel suggests the development of new manufacturing techniques from either local enterprise or from outside influences. This, however, seems to have been slight as traditional methods of pottery making remained dominant and persisted to the end of the settlement.

Vessel form does not substantially change over time. In Early Phase 7, small round-bottomed hanging pots existed with both decorated shouldered or globular jars of various sizes and with straight-walled bucket-shaped vessels. Shouldered jars, both wide and narrow mouthed, generally became less globular in Phase 8, and virtually straight-sided, fine-walled vessels became more prominent in Later Phase 8. This was due to a gradual development, rather than a change in style. The same parallel tendency can be seen in the rim forms. The dominant round or square everted rims of Early Phase 7 gradually became more rounded in Later Phase 7 and Early Phase 8, and eventually rolled or flattened in Later Phase 8. Nowhere in this sequence is there a rapid change of style, or an introduced new form. Vessel style was varied in Early Phase 7, remained so in Later Phase 7, and variations in fabric, form and rim shape can still be seen in the Phase 8 examples, although amongst a reduced number of vessels.

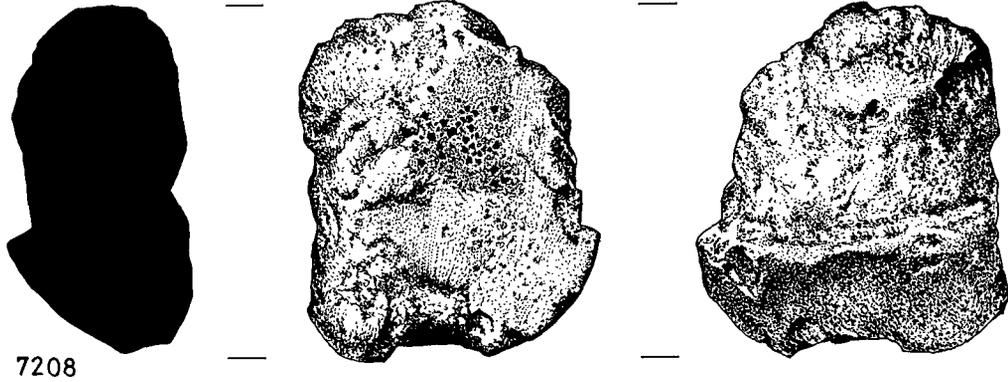
An initial analysis of the securely stratified decorative vessels has produced a number of interesting results. It appears that most of the decoration occurred only on vessels of Early Phase 7 date, during the life of the broch and village. Adaptations of some simple incised motifs occurred in Later Phase 7, as seen from ditch fills, as no decorated sherds were found in a domestic or industrial context. There were far fewer decorated vessels from Later Phase 7 than from the early part of the phase, and the decline in numbers continued into Phase 8. A sherd with a wavy cordon, from a vessel with a shoulder decoration, is the only stratified decorated sherd from the whole of Phase 8, and this occurred in one of the later stages.

Of designs that continued throughout Phases 7 and 8, although in small numbers, are fingertip impressions on bases and, more especially, beneath everted rims. The origins for this are early and go back at least to Phases 3 and 5. Combing of vessels' surfaces began in Early Phase 7 and continued to the end of the settlement. The only new form of decoration to occur on the site after Phase 7, was that of painting during Phase 8. Very few sherds have what is thought to be a painted design, and none has been definitely confirmed by analysis.

The filling in of the settlement's defences during the early part of Later Phase 7 is confirmed by this brief analysis of the decorated pottery. The material dumped in the lower parts of the ditches contained many decorated wares, presumably from the village houses prior to their levelling. Their decorative motifs are similar, if not the same as, examples found within the buildings. The same is true of a large dump of material, found outside the broch entrance, which reflects the vessel styles, rim and body designs as in Early Phase 7. As originally thought, this dump could have been from a major cleaning out of the broch tower.

The paucity of sherds from Phases 3 to 6 makes the derivation of decorative elements and forms difficult to ascertain, but the beginnings of simple incised and impressed designs were noted on sherds from Phases 3 and 5. It is hard to determine whether Phase 6 was a developmental period in pottery design, or whether that came in with Phase 7. How much the decorative pottery is a reflection of local or wider influences, is as yet not fully understood, nor is the continuation or reappearance of motifs from the Neolithic and Bronze Ages.

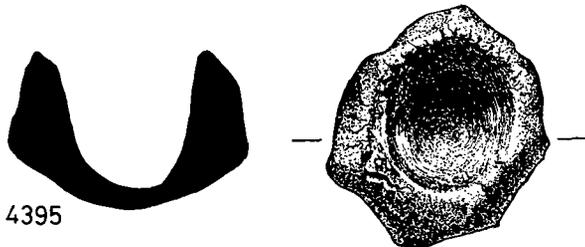
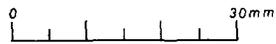
Comparisons with the Howe assemblage have been made with material from sites as far afield as Shetland, the Western Isles and the south of England, from the Bronze Age to the pre-Viking Iron Age. In the latter two areas, the comparison has mainly been concerned with the decorative motifs. None of the Iron Age sites mentioned help in any way to provide comparative absolute dating evidence for the Howe material. Indeed, it is suggested that the Hebridean sites require reassessing, with their relative chronologies matched by a sequence of C14 dates (Lane 1990). For the present study, Howe remains the only settlement site of its type to produce a large quantity of pottery which is linked to C14 dates. The forthcoming publications of other sites, such as Deerness and Pool, may, together with Howe, suggest a more definitive chronology for Orcadian Iron Age pottery.



7208



7875



4395

Illus 154  
Other fired clay: tuyère and crucibles, Phase 7.

## 8.10 • OTHER FIRED CLAY, UNFIRED CLAY AND MORTAR

Objects formed of clay, other than pottery vessels, were rare as only 14 examples were found including pieces of modern clay pipe and samples; a full catalogue is available in microfiche (3:G3–G4).

### DETAILS AND DISTRIBUTION

#### MORTAR

Only one sample, tentatively identified as mortar, was retrieved from the dump of rubbish [981] outside the broch tower in Later Phase 7.

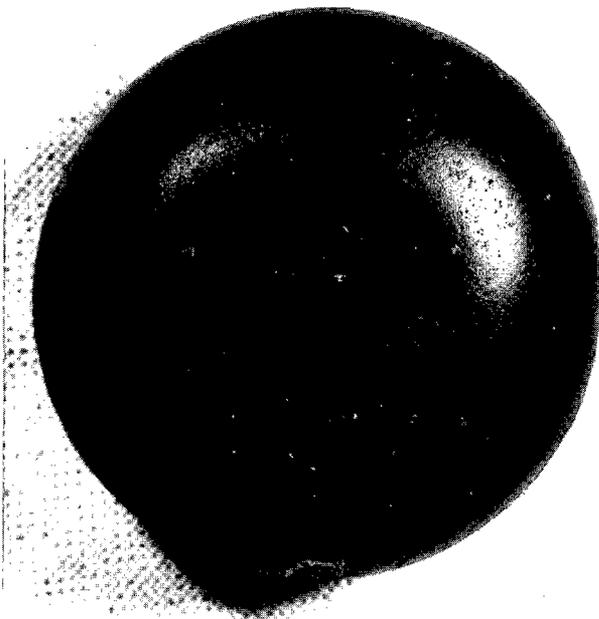
#### CRUCIBLES

The majority of fired clay objects have been identified as being associated with metal working processes. The earliest stratified clay objects were from a hearth within a Phase 5/6 building. It is suggested that these two pieces of eroded clay are in fact crucible fragments even though they have no metal or slag deposits adhering to them.

From an ash deposit in the **S** Building, early in Phase 7, came two pieces of another crucible, SF 7875 (illus 154), which had been fired to a high temperature. The fragments are grey in colour and have vitrified material, probably from copper-alloy working, on their internal surfaces. Enough of the sherds survive in spite of distortion to suggest they were fragments of a pear-shaped crucible, used in the smelting of copper-alloys and other precious metals. Several similar crucibles have been found in Orkney Iron Age contexts, notably at the brochs of Bu, Gurness, Midhowe and Lingro (Hedges 1987a, 24; 1987b, 56–57; 1987c 82, 116).

A small irregular shaped pot, SF 4395 (illus 154), was found early in Phase 8. Its interior surface has been burnt but it contains no deposits. It can be identified as a crucible as several different types, including tiny pots such as this, were found at the Glastonbury Lake Village (Bulleid & Grey 1911, pl 40, 306 C14, 308 D63). The rim of the vessel has been pinched to form a slight lip for pouring, as were the pots at Iron Age Glastonbury.

The light grey colour of crucibles such as SF 7875 was remarked on in the Glastonbury Lake Village publication by Mr Clement Reid (*ibid*, 301), who suggested that they were made of fire-clays and gannister beds not available locally and were therefore transported to the site. A similar situation may have existed in Orkney, but further analysis of the fabric of crucibles is needed. Fragmentary crucibles, also of grey clay, were found at Dun Mor Vaul (MacKie 1974b, 150 pl 12F) with crucible tongs. Unidentified crucible fragments were also recovered from the Iron Age fort and wheelhouse at Clickhimin and from the Late Bronze Age levels at Jarlshof. This suggests that small scale, domestic working of non-ferrous metals and perhaps glass took place at these Iron Age sites. Accompanying equipment such as tongs are rare from the northern sites and from the available evidence and lack of locally available raw materials it is unlikely that there were any organized industrial centres in the Northern Isles.



Illus 155

Glass linen smoother (SF A119) a) upper surface; b) lower surface; scale 1:1.

## BUNG OR TUYERE

Other fired clay pieces which relate to industrial processes include SF 7208 (illus 154), found in levelling rubbles prior to the construction of the Phase 7 village. This piece, which forms c 40% of an object, is part of a clay bung with a central linear perforation. Its small size and uncertain shape do not specifically aid its positive identification as a tuyère for a furnace, but it has been subject to high temperatures. Mrs Curle identified tuyères from Birsay (1982, 42, ill 25, 405, 406, 408a), but none had an external flange as does SF 7208. The only other from an Iron Age context in Orkney is the tip of a tuyère from Bu (Hedges 1987a, 108). Both the Howe and the Bu examples may indicate the presence of iron-working activities in the Early Iron Age, prior to the 1st century AD.

## POTTERY BEAD

Apart from two unstratified fragments of clay pipe only one ceramic artefact was found and this too was from Phase 9. SF 294 (illus 107) is a biconical bead which is pierced centrally. Unlike artefacts made from broken pottery, this bead was manufactured from clay which was burnished and slipped before firing. The narrow shaft, made after firing, suggests that the artefact is a bead rather than a spindlewhorl; it is of unknown date. It is not common to find artefacts other than pottery, of fired clay in the north of Scotland, but a single glazed(?) baked clay bead was found at Crosskirk Broch, Caithness from below the topsoil (Fairhurst 1984, 119, ill 70, 514).

## 8.11 • FINDS FROM THE 19TH CENTURY

In the National Museums of Scotland is a list of finds recovered from Howe in the 19th century, when it was known as the *Broch of Cairston, Bridge of Waithe, Stromness, Orkney*. The finds were donated to the museum by the Rev JH Pollexfen MA of Middleton Tyas, Richmond, Yorkshire. The finds consisted of:

'Bone handle of an implement, two whorls and disc of sandstone, portion of vessel of steatite and part of a tubular handle of an earthenware porringer' (PSAS 1888-89).

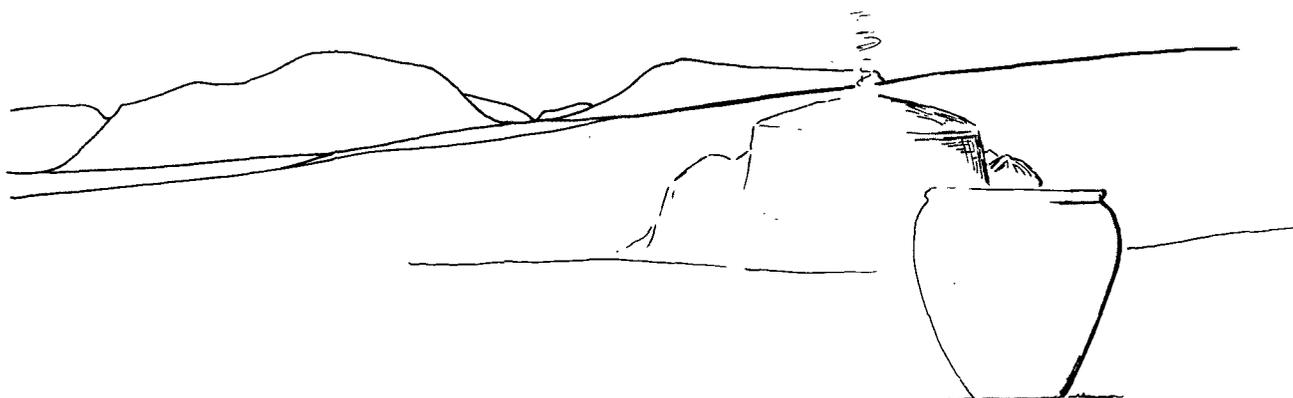
These finds are now accessioned under the numbers GA 294-303 (see Catalogue 8.11.1, 3:G5-G6).

## DISTRIBUTION

Where on the mound these objects were found is unknown, but the Phase 9 plan (illus 77) shows the extent of disturbance during the 19th century and later. Apart from a piece of coral which is unusual, the only other object of interest is the fragment of earthenware porringer handle (GA 297). This piece might suggest late dumping of refuse on the mound, but all the other pieces are characteristic of other Iron Age artefacts found on the site such as the rim fragment GA 298 and the antler tine GA 302. The antler handle GA 299 is a T-bar handle from a digging tool, and the sandstone pebbles represent an unworked stone, a counter and spindle whorls.

Another object found on the mound, but presumably not at the same time as the above, was a glass linen smoother No A119 now

in the Stromness, Natural History Museum (illus 155a, b). A discussion of it was published in 1927 by JG Marwick as being found in the 1860's at Howe Farm, Cairston, Stromness (PSAS 1927-8, 121-122). Grieg described (1940, 80-81) the linen smoother as a 'grave find of the Viking period' and of the type Rygh 446, a common Viking form. The description of the location of the linen smoother was given precisely in Grieg's account, but no undisturbed grave of Norse date was found on the mound. Only one fragmentary skeleton, SF 68/126/644, was identified from the top of the mound; it did not have a formal grave and there is no evidence to suggest that it was Norse (9 Human Bone report below). The linen smoother of green glass, however, remains the only object of probable Norse date from Howe.



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## THE HUMAN REMAINS

### DAPHNE HOME LORIMER

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The human bones from Howe were very fragmented and showed signs of considerable disturbance. Many individual bones were excavated from rubble contexts and wall fills and although these were, wherever possible, fitted on to an individual skeleton, in most cases this could not be done. Using the left femur as an indicator, a minimum of eight bodies were identified from the site, mainly from the Iron Age phases. These were represented by five adults, one juvenile and two foetal or full-term skeletons.

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### METHODS AND MEASUREMENTS

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The small sample makes mortality statistics meaningless but it is perhaps significant that only just over half the individuals found had reached maturity. Calculations of foetal and infant ages, using tables based on modern measurements from Hungary, although a useful guide, must be taken with caution when applied to prehistoric skeletons from Britain.

An absence of complete long bones precluded the estimation of stature in most cases. The catalogue with measurements is available in archive. Details of the pathology and analysis of the bones are available in microfiche (3:G7-G14).

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### DISTRIBUTION AND DESCRIPTION OF THE BONE

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#### PHASES 3-6

Phase 3 was the earliest phase to produce human bone. Here a vertebra, SF 6623, was found in clay forming part of the upper fills of the Neolithic ditch.

In Phase 5, a number of human bones, SF 5451, were found in the fill of a tank beneath the roundhouse entrance passage. The bones were used for radiocarbon dating (GU-1799) and produced a date which gives a calibrated range of 524-375 cal BC (10 Radiocarbon Dates below). The condition of the bones from this phase was poor; they were very thin with poor muscle markings; some features are suggestive of walking or running in rough country. Although they were found and excavated as one skeleton, they appeared to belong to two adults, possibly a young male in his teens and a female of 20+. Excavation evidence did not suggest a burial but it is likely that the bones were deposited at the end of Phase 5.

During Phase 5/6 five unrelated human bone samples, representing a minimum of two adults, were mainly recovered from the E side of the settlement. Over the top of the Neolithic ditch fills in the E came SF 6463 and 6472/7104, the latter being most of a mandible. Further fragments of a mandible, SF 5908, from an individual aged between 17 and 20 and other bones and fragments including SF 5557, were found in rubble layers in the NE. Fragments of a skull, SF 5737, possibly of a young adult, came from a rampart wall in the E. The distribution of these early samples and their deposition in rubble contexts suggests that the bones were old before Phase 5 and possibly before Phase 3.

Two other isolated samples were found in Phases 6 and 6-9 contexts: the former, SF 5926, in the Broch 1 wall core, and the latter, SF 3339, probably a young adult of 18-20, in clay over the Phase 5/6 rampart in the W.

#### EARLY PHASE 7

From the early part of Phase 7, nine individual samples of human bone were found scattered across the site. Several bones forming

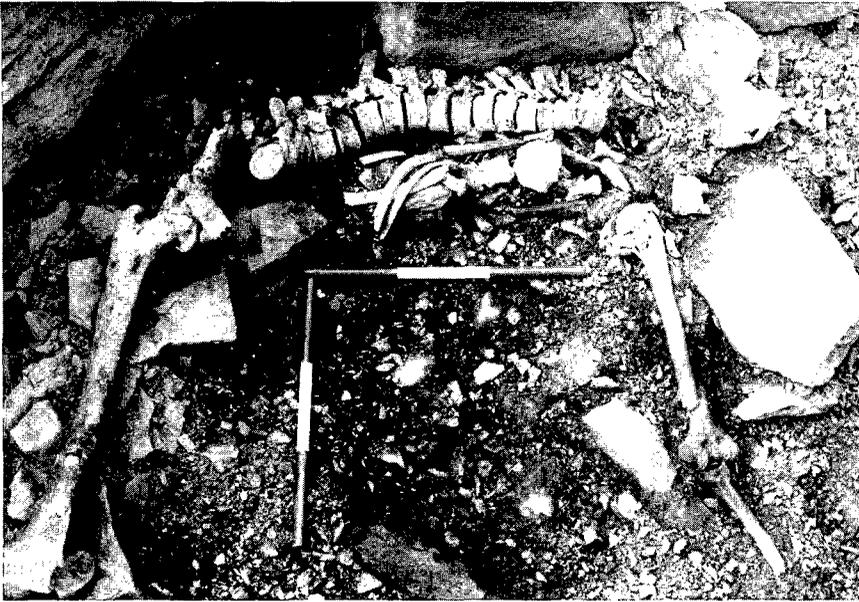
SF 3377, an adult, were found in an earth floor of the **SE** building. SF 3362 came from an ash spread and SF 3683 from rubble in the same building, but the bones were not related. The dividing wall between the **SE** and **E** buildings contained a human molar, SF 6615, and another, SF 5726, was found within the floor of the **NE** building. Isolated bones of an adult over 25, SF 3390, were found in one of the walls of the **SW** building and others, SF 6492, in the rubble backing to the dividing wall between the **SW** and **NW** buildings. Other bones, SF 5690, came from the broch wall core and fragments of a fibula, SF 3355, from rubble inside the broch tower.

As in earlier phases, isolated or groups of fragmentary bones occurred in walls and rubble contexts, the exceptions being the three samples which were located in domestic floors and debris within buildings. The predominant distribution of these samples lay towards the E and N of the site.

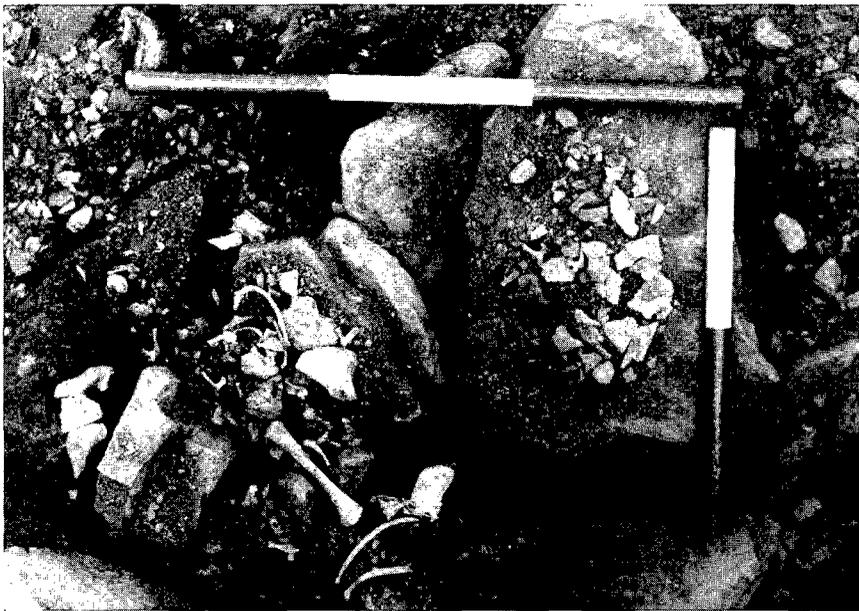
From contexts at the end of this phase, the remains of four skeletons were discovered. Prominent amongst these was the skeleton, SF 4546, a probable male of 35-45 with underdeveloped shoulders and poor teeth (illus 156). It was found in rubble within the rampart cell of the **NW** building yard. The skeleton lay against the curved wall of the cell towards the NW. Its surviving leg and its back lay parallel to the wall of the cell and its left arm lay outstretched away from the body. The head of the skeleton lay close to an upright stone and the body lay on its left side, which was the best preserved.

The position of the skeleton suggests that the body had been placed in the cell rather than buried. The fact that it lay within a layer of rubble and was soon covered by collapse from the broch tower, suggests that the body was dumped in an area no longer used and that the cell may have been roofless or unsafe.

Scattered in the N part of the yard of the **NW** building to the E of, and immediately above the male skeleton SF 4546, was the remains of a foetus, SF 4546/3773. The evidence suggests that the foetus was not formally buried but placed in the rubble in the same way as, and close to, the male skeleton. Disturbance of the



Illus 156  
Male skeleton (SF 4546) found in rubble, Phase 7.



Illus 157  
Infant skeleton (SF 4736/4738) found in rubble, Phase 7.

foetal bones may have been due to its shallow deposition within the rubble.

1m to the SW of skeleton SF 4546 were found the bones of an infant, SF 4736/4738, in the levelled rubble of the same yard (illus 157). Some of the bones were also located in the adjacent rampart wall, possibly due to animal disturbance. As with the two skeletons described above, no features of a formal burial were observed. These three skeletons, adult male, foetus and infant, were contemporary, being deposited in the same rubble context.

Close to these skeletons but found partly within an ash dump in the same yard was the skeleton of a young child, possibly female, about 10 or 11, SF 5677/5958/3951/6462/5445. The bones were, however, widely scattered throughout the deposits of the yard and a burial pit was not found in the ash. This skeleton is stratigraphically earlier than those described above, as it was deposited within ash formed during the use of the yard. The scattered nature of the skeleton can be partly explained by subsequent yard clearance and later disturbances.

#### LATER PHASE 7

During the latter part of Phase 7, eight samples of isolated human bone scatters were located. Fragments of a skull SF 3135, were found in the large dump of material placed outside and immediately W of the broch entrance. In the second reuse of the broch tower a sample, SF 3121, was found in the entrance. In sheds to the S of the tower, a bone, SF 3446, and a skull fragment, SF 3887, were found. Within the alterations to the **SE** building a clavicle, SF 3359, and fragments of another, SF 3454, were located. SF 3694 was found in the earth floor of the **E** building and in the levelled rubble of the **NE** yard, SF 3711 was recovered.

As with the scattered bones from earlier phases, many of these samples came from rubble contexts and wall fills. The evidence suggests that the material had been reworked and possibly been brought in from other areas of the site. Human bone found in domestic earth floors is more of a problem, and it might suggest that soil was brought in to prepare an earth floor and bones were brought in with it.

### LATER PHASES

In Phase 7/8 only one fragmentary human bone, SF 3031, was located in an abandonment surface. From Phase 8 in the abandonment rubble of the broch tower fragmentary bones, SF 1920, were found. In a wall of a Late Phase 8 Stage 4 building was a single phalange, SF 1257. In the rubble on top of the broch was another fragmentary sample of human bone, SF 51, found in Phase 8/9. In the unstratified rubble and ploughed topsoil three samples of single bones, SF 448, 650, 1749, were found scattered across the southern part of the site.

Close to the top of the mound were the remains of one fragmentary skeleton, SF 68/126/644, a male of between 25 and 30 years of age. The bones had been excavated from rubble lying one metre over the top of the Broch 2 intramural staircase and 0.5–0.8m below the turf line. Although not found in a formal grave, these bones may have been redeposited on top of the broch from a site lower down the settlement mound, or at the base of it where they were probably disturbed by ploughing. It has been suggested (8.11 Finds From the 19th Century above) that this skeleton may have been of Norse date through its implied association with the putative Norse glass linen smoother (illus 155) found in the 19th century.

### CONCLUSIONS – with BBS

This collection of human bone from Howe is important as it is the largest contemporary collection from an Iron Age site in the Northern Isles. However, no intact formal burials were located although five, possibly six, skeletons were disposed of from Phase 5 to the end of Early Phase 7. This covers the period from at least the 4th century cal BC to the 4th century cal AD.

Of the 38 samples of human bone collected from the site, the vast majority were isolated bones or groups of bones. They were found in rubble contexts, wall fills and occasionally in earth floors. As mentioned above, it would seem that these remains were subject to disturbance and reworking, perhaps over an exceedingly long period of time. The occurrence of isolated bones in rubble layers in Phases 3 to 6 indicates that the bones were older than the phases in which they were found. The same can be said for isolated bones in Phases 7 and 8. It would seem unlikely that a cemetery would be disturbed and used for building rubble. More plausible is the idea that these bones originally derived from either the Phase 1 or the Phase 2 Neolithic tombs on the site.

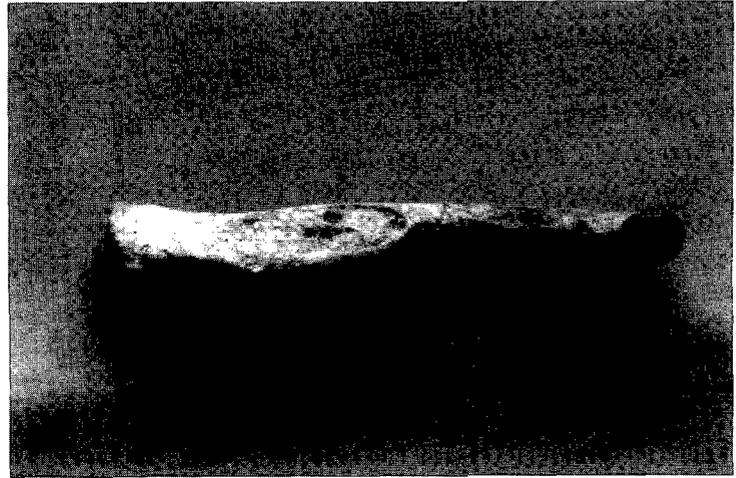
The Phase 2 Maeshowe-type tomb was robbed of stone prior to Phase 5 and was rebuilt as a roundhouse in that phase. If human skeletal remains in the tomb were disturbed then, they may have been reburied beyond the settlement to the E. The majority of the isolated bones were found in Iron Age structures in that direction. Although it has been argued (2.2 above) that the Maeshowe-type tomb could well have remained unused, it would seem a logical origin for these bones. Radiocarbon dates from some of the bones may solve the problem of their origin, but this was not thought worthy of the expense.

The Iron Age inhabitants at Howe are represented by the possible young male and associated young female, a female foetus, a 10 month old boy, a 9–10 year old girl and an older middle aged man. This selection of the settlement's population reflects the disposal of bodies in unusual circumstances. Where the majority of the inhabitants were buried is not known, but the assumption must be somewhere in the vicinity of the settlement.

The hurried disposal of 4 corpses in debris within the *NE* building at the end of Phase 7, may reflect the structural problems seen in the broch tower then, and the threat it must have produced on the daily life of the village. The corpses were only shallowly placed in rubble and were disturbed by dogs or other animals as the evidence of gnawing indicates. Traditional burial rites were no doubt disregarded and in fact the disposal of these corpses suggests little about the inhabitants religious beliefs, except it seems that a hurried and informal deposition of four bodies within a relatively short space of time, was acceptable.

The partial remains of what are now thought to be two young adults were found deposited in the roundhouse tank at the end of Phase 5. The condition of the bones was poor and there is little to indicate if they were deposited in a ritual form, or whether their inclusion in the tank silts was accidental. They were buried beneath a collapse from the Neolithic clay mound which formed parts of the side of the tank. There appears to have been little or no attempt to recover the bodies.

A collection of disturbed bones, representing one other skeleton (a male of between 25–30 years of age) were found during the early stages of excavation on the top of the settlement mound. This may have been a Viking burial from which a glass linen smoother (A119: Stromness Natural History Museum; 8.11 19th-Century Finds above) is derived. The link is tenuous, but the incident is not unknown. Up to six possible, and one definite, Viking graves have been identified at the Broch of Gurness, associated with grave goods and isolated Norse finds including a glass linen smoother (Hedges 1987b, 72, 73).



Illus 158  
Left clavicle of skeleton (SF 4546) showing marked flattening of antero-posterior at sternal end of shaft.

The small sample of the population represented by the total collection of bones from the site would appear to have been fairly healthy; no broken bones were noted, but infant mortality may have been high. The main diseases seem to have been related to the gums and teeth, where caries, heavily worn teeth, pulp exposure, and abscesses may have been the norm. Other evidence indicates that heavy manual work brought about skeletal changes especially in the clavicles (illus 158), femora and tibias. This type of skeletal evidence has been well documented in the Neolithic populations of Orkney (Chesterman 1979 & 1983), where pushing or carrying heavy loads, especially up hill is thought to be the cause.

It is not possible, given the small number and scattered nature of human remains from Howe, to indicate familial traits, average life expectancy, the physique of the population, the general occurrence of diseases and abnormalities or the traditional burial rites. In an intensively occupied settlement mound it was unusual to find contemporary skeletons; in the absence of evidence for the site's cemetery, these remains at least offer some insight into the physical nature of the Iron Age, if not earlier, community at Howe.



## THE RADIOCARBON DATES

### STEPHEN CARTER

25 samples of bone or charcoal were dated from Phases 3–8 inclusive (all the Iron Age phases), but none from the Neolithic (Phases 1 & 2). The samples are listed by Phase in Table 73. The radiocarbon dates are quoted in conventional years before present (1950 AD) with errors expressed at the  $\pm$  one sigma level of confidence. The calendar dates are from the high precision calibration of Stuiver and Pearson (1986), derived by interpolation from Table 3 of that paper as recommended by the authors. As explained by Stuiver and Pearson, it is not possible simply to calculate the probability that an actual sample date lies within the

Table 73: Radiocarbon dates from Howe

Phase	Lab No	Context	Material	Radiocarbon Date	Calibrated Date
3	GU-1760	1922 silting in well	Charcoal	2405 $\pm$ 75 bp	760BC–683BC 657BC–637BC 592BC–585BC 553BC–397BC
	GU-1804	2046 midden	Animal bone	2420 $\pm$ 55 bp	760BC–683BC 657BC–637BC 592BC–585BC 553BC–402BC
4	GU-1805	1993 floor	Animal bone	2305 $\pm$ 60 bp	402BC–370BC
5	GU-1789	1861 rampart	Charcoal	2405 $\pm$ 70 bp	760BC–683BC 553BC–395BC
	GU-1799	1001 drain/tank	Human bone	2380 $\pm$ 50 bp	524BC–395BC
	GU-2348	1894 clay levelling	Animal bone	2280 $\pm$ 50 bp	399BC–361BC
5/6	GU-1758	2029 rampart	Wood charcoal	2255 $\pm$ 95 bp	400BC–200BC
	GU-1759	1857 rampart	Charcoal	1940 $\pm$ 60 bp	2BBC–AD119
	GU-2355	1818 rampart	Animal bone	1930 $\pm$ 120 bp	100BC–AD230
7	GU-1750	1498 layer of burning	Wood charcoal	2070 $\pm$ 50 bp	187BC–1BC
	GU-1786	861 layer of burning	Wood charcoal	1975 $\pm$ 55 bp	56BC–AD78
	GU-1787	1491 floor in <i>NE</i> building	Wood charcoal	1670 $\pm$ 55 bp	AD257–AD297 AD320–AD441
	GU-1788	972 layer of burning	Wood charcoal	1935 $\pm$ 55 bp	2BC–AD119
	GU-2342	858 floor in broch	Animal bone	1790 $\pm$ 50 bp	AD128–258, AD295–322
	GU-2343	1356 floor in <i>E</i> building	Animal bone	2130 $\pm$ 80 bp	362–282BC, 258–96BC
	GU-2344	1017 floor in <i>S</i> building	Animal bone	1810 $\pm$ 50 bp	AD118–250
	GU-2345	826 floor in broch	Animal bone	1750 $\pm$ 50 bp	AD213–344
	GU-2346	972 floor in <i>SE</i> building	Animal bone	1750 $\pm$ 50 bp	AD213–344
	GU-2349	876 floor in broch	Animal bone	1790 $\pm$ 50 bp	AD128–258, AD295–322
	GU-2351	906 floor in broch	Animal bone	1850 $\pm$ 50 bp	AD77–228
	GU-2351	583 floor in <i>E</i> building	Animal bone	1770 $\pm$ 50 bp	AD213–343
8	GU-1749	775 floor	Wood charcoal	1565 $\pm$ 45 bp	AD428–549
	GU-1756	390 occupation deposit	Animal bone	2200 $\pm$ 70 bp	388–168BC
	GU-1757	345 floor	Animal bone	1450 $\pm$ 50 bp	AD560–655
	GU-2347	284/383 floor	Animal bone	1170 $\pm$ 50 bp	AD785–962

given calendrical age range. Up to four separate age ranges are found for some of the radiocarbon dates because of minor fluctuations in the calibration curve.

An original set of 14 samples (GU-1749–GU-1805) have already been published in an interim report of the site (Carter *et al.*, 1984, 72). The calibration used at that time was from Klein *et al.* (1982), and the results differ from those published here. The main effects of changing to the Stuiver and Pearson calibration are to significantly reduce the age ranges of the samples, particularly those with radiocarbon dates of 2000–2500bp (Phases 3–6), and also to give slightly younger calendar dates, particularly for the period 1000–1500bp (Phase 8).

The purpose of the following discussion is to establish an absolute chronology for the Iron Age settlement at Howe in as much detail as the data allow. In order to clearly separate the radiocarbon dating evidence from other sources, such as imported metalwork, this chronology is based solely on the radiocarbon dates, interpreted with respect to their stratigraphic positions and the nature of the dated samples.

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## DISTRIBUTION OF DATED MATERIAL

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### PHASE 3

Two dates are available, GU-1760 from the silts in the base of the Phase 3 well chamber, and GU-1804 from the stratigraphic early midden rich deposits over the Phase 2 tomb ditch. When calibrated they allow a range of dates from the 8th–4th centuries cal BC

### PHASE 4

The one sample from a floor GU-1805, gives a small age range of 402–370 cal BC. This suggests that Phase 3 need only lie within the 6th and 5th centuries cal BC unless it represents fragments of a very long occupation.

### PHASES 5 & 6

Of the six dates available, three come from Phase 5 contexts and three from Phase 5/6 contexts. Phase 6 contexts are limited to Broch 1 itself and no material was recovered that was suitable for dating. For Phase 5, GU-1789 and GU-2348 are both samples of residual material incorporated into the original Phase 5 structures and therefore must predate Phase 5. GU-2348 gives the earliest possible date for the start of Phase 5 as 399 cal BC and this compares well with the Phase 4 result of 402–370 cal BC (GU-1805). GU-1799 was a sample of human bone which, at the time it was submitted for dating, was thought to be the partial remains of an adult male skeleton. It was argued that the presence of a human corpse in the Phase 5 roundhouse drain/tank indicated a date for the skeleton at the very end of Phase 5 when it fell out of use. Subsequently the bone has been re-identified as belonging to at least two individuals (9.1 Human Bone Report above), and their interpretation is now uncertain. The calibrated age range for GU-1799 of 524–395 cal BC shows that the bones are older than Phase 5, although they are very unlikely to have been deposited in the drain/tank until the end of Phase 5.

GU-1758, GU-1759 and GU-2355 are all samples of material incorporated into rebuilds of the Phase 5 rampart which were completed at or by the start of Phase 7. After calibration GU-1759 is no earlier than 2 cal BC, so that the final modifications probably occurred during the 1st century cal AD, and this may also date the end of Phase 6.

### PHASE 7

Datable material from the start of Phase 7 was not recovered and the stratigraphically earliest samples, GU-1750 and 1788, are from contexts which formed after a considerable occupation of the

Phase 7 settlement, judging by the stratigraphic complexity. Both samples are of charcoal formed during major fires, which, although not necessarily contemporary, both predate the first large collapse of the completed version of the Broch 2 tower. GU-1750 was from charred roof timbers, burnt in the fire that destroyed the W side of the settlement (7.2 Plant Remains above). The calibrated age is 187–1 cal BC, but this is unlikely to indicate the actual date of the fire. Large roof timbers must have been a valuable commodity and would have been reused on Iron Age Orkney. When this factor is combined with the age of the timber when cut – the wood was local willow (*Salix*) – the probable date of the fire is in the 1st or 2nd centuries cal AD. The range of 2 cal BC to cal AD 119 cal for GU-1788 from a major fire inside the broch supports this interpretation as large timbers were not involved in this sample.

The other Phase 7 samples fell into two stratigraphic groups. GU-2351, GU-2349, GU-1786, GU-2342 and GU-2345 form a series decreasing in stratigraphic age from closely related floors within Broch 2. GU-2342 and GU-2345 are from contexts assigned to Phase 7/8 as it is uncertain whether they just predate or post-date the major broch wall collapse that marks the end of Phase 7. The calibrated age for GU-1786 is significantly earlier than the other samples in this series and like GU-1750 this sample includes charred roof timbers from a major fire. The remaining four samples date this late reuse of the broch in a range cal AD 77–344. On stratigraphic grounds, a 300 year occupation seems unlikely, and an actual range of c cal AD 200–300 is more acceptable. The remaining five dates are from Late Phase 7 floors in structures surrounding the broch tower. GU-2343 is stratigraphically later than GU-2353 and therefore its early age range must represent residual bone from earlier phases. The other samples (GU-1787, GU-2344, GU-2346 and GU-2353) produced overlapping ranges with a combined maximum of cal AD 118–441 cal. This does not conflict with the results from the broch which place the end of Phase 7 at the start of the 4th century cal AD.

### PHASE 8

Four Phase 8 samples were dated, of which the earliest stratigraphically is GU-1749 (Stage 4). This has a calibrated range of cal AD 428–549 which is significantly later than all except one of the Late Phase 7 samples. GU-1757 (Stage 10) is stratigraphically later than GU-2347 (Stage 5). If GU-1757 is assumed to include residual charcoal or old wood and therefore be too early for Stage 10, then there is a minimum of 236 years separating the dates from the Stage 4 and 5 samples. Unless there is a major stratigraphic break at this point, one or both of these samples is not accurately dating the context from which it was derived. In the absence of additional dated Phase 8 samples, the

radiocarbon data are unhelpful in improving the dating of this phase. Even if GU-1757 is derived in part from earlier material, it demonstrated that Phase 8 continued at least into the 7th century cal AD and probably later, as the final Stages of Phase 8 (Stages 11–12) remain undated.

#### DATING OF UNCARBONISED *RUMEX* (DOCK) SEEDS

The plant remains from Howe included two large collections of uncarbonised *Rumex* (dock) seeds from apparently well-sealed

contexts (7.2 Plant Remains above). In view of a potential Iron Age collection of *Rumex* and also the fact that some of the seeds germinated, one sample was submitted to the Oxford Radiocarbon Accelerator Unit for dating.

The result obtained (Ox-A 1238. Seeds, SF No 6369 135% modern), published in the 8th Oxford Accelerator Archaeometry datelist (Hedges et al, 1988, 298), suggests that the seeds were probably collected and buried by the Orkney Vole, possibly during the five years of excavation .

### CONCLUSIONS

Overall, the 25 radiocarbon dates from the Iron Age phases at Howe produce a sequence that is consistent with the site stratigraphy that extends over at least 1,200 years from 500 cal BC to cal AD 700. However, none of the key constructional events are precisely dated due to a lack of both suitable contexts and samples. The interpreted chronology for the Iron Age phases may be summarized as follows :

- Phase 3: of unknown duration, possibly includes 6th and 5th centuries cal BC
- Phase 4: 5th and 4th centuries cal BC
- Phase 5: probably 4th and 3rd centuries cal BC
- Phase 6: at least the 2nd and 1st centuries cal BC
- Phase 7: 1st to 4th centuries cal AD
- Phase 8: 4th to 7th centuries cal AD and possibly as late as the 9th century cal AD



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## DISCUSSION AND APPRAISAL

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### 11.1 HOWE – A REVIEW OF THE SEQUENCE • ALEXANDRA SHEPHERD

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‘... the strength of the archaeological record is its ability to lay bare long sequences of change ...’ (Bradley & Gardiner 1984, 2)

#### INTRODUCTION

Throughout a period that stretched from somewhere in the 4th millennium BC until that point in 1982 when excavation ended, the site of Howe represented a focal point in the landscape, a distinct outline on the horizon of the neighbourhood of Stromness and beyond. Its mound provided a navigational aid to ships well into this century (2.2: Discussion above) and the prominence of its location must have been fundamental in the first choice of the site and in its continuing utilisation. The gradual build-up of the debris from this occupation produced the *tell* of Howe, the embodiment of its four millennia as a focus of activity.

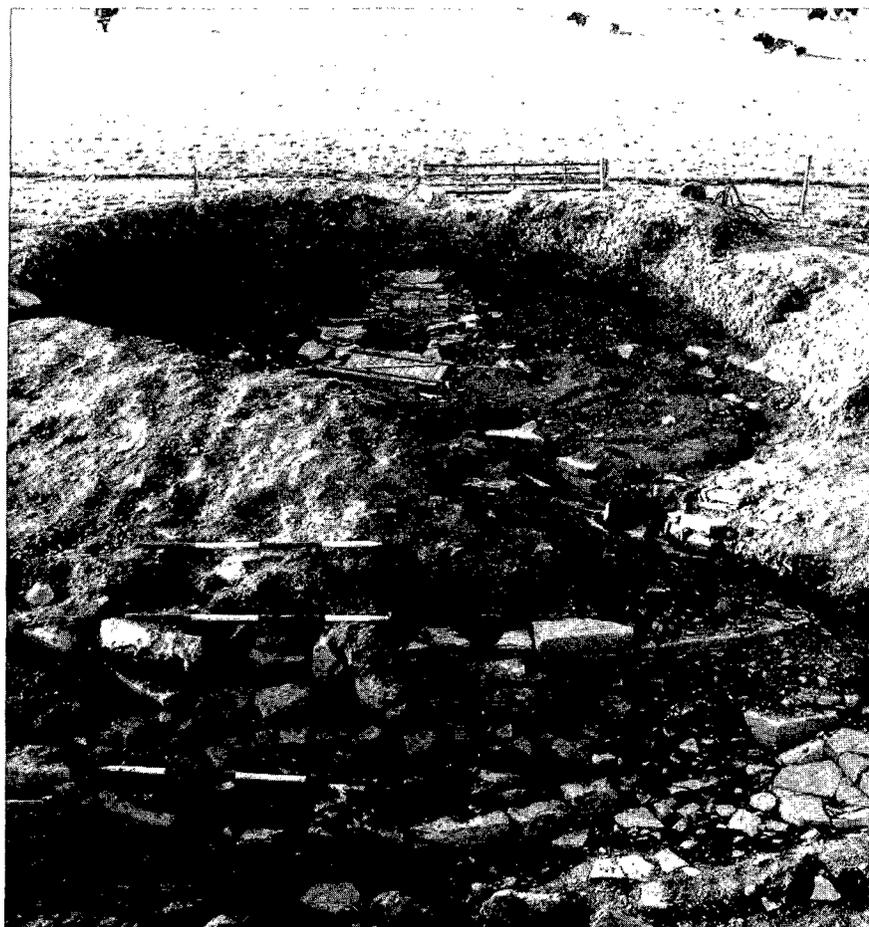
In the twelve years since excavation ceased, a number of interim publications by the excavators (*inter alia* Carter *et al* 1984; Neil 1985; Smith 1990) have presented the main structural and chronological aspects of the site; they have thereby placed much of the material in preliminary contexts from which inferences have already been drawn. This monograph has finally brought together the mass of data from the excavations which provided the basis for those initial statements.

Presenting fresh perceptions of a site, a large proportion of whose data has already become embedded in the archaeological literature, is no easy task. The restricted excavation of the earliest phases combined with the predominant survival of the later phases, 7 and 8, have biased previous discussion of the site towards the later, Iron Age, themes, particularly those relating to broch development and interpretation (most recently Armit 1990; 1991; Foster 1989a; 1989b; 1990; Hedges 1990; Hingley 1992).

Whilst highlighting, therefore, the contribution which individual stages of the site have already made to a number of debates, this discussion will seek to stress the overriding importance of the *sequence* and what this can reveal of the more general pattern of Orcadian society at particular moments in its prehistory.

The assessment will present the sequence in the traditional three age chronological pattern which has been followed throughout the volume, whilst attempting to identify significant changes in the inhabitants, represented by facets of architecture and material culture, technology and exploitation of land and resources. It will attempt to identify the nature of these changes and reflect on the existence of similar sequences elsewhere.

At this point a note is required on the terminology employed in this discussion. It has been stated in the Introduction (1.3 above) that the terms used for the three phases of substantial round structures in the volume would continue to be those established early in the excavation and post-excavation work – Roundhouse (Ph 5), Broch 1 (Ph 6) and Broch 2 (Ph 7). It is recognised that there is a clear need to divest the term *broch* of the ‘clutter of prejudice and unfounded assumption’ (Armit 1991, 204) which has built up around it, in particular that part relating to chronology and dimension: ‘not all brochs are Mousa’ (Fojut 1981). However the substitution of the term *roundhouse* (Armit 1991, 182–3), whilst representing an understandable attempt to establish and confirm a continuum and to release the terminology from the any inference of exotic introduction, needs to be continually and scrupulously qualified – *simple* or *complex*, with or without facets of *broch architecture* – if it is not to produce as many ambiguities and provoke comparable false expectations. Consequently the sections of this review which deal with the Iron Age sequence of the site



Illus 159  
Relationship on the Neolithic mound of the Phase 6 broch (Broch 1) outer wall (upper scale), to that of the Phase 5 roundhouse (middle scale), and the Early Phase 7 broch tower (Broch 2) (lower scale); scale – 2m; from S.

will adhere to the original terminology but, to aid future reference and clarity, will be followed by equivalent terms (after Armit 1991) in parentheses. The term *broch tower*, sanctioned by Armit (*ibid*, 183) for use only with those structures displaying palpable evidence of multi-storey construction, is used to distinguish the broch *tower* from the surrounding settlement, Hedges' (1987c, 13) distinction of *keep* and *village*.

A note is also necessary on the use of the radiocarbon determinations. In the body of the report, they have been expressed (10: The radiocarbon dates above) at the  $1\sigma$ , 68%, level of confidence; a recent reassessment of their interpretation (Armit 1991) also employed this level. A number of the dates, particularly those from the earlier phases 3–5/6, have standard deviations well in excess of 50 years; at the  $2\sigma$ , 95%, level of confidence, therefore, a very wide bracket for the calibrations of in excess of 300 or more years is produced. Consequently the dates provide a framework in spans of 200–300 years, or Case's (1991) quarters of a millennium, indicating a rough currency for phases of the site: they do not offer the precision that some examples of their use might suggest. In this respect they differ little from suites of radiocarbon dates from many other comparable sites. They are most effective in confirming the general time frame for a particular phase, suggested by other comparative material, rather than in attempting to support a definitive chronology. The derivations of chronological brackets from the excavators and subsequent work (Armit 1991) will be quoted in the following discussion with the proviso that the use of  $2\sigma$ , 95%, level of confidence can stretch the possible span of some periods of activity over a further 50–100 years.

## THE SEQUENCE

The excavation of the *howe* of Howe uncovered a range of occupational episodes indicating the changing uses of the mound over time (illus 159): it spans two periods at least of Neolithic building, some incidence of Beaker activity, a hiatus or lack of apparent activity over much of the Bronze Age (or more accurately the 2nd millennium), the first enclosure of the site at a time heralding the Early Iron Age, the re-emergence of large-

scale building with a fully demonstrable development from roundhouse to complex roundhouse to full broch tower, all with accompanying settlements, and finally a multi-stage post-broch settlement lasting into the Late Iron Age/Pictish period.

From at least one period as a major Neolithic funerary monument, it became a focus for Iron Age settlement, culminating in the highly organised village centred on Broch 2 (the *broch tower*).

## NEOLITHIC BUILDING AND REBUILDING

The restricted nature of the excavation of the Neolithic levels at Howe has meant that definitive statements about the essence of the first use of the site are difficult to substantiate. Nonetheless, on the basis of the evidence presented, it has been strenuously argued (2.2: Discussion above) that the earliest activity at Howe is represented by the construction, somewhere in the 4th millennium BC, of a mortuary structure, subsequently modified to act as the forecourt for a stalled tomb of Orkney-Cromarty type, together with the erection of at least one standing stone. The ensuing construction of a Maeshowe-type tomb is not in doubt, but the interpretation of the earliest evidence as a funerary rather than domestic structure has been questioned (Davidson & Henshall 1989, 52).

The structural design – two building compartments, each with their own ‘hearth’ – has prompted comparison with the domestic structures at Knap of Howar (Ritchie, A 1983) rather than Orkney-Cromarty stalled cairns. Architectural similarities with existing house types need not rule out funerary interpretation for the structures: it might rather suggest their identity as houses of the dead, their form developing from the design of structures for the living (Hodder 1984).

A ritual funerary role rather than a domestic use for the hearths is suggested by the evidence for the use of fire as part of the pre-completion ritual within Orkney chambers such as Knowe of Ramsay, Knowe of Yarso, Unstan and Calf of Eday Long (Davidson & Henshall 1989, 57), although none of these included a hearth arrangement as such. A non-domestic, hearth-like structure, the enigmatic central feature at the henge monument of Stenness (Ritchie, JNG 1976, 12–13) provides a possible comparison but in a ceremonial rather than funerary setting. In this connection, the inferred presence of at least one standing stone in this phase at Howe (2.1.1: Phase 1 above) adds weight to a ritual interpretation for at least some of the early activities.

The lack of any *in situ* human bone within the structure has been noted; yet even well-preserved tombs have sometimes yielded only small amounts of bone (Clarke *et al* 1985, 23). Some of the later scattered finds (9: The human remains above) could represent redeposition from successive periods of cleaning out and building works. Against the lack of skeletal remains can be set the two polished axes from the clay layer which suggest deposition as part of a funerary rite such as represented by the two from the innermost chamber at Calf of Eday (Davidson & Henshall 1989, fig 21, 30, 31; 107).

A comparative sequence of a domestic structure overlain by a Maeshowe-type, cellular, funerary monument has not so far been demonstrated on Orkney. However, evidence for sequential funerary monuments does exist. At Knowe of Laird the long mound with Orkney-Cromarty tripartite chamber was structurally altered into a cellular type (Richards 1988, 54). At Calf of Eday Long (Davidson & Henshall 1989, 107–8) and Bigland Long (*ibid*, 101) the stratigraphic sequence is horizontal rather than vertical with a large stalled chamber succeeding a smaller Bookan-type at the former (*ibid*, 87) and a smaller stalled chamber succeeding a larger at the latter (*ibid* 88). What has been identified as a stalled cairn at Tres Ness, Sanday (*ibid*, 163–4) has further, unquantifiable, structures superimposed.

At Maeshowe itself, there were traces of a possible earlier structure (Richards 1991) and, as at Howe, evidence for at least one standing stone. That other similar sequences may exist beneath standing monuments, whose excavation is precluded by the need to preserve their present entities, serves to underline the value of the Howe sequence.

Whichever interpretation – domestic structure of Knap of Howar type or funerary monument of Orkney-Cromarty type – is to be accepted for the earliest structure at Howe, it is of note that both structural types are associated with an Unstan cultural identity. For either type of monument to be succeeded by a cellular,

Maeshowe-type tomb, with the Grooved Ware associations which that carries, implies an Unstan>Grooved Ware progression. Howe consequently presents a stratified architectural sequence of the two traditions, whether house to tomb or tomb to tomb, a sequence more recently demonstrated by the ceramic assemblages from the settlement at Pool, Sanday (MacSween 1992, 259–71).

It is interesting to speculate on the nature of the transition: does the clay sealing of the earlier structure by the builders of the later indicate a 'respectful' laying to rest of the recent past, a vengeful act of slighting or an attempt to achieve a level surface for an impressive new monument over the decrepit remnants of long past generations? Each has a chronological implication, with the last possibly the least acceptable as it demands a hiatus between the two traditions rather than the considerable overlap, if not contemporaneity, which has been argued for elsewhere (Clarke DV, 1983) and which finds support in the range of radiocarbon dates (*ibid*; Davidson & Henshall 1989, 90–2). The proximity of Howe to both type-sites of Unstan and Maeshowe (illus 9) poses questions of territorial integrity. It would certainly seem that, in this corner of western Mainland at least, there is a progression from one cultural identity to the other; however, change may have been more rapid on Mainland Orkney (MacSween 1992, 268) while the old traditions survived longer in the peripheral regions, allowing for greater overlap. The implications of this change will be returned to below.

Whatever the impetus for its construction, the Maeshowe-type tomb at Howe would have presented a stunning stepped appearance, reinforcing the sense of commitment of massive communal resources to facilitate its construction. The impressive qualities of this tomb should be borne in mind when construction of the substantial structures on the site of two millennia later are discussed.

The whereabouts of the dwellings of the community who constructed the tomb can only be surmised. The identification through fieldwalking of the hitherto unknown, yet extensive, Grooved Ware site at Barnhouse (Richards 1986) provides hope that the recovery of similar material from the area might yet indicate the whereabouts of such a settlement for Howe.

#### THE ADVENT OF THE BRONZE AGE – BEAKER TRACES

The problem of discerning the nature of the transition between phases – whether it is one of destruction, abandonment, renovation or continuum – becomes more acute when the limited evidence for the immediate post-Neolithic years is examined.

At Howe, there is no structural evidence for the period that follows the use of the Phase 2 tomb. The Beaker sherds (illus 10, 139), found in the area in front of the tomb, represent the only evidence for the presence of the cultural change which elsewhere marks the centuries approaching the turn of the 2nd millennium BC for much of mainland Britain. In this, Howe reflects the sparse evidence from Orkney where Beakers have not been found in the same concentrated single-grave funerary context displayed on the British mainland, but sherds and related material, in particular barbed and tanged arrowheads, have been found deposited within the fill of Neolithic tombs (Knowe of Yarso, Calf of Eday, Unstan; Davidson & Henshall 1989, 78–9) and some in later levels of settlement sites (Childe & Grant 1939, 26). Howe and the other Orkney examples consequently form part of the phenomenon of the association of Beaker material with the filling-up and abandonment of chambered tombs, as well as what appear to be last acts of ritual associated with other burial mounds and stone circles, from as far apart as Wiltshire and the Western Isles (Shepherd, IAG 1986, 9): it is of note that one of these episodes, at Cletraval, N Uist, produced a sherd offering the closest parallel to one of the Howe pieces (8.9: Pottery above).

Just when these sherds were deposited at Howe is uncertain; they do not represent any clearly definable mainstream Beaker phase. The most recent, if still somewhat inconclusive, dating of Beaker associated skeletal material (Kinnes *et al* 1991) presents a currency of 2400 cal BC to 1800 cal BC for their deposition. Unless considerable overlap with Grooved Ware supremacy is envisaged, the latter part of this time span, the first quarter of the 2nd millennium, would seem the more likely timing for activity within tombs such as Howe.

Perhaps too much stress can be laid on the incidence of a few – in the case of Howe, four – Beaker sherds (see Morton 1990 for a detailed study of the incidence of Beaker deposits in Neolithic contexts). Yet even amongst the Neolithic pottery in the tombs, representation of a vessel by only one or two sherds is the norm

(Davidson & Henshall 1989, 57). For Beaker deposition, however, there is a striking contrast between the apparent scattering of a few small sherds within an earlier monument, as at Howe, and the reverent placing of a whole pot close to the body as part of the classic Beaker single burial ritual. Does sherd deposition represent the re-use of past ritual foci (Thorpe & Richards 1984, 79–80) or does the nature of deposition at Howe and elsewhere suggest rather the laying down of markers: registering ‘under new management’ or the end of the old era? Again, these themes will be returned to below.

Elsewhere in Britain, the advent of Beakers and Beaker-related material heralds the earliest appearance of metalworking (Burgess 1980). The evidence for this development within Orkney is recognised as being slight indeed (Clarke *et al* 1984, 84) and none was revealed in the Howe sequence. Yet Orkney is shown to have varied metal resources (Øvrevik 1985, fig 7.1), a number of these within easy access of Howe; if the advent of Beaker producers was as metalworkers and prospectors, then they seem to have left very little trace.

## THE BRONZE AGE HIATUS

At Howe, the fragmentary evidence for Beaker activity in the sequence is followed by none at all for what could be ascribed to the full Bronze Age. In real terms this could mean a hiatus in the habitation of the site of anything up to 1200 years, beginning with cessation of activity post tomb closure, suggested as the first quarter of the 2nd millennium, and its reassertion with the earliest re-enclosure of the site in Phase 3, which could, from radiocarbon determinations, be as early as the 8th, or as late as the 6th, century cal BC.

Given the nature of the Early and Middle Bronze Age evidence from the rest of Orkney (Øvrevik 1985), characterised as it appears to be by smaller scale, scattered settlements, burnt mounds and barrow groups, it would not be surprising if Howe lay unoccupied during much of this time. The massive stepped mound, however altered its associations following a Beaker interlude, may not have presented an attractive building proposition to what was an altogether smaller scale, possibly more mobile society (*ibid*, 131).

Alternative interpretations for the apparent break in the Howe sequence should not be entirely ignored: rather than a total hiatus in occupation it is possible that an impoverished, and consequently insubstantial, 2nd millennium occupation might have taken place, all traces of which were destroyed by subsequent Iron Age activity; or again, activity might have been in areas slightly off the main mound which would therefore not have been within the scope of the excavation. Yet even these interpretations serve to underline the sharp contrast between an Orkney studded with massive tombs and flourishing settlements and a much reduced Bronze Age aftermath.

## THE EARLY IRON AGE – ENCLOSURE AND BUILDING DEVELOPMENT

It is probably most accurate to envisage Howe lying dormant for much of the 2nd millennium. The resumption of activity following this interlude marks the beginning of the second major part of the Howe sequence. The chronology of the first two and a half thousand years has been inferred by analogy with other Neolithic and Beaker associations. At this point in the sequence, radiocarbon dates (10 above) become available to help define the chronology. They indicate that at least from the 8th, possibly even the 9th century cal BC, full occupation of the site resumes.

### The first enclosures

The resumption of activity is characterised by the construction of a shallow ditch or gully which enclosed an area to the south of the old Neolithic mound. Concrete evidence for structures within the enclosure during this period is limited but the construction of a well *outside* the ditch has been taken as evidence that it served purely as a boundary marker, rather than a physical defensive structure (see below). The radiocarbon determinations (Table 73) give wide brackets of *c* 8th/9th to 5th century cal BC for this phase; it has been termed Early Iron Age but a Late Bronze Age label might be as valid; the distinctions at this stage are somewhat academic.

Evidence for the nature of the settlement within the enclosure, and consequently for the people who constructed it, is fragmentary (illus 11) and cannot provide a coherent picture of the period represented by the dates; but the establishment of this enclosure at Howe initiated a series of structural developments on the mound, and set the boundaries for settlement on the site for almost a thousand years.

After some unquantifiable period of time, the boundaries of the settlement were consolidated by the recutting of the first ditch, the construction of a stone wall on its inner edge, and the taking in of the tomb mound within the enclosure. The timing of these developments, differentiated as Phase 4, is uncertain; the single radiocarbon determination (Table 73) appears to overlap stratigraphically later phases: somewhere around the 5th century cal BC would seem to be the most appropriate placing.

During this phase, there were only three, possibly four, recognisable buildings (illus 13), two of which provided definite evidence of construction against the enclosure wall. From the scant remains, sub-circular structures were suggested, with no discernible indication of hierarchy between them: what seems to have been important was the clustering of structures. From the beginning, the evidence indicates the formation of a nucleated farming settlement complex rather than an isolated single farm unit and points rather to a pattern of recurrence of similar forms from the cellular traditions of the Neolithic (Armit 1990, 195–7).

There is evidence that other similar enclosed settlements were created at this time. Lying respectively 1km to the NNE and 2.6km to the NE on the edge of the Loch of Stennes are two enclosed promontories, the Tàng of Onstan and Nether Bigging (Lamb 1980, 78). The presence of ditches, banks and walls plus a sherd of Iron Age pottery suggest activities contemporary with the Early Iron Age enclosed settlements at Howe. However, if these were indeed Early Iron Age communities then, for some reason, unlike Howe, they did not thrive and develop into similar substantial settlements with roundhouses.

The evidence from these more fragmentary and less visible settlements has been somewhat eclipsed by the substantial structures which characterise the later stages of the Iron Age in the area. However, recognition of these (Armit 1990, 198; Hingley 1992, 17) is increasing and again, the importance of the fugitive Phase 3 and 4 structures at Howe lies in helping to elucidate the complexity of the progression towards thriving Iron Age village.

#### Roundhouse development – simple and complex

The span of calibrated radiocarbon dates (Table 73) suggests that the enclosed settlements of Phases 3 and 4 could have been in existence for anything from 100 to 400 years before a large roundhouse with 4m thick walls, a ditched and walled enclosure and adjoining structures, was built on the site.

Radiocarbon determinations for this first substantial circular structure on the site place the possibility of its occupation sometime between the 8th and 4th centuries cal BC. In the original discussion of the site, the excavators (3.1.3: Phase 5 and 10: The radiocarbon dates above) preferred a span of 4th and 3rd centuries for its occupation. More recently, Armit (1991, 187) has placed the roundhouse within a 500–400 cal BC bracket as part of the *simple roundhouse* development recognised at Bu (Hedges 1987a), Calf of Eday (Calder 1937; 1939), Pierowall (Sharples 1984), Quanterness (Renfrew 1979) and represented by the early ‘broch’ at Crosskirk (Fairhurst 1984). As a class Armit ascribes them to the period 800–400 cal BC. The Bronze Age horizon for a large thick-walled structure at Tofts Ness (Dockrill 1986, 22–3) suggests that their establishment could have been even earlier.

The emergence of these single isolated farmhouses has been seen as a contrast with the tradition of cellular ‘courtyard’ houses with their Neolithic ancestry (Foster 1989b, 34). The importance of the appearance of the roundhouse in the sequence at Howe is twofold. Firstly, together with Bu, Quanterness, Pierowall and others, it helps to establish a native pedigree for the later complex roundhouses, the brochs, both in their thick walling and their interior features, and obviates the need to attribute the development of their construction to external influences (cf MacKie’s long held and firmly argued views eg 1971; 1983). Secondly, whilst contributing to this picture of established substantial roundhouses, the size of the enclosure together with the accompanying remnant structures suggest that even at this stage it does not represent an isolated single homestead with, possibly agricultural (Foster 1989b, 35), outbuildings but can be seen as an embryonic nucleated settlement.

With its souterrain, derived from the remodelled Neolithic underfloor chamber, the roundhouse also helped to amplify understanding of the relationship of these structures; it helped to demonstrate that many roundhouses, both thin- and thicker-walled, possessed souterrains which were entered from their interiors. This augmented the increasing evidence that souterrains were not isolated occurrences but invariably

ancillary to an above-ground domestic structure such as was identified at Grain (Haigh 1983). It does not, however, aid the interpretation of their use; Orcadian examples are likely to have been extremely damp and their use for storage of grain (Foster 1989b, 35) is considered unlikely.

Evidence of other internal arrangements at Howe had been largely removed by successive restructuring but analogies with Bu suggest that radial partitioning was likely.

This simple roundhouse settlement could have been in existence for as much 200 years before some form of impetus for change led to the building of a more complex form differentiated as Broch 1 (3.1.5: Phase 6 above). There were no radiocarbon determinations for this (Phase 6) structure but its stratigraphical position between dated phases prompted the excavators (10: The radiocarbon dates above) to place it in the 2nd and 1st centuries cal BC. Again, more recent assessment (Armit 1991) ascribes it somewhat earlier date brackets of 400–200 cal BC.

This substantial structure had walls 3.5m in width (illus 20), preserved up to 2m high, together with two intramural staircases and two guard cells (illus 22). Sets of post-holes may indicate roof supports (Carter *et al* 1984, 66) and a possible timber gallery. The interior of this structure was divided by radial partitions similar to those in the Bu roundhouse and Crosskirk broch (*complex roundhouse*). It provides a link in the development from *simple roundhouse* to full *broch tower*, displaying some elements of *broch architecture* – intramural staircases and guard cells – but not the full height and features of the subsequent Phase 7 Broch 2. The broch structure (*complex roundhouse*) at Crosskirk, placed in the 5th century cal BC, is seen as a parallel (Armit 1991, 202). Like Howe, it appears to have been enclosed and may also have had ancillary structures.

The indications are that there is a development in this period from simple thick-walled roundhouses as at Bu and Howe to more complex, ie more recognisably broch-like structures, as exemplified at Crosskirk.

The importance of the Howe sequence at this point is to help demonstrate that, possibly as early as 300 cal BC, there are structures in Atlantic Scotland displaying features of broch architecture which would formerly have placed them in a much later period (Armit 1991, 190). In addition, there is evidence of a nucleated settlement, fully enclosed, based around this complex structure.

## MIDDLE IRON AGE – BROCH TOWER AND SETTLEMENT

The first broch (*complex roundhouse*) form appears not to have been architecturally successful and at some point, possibly less than 100 years after its construction, it was replaced by a more substantial structure, designated Broch 2 (the *broch tower*). The construction and occupation of this, the final and best-preserved of the three substantial roundhouse forms on the site, has, together with its accompanying village settlement, been given chronological brackets (10: The radiocarbon dates above) of the 1st to 4th centuries cal AD. The dates, however, all relate to the later part of the phase (Table 73): the major fires, collapse and subsequent partial reconstruction. They do not date the construction or early occupation of the broch tower and settlement; this must lie some time earlier, probably closer to the more recent reassessment (Armit 1991) of 200 cal BC–cal AD 100, which crucially places the broch village construction and *floruit* in a *pre-Roman* context.

The massive dry-stone broch tower construction, with its 5–6m thick walls (illus 24; 25), was built over the remnants of the previous, less stable, version at the same time as a planned settlement of six buildings and yards was laid out. Broch 2 is considered by Armit (1991) to be a *broch tower* in the full sense although its original height and number of storeys are matters of conjecture. The very high percentage wall base (PWB), 84%, well above an estimated average of 72% for the Orkney brochs and far in excess of the 62% for Mousa (Fojut 1981), would argue for an improbable height to the tower; it is more likely (4.2: Discussion above) that the considerable thickness of the walls (illus 160) was aimed at ensuring stability rather than achieving excessive height. The defensive implications of possible height are discussed below.

Any discussion of the likely number of storeys present in the broch tower assumes a multi-storey construction for which there is no definite support in the evidence. The height of the remnant masonry and the presence of a staircase (4.1.1: Early Phase 7 above) does suggest a possible upper storey, varying slightly from Hedges' suggested 1.8m norm for brochs (1987c, 10). However, unlike the earlier Broch 1 (*complex roundhouse*), no



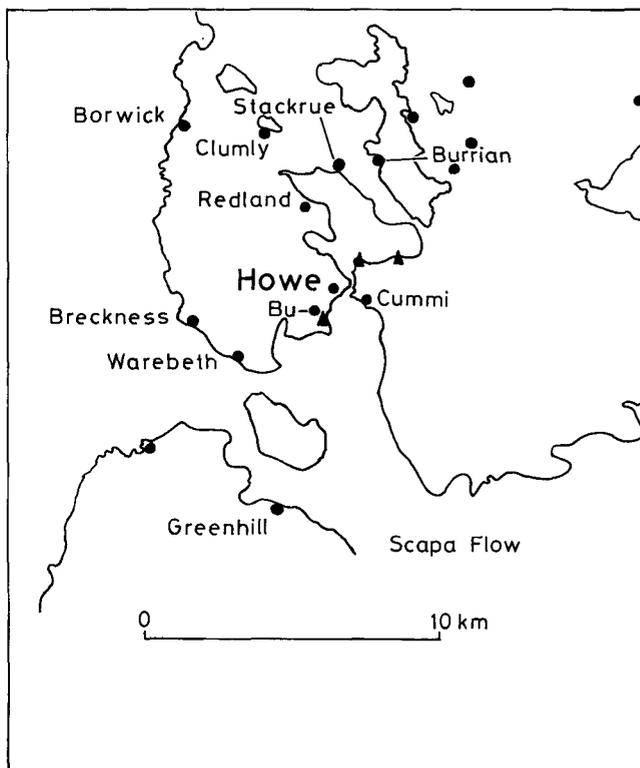
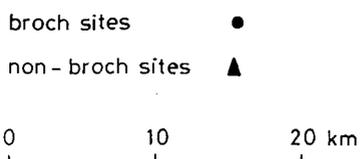
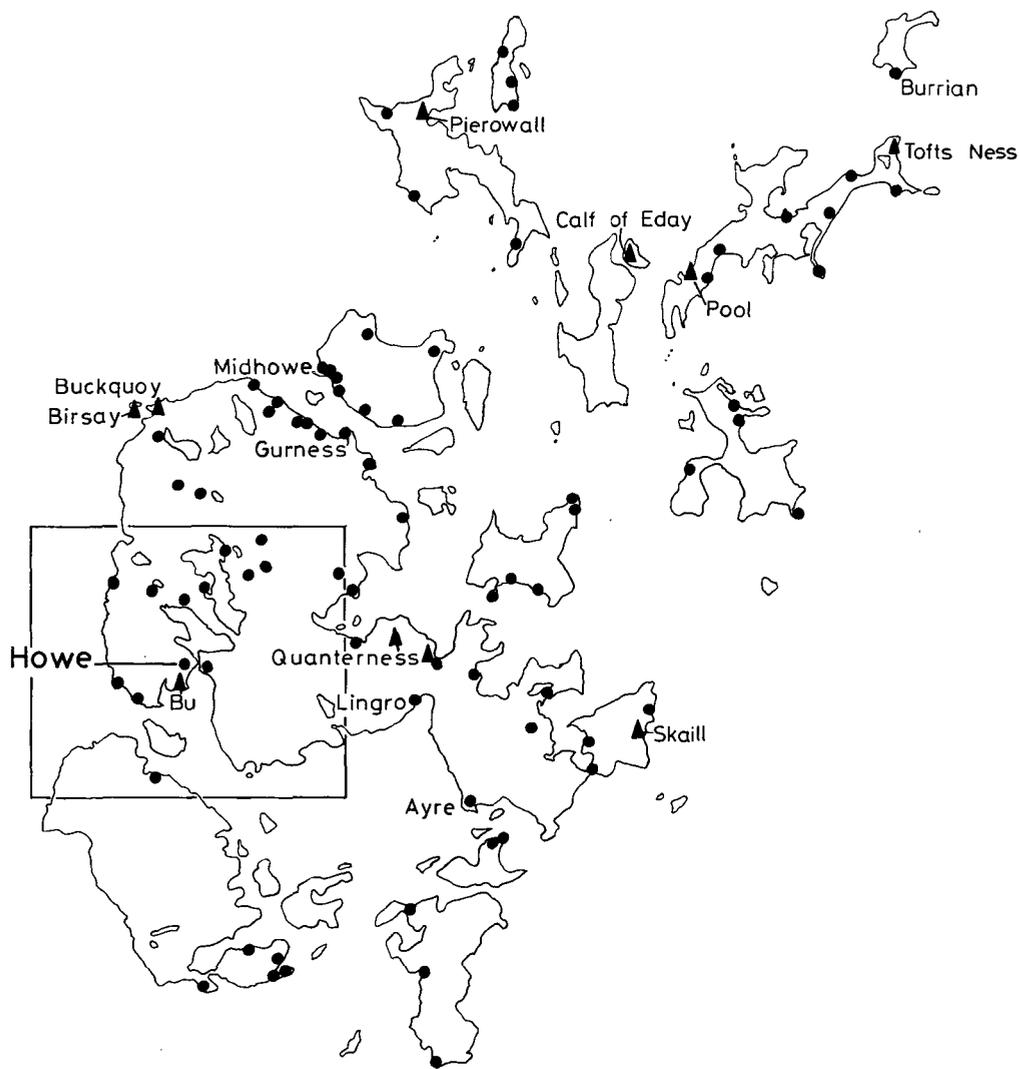
Illus 160  
The surviving masonry of the broch tower (Broch 2).

post-holes were revealed which might indicate the presence of an internal timber structure with support for floors. The radial uprights, by their flagstone nature, would not offer firm enough support for flooring in the way that stone piers might; timbers resting on a scarcement would be the most plausible support for a second storey (Harding 1984, 209–10).

Parallels for this stage of broch development at Howe are noted from the earlier stages at Crosskirk (Armit 1991, 190); its interior partition and general plan link it with complex and earlier simple roundhouses. The period of its occupation corresponds to the period of the bulk of the broch tower sites in the west (*ibid*); it seems to be a period of general increase in architectural complexity, with continuous intramural galleries and other features of broch architecture, and in the number of complex roundhouses overall.

The architecture of the Broch 2 tower shows its antecedents and similarities with the complex roundhouses such as Bu and Crosskirk, but the major comparisons for this stage of full broch tower are with a number of other sites which display, in addition to the tower, the same accompanying regulated settlement: in particular Gurness, Midhowe and Lingro (Hedges 1987c). The major contribution of this stage of the Howe sequence is to demonstrate contemporaneity of the Broch 2 (*broch tower*) and the village structures (although opinion on whether contemporaneity is satisfactorily demonstrated elsewhere still varies: Anna Ritchie pers comm).

Although the closest comparisons for similar broch village settlements lie further afield on Orkney, within close proximity to Howe a number of structures identified as brochs (*complex roundhouse/broch tower*) can be seen in the landscape (illus 161). Their incomplete nature does not allow exact comparisons and no radiocarbon dates are available; although ascertaining their exact contemporaneity with stages in the Howe sequence is not consequently possible, their identification as broch structures (Hedges 1987c, fig 3.1) indicates that a considerable number of comparable contemporary sites are likely to have been present in the vicinity of Howe. In a 4km radius there are: Breckness and Warebeth on the W coast of Mainland; Cummi Howe Broch across the Bay of Ireland; the Brochs of Redland and Stackrue bordering the Loch of Stenness; and the Broch of Burrian (Russland) on the W shore of Harray Loch. At a slightly greater distance is the



Illus 161  
 Howe in its Iron Age setting.

Broch of Clumly and, beyond that, on the W coast the comparable site of Borwick. None now demonstrates a full accompanying settlement but traces, in some cases considerable, at the majority (*ibid.*, 83–93) suggest that, as at Howe, Gurness and Midhowe, such settlements, or certainly subsidiary structures, did exist.

Two further sites may add to the picture of the landscape around Howe studded with a number of settlements in these centuries: the cairns of unknown date which lie S of Cummi Howe Broch, on the E coast of the Bay of Ireland, and an extensive site of Iron Age date found close to Bu but on the coast (Lynn & Bell 1987; 1988; Hedges 1987c). This picture of a thickly populated landscape is emphasised by Hedges' estimate (1987c) of 52 definite and 80 probable broch sites within the island group; the Orkney Sites and Monuments Record suggests that 120 definite brochs would be an underestimate (Raymond Lamb pers comm). This latter number does not take into account large mounds of Iron Age date without visible defences.

Recent work on the Grainbank souterrain (Haigh 1984) has demonstrated a possible middle Iron Age date for this monument and revealed related surface structures. If souterrains as a class of structure could be placed in this period, then at least thirty unenclosed non-broch Iron Age settlements should be included. Øvrevik (1985, 149) has, however, put forward a late Bronze Age date for some of these, and at Howe, souterrains were used throughout the Iron Age, a period here of about one thousand years.

Episodes in the sequence during Phase 7 suggest that this picture of a landscape filled with settled communities became disrupted. A major fire in the broch tower and the W of the settlement was followed, possibly very closely, by substantial collapse of the broch tower on the W, on to that half of the settlement, collapse of the door cell and filling in of the ditched defences. The fires have been interpreted as accidental by the excavators (4.2: Discussion above) and the collapses are seen as a continuation of the period of slow decline in the level of upkeep and repair of the settlement. However, the fires and collapse precede a total change in the nature of the settlement: in particular, the broch tower was no longer inhabited in the same way after this point, which is likely to have been towards the end of the 1st century cal AD. The grandeur of the defences and of the broch tower were past. The changes which occurred must be accounted for either in terms of social change within the settlement itself or politically within a wider Orcadian scenario. The nature and implications of these changes will be looked at below. The appearance of Roman material at this point, coinciding with decline of the broch village rather than its construction or *floruit*, is perhaps a pertinent point.

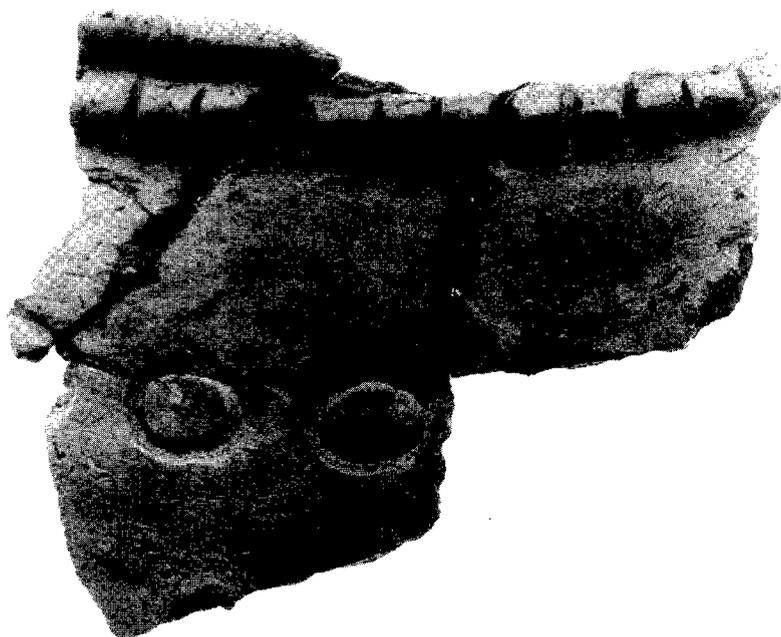
## POST-BROCH – THE LATE IRON AGE

After the final abandonment of Broch 2 (the *broch tower*), at some time around the 4th century cal AD, the occupation sequence continues with a 12-stage series of buildings, which varied considerably in shape and function. The radiocarbon dates for this series have calibrations giving very wide brackets of 4th–10th centuries cal AD; original approximations (10: The radiocarbon dates above) suggested that this, Later Iron Age, phase of occupation lasted into the 7th or 8th if not the 9th centuries cal AD. Elements of the material culture, however, incline to support abandonment of the site nearer the earlier of these dates as the diagnostic material 'scarcely trespasses' (Foster 1989b, 38) beyond 600 cal AD.

The settlement over this period appears to have been predominantly a domestic farming complex which reached a peak in Stage 5, somewhere around the 6th century cal AD; from then on the impetus of the settlement declined. The individual buildings, or periods of activity, were short-lived; buildings were repaired frequently, doorways blocked, floors repaved, and structures often levelled after their use was over. The structural degeneration which had begun in Late Phase 7 becomes more noticeable and represents a marked decline of population on the site. From a conservative estimate of seven households comprising the broch village in the first century AD, the number had been reduced to one by the 7th century.

However, it has been stressed (5.2: Discussion above) that it is possible that by no means all Phase 8 structures were excavated, particularly in the early phase; buildings were located predominantly off the mound to the SW of the site, where the slope of the land was not as severe and there were less limitations on construction. It is highly probable that the settlement extended further, both to the SW and E, beyond the limits of excavation.

The Late Iron Age levels at Pool offer close comparisons for this period at Howe, both in the architectural techniques and in the decline of the population and settlement, the latter noticeable from the beginning of the 7th century AD at Pool (Hunter 1990, 184, 189).



Illus 162  
Phase 7 sherd decorated with  
ring-headed pin impressions;  
scale 1:1.

At the end of the period represented by Phase 8, the early 7th century cal AD, more distinctive buildings and artefacts begin to appear elsewhere on Orkney (Foster 1989b, 38). There appears to be some sort of watershed around cal AD 625 (the horizon between Foster's (1990) LIA I and LIA II) which sees the rapid development, thereafter, of a fully formed Pictish state and church (*ibid*, 156). From the decline of its architecture and the lack of the new material, the implication is that Howe was not part of this new phase in Orcadian life.

#### PHASE 9 – ABANDONMENT

The final phase of the Howe sequence has evidence only for periodic use and abandonment of the massive rubble mound. It was not used to provide a basis for a subsequent Norse settlement although some possible Norse presence has been implied from the glass linen smoother (illus 155), ascribed to that period (Marwick 1927, 121) and latterly believed to have been associated with a concentration of human bones on the eroded broch tower wall-head, disturbed in the 19th and 20th centuries.

Parts of nine other late structures, which cannot be assigned to specific phases, were present on the site. It is recorded (*ibid*) that the site was 'excavated' in the 1860s and the area ploughed close up to the mound (illus 77). It must be left to the imagination to speculate on the extent of settlement beyond the defences which was lost to the plough.

#### THE MATERIAL CULTURE – DISCERNIBLE CHANGES

A sizeable assemblage is not available for the early part of the Howe sequence to augment the evidence of structural change but, from around the 7th century cal BC onwards, a full range of material does exist. What this assemblage reveals is a strong measure of continuity, punctuated by new introductions.

At Howe, pottery (illus 162) is by far the largest component of the material culture (Table 67), responsible, in numerical terms, for 92% of the small find assemblage; of this, the major part comes from Iron Age levels, and the Broch 2 (*broch tower*) village in particular. The publication of the pottery assemblage has been eagerly awaited (Armit 1991, 199; MacKie 1983, 121) in the expectation that it might answer many of the

questions of the development and chronology of the Iron Age pottery sequence. The report in this volume (8.9: Pottery above) presents a detailed review of the ceramic collection, but the analysis can only show broad trends since the bulk of the sherds were derived from redeposited rubble contexts, making clear attribution to specific contexts difficult; the number of joins across contexts bears witness to this. Yet within these broad trends a number of factors are observable.

The phases display a range of forms, fabrics and design, indicative of a common basic repertoire which appears to have a long-lived existence from the Late Bronze Age/Early Iron Age well into the later Iron Age. Fabric, form (illus 142; 152) and rim shape (illus 141mf) continue with little change throughout the broch tower and village occupation into the succeeding farmhouse complex. The vessel range includes globular jars of various sizes, straight-walled bucket-shaped vessels, shouldered jars, with both wide- and narrow-mouthed vessels; all have parallels with the assemblages identified at other Orkney roundhouse and *complex roundhouse*/broch sites, as well as in Caithness and Shetland and to some extent the Western Isles (Hamilton 1956; 1968; Renfrew 1979; Hedges 1987c).

This common repertoire of shapes appears to have fulfilled the needs of households over a considerable time; the requirements would seem to have changed little from the Late Bronze Age to the early stages of the Late Iron Age. Techniques of manufacture remain largely unchanged throughout the major part of the Early and Middle Iron Age; the major demonstrable change is apparent only after the decay of the broch tower and village; this change is indicated by the appearance of wheel-finished vessels, followed by a marked decline in the production of decorated pottery. From Phase 8 there is evidence of wheel-made and some painted pottery although pot quantities generally are reduced at this point. On their own, these changes do not appear dramatic; they have been perceived (8.9: Pottery discussion above) as being due to a gradual development, under the impetus of local influence, rather than a deliberate change in style. However, the distinction in a pottery assemblage at this point which otherwise alters very little throughout the Iron Age life of the site, underlines the sense of change which the destruction of the architecture of the Broch 2 (*broch tower*) village presents.

Except for one piece of Roman Samian pottery, no other sherd has been positively identified as being an import. It has been assumed that all the pottery was made at the site, although the supporting evidence for the Phase 8 wheel-thrown vessels is lacking and they may well have been manufactured elsewhere in Orkney and brought to the site.

Given the continuation of the range of pot forms during much of the Iron Age history of the site, it is only within the repertoire of decoration that the clearest changes and trends are likely to be observable. A rigorous analysis of the decorative element, of the kind undertaken by Miller (1985) for a modern Indian pottery assemblage, might enable the isolation of significant trends; but the paucity of decorated sherds, <200 out of 17,000, suggests that the fine distinctions discernible in a fully controlled modern assemblage would be impossible to detect. Most of the range of motifs can be paralleled by other examples extending across the range of Iron Age sites within the Atlantic province (8.9: Pottery above) giving a picture of a shared vocabulary of design built up over time.

The comparatively small percentage of decorated pottery begs the question: which media were used as the main outlets for the expression of design? The mass of surviving Iron Age stonework bears no ornament, unlike that visible on Neolithic structures and at Howe on the reused cup-marked stone. It is possible that stonework was painted, in the manner of Pictish pebbles, of which there is an example (SF 2200, illus 106) from the site, but, if so, some trace might have been expected to survive. Clearly, wider outlets must have lain in the metalwork of which we have some evidence, or in textiles or other fugitive materials which have not survived.

What does survive in other material at Howe presents an array of items of personal ornament, in particular pins of bone and metal and personal hair combs (8.2: Bone artefacts, 8.6: Metal artefacts above), which are contingent with the picture of an Iron Age community identified elsewhere on Orkney and the wider sphere of the Atlantic Province and beyond (Foster 1990); examples of the range of pins and combs in particular offer comparisons with the assemblage from Broch of Burrian, North Ronaldsay. The artefacts indicate that in addition to bone ornament produced in the settlement, from as early as the 3rd century BC until some time in the 7th century AD or just possibly later still, the inhabitants of Howe came into possession of pieces

of precious metalwork, fashionable jewellery in current circulation. These pieces entered Orkney from the west, from Ireland and the east and south from Scotland (and England), presumably along coastal routes (8.6: Metal artefacts above). The iron drum-headed pin was, however, probably made in Orkney, but not at Howe. During Phase 8, when the apparent wealth of the settlement was in decline, the movement of jewellery into the site was maintained from the same areas.

These objects both amplify the wider picture and aid clarification of the chronology, although, as with the radiocarbon dates, the precision of the dating brackets offered by metalwork types is limited to one century at best, and usually two to three. Within the range of metal artefacts there is little to differentiate phases 7 and 8. The lengthy currency of some types, as with the pottery forms, restricts their chronological usefulness (Armit 1991, 200). However, even the wide brackets available can serve to extend the known currency of some types, such as group 5 double-sided combs (Foster 1990, 162), where the Howe examples represent the earliest finds of the type. More generally, the appearance of some types in the later Iron Age levels serves to underline the somewhat paradoxical post-broch picture of a less regimented architecture with a less tightly organised village but an apparent maintenance of the range and quality of personal goods.

Evidence for imported copper-alloy and other luxury items is counterbalanced by the picture of home production of a range of workaday iron tools, including blades fine enough to carve bone combs and pieces solid enough for agricultural implements. By comparison with the small numbers of metal objects, particularly in the early stages, there is considerable evidence of the metalworking process itself. A stone toolkit suitable for metal working (8.3: Stone artefacts above) can be identified and location of large quantities of residues (8.7: Slag above) enabled identification of metalworking locations within the settlement. This was limited to certain sheds in the broch tower period indicating specialised workers, although not on an industrial scale. After the decline of the broch tower, the **NE** building was exclusively used as a smithy; the smithy in the **W** building was the only manufacturing place identified for Phase 8. Clearly this was enough to satisfy local demand.

As indicated above, the introduction of Beaker elements heralds early metalworking in mainland Britain but apparently not in Orkney – or has left little trace. For Howe there is no evidence for a developmental metalworking phase in the 2nd millennium; either the evidence for this is lost or the expertise must have arrived ready formed in the Early Iron Age, accompanying the re-occupation of the site. Øvrevik (1985, 140) describes the lack of mining evidence for Bronze Age Orkney, while indicating useful sources of material within the isles. It is of note that metal sources cluster in the area of concentrated roundhouse/broch occupancy between the knuckle of land to W and NW of Stromness (area of inset illus 161; Øvrevik 1985, fig 7.1) Iron sources lie on Hoy in the area of Green Hill broch (*ibid*) coincidentally the tallest recorded (Hedges 1987c, 2–3, fig 3.1); a further metal source on Hoy, Lead Geo, was identified (8.7: Slag above) for the Howe residues. It is interesting to ponder on the similar correspondence of metal resources on the W of Rousay and the concentration of known brochs lining either side of Eynhallow Sound. Just how noteworthy these and other apparent congruences are is perhaps a matter for further discussion.

Other more basic resources were clearly offered by the Howe location through the life of the settlement. Clay for the pottery was obtained from a local source (8.9: Pottery above), as was the bulk of the stone used in the range of tools (8.3: Stone artefacts above); bone for tools and ornament (8.2: Bone artefacts above) derived from the basic resources of animal husbandry which would have been established in the Neolithic and survived the Bronze Age recess. One major resource, red deer, does alter during the period of the site. The discrepancy between the apparent reduction of red deer as a resource, and the continuance of antler artefacts on the site, has led (8.2: Bone artefacts above) to suggestions of imported substitutes. The possibility has been advanced that reindeer antler was already being traded by the 7th century cal AD. This could be taken as an indication of greater contact between Scandinavia and the Northern Isles, prior to the Norse invasions, than has previously been considered (Myhre 1992). Emerging centres of power, which would be identified latterly as Pictish, could have acted as distribution centres for traded wares. However, it is unlikely that the dispersed farms of the Later Iron Age at Howe were sizeable enough to have been part of this development.

A further intrusive element, Roman material, has been noted as first appearing during Later Phase 7 in the Broch 2 (*broch tower*) and continuing in post-broch Phase 8 contexts. The glass, metalwork and Samian sherd from Howe provide another example of the presence of Roman material in Iron Age settlements of the early centuries AD (Armit 1991). Previously, Roman material within broch stratigraphy was used to date

initial broch occupation, placing it well into the first centuries AD; its presence is now recognised (*ibid.*, 196–8) as dating some period of broch use which clearly post-dates construction. The implications of this revised dating and the significance of the material are examined below.

The need for examination of gender and age grouping within Iron Age settlement has been expressed (Hingley 1992, 40) but attempts to address this within the Howe evidence come up against restrictions of the limited data even on this well-documented site; Howe displays the general lack of Iron Age (*ibid.*, 16) burial evidence, a dearth which makes difficult the identification of gender specific pottery categories (such as is beginning to emerge for Beakers – Shepherd, AN 1989) or provide other items of the Iron Age assemblage with gender specific contexts. Little can be discerned within the material from other activities which might be categorised by gender, such as spinning and weaving, other than to say that these are fairly constant throughout the Iron Age settlement. There are no elements within the internal roundhouse layout which lend themselves to possible gender differentiation as do the beds at Skara Brae (Childe 1931, 15; Piggott 1954, 326) although status, which has implications of gender and age ranking, is looked at below.

### THE ECONOMIC BASE

A review of the influences and changes observable in the material culture leads on to a look at the evidence for the economic base which sustained the settlement throughout its changing lifetime. Like the material culture, this also presents the appearance, from the Early Iron Age onwards, of the preservation of a basic norm, a mixed farming core (7.1: Introduction to environmental section above), with some periodic adaptations and introductions. This is maintained by a settlement which over time sustained a level of tool-making and artefact production in a range of materials, most obtained locally but some traded, which ensured a viable community for some considerable time.

Within the agricultural base, the main transition appears to be around the 5th century AD with the introduction of hulled six-row barley. Unlike other Iron Age sites, such as Gurness (Armit 1991, 192–4) where saddle querns occur in the earliest layers and rotary in the upper levels, at Howe this distinction is not discernible as the rotary quern appears in contexts from the earliest Iron Age onwards. Grinders/mortars do not appear in the farmstead of Phase 8, underlining the sense that these were for non-agricultural purposes. Saddle querns have been shown to be used for very specific tasks in the stages of pot production, grinding material for gritting, slip and paint production (Miller 1985, 226), an indication of their continuing importance after the rotary quern would have been expected to have made them redundant.

It is likely that the inhabitants were experiencing economic stress in face of a deteriorating climate in the 1st millennium BC. Other changes in agricultural practice at this time are likely to have been the suggested replacement of stone ards with iron (Hedges 1987a, 93) and the use of the horse, indicated by the recovery of bones of a smallish Shetland pony type (7.3: Animal bone above) suggesting the presence of small domestic horse herds like those at Crosskirk (Macartney 1984, 133–47). These would have been useful as a working animal, and possibly as a food source too. The fact that the early Christian church in Celtic Britain frowned upon the eating of horseflesh as a ‘practice fitting only for thieves’ (McCormick 1979, 315) indicates that it was normal custom, at least before conversion. Horses are likely to have been used as gifts and dowries (as noted by Tacitus for the Germani (trans Mattingly 1980, 114, 116)), acting as conspicuous indicators of wealth and status. Their use in warfare is a further possibility.

The introduction to the environment of the site (7.1 above) discussed the changes in resources which became apparent in early Phase 8. These changes imply not only loss of control over natural resources but also of territory. Included here is the decrease in numbers of red deer, the change-over to the use of heathy turves as fuel and the significant decrease in the use of wood on the site. Farming at the settlement was certainly affected and there was a gradual change to more sheep and pigs and new crops. Taking into consideration the reduced site population which is seen during Phase 8, it seems quite likely that the territory held by the settlement was broken up and redistributed prior to AD 300, and was later modified in subsequent centuries.

The organisation of the landscape during the late Iron Age period may have formed the basis for land-holding during the Norse period (Smith 1990, 38) and also for Norse administration (Barrett & Foster 1991, 53). The events during later Phase 7 may have been more far-reaching than can be interpreted solely from the archaeological record.

## RITUAL AND BELIEF

Assessing indications of ritual behaviour at Howe is biased by the overshadowing massive architecture. Indeed the broch tower itself can be interpreted as an ‘artefact’ whose sheer scale would have made it an extremely powerful symbol (Armit 1991, 204); but Hingley (1992, 14) has warned against the categorising of all substantial sites as necessarily symbolic or special. That so imposing a structure must have been central to the enforcement of the formalised nature of much of day to day existence cannot be denied, but this is not to rule out its initial construction for more practical considerations of domestic or defence requirements.

Beyond what can be inferred from other Neolithic ritual and funerary monuments, there is little concrete evidence for ritual, belief and deposition at Howe. In the funerary context, there is the possible use of fire, if the ‘hearths’ are accepted as part of the ritual; the deposition of the two stone axes already mentioned; and the sealing of grey clay over the first structures which may have been of ceremonial significance or may have had a purely constructional rationale. At a later stage, the deposition of Beaker sherds has been interpreted as ritual expression of changeover.

One aspect of the formal layout of the Howe tomb(s) is indicated by the orientation of the entrance to the ESE, a line preserved by the subsequent Iron Age roundhouse/broch settlements. This orientation towards the SE quadrant is shared by the bulk of tombs (Davidson & Henshall 1989, 85–6) although notably not Maeshowe, for which close parallels have been drawn with the Howe Phase 2 tomb. The significance of orientation to the S and E is not difficult to interpret. In utilising this line for the entrance to their roundhouse/broch settlements, the Iron Age builders were able to follow a direction that was acceptable for broch entrances, the preponderance of which are to the E and SE (Hedges 1987c), with the notable exception of Midhowe to the W. Although architectural convenience is likely to have dictated the reuse of the tomb entrance, the positioning of broch entrances generally is likely to have been prescribed by a number of practical considerations, not the least of which would have been the maintenance of defence, in addition to their ceremonial requirements.

The ‘cup-marked stone’ (SF 7309) was suggested as having come from the Maeshowe-type tomb facade (8.3: Stone artefacts above). This is a possible primary use but its context, in the area of the Phase 5 roundhouse souterrain entrance, also suggests that it could have been reused, either as part of the roundhouse masonry, paralleling the two stones from Midhowe (Callander & Grant 1934, 484–5) or as part of the phenomenon of reuse of cup-marked stones within souterrain masonry in southern and eastern Scotland (Hingley 1992, 29). The symbolic nature of their use and re-use in mortuary contexts has been examined recently (*ibid*; Bradley 1993, 63–5), in particular the sense in which they can be used to bring an external landscape into an internal setting has been stressed. They could have also represented a past landscape, adding status and an air of antiquity – past versions of the diamond-ledged panes and carriage lamps of the present.

Of possible ritual depositions, Howe presents little. The deer bones within the well (7.3: Animal bone above) possibly exist within the same general hunting-related and ritual context as deposition of deer on a number of wheelhouse sites (Hingley 1992, 24). Hunting was clearly a substantial part of the economy and associated rituals are possible. These suggest a continuity from the Neolithic where sites such as Links of Noltland (Clarke & Sharples 1985, 75–7) display apparent ritual deposition of deer.

More easily identifiable areas of ritual lie within the sphere of burial practice. However, as for the Iron Age as a whole (Hingley 1992, 16), very little burial evidence exists at Howe and what there is appears haphazard and ad hoc. Following the decline of the old nucleated settlement, prior to the W collapse of the broch, four bodies were placed in the rubble in the levelled remains of the **NW** building. The positions of the bodies are not suggestive of formal burial, nor do they lend themselves to any definite ritual interpretation. In addition, it is uncertain whether the subsequent buildings were erected in the knowledge that corpses lay in the rubble beneath. It is suggested (4.2: Discussion above) that the burials indicate a breakdown in social organisation and highlight the significant physical and hierarchical changes which the settlement experienced during the early centuries AD. Their existence clearly displays some rupture of the existing pattern and contributes to the discussion (below) of how far these shifts were the result of peaceful change or violent disruption.

## ASSESSING THE CHANGES

The foregoing review of the Howe sequence has looked at the major structural and material aspects of the site and how these have altered over the lifetime of the settlement. At this point it is necessary to try and analyse what these changes represent in real terms for the people who produced and experienced them, to try and

further identify the nature of the influences and impacts that moved the site from some form of early Neolithic monument, through periods of expansion and contraction over four millennia, to final abandonment in the Late Iron Age.

It is no longer possible at Howe, as it is at some sites, to 'walk through doors and up stairs, lie down in bed-neuks, and collect water from the wells' (Foster 1989a, 44); but it is possible to sustain these images and to amplify them through interpretation of the evidence from the site. It is possible, for instance, to give the houses roofs of willow timbers, to place in them pottery and iron tools and baskets of barley waiting to be ground, to fill the yards with milch-fed calves lowing gently, and to add the smoke and noise of iron-working to the sounds of herds of cattle and small ponies grazing outside the settlement. These and many other images are sustainable for much of the life of the settlement. But, as has been shown, the background against which they are seen alters greatly and the details of many aspects change through time.

The problem of assessing the nature of these changes within the artefactual and structural types has always lain with the paucity of the evidence. It is seldom enough to demonstrate unequivocally whether these changes were evolutionary, peacefully achieved under the impetus of new influences and ideas, or whether they were revolutionary, brought about by malignant forces from elsewhere, characterised by conflict, colonisation and force. Interpretations have varied, dictated by the archaeologist's own 'ideas and histories' (Sharples 1991, 80).

Disentangling change from continuum has relied on alterations in design, visible in architecture and material culture; these are the best indicators of shifts in the guiding principles, either of individuals or of communities and a wider society. It is clear that much of the material culture for the period under discussion shared a common ancestry, and consequently much of its basic repertoire, with a wider Atlantic Scottish society (Harding 1990). Only a very marked intrusive impact will consequently show unequivocally in the record. High status material, which allows greater opportunity to express individuality, can help to demonstrate the qualities which set an intrusive culture apart. Yet it is still difficult to assert with any confidence that the visible changes resulted from invasion or influence, whether they were aimed at maintaining defence or merely for conspicuous display, the by-products of friction or fashion.

Sharples (1991, 79) has commented on the reluctance on the part of modern archaeologists to discuss the role of warfare. Its dismissal has been part of the reaction against invasion hypotheses which has engendered a reluctance to place any responsibility for cultural change on the movement of peoples and all on the movement of goods and ideas. A total reliance on one or the other approach is unhelpful. Given the successive invasions into Britain in the first millennium or so AD, it seems unlikely that within the last millennia BC any substantial change was brought about entirely without some degree of forceful incursion and violence. The developments at Howe are unlikely to have escaped such forces.

The first demonstrable changes occur during the two phases of Neolithic construction; these have been discussed above and it has been argued that they indicate an *Unstan to Grooved Ware* cultural sequence. This stratigraphical progression is seen against the overlap, if not contemporaneity, which has been argued for the two cultural entities (Clarke 1983; Davidson & Henshall 1989, 90–2). The situation elsewhere within the islands is clearly a complex one, but the Howe evidence indicates that in one area at least the two traditions, exemplified in architecture, have a sequential rather than parallel relationship.

Whether in the case of Howe this sequential relationship also represents a change in the type of use, from domestic to funerary, has also been touched on above. If indeed a great tomb was superimposed over a domestic structure, this implies either a change in attitude, with the land becoming sanctified in a different way, or a change in the population itself so that the former use held either no meaning or presented no taboos. Such a change argues for a much greater break with the past than the replacement of a tomb with a newer, more modern, burial construction. The re-use of the Howe mound for a succession of tombs, its continuation as a focus for burial and delineation as sacred land, would represent the maintenance over time of some sort of enduring spiritual identity. It is a matter of personal choice as to which of these interpretations appears the more plausible – whether the change is merely to something new, in the case of the tombs simply bigger and better, or whether it is inimical, flouting and destroying the past, and the previous occupants in the process.

What is clear is that at some point the population underwent some form of transformation, either economic, philosophical or cultural, enough to provide the catalyst for the production of an entirely new massive structure over the remnants of what had gone before. If no more than the equivalent of the shift from Romanesque to Gothic, it indicates some form of development within the principles guiding the society.

Massive building is seen in some cases to coincide with periods of change (Clarke *et al* 1985, 38): monumentality is important when societies are forming and expanding and also when they are collapsing. The construction of the early tripartite Orkney-Cromarty tombs would be seen as part of such a period of expansion by immigrants from the northern mainland (Davidson & Henshall 1989, 87) and the early Howe tomb, if such it was, could have been constructed as part of this movement. Elements of the succeeding cellular tomb – its platform, massive ditch, great clay capping and impressive monumental stonework, reminiscent of Maeshowe itself – have been interpreted as the expression of a consequent shift in hierarchical control (Kinnes 1985, 43). Such a shift, with its stress on monumentality may have held within it the seeds of its own downfall, a requirement of effort that was ultimately too much for the community to sustain.

It is perhaps within such a climate of decline that the abandonment of the Maeshowe-type tomb at Howe took place. Alternatively, the dramatic disruption of the continuous sequence suggests that the explanation for abandonment may lie, not with internal social stresses, but with external pressures. Sharples has suggested (1991, 80) that warfare is likely to have been endemic since the introduction of agriculture; the communal nature of the Neolithic may well have been overstressed. Alternatively, in the face of the evidence for intrusive Beaker material at this point at Howe and the other sites noted above, it is tempting to see this as the instrument which brings about the change.

Models for Beaker introduction have varied widely in recent years (summarised by Thorpe & Richards 1984, 67); reluctance to accept Clarke's (1970) waves of invasion produced a resistance to acceptance of any form of population movement and a concomitant rationalisation of Beaker dissemination as the product of a trade in prestige items, a cult package (Burgess & Shennan 1976). The uniformity of Beaker skeletal orientation and formal positioning over much of northern Britain (Shepherd, AN 1989) suggests that population movement must be considered an important element within a combination of a number of facets of Beaker influence, still inexplicable (Kinnes 1985, 44) in its entirety. How this impacted on Orkney, what was the nature of the Beaker presence within the closing phases of the Grooved Ware hegemony, are still difficult to identify. The picture, of which the Howe sherds and the similar sherd from Rinyo (Childe & Grant 1939, 26, fig 7) form a part, appears to be one of rich Grooved Ware activity followed by scant Beaker material: this pattern contrasts with areas where Grooved Ware was either non-existent or had no strong hold, such as the North East of Scotland and Yorkshire (Thorpe & Richards 1984, 73) where the Beaker influence appears to have been considerably greater. For Howe, as for elsewhere on Orkney, all that can be said is that at some point Beaker users were clearly present; they almost certainly entered the tomb but there is little evidence for them doing anything further. Their presence at Howe is followed by the cessation of monumental architecture rather than the superimposition of a new tradition. The absence of anything other than a scatter of sherds suggests that if those depositing the Beakers made any impact on the site then their effect was to eradicate activity, and thereby population, from its vicinity. The site becomes deserted and since the period of this depopulation would seem to precede major climatic decline the sense that their demise was not the result of a gentle waning persists. There remains a major interruption to the Howe sequence for which there can be no definitive explanation.

The nature of the intervening years when the Howe tomb lay unused can only be guessed at. The likelihood that reoccupation takes place in a period of upheaval is suggested by the nature of the subsequent settlement. The creation of enclosed defended settlements in the Early Iron Age indicates the need to delineate clearly and defensively, suggestive of response, if not to conflict, then at least to threat and uncertainty. The location of the well *outside* the first enclosure, has been taken as demonstrating a peaceful existence for this settlement (3.1.1: Phase 3 above); however, the well of the subsequent Phase 4 settlement was placed within the boundary and the increased fortification from then until Early Phase 7 suggests growing, rather than diminishing, unease.

It is still only possible to guess at the origins of the inhabitants of the early Iron Age enclosures. Are they the descendants of communities that endured through an impoverished Bronze Age to renew skills and enterprise under the impetus of external cultural influence, or are they indeed invasive land-takers arriving

from outwith Orkney? (Hamilton 1968, 34; Armit 1990, 196–7). There is nothing in the design of the enclosure *per se* that demands it be regarded as an exotic concept; it need not be seen as anything other than a recurrence of the basic design of circular or penannular enclosure first displayed on the site in the creation of the Maeshowe-type tomb ditch. The evidence for the design of structures within the enclosure is fragmentary but could well indicate the continued cellular style of the earlier Neolithic traditions (Foster 1989b, 34). At this stage, however, there is no unequivocal conclusion to be derived from the material culture since it lacks the immediate antecedents to demonstrate change. Such material as does survive from these early phases appears to fit a picture of possible survival combined with new types circulating within an accruing Late Bronze Age/Early Iron Age assemblage.

If the major purpose of the enclosure was defensive then the ditch and ramparts would need to be of a size to allow some protection – and certainly the subsequent enclosures of Phase 5 and 6 appear to offer this. Whether these were ever tested in full warfare is uncertain; their major value would have lain in acting as deterrent, to outsiders as well as neighbours in other defended or non-defended settlements. Deterrence is certainly likely to have been the most crucial aspect of defence (Sharples 1991, 88). They could also have had the additional attribute of forming a psychological, or symbolic, as well as a physical barrier between ‘us’, the elite within, and ‘them’, the poorer tribal members without. On a more practical note, both Howe and Gurness suggest that the ditches themselves are unlikely to have been used as places of refuge for farm animals because of their narrow V-shaped profiles and their difficulty of access.

Whatever their purpose, purely defence or a more general exclusivity, the rampart and ditch were clearly maintained for Broch 1 (the *complex roundhouse*) with a widened rampart but narrower ditch. It is possible that a redefining of the settlement area took place, or there was a change in the expression of power, which manifested itself in the architecture of the defences. This development may reflect an attempt at the consolidation of power in face of increased local unrest, with tribal leaders or chieftains vying for power, or, conceivably, redoubled threats from sea-borne raiders from beyond the island group representing more intrusions from those areas whence derived earlier Late Bronze/Early Iron Age settlers.

The debate as to whether the origins of change lay with indigenous development or external intrusions goes beyond the defences to the generality of the architecture from the appearance of the first roundhouse onwards. This displays a high degree of planning and forethought, which is continued and refined in the two successive *complex roundhouse/broch* settlements. The preparation of the Neolithic mound, the construction of the souterrain and the drain across the enclosure, as well as the building of both defences and internal structures, demanded organisational skills and an overall view of the project suggestive of innovation. The construction of both the roundhouse and the defences required management and control of a considerable labour input over more than one season. The scale of co-operation and community input which the project required, possibly involving neighbouring settlements, is comparable to that last seen in the construction of the tombs, henges and stone circles of the Neolithic.

The settlements display a mastery of techniques of construction, a control of the resources required and a rigid application of architectural pattern suggesting an embedded framework of refined social control. In the nature of the building works, the depth of the ditch and the impressive style of architecture, the symbolic communication of the assumption of power in the locality by a tribal leader has been discerned (Armit 1990, 198). Although a well-defended settlement was conceived, the scale of the building works was probably as important a factor in the consolidation of the power and territory of the chieftain. How far the internal arrangement of the Howe roundhouse also displayed status is unknown as the floor plan was largely destroyed.

In the subsequent broch/*complex roundhouse* settlements, refinements of this plan, presumably at the instigation of chieftains who were the successors of the originator of the first substantial roundhouse, can be observed.

It is the massive construction and apparent uniformity of design which led to the interpretation of the brochs and their settlements as the product of intrusive forces, with their specialist architect builders, imposing a ready-made structural identity upon the landscape (MacKie 1971; summarised by Hedges 1990, 18–20). Yet the architectural details are not entirely new and need not be exotic; indigenous sources can be found for substantial walls and fine masonry, corbelled cells, partitioning, drainage; even staircases could be developed

out of native architectural elements. Nor did the unitary nature and layout of the village require external impetus for its instigation. The existence of Neolithic nucleated settlements such as are seen at Skara Brae, Rinyo and Barnhouse, provide models whose pattern need not have been entirely lost during the Bronze Age interlude; at these sites, ranking of structures, with apparent supremacy of one, is also apparent (eg House 7, Skara Brae (Childe 1931); Structure 8, Barnhouse (Richards 1989)).

What differentiates the Early and Middle Iron Age roundhouse/broch settlements, then, is not their architectural features *per se* but the re-emergence of these features as an integrated unified whole, apparently designed and executed as one concept. The completeness of the archaeological record in Early Phase 7 provides the strongest evidence yet that the broch tower and village were conceived as a unified design for a nucleated settlement. The sophistication of this design can be seen in the use of space; piecemeal development of buildings within the enclosure appears to have been discouraged. The size of the ultimate broch tower monopolised the available building area within the enclosure and the six contemporary houses were neatly fitted around it. They shared common walls, yet each could operate as a self-sufficient, independent unit. The uniformity of domestic design can be seen in the provision, from the outset, of standard internal features such as ovens and cupboards: additional features or alterations were not noted in the earliest period of the settlement.

Through access analysis of a number of the Orkney broch settlements, including Howe, Foster (1989a) has underlined the hierarchical status of the broch tower within the settlement. In addition to being the most dominant structure, it was also the most segregated area of the settlement; its alignment with the village entrance allowed a processional access along the entrance passage over which it held control. A degree of social inequality is likely to have existed between the inhabitants of the broch tower and those of the village houses; if the broch tower was inhabited by the pre-eminent household or family, a further hierarchy is possibly discernible between the other six households of the village. The houses in closest proximity to the broch tower, display higher status in terms of size and ease of access to the tower; they were the best preserved in terms of interior furnishings and deposits, and both had extremely good, even elegant, masonry in parts. This could merely reflect the overall quality and standard of the architecture of the village and the apparent superior quality in this area could result from differential preservation; notwithstanding, some suggestion of ranking within the settlement is advanced, the sort of ranking of status and rights with regard to housing preserved in the Irish *Crith Gablach* of some few centuries later (Hamilton 1968, 71–5).

An even greater social disparity, however, would have lain between the settlement and what lay beyond the earthworks, which are seen as extending ‘the depth between the inside and outside worlds’ (Foster 1989a, 48). It can only be surmised where those of even lesser rank may have lived. It would appear that, contemporary with the brochs/*complex roundhouses*, simpler roundhouses and more fragile settlement types, particularly those associated with souterrains, continued to exist (Foster 1989b, 36). Occupation at Skaill suggests that settlement in Orkney was not limited to massive complex roundhouse settlements (Armit 1991, 202). The extent to which the Middle Iron Age population may have existed in such settlements in close proximity to brochs cannot be gauged and the proportion of those sites in close proximity to Howe which represent the simpler or more complex version is hard to assess. Again, how much these more fragile settlements represent survival, not just of earlier architectural elements, but also of an earlier population – cf the Saxon settlements beyond the Norman keeps – is an area for speculation.

The monumentality of the brochs is seen as a means of justifying the power of the tribal aristocracy. Like Foster, Armit (1990) suggests that the symbolic communication expressed in the architecture was all important to the maintenance of a social hierarchy; the broch and settlement are seen as the ‘ultimate outcome of the processes of competition and display which operated during the second half of the 1st millennium BC’ (*ibid.*, 198–200) (illus 163). The extent to which that process contributed to their apparent defensive nature needs to be examined.

The primary internal broch fittings at Crosskirk and Howe have been taken to suggest that the broch had primarily a domestic function (Foster 1989b, 36). Conversely, its implied height, hostile stonework, lack of windows, intramural stairs and provision of guard cells can be seen as arguing for a defensive role (Hingley 1992, 14). For the tower or keep to take up such a proportion of the central area of enclosure argues for a vital use.



Illus 163  
Defence or display: the impressive  
entrance to the broch tower (Broch  
2).

The excavators prefer the view (4.1.1: Early Phase 7 above) that the thickness of wall was not intended to achieve height, but rather to ensure stability and maintain status, although the latter would also be a by-product of impressive height. If the direct relationship of the percentage wall base (PWB) to the height of the broch tower is accepted (Fojut 1981, 225) then it would appear that the height of Howe was impressive. Although it is difficult to be certain from their fragmentary nature, it appears that the PWB, and consequently the height, of a number of those brochs in close proximity to Howe (illus 161) was also considerable (Hedges 1987c, fig 3.4). Acceptance of the correspondence between PWB and height would mean it was likely that at least four (Cummi Howe, Redland, Stackrue, Burrian (Russland)) could have been seen directly from Howe; the use of beacons would have increased the visible communication immensely. Howe's position lent it two-way communication: inwards to those settlements around the Loch of Stennes and outwards as a link in a possible chain of coastal brochs, lining the approaches to the Bay of Ireland and Scapa Flow beyond.

Allied to its height, a further possible defensive feature of broch architecture is the intramural protected staircase. A single continuous staircase would have allowed fast uninterrupted access to any upper storeys and the wallhead (Fojut 1981); the Phase 6 Broch 1 (*complex roundhouse*) had two opposing stairs which would have slowed access to the wallhead – reducing the defensive advantages of height (Fojut 1981, 225). Only the W staircase was retained for Broch 2 (*broch tower*) indicating the development at this point of a single, possibly, continuous stair. But Sharples (pers comm) maintains that on those sites where survival is good, it is often the case that the intramural stair is too narrow to give access to the wallhead; its contribution to a defensive role must therefore remain suspect.

A certain amount of discussion centres around the implication of large defensive complexes: which stage in

the developmental process of the settlement do they represent? Do they indicate a finality, of power having been established, dominance being both exerted and displayed, or do they indicate continuing attempts at gaining and maintaining control against various odds?. The most likely sequence is one of a period of instability in which statements of defence are needed to ensure security and, in the case of towers, to display exactly where the power lay; once established, they can simultaneously embody status and deterrence. The subsequent decay of these substantial structures then can be interpreted either as showing break down in this power struggle or lack of need any longer to display it once its hold is confirmed. The fluctuating periods of growth and embellishment of the enclosure and structures that comprise the Howe settlement suggest such a sequence of challenging settlement, authoritative establishment and ultimate decline.

Yet the wide proliferation of brochs/*complex roundhouses* suggests that not all need represent ownership by powerful households (Hingley 1992, 14). They may well have been the norm – small hamlets spread across the landscape (as in the Western Isles: Armit 1992). However exceptional or otherwise was the family that inhabited the Howe broch tower and held sway over the village and its surroundings, the major fires and building collapses (4.1.2: Later Phase 7 above), which took place probably during the 2nd century cal AD, transformed their settlement and must have produced considerable changes in their circumstances.

The fires and collapse, which resulted in the filling up of the ditch with the debris from the burnt W half of the settlement, have been interpreted as accidental. No suggestion of warfare at this stage is discerned from these levels of conflagration and destruction. Prior to the fire some decline was already apparent in the accumulation of debris and apparent lack of maintenance. Yet after the fire, the rebuilding described above (4.1.2: Later Phase 7) suggests a contrast of form, function and planning with the earlier village: architecturally, and consequently socially, it had become a very different place.

An attempt seems to have been made on the E of the site to rehouse people from the W half of the settlement. Small irregular cellular rooms, were constructed away from the broch and, for the first time, on and over the rampart; entrances were turned away from the broch and new ones opened over the rampart. In the attempted rebuilding, the pattern and symmetry of the old village, and its nuclear unity, were lost. Once the physical and psychological barrier of the enclosure, which had kept the tightknit unity of the settlement, had gone, so too must have the control of the settlement leader. The rebuilding of the W side of the settlement can be interpreted as an attempt to maintain social organisation and control, as was the buttressing of the broch and the insertion of the internal staircase. The attempts, however, were thwarted and incurred increasing difficulty as the whole pattern of the settlement changed: from focusing in on the broch, it was now reversed, and began to look outwards.

Although the broch tower still retained its position within the settlement, its function as the residence of the village leader may have ended overnight with its fire; it appears never to have been reinstated: the balance of power and leadership had apparently changed. This suggests something other than the purely accidental destruction of the tower.

Although some form of leadership must have still been present within the settlement to organise the clearance of half the village and to set rebuilding in motion, it would seem that, from later Phase 7 on, the skills of stone working and organisation, the skills which enabled the execution of the broch village design, were no longer present. It is possible that the necessary human resources were no longer available for any serious rebuilding attempts at Howe. This implies a rapid decline in, or redistribution of, population. Up to this point, population numbers at the settlement seem not to have altered significantly throughout the occupation of the broch village.

What happened to the former inhabitants can only be guessed at; whether the destruction of the broch tower settlement was deliberate, or accidental as the excavators maintain (4.2: Discussion above), it is likely to have resulted in death for many of the inhabitants, either immediate or through resultant ill-health and disease. The presence of the four skeletons, the young man, foetus, infant and child (9: The human remains above), in the rubble contexts that follow this collapse (illus 156; 157) are perhaps further indicators of some sort of dramatic end to this phase of the settlement.

The appearance of Roman material at a stage after the fires and collapse which herald the decline of the broch settlement link its initial introduction to this time of upheaval. An equivalent shift in emphasis is seen

on North Uist at Sollas at the time of the introduction of Roman material (Campbell 1991, 168–9). Fitzpatrick (1989) has used the evidence of the Gurness amphora to reassess the disputed historical information which places the Orkney Islands under some form of Roman restraint or control, either through submission to Claudius in AD 43 or subjugation by Agricola around AD 83. The details of this argument need not concern us here; more important is that the historical sources indicate that some form of Roman penetration clearly took place and the presence of Roman material within broch settlement stratigraphy supports this; the major difficulty lies in discerning the nature of that penetration and the mechanism by which the material arrived. This has been variously interpreted as looting, trade or gift exchange. Barrett (1981) has argued that Roman material in Atlantic Scotland should not be seen as merely exotic imports but in the context of relationships of marriage and kinship by which external alliances would have been secured. The material could equally support the proposition that Orkney was incorporated into the Roman sphere as client kingdom; it could be placed in a context where the client status was reinforced by an enforced dependency on controlled trading links. The possible contents of the Gurness amphora (Fitzpatrick 1989, 26) suggest the sort of dimension within which the Howe material would have been circulating. The possibility of liqueur wine or olives, deriving from a continental or, more likely, British source, aboard a ship plying the cold grey waters around Mainland Orkney adds a degree of richness to the otherwise fragmentary finds from Howe and the other broch settlements.

Howe's prominent location in the vicinity of Stromness, which then as now would almost certainly be a key route into the isles, would put it in direct line for such contact. The process which brought about its introduction may not have been an altogether happy one and the possible client status which ensured continuing contact may well have been an entirely subservient one, less equal than a network of alliances would suggest.

Whether Roman agency contributed to or merely exploited the decline of the broch settlement, it would seem from the Phase 8 evidence that the mechanisms by which Roman and other traded materials made their way into the settlement were still in place. The picture of the Late Iron Age inhabitants surviving within a once great settlement is not an impoverished one. Armit (1990, 202) has suggested that material culture and not domestic architecture was the important status factor of the later Iron Age and indeed, whatever the circumstances which precipitated the decline of the broch settlement, the quality of material wealth did not alter dramatically with the change in the social and territorial organisation of the settlement, even though actual artefact numbers were smaller. The increasing importance of imported goods during Phase 8 indicates the availability of tradeable wares, the maintenance of personal wealth, and the widespread contact possible through and across the Pentland Firth.

Some of the new styles of buildings (5.1: Phase 8 above) which appear on the site during this time must also represent ideas from outwith the settlement, following current designs which would have been circulating within the Late Iron Age milieu. New structural forms, possibly representing imported ideas, were an *Oval* shed and a rectangular building with an apsidal end (illus 61–3), the subsequent *Stalled* building (illus 64) which had two rounded gables and the figure-of-eight house, *U*, (illus 73). The latter is paralleled at the Red Craig, Birsay (Morris 1989) and the *Stalled* building possibly by the Late Iron Age wags of Caithness (Curle, AO 1948). These new buildings were accompanied by an indigenous but interconnecting series of small cells and sheds. The predominant building however, that of a farmhouse, was centred on the old *E* building of the broch settlement, before being replaced by the *Stalled* building at one period and latterly by the figure-of-eight building. It is still not possible to say whether these changes are simply matters of style or of population.

The final major change for the site came with its abandonment; again, it is not possible to do more than speculate on the cause of this. It happens over a period that elsewhere can be termed Pictish; Howe is clearly in no position to take advantage of the developments which elsewhere produced the power centres for this phase of Orkney protohistory. Perhaps abandonment had been precipitated by death or disease amongst the diminished Late Iron Age population or perhaps they had simply moved on, reflecting the wider migrations of that period which characterised much of north-west Europe.

### THE HOWE SEQUENCE – ECHOES AND PARALLELS

From the outset, the aim of this section has been to attempt a review of the whole sequence at Howe, thereby demonstrating the major factors which marked the individual stages and arriving at a continuous picture of

the site over time. During this process, individual sites have been cited as comparisons for separate episodes at Howe; what becomes clear is that, where these sites include two or more of the phases discussed, the pattern displayed within their sequence has strong echoes of Howe. Possibly the most important similarity, highlighted by Hunter (1990, 178), is demonstrated by the growing list of Orcadian Neolithic sites which, after apparent long-term abandonment, were restructured in the Iron Age. This restructuring mainly takes the form of roundhouses built on, adjacent to or in close proximity to, Neolithic cairns (Howe, Pierowall (Sharples 1984), Quanterness (Renfrew 1979), Calf of Eday Long (Davidson & Henshall 1989, 107–9) and possibly Pool (Hunter 1990)) and the reuse of Neolithic tomb passages and chambers as souterrains (Howe, Knowe of Rowiegar (Davidson & Henshall 1989, 137), and again possibly Pool (Hunter 1990, 179) and Quanterness (Renfrew 1979, 198) ). There are other possible additions to this list where activity cannot be definitely attributed to the Iron Age (Davidson & Henshall 1989, 62). The pattern is also discernible beyond Orkney in the Western Isles at Cletraval (Henshall 1972, 506–11) and Unival (*ibid*, 529–34).

What is of note is that for none of these sites is there any demonstrable intervening Bronze Age occupation. The apparent Bronze Age hiatus and the possible Beaker agency in this have been discussed above. Clearly work is needed to help to discern whether this hiatus is real or illusory.

The other major facets of the Howe sequence – the roundhouse to broch development and the post-broch restructuring – are also replicated on sites where excavation has made identification of multi-phasing possible. The demonstration of a roundhouse to full broch tower sequence on a single site is now well attested, not just on Orkney but in other parts of the Atlantic province (Hingley 1992, 16). In Caithness, the early broch at Crosskirk resembled a roundhouse in many respects and it is becoming increasingly obvious that, as at Howe, the brochs are but a later addition to an underlying palimpsest of earlier settlement (Mercer 1985, 98). On Shetland, a roundhouse at Clickhimin precedes the broch (Hamilton 1968). Howe represents the ‘mound upon mound’ profile which is seen as being less common in Orkney (Foster 1989b, 35); perhaps its major importance lies in pointing to the likelihood of other such sites being the norm.

After development of the full broch tower, its decline and post-abandonment occupation are also replicated elsewhere. MacGregor (1974) sees the Broch of Burrian, probably built between the 1st century BC and 1st AD, after an initial period as purely a defensive structure, changing to meet more domestic requirements. Other broch sites, such as Gurness and Midhowe, display the same post-occupation phase as at Howe when they ceased to exist as anything other than housing for temporary workshops or sheds; like Howe too, their function had been changing up to this time (Foster 1989b, 38). Three of the above mentioned broch sites in proximity to Howe – Stackrue, Breckness, and Warebeth – have possible or proven evidence of later Iron Age settlement (Hedges 1987c). Without excavation it is difficult to assess how many more broch sites also display the same pattern of later Iron Age (Pictish) activity, as many of the buildings are hard to recognize on the surface. Most of the well-documented excavations such as the brochs of Burrian (MacGregor 1974) and Gurness (Hedges 1987b) have produced artefactual, if not structural evidence of later settlement. Work on non-broch sites such as Skaill, Deerness (Gelling 1985 and forthcoming), Buckquoy (Ritchie, A 1977), Birsay (Morris 1989) and Pool (Hunter 1990), which have until recently been somewhat eclipsed by the more prominent sites, has produced Late Iron Age buildings; this gives a better picture of the existence of scattered farmhouses in the landscape at this stage and helps redress the bias which past concentration on the broch structures has produced.

Recognition of the exact nature of the reuse has been a more recent achievement (Hedges 1987c). The identification of who was responsible for the later activity has depended on the proper distinction of secondary settlement: whether the broch (and settlement) was being altered by original inhabitants or being built into by those who would be considered Picts (Hedges 1983, 117).

What are the factors that govern the reuse of the sites? These are likely to range from the practical, which includes the site’s location and quarrying potential, to the strategic, which also involves location together with use as a centre for subjugation and control, to the symbolic, which uses the past to justify the present (Hingley 1992, 42) and from that draw status. At Pool, reuse would have been encouraged by the ease of levelling and availability of material for manuring (Hunter 1990, 178). This would not have been the case for the great clay mound of Howe; here, the major reasons for reuse are more likely to have been as a strategic location or as a source of stone, or status.

Is there some survival of folk memory through the Bronze Age? There is the sense that a claim of right to the land could be reinforced by the reuse of an ancestral site (Clarke *et al* 31). Perhaps the reuse of cup-marked stones were an expression of this or conversely they may have been re-used with as little thought as Pictish symbol stones become incorporated into modern farm walls. Did the remnant Maeshowe-type tomb represent a monument as enigmatic to Iron Age incomers as it does 5000 years later or did it offer a prime development site with status, the Aberdeenshire tower house renovated to provide the oil executive's mansion?

Whatever the motivation and justification for the reuse, the major incidents of the Howe sequence can be seen reflected across Orkney: two great periods of massive building, Neolithic and Iron Age, with between them some form of Bronze Age recession with its fragmentary Beaker presence.

'... it is the process of historical imagination which draws the evidence together into a coherence. Historical science is about criticising and increasing these insights.' (Hodder 1986, 96-7). Howe allows a coherent historical picture to be drawn: it has rich foreground details, a hazier middle ground and a background still subject to criticism; further insights remain for others to extract but the framework now exists for the imagination to work upon.

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## 11.2 POSTSCRIPT • BBS

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Howe was the first total excavation of a related series of Iron Age settlements within the Northern Isles to produce a stratified sequence of both buildings and artefacts. For the first time, unequivocal evidence for the complexity of structures on a single site spanning the whole of the Iron Age was revealed. The stratified sequence of events from the development of the roundhouse, through the brochs to the eventual decline of the settlement is a landmark in Iron Age studies in the North of Scotland.

Of vital importance was the radiocarbon dating of the structures, fundamental in the debate on the origins and development of roundhouses, brochs and their settlements. Perhaps more importantly, this has obviated once and for all, what Hedges termed "That tower of Scottish Prehistory" (Hedges and Bell 1980). The idea of the lone stone tower, isolated in the landscape in the Orkney/Caithness region and Shetland, must be altered in preference to the broch tower being one building, but undoubtedly the dominant one, within a nucleated settlement. The combination of the roundhouse or broch with its accompanying settlement and surrounding defences has been well recorded through the excavations at Howe, and the development of them as a nucleated unit has thus been stressed. The results from Howe can be used in a positive fashion for the reinterpretation and reassessment of past excavated sites such as Clickhimin in Shetland and Gurness and Midhowe in Orkney. It is perhaps the only means whereby the problems of interpreting recently consolidated buildings can be overcome. The narrowness of previous broch studies has unfortunately bequeathed to us an inadequately poor data base from which it has been almost impossible, to date, to assess with any validity the role Howe played in its locality, in the region and its relationship with other broch and non-broch sites. In this area, themes can be suggested for future research.

In spite of the positive results from this excavation, there are negative aspects. There was neither time nor money to explore the extent of structures which lay beyond the Iron Age defences. Although poorly preserved and at the mercy of the plough, later Phase 7 buildings existed beyond the settlement entrance. Did earlier buildings lie outwith the settlement? What was their relationship with the nucleated and enclosed village? How many buildings lay away from the mound in Phase 8, and how complete was the settlement on the mound? It is to be hoped that in future excavations of this type, a more comprehensive investigation of structures external to the defences can be made.

Similar problems existed with the Neolithic structures, which were never fully excavated. It is to be regretted that a fuller investigation of the relationship and function of the Phase 1 and 2 structures was not possible due to the limits of the excavation brief and the lack of funding.

From aspects such as this, pointers lead to the future. The emphasis in Iron Age studies has moved away from the broch tower. Future excavations must look beyond the defended nucleated broch settlements to

non-defended broch sites and to both early and later Iron Age non-defended and non-broch sites. Iron Age studies must become more integrated, to look at the whole complexity of Iron Age settlements within an area, and the social organization of surrounding territories. Hedges remarked that "broch towers will only be understood adequately when we have a much clearer picture of the Iron Age landscape as a whole" (1985, 175). Only by this means will the function of the roundhouse – broch in the landscape become clearer. Hypotheses about broch overlordship, territory and land-taking must be tested. Were broch villages surrounded by satellite farms, how was the landscape organized, and what can be learnt about the size and extent of Early and Middle Iron Age territories? The decline of broch settlements is perhaps better understood. Research at Pool in Sanday and at Skaill, Deerness (Hunter & Buteux forthcoming) will help elaborate the pattern of the setting up of single unit farms in the Middle to Late Iron Age period as seen at Howe. Did the Norsemen come to a preexisting dispersed farming landscape where a territorial pattern had been long in existence (Smith 1990, 38)? The answer is difficult to evaluate as it is yet another area into which research is urgently required. The questions and some of the answers that have been generated by Howe could also be applied to other geographical regions such as the Western Isles, Shetland and Caithness, where the relationship of brochs to other forms of Iron Age settlement is lacking, and the study of the interplay of building development and ideas between the regions and Orkney is needed.

At the time of excavation Howe was the most expensive excavation ever to have been undertaken in Scotland. An approach was made by the Inspectorate of the then Ancient Monuments, for the first time, to the government treasury department for permission to go beyond an upper threshold limit of £250,000 for an individual excavation. The excavation ended in 1982, but its expense still has important ramifications for the future. Howe was a total excavation of an average Iron Age broch settlement site in Orkney: a type of excavation suggested by Fairhurst in 1984 (181). Both larger and smaller sites exist, but in the light of the cost, can mound sites be excavated to modern scientific standards in the foreseeable future? The results of the excavation presented here are due to the total excavation of the site and removal of exceptionally well preserved stone buildings. The methods were drastic and nothing is left of the structures apart from remnants of the Neolithic and the Phase 5–6 rampart and ditch. It is a site which cannot be reappraised through further selective analysis of stratigraphy or structures. Archaeologists have long laboured with inadequate data from incomplete excavations, where ideas put forward have often been subject to doubt and uncertainty, and hypotheses have not been provable. It can be argued that the total sacrifice of the occasional complex site is justifiable, to increase not only the complete knowledge of that and like sites, but to test the hypotheses and put forward new ones with unquestionable evidence.

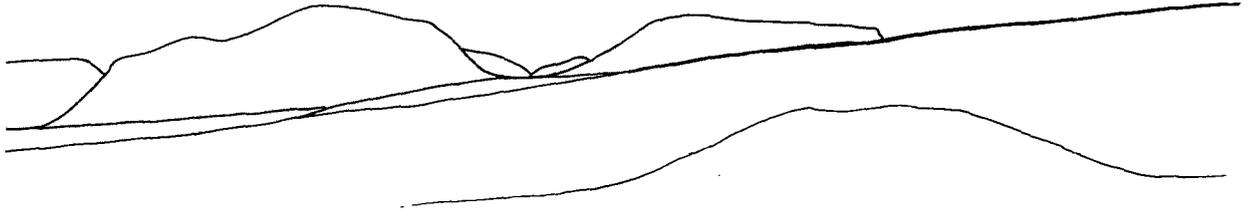
Howe was an exceptional challenge, which has already yielded far reaching results. It is argued that it would have been impossible to have sampled this site to have produced any worthwhile information. Indeed the stoney nature of the site excluded any viable selective sampling of its structures. In order to have achieved a stratified sequence of buildings and artefacts, total excavation of the site was the only feasible means of recovering useable information. With these factors in mind, excavation of similar sites in the future will not be cheap, if the reliability of the data is to be ensured.

In the case of Howe, consolidation was also not feasible. The problems inherent in the Phase 7 broch tower were still present after 2000 years. The stonework of the contemporary village was in poor condition and often reduced to a fragmentary state. The cost of consolidation was insupportable when considering the presence of the two guardianship sites of Gurness and Midhowe. The fact remains, that if Howe had been consolidated at its Phase 7 structures, the information produced would have been little advanced over the 1930's excavations of Gurness and Midhowe. Only by removing that broch and village did the other six phases of the site, spanning another 3000 years of prehistory, come to light. Through this example can the earlier excavated Iron Age sites on Orkney be better understood and explained.

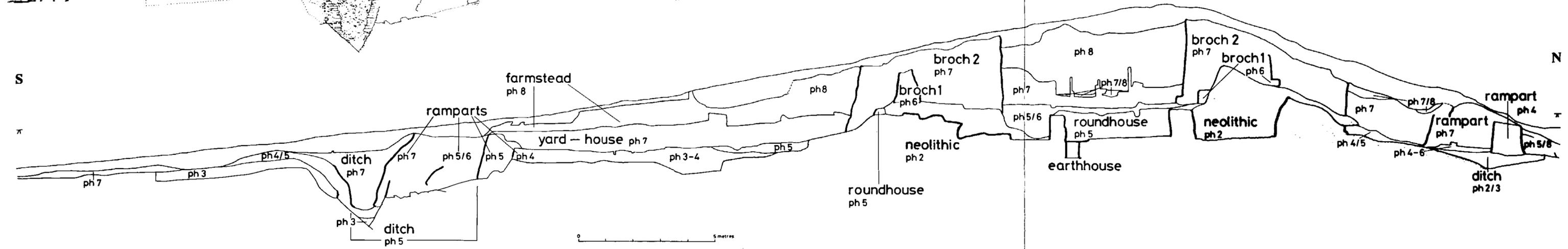
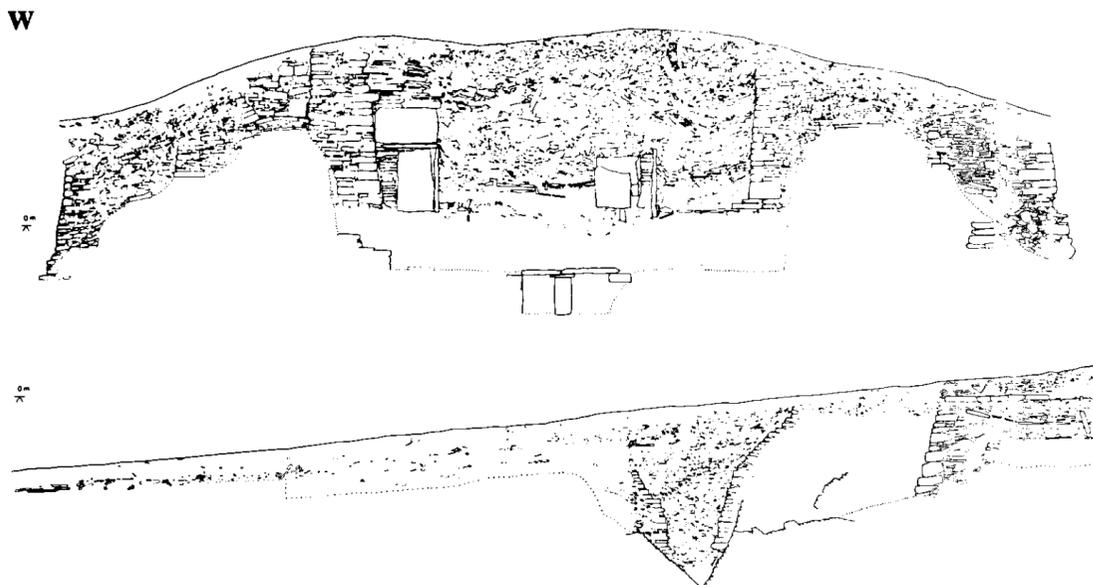
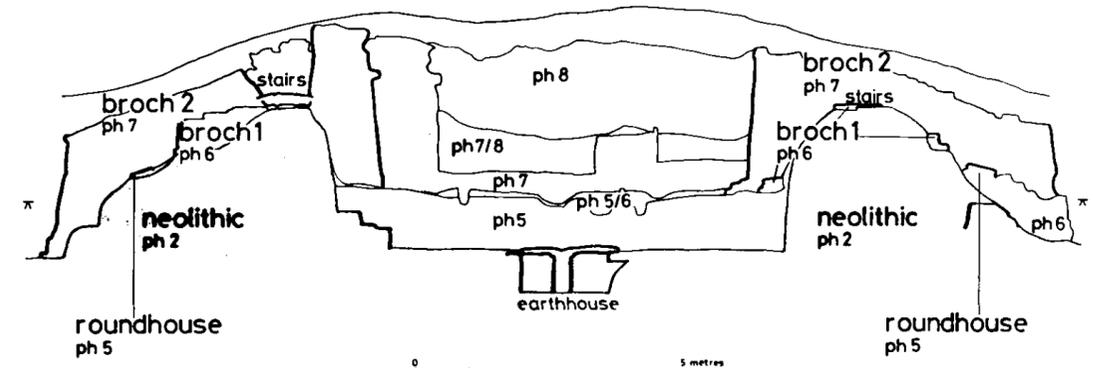
From the excavated evidence produced at Howe, it is possible to learn a little more about our Iron Age ancestors, their social organization, a little of their beliefs, their life styles, wealth, poverty, ritual, death, disease, habits, aesthetic tastes, and their craftsmanship and abilities. Rarely does the archaeologist find the skeletons of the inhabitants of the settlement under excavation. At Howe this was possible and some of the very young and the old were met in exceptional circumstances.

For the present, if a little of the colour and vitality of the life of our Iron Age ancestors is reflected in these pages, then we will have partly succeeded in revealing to the reader the sophisticated achievements of the

past. These achievements have been long undervalued whilst tucked away in the NE corner of the British Isles. However an attempt to readdress this discrepancy was made by Harding who wrote “ what the Atlantic Iron Age emphatically is not is either ‘peripheral’ or ‘marginal’” (1990, 16). The inhabitants of Howe were participants in the long term game of the turning of prehistory into history in the North of Scotland, but their particular placings in the various events still await future assessments.



Detailed and explanatory sections N-S and E-W through the site; key to plans and sections.



Keys to plans and sections

- |                          |  |                                      |  |
|--------------------------|--|--------------------------------------|--|
| new walls                |  | old walls in use                     |  |
| stones on edge           |  | orthostats                           |  |
| earthfloor               |  | ash                                  |  |
| charcoal                 |  | clay                                 |  |
| shell                    |  | silt                                 |  |
| pea gravel               |  | burnt stone                          |  |
| continuation of features |  | limit of features and wall overhangs |  |
| slopes                   |  | slipping stones                      |  |
| stakeholes               |  | disturbed by later activity          |  |
| limit of plough damage   |  |                                      |  |

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HOWE 1-4	PHASED LAYER LIST	40	"	"	79-83	9	Victorian walls.	123	7/8	Ground surface.	
		41	8	Wall.	84	9	Flags.	124	7	Rubble.	
	Phase	Description	43	"	"	85	8	Flags and clay.	125-127	-	Scrapped.
			44	"	"	86	7/8	Ditch silts.	128	7	Rubble, = 124.
1	9	Topsoll.	45	"	"	87	-	Scrapped.	129-132	9	Victorian fill.
2	9	Victorian trench.	46	"	"	88	-	"	133	8	Rubble.
3	8	Rubble.	47	-	Scrapped.	89	7/8	Collapsed clay rampart.	134	9	Ploughsoil.
4	9	Victorian trench.	48	8	Flags.	90	4	Wall.	135	7/8	Rampart collapse.
5	9	Ploughsoil.	49	8	Flags, = 50	91-92	7	Rampart face.	136	7	Broch II foundation.
6	9	Rubble.	50	"	" = 49	93	8	Flags.	137	9	Rubble.
7	9	Rubble.	51	8	Ground surface.	94	8	Sill.	138	-	Scrapped.
8	8	Shillet and earth.	52	"	"	95	8	Wall.	139	7/8	Rampart collapse = 135.
9	8	Rubble, = 722.	53	9	Victorian trench.	96	8	Wall.	140	5/6	Rampart face.
10	-	Scrapped.	54	8	Flags.	97	-	Scrapped.	141	8/9	Ploughsoil, = 731.
11	-	"	55	"	"	98	5-7	Claysilt.	142	-	Scrapped = 731.
12	-	"	56	8	'Occupation deposits'	99	7/8	Slip from clay rampart.	143	-	" = 731.
13	8	Wall.	57	-	Scrapped.	100	7	Broch II staircase.	144-146	9	Recent disturbance.
14	9	Rubble.	58	7	Rampart face.	101	7	Blocking.	147	8	Shillet.
15	9	Victorian trench fill.	59	7	Rubble.	102	8	Shillet.	148	8	Rubble.
16-21	8	Rubble.	60	7	Hearth.	103	7	Rubble.	149	8	Midden.
22	-	Scrapped.	61	7	Ground surface.	104	-	Scrapped.	150	8	Rubble.
23	9	Ploughsoil.	62	4/5	Clay bank.	105	-	Scrapped (= 1).	151	7	Ditch fill.
24	-	Scrapped.	63	7	Midden.	106	9	Victorian wall.	152	8	Wall.
25	7	Broch Tower wall.	64	8	Ground surface.	107	8	Rubble.	153	8	Rubble.
26	8	Rubble, = 722	65	9	Victorian trench.	108	9	Rubble.	154	8	Wall.
27	-	Scrapped.	66	4/5	Ground surface, = 170.	109-110	9	Ploughsoil.	155	8	Flags.
28	9	Rubble.	67	4/5	Silt clay.	111	8	Sill.	156	8	Walls.
29	8/9	Rubble.	68	-	Natural clay.	112	8	Wall.	157	-	Scrapped.
30	9	Wall.	69	-	Scrapped.	113	8	Wall.	158	7	" = 211.
31	9	Rubble.	70	-	Scrapped.	114	7	Wall, = 330.	159	5/6	Rubble.
32	8	Rubble.	71	7	Rubble.	115	8	Rubble.	160	8	Rubble.
33	-	Scrapped.	72	8	Wall.	116	8	Flags.	161	8	Wall, = 336.
34	8	Rubble.	73	8	Rubble.	117	9	Victorian spoil.	162-3	-	Scrapped.
35	7	Rubble = 124.	74	9	Victorian trench.	118	8	Ash patches.	164	8	Wall.
36	"	" "	75	"	"	119	8	Ground surface, = 64.	165	8	Rubble, = 1495.
37	8	Rubble.	76	9	Ground surface.	120	8	Entrance.	166-7	8	'Occupation deposit' - 204.
38	8	Wall.	77	9	Flags.	121	8	Rubble, = 722.	168	9	Rubble.
39	8	Wall.	78	9	Victorian fill.	122	9	Flags.	169	-	Scrapped.

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170	4/5	Ground surface.	212	8	Earth floor = 210.	254	8	Blocking.	294	8	Wall.
171	8	= 250	213	8	Flags.	255	-	Scrapped.	295	5/6	Rampart core.
172	8	Rubble.	214	"	Partition.	256	-	Scrapped = 1278.	296	8	Hearth deposits.
173-6	"	"	215	-	Scrapped.	257	8	Hearth deposits.	297	8	Hearth, = 374.
177	8	Ground surface.	216-220	8	Hearth deposits, = 357.	258	8	Partition.	298	"	Hearth deposits, = 357.
178-9	8	Rubble.	221	8	Occupation deposit.	259	8	Floor levelling, = 460.	299	-	Scrapped = 384.
180	9	Rubble.	222	"	Wall.	260	-	Scrapped = 90.	300	8	Hearth.
181	8	Rubble.	223	7	Rampart core.	261-2	7	Broch II rampart core.	301	-	Scrapped.
182	8	Flags.	224	8	Wall.	263	8	Earth floor, = 346.	302	5/6/7	Ditch silts.
183	-	Scrapped = 371	225	-	Scrapped.	264	-	Scrapped = 190.	303	8	Hearth deposits.
184	8	Rubble.	226	8	Wall.	265	7	Rampart core.	304	8	Earth floor.
185	-	Scrapped = 1225	227	"	Flags.	266	-	Scrapped.	305	5	Rampart revetment wall.
186	8	Wall.	228	"	Floor.	267	7/8	Abandonment.	306	9	Ploughsoil.
187	8	Floor.	229	"	Orthostats.	268	-	Scrapped = 655	307	8	Entrance.
188	8	Midden.	230	"	Post setting.	269	8	Flags, = 539.	308	8	Entrance.
189	8	Flags.	231	"	Wall.	270	8	Charcoal spread.	309	9	Ploughsoil.
190	8	Ground surface.	232	"	Post support (?).	271	"	Hearth deposit.	310	5-7	Ditch silts.
191	"	Rubble.	233	"	Rubble, = 176.	272-3	7	Rampart core.	31	8	Hearth.
192	"	Levelling earth.	234	"	Wall.	274	8	Flags.	312-3	5-7	Ditch silts.
193	"	Rubble.	235	8	Entrance - blocking.	275	-	Scrapped = 605.	314	5-7	Ash.
194	"	Floor.	236	8	Wall.	276	8	Orthostat.	315	5-7	Ditch revetment.
195	"	Sill.	237	-	Scrapped.	277	8	'Alcove'.	316	8	Flags.
196	-	Scrapped.	238	8	Path.	278	"	Flags.	317	"	Floor deposit.
197	8	Blocking.	239	"	Flags.	279	8	Rubble.	318	-	Scrapped.
198	"	Wall.	240	9	Recent disturbance.	280	"	" (= 241).	319	5-7	Rubble.
199	"	"	241	8	Rubble.	281	"	Wall.	320	2/3	Ditch fill, = 684.
200	"	Flags.	242	"	Path, = 238.	282	"	Flags.	321	7	Rampart core.
201	-	Scrapped.	243	"	Wall face.	283	"	Orthostat.	322	-	Scrapped.
202	8	Wall.	244	9	Rubble.	284	"	Earth floor.	323	5/6	Rampart revetment, = 323.
203	"	"	245	8	Rubble.	285	"	Rubble, = 399.	324-6	-	Scrapped.
204	"	Occupation deposit.	246	"	Ground surface, = 64.	286	7	Earth - floor.	327-9	9	Victorian spoil.
205	"	Blocking.	247	"	Wall.	287	8	Ground surface.	330	7	Wall.
206	"	Rubble.	248	-	Scrapped.	288	8	Rubble.	331	8	Rubble.
207	7	Rampart core.	249	8	Wall.	289	"	Entrance.	332	8	Flags, = 250.
208	-	Scrapped.	250	8	Floor.	290	"	Flags.	333	9	Topsoil.
209	9	Victorian fill.	251	9	Rubble.	291	"	"	334-5	"	Victorian fill.
210	8	Earth floor.	252	9	Animal Intuition.	292	-	Scrapped.	336	8	Wall.
211	7	Ground surface.	253	8	Partition.	293	8	Hearth.	337	8	Wall.

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338	8	Wall.	360	8	Packing = 386.	420	9	Victorian trench.	459	8	Packing.
339	"	Rubble.	381	8	Ground surface, = 710/711.	421	8	Wall, = 96.	460	"	Floor levelling.
340	"	"	382	-	Scrapped.	422	9	Victorian fill.	461	"	Orthostat.
341	"	Orthostat.	383	8	Floor.	423	8	= 177.	462	8	Wall core.
342-3	9	Victorian fill.	384	7	Wall.	424	"	Rubble.	463	"	Blocking.
344	8	Wall.	385	8	Hearth slabs.	425	"	Orthostat.	464	"	Roof support.
345	8	Floor.	386	8	Hearth.	426	"	Blocking.	465	"	Flags.
346	"	Floor.	387	"	Hearth base slabs.	427	"	Wall.	466	9	Victorian fill.
347	"	Hearth.	388	"	Hearth slabs.	428	"	Rubble.	467-469	9	Victorian spoil.
348	7	Wall.	389	"	Rubble, = 399.	429	"	Ground surface.	470-479	-	Scrapped.
349	9	Victorian fill.	390	"	Occupation deposit.	430	"	Floor levelling.	480-2	8	Hearth deposits.
350	8	Floor.	391-2	-	Scrapped.	431	"	Floor.	483	8	Flags, = 465.
351	"	Kerb.	393	8	Roof support.	432	"	Wall.	484-492	8	Hearth and floor deposits.
352	"	Flags.	394	"	Door post.	433	"	"	493	8	Ground surface, = 64.
353	5	Clay core of rampart.	395-6	"	Packing.	434	"	"	494	"	Hearth deposit.
354	8	Partition.	397	-	Scrapped.	435	"	"	495	"	Hearth.
355-6	"	Floors.	398	8	Sill packing.	436	"	Stake hole.	496	9	Victorian hut base.
357	8	Hearth deposits.	399	8	Rubble.	437	"	Wall.	497	8	Floor.
358	"	Rubble, = 710/711.	400	-	Scrapped.	438	"	Rubble.	498	"	Wall, = 433.
359	5	East side of rampart entrance.	401	7	Partition, = 1581.	439	9	Rubble.	499	"	Floor.
360	7	Flags.	402	8	Flag.	440	"	Victorian fill.	500	"	Hearth uprights.
361	7	Rubble.	403	"	Wall, = 226.	441	8	Ground surface, = 550.	501	"	Wall, = 498.
362	8	Floor.	404	"	Flag.	442	"	Paving.	502	"	Levelling rubble.
363	"	Wall.	405	"	Floor.	443-4	-	Scrapped.	503-4	"	Hearth deposits.
364	"	Occupation deposit, = 221.	406	"	Post setting.	445	8	Rubble, = 245.	505	"	Rubble, = 37.
365	7	Wall.	407	"	Entrance.	446	"	Wall.	506	"	Hearth deposits.
366	8	Hearth slabs.	408	"	Hearth deposits.	447	"	Ground surface, = 537.	507	"	Hearth.
367	8	Hearth deposits.	409	"	Floor.	448	"	Rubble.	508	"	Hearth deposits.
368	8	Flooring.	410	"	Rubble.	449	"	Wall.	509	"	Hearth slab.
369	"	" (= 368).	411	"	Levelling rubble.	450	8/9	Ploughsoil, = 731.	510	"	Orthostat, = 435.
370	8	Hearth deposits.	412	"	Sill.	451	8	Midden.	511	"	Packing.
371	8	Roof support.	413	"	Packing.	452	"	Paving.	512	-	Scrapped.
372	"	"	414	"	Orthostat.	453	"	Orthostat.	513	8	Ground surface, = 177.
373	"	Ground surface.	415	9	Wall.	454	"	Hearth deposits.	514	"	Flags.
374	"	Hearth.	416	8	Floor, = 228.	455	"	Hearth slabs.	515	"	Wall core.
375	7/8	Ground surface, = 267.	417	"	Fill of post setting.	456	"	Scrapped, = 239.	516	-	Scrapped.
376-8	8	Floors.	418	"	Blocking.	457	-	Scrapped = 750.	517-8	8	Hearth deposits.
379	"	Hearth slabs.	419	"	Ground surface, = 177.	458	8	Levelling.	519	8	Rubble, = 37.

PHASED LAYER LIST

520	8	Stacked rubble.	558	-	Scrapped, = 705.	598	8	Levelling.	638	8	Hearth deposits.
521	"	Paving.	559	"	Kerb.	599	"	Flags.	639	"	Floor.
522	8	Wall.	560	"	Kerb.	600	"	Rubble.	640	"	Hearth.
523	"	Rubble.	561	"	Floor levelling.	601	"	Floor.	641	"	Levelling.
524	"	Post setting.	562	"	Hearth.	602	-	Scrapped = 734.	642	"	Ash.
525	"	Earth floor.	563	8	Kerb.	603	8	Wall.	643	"	Floor levelling.
526	"	Rubble.	564	"	Floor levelling.	604	"	Silt.	644	"	Ash dump.
527	-	Scrapped.	565	"	Rubble.	605-6	"	Hearth deposits.	645	"	Floor deposit.
528	8	Hearth deposit.	566	"	"	607	"	"	646	"	Post setting.
529	"	Levelling rubble.	567	9	Victorian fill.	608-9	8	Floor levelling.	647-8	"	Stakeholes.
530	"	Earth floor.	568	8	Ground surface, = 177.	610	8/9	Ground surface, = 731.	649	"	Flag, = 734.
531	"	Wall.	569	"	Hearth deposits.	611	8	Earth floor.	650	"	Scrapped.
532	"	Wall, = 750.	570	"	"	612	"	Wall core.	651	"	Wall core.
533	"	Wall.	571	"	"	613	"	Rubble.	652	7	Wall, = 675, 676.
534	"	Paving.	572	"	"	614	"	Floor deposit.	653	8	Hearth deposit.
535	"	Wall.	573	"	"	615	"	Floor.	654	8	Orthostat.
536	"	Wall.	574	"	Floor levelling.	616	"	Flags.	655	"	Earth floor.
537	"	Ground surface.	575	"	Orthostat.	617	9	Recent disturbance.	656	8	Rubble, = 734.
538	"	Rubble.	576	"	Flags.	618	8	Wall core.	657	8	Rubble, = 734.
539	"	Flags.	577	"	Earth floor.	619	8	Blocking.	658	"	Ground surface.
540	"	Wall core.	578	"	Hearth deposits.	620	"	Floor.	659	9	Ploughsoil.
541	"	Rubble, = 734.	579	8	Packing.	621	"	Rubble.	660	8	Kerbing.
542	"	Stake holes.	580	9	Ploughsoil.	622	"	Ground surface.	661	"	Flags.
543	"	Hearth deposits.	581	8	Floor levelling.	623	"	Floor.	662	"	Scrapped = 750.
544	"	Flags.	582	"	Rubble.	624	"	Rubble, = 37.	663	8	Floor deposit.
545	"	Rubble.	583	"	"	625	"	Scrapped = 179.	664	"	Ground surface.
546	"	Entrance.	584	-	Scrapped.	626	8	Levelling.	665	"	Rubble core.
547	"	Rubble.	585	8	Hearth deposits.	627	"	Floor.	666	"	Stakehole.
548	"	Levelling.	586	"	Wall.	628	"	Ash patch.	667	"	Wall packing.
549	"	Flags.	587	"	Hearth deposits.	629	"	Floor.	668	"	Rubble, = 37.
550	"	Ground surface.	588	"	Post setting.	630	"	Midden.	669	"	Floor deposit.
551	"	Earth floor.	589	"	Occupation deposit.	631	"	OGS.	670	"	Rubble = 734.
552	9	Wall.	590	"	Floor.	632	"	Wall.	671	"	Rubble.
553	8	Levelling rubble.	591	"	Orthostat.	633	"	Flags.	672	"	Flags, = 550.
554	"	Wall core.	592	"	Flags.	634	"	Floor deposit.	673-4	"	Scrapped.
555	"	Levelling rubble.	593	"	Ground surface, = 177.	635	"	Levelling.	675	7	Wall.
556	"	Post setting.	594-596	"	Hearth deposits.	636	"	Floor.	676	8	Wall.
557	"	Stake hole.	597	"	Floor deposit.	637	"	Floor.	677	7	Rubble.

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678	-	Scrapped.	722	8	Rubble.	770	7/8	Rubble, = 729.	810	8	" = 710/711.
679	8	Wall, = 750.	723	7	Corbel.	771	7/8	Partition.	811	"	Rubble.
680	8	Wall, = 750.	724	9	Trench - Victorian.	772	8	Setting.	812	"	"
681	4/5	Ground surface.	725	7	Wall face.	773	8	Setting.	813	"	Wall.
682	7	Rampart foundation.	726-7	7	Partitions.	774	8	Kerb.	814	9	Rubble.
683	4/5	Ground surface.	728	7	Cupboard.	775	"	Hearth.	815	7/9	Robbing trench.
684	2/3	Ditch fill.	729	7/8	Rubble.	776	"	Flag floor.	816	9	Ploughsoil.
685	8	Orthostat.	730	8	Flags.	777	"	Wall.	817	8	Wall.
686	8	Entrance.	731	8/9	Rubble.	778	"	Wall foundation.	818	7	Wall.
687	"	Orthostat.	732	-	Scrapped.	779-81	"	Settings.	819	8	Wall.
688	"	Flags.	733	8	Rubble.	782	7	Wall, = 1078.	820	8	Wall.
689	"	Flag, = 603.	734	8	Rubble.	783	8	Ash.	821	"	"
690	"	Packing.	735	9	"	784	8	Hearth deposit.	822	"	Rubble.
691	"	Ground surface, = 734.	736	8	Hearth.	785	"	Ground surface.	823	"	" (= 173).
692	"	Rubble, = 734.	737	7	Partition.	786	"	Floor levelling.	824	7/8	Rubble.
693	"	Flags.	738	7	Blocking.	787	"	Kerb.	825	8	Rubble.
694-697	-	Scrapped.	739	7	Flag lid.	788	7	Burning.	826	7/8	Floor.
698-9	8	Rubble, = 37.	741-744	7	Orthostats.	789	7	Rubble.	827	7/8	Hearth.
700	8	Orthostat.	745	7	Partition.	790	7	Soakaway.	828	7/8	Wall.
701	"	Flags.	746	7	Flag lid.	791	7	Slag deposit.	829	7	Levelling rubble.
702-3	5	Door jambs.	747	7	Staircase.	792	"	Cell.	830	7	Wall.
704	7	Wall.	748	"	Wall.	793	2	Tomb mound clay.	831-4	8	'Features in "Shed".'
705	9	Rubble.	749	"	Orthostat.	794	8	Levelling earth.	835	7/8	Hearth.
706	8	Wall.	750	8	Wall.	795	"	"	836	7/8	Setting.
707	"	Rubble.	751	7	Cupboard.	796	7	Cupboard.	837	7	Kiln?
708	"	Ground surface.	752-3	7	Buttresses.	797	7	Wall.	838	7	Ash.
709	"	Flags.	754	7	Floor.	798	"	Floor.	839	8	Midden.
710-11	"	Ground surfaces.	755-759	7	Orthostats.	799	"	Clay.	840	7/8	Hearth.
712	-	Scrapped.	760	7	Partition.	800	"	Flags.	841	8	Rubble.
713	9	Recent disturbance.	761	"	Wall.	801	"	Levelling.	842	"	Earth.
714	9	Rubble.	762	8	Flags.	802	9	Recent disturbance.	843	7/8	Furnace.
715	8	Rubble.	763	7	Wall.	803	8	Tank = 398.	844	8	Rubble.
716	5/6	Rampart.	764	"	Rubble.	804	7	Hearth.	845	8	Flags.
717	8	Rubble, = 37.	765	8	Earth floor.	805	"	Rubble = 71.	846	8	Wall face.
718	7	Rubble.	766	"	Wall.	806	"	"	847	"	Rubble wall core.
719	8	Roof support.	767	7	Flags.	807	6-9	Rubble.	848	8	Wall.
720	"	"	768	"	Rubble.	808	"	Scrapped.	849	"	Rubble.
721	9	Robbing trench.	769	7/8	'Platform'.	809	8	Ground surface.	850	"	Wall.

PHASED LAYER LIST

851	8	Wall = 750.	895	8	Floor.	934-6	8	Walls.	974	8	Floor.
852-4	"	Rubble.	896	"	Ash and slag.	937	"	Rubble.	975	7	Rubble.
855	"	Wall.	897	"	Burnt clay.	938	"	Wall.	976	8	Rubble, = 734.
856	"	Rubble - Charcoal.	898	6	Wall face.	939	"	Buttress.	977	"	Rubble.
857	"	Wall.	899	8	Orthostats.	940	"	Wall.	978	7	Burning.
858	7/8	Floor.	900	9	Recent disturbance.	941	"	Flags, = 1119.	979	8	Flags.
859	7/8	Rubble.	901	8	Ground surface.	942	"	Sill.	980	-	Scrapped.
860	8	Stairs.	902	"	Flags.	943	7	Wall.	981	7	Dump.
861	7	Burning.	903	"	Wall.	944	8	Wall.	982	8	Rubble.
862	7/8	Post setting.	904	7	Flags.	945	-	Scrapped.	983	"	Floor.
863	7	Rubble.	905	"	Hearth.	946	8	Flags.	984	8	Silt and charcoal.
864	"	Tank.	906	"	Occupation deposit.	947	"	Orthostats.	985	7	Floor.
865	7/8	Flag cover.	907	8	Yard surface.	948	"	Flags.	986	7	Flags.
866	7	Kiln.	908	8	Rubble.	949	"	Rubble.	987	"	"
867	7	Ground surface.	909	7	Ash dump.	950	"	Wall.	988	"	"
868	8	Flags.	910	8	Rubble.	951	"	Rubble.	989	"	Orthostat.
869	7	Wall, = 1308.	911	"	Hearth.	952	7	Floor levelling.	990	"	Packing.
870-3	8	Walls.	912	"	Rubble.	953	"	Packing.	991	"	Packing.
874	"	Paving.	913	-	Scrapped.	954	7	"	992	"	Orthostat.
875	"	Wall.	914	7	Blocking.	955	"	Rubble.	993	"	Flags.
875	7	Floor.	915	8	Buttress.	956	"	Wall.	994	"	Packing.
877	"	Posthole.	916	7	Wall, = 1308.	957	"	Doorway.	995	6	Packing.
878	8	Wall core.	917-8	8	Walls.	958	8	Wall.	996	7	Packing.
879	7	Sill.	919	8	Orthostat.	959	7	Sill.	997	"	Orthostat.
880	"	"	920	"	Rubble.	960	8	Ground surface, = 785.	998	"	"
881	"	"	921	"	Wall.	961	7/8	Rubble.	999	5	Earth-house.
882	"	Partition.	922	"	Ground surface.	962	8	Sill.	1000	6	Flags.
883	"	Levelling rubble.	923	"	"	963	8	Floor.	1001	5	Drain.
884-5	8	Orthostats.	924	"	Rubble.	964	-	Scrapped.	1002	7	Flag ind.
886	8	Floor.	925	"	Paving.	965	8	Occupation deposit.	1003	"	Partition.
887	"	Partition.	926	"	Ground surface.	966	7	Soakaway.	1004	8	Rubble, = 631.
888	"	Floor.	927	8	Rubble.	967	7	Orthostat.	1005	"	Sill packing.
889	"	Flags.	928	-	Scrapped = 1318.	968	"	Hearth.	1006	7	Packing.
890	"	"	929	8	Wall, = 1150.	969	7	Paving.	1007	-	Scrapped.
891	"	Setting.	930	"	Wall.	970	7	Wall.	1008	8	Wall.
892	"	Floor.	931	"	Rubble.	971	7	Ash.	1009	"	Flags, = 730.
893	"	Wall.	932	"	Wall.	972	7	Earth floor.	1010	"	Wall, = 750
894	7/8	Ditch fill.	933	"	Flags.	973	"	Clay.	1011	5/6	Yellow clay.

PHASED LAYER LIST

1012	7	Hearth.	1054	7	Wall.	1094	8	Silled entrance.	1133	7	Flags.
1013	-	Scrapped.	1055	"	"	1095	7	Flags.	1134	8	Blocking.
1014	7	Orthostat.	1056	7	Wall.	1097	8	Rubble.	1135	"	Flags.
1015	7	Floor.	1057	"	Paving.	1098	"	Floor.	1136	"	Hearth.
1016	"	Sill packing.	1058	"	Stone setting.	1099	7	Rubble, = 1085.	1137	"	Floor, = 1143.
1017	"	Earth-floor.	1059	"	Wall.	1100	8	Orthostat.	1138	"	Sill.
1018	-	Scrapped.	1060	"	Paving.	1101	"	Flags.	1139	7	Wall = 1179.
1019	8	Rubble.	1061	"	Post setting.	1102	7	Wall.	1140	8	Wall.
1020	5/6	Floor.	1062	"	Wall.	1103	"	Levelling rubble.	1141	"	"
1021	8	Wall.	1063	"	"	1104	"	Levelling rubble.	1142	"	Door lintel.
1022	"	"	1064	5/6	Rampart revetment.	1105	8	Post setting.	1143	"	Floor, = 1137.
1023	"	Flags.	1065	7	Paving.	1106	"	Ground surface, = 1181.	1144	"	Floor.
1024-5	8	Partitions.	1066	"	Wall.	1107	"	Floor.	1145	"	Flags.
1026	"	Stone setting.	1067	"	Rubble levelling.	1108	7	Wall.	1146	"	Earth levelling.
1027	9	Recent disturbance.	1068	7	Sill.	1109	8	Floor.	1147	"	Hearth.
1028	8	Flags and sill.	1069	"	"	1110	"	Wall.	1148	-	Scrapped.
1029-32	6	Partitions.	1070	"	Wall.	1111	"	Ground surface, = 1181.	1149	7	Wall.
1033	5	Post-holes.	1071	"	Cupboard.	1112	"	Floor.	1150	8	Wall.
1034	6	Partition.	1072	8	Entrance.	1113	"	Hearth.	1151	"	Flags.
1035	6	Postholes.	1073	7	Hearth.	1114	"	Ash.	1152	7	Flags.
1036	"	Partition.	1074	8	Threshold flags.	1115	7	Rubble.	1153	7/8	Charcoal-earth.
1037	"	Packing.	1075	"	Wall.	1116	8	Rubble.	1154	7/8	Wall.
1038	"	Hearth.	1076	7	Levelled rubble = 883.	1117	"	Wall.	1155	7	Levelling.
1039	"	Packing.	1077	8	Wall.	1118	"	Partition.	1156	7	Tank.
1040	"	Packing.	1078	7	Wall.	1119	"	Flags.	1157	7	Wall.
1041	8	Rubble.	1079	8	Wall.	1120	"	Earth floor.	1158	8	Wall.
1042	5	Clay.	1080	7	Earth floor.	1121	-	Scrapped buttress = 1075.	1159	"	Floor.
1043	8	Hearth.	1081	"	Rubble.	1122	"	Hearth.	1160	-	Scrapped.
1044	"	"	1082	"	Levelling rubble.	1123	"	Furnace dumps.	1161	7	Wall.
1045	7	Hearth.	1083	8	Rubble.	1124	7/8	Earth surface.	1162	7	Rubble.
1046	"	Ash and stone levelling.	1084	7	Earth-house.	1125	8	Orthostat.	1163	8	Rubble.
1047	7	Paving.	1085	"	Rubble.	1126	"	Dump.	1164	7	Wall.
1048	"	Ash spread.	1086-8	"	Levelling rubble.	1127	"	Hearth.	1165	9	Victorian trench.
1049	7	Hearth.	1089	"	Earth floor.	1128	"	Ground surface/midden, = 1181.	1166	8	Wall.
1050	"	"	1090	"	Wall.	1129	7	Post setting.	1167	8	Rubble.
1051	"	Earth floor.	1091	"	Wall.	1130	"	Earth floor.	1168	-	Scrapped.
1052	"	Clay floor.	1092	"	Hearth.	1131	"	Rubble and silt.	1169	-	Scrapped.
1053	"	Tank lid.	1093	"	Setting.	1132	"	Rubble.	1170	8	Rubble, = 20.

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1171	8	Rubble.	1209	5-7	Sill.	1247	7	Tank.	1285	8/9	Wall.
1172	7	Buttress.	1210	7	Doorway.	1248	"	Commode.	1286	6/7	Rampart revetment.
1173	-	Scrapped.	1211	"	"	1249	8	Flags.	1287	5/6	Rubble.
1174	7	Wall.	1212	"	Sill.	1250	7	Rampart wall.	1288	8	Rubble.
1175	7	Wall, = 1157.	1213	"	Doorway.	1251	7	Rubble.	1289	7	Hearth and ash.
1176	7	Cupboard.	1214	"	"	1252	"	Rubble.	1290	"	Soakaway.
1177	"	Levelling.	1215	"	Paving.	1253	7	Post hole.	1291	"	Clay floor.
1178	"	Setting.	1216	"	"	1254	-	Scrapped.	1292	"	Cupboard.
1179	"	Wall.	1217	"	Flags.	1255	7	Hearth.	1293	8	Buttress.
1180	-	Scrapped.	1218	"	"	1256	7	Wall, = 1265.	1294	"	Path.
1181	8	Ground surface.	1219	"	"	1257	8	Buttress.	1295	"	Entrance.
1182	7	Ash.	1220	5/6	Orthostat.	1258	8	Entrance.	1296	7	Wall.
1183	8	Flags.	1221	5/7	Blocking.	1259	8	Wall.	1297	"	Wall.
1184	7/8	Rubble = 1185.	1222	7	Earth floor.	1260	"	Floor.	1298	"	Wall.
1185	7/8	Earth and rubble.	1223	7	Floor levelling.	1261	7	Hearth.	1299	"	Blocking.
1186	-	Scrapped.	1224	-	Scrapped.	1262	7	Hearth, = 1820.	1300	8	Hearth.
1187	7	Rubble.	1225	8	Buttress.	1263	"	Hearth.	1301	"	Buttress.
1188	7	Rubble and earth, = 1076.	1226	"	Flags.	1264	8	Rubble.	1302	"	Stone setting.
1189	7	Rubble, = 71.	1227	7	Paving.	1265	7	Wall.	1303	"	Packing.
1190	9	Recent disturbance.	1228	7	Broch II phase 2 wall foundation.	1266	7	Ash.	1304	8	Earth floor.
1191	"	"	1229	7	Paving.	1267	7	Rubble.	1305	7	Clay.
1192	8	Recess.	1230	7	Buttress.	1268	9	Ploughsoil.	1306	7	Rubble = 1326.
1193	7	Flags = 1060.	1231	7	Collapsed rampart face.	1269	8	Floor.	1307	8	Passage.
1194	8	Sill.	1232	7	Rubble.	1270	8	Wall.	1308	7	Cell wall.
1195	7/8	Rubble and earth.	1233	7	Rubble.	1271	7	Wall.	1309	7	Paving.
1196	8	Flagged floor.	1234	-	Scrapped.	1272	8	Walls.	1310	7	Wall.
1197	7	Hearth.	1235	8	Wall.	1273	"	Flags.	1311	7	Doorway.
1198	8	Hearth.	1236	7	Wall.	1274	7	Rampart face.	1312	7	Oven.
1199	8	Earth floor.	1237	7	Silt and rubble.	1275	7	Wall.	1313	7	Wall.
1200	"	Wall.	1238	8	Wall.	1276	7	Silt.	1314	7	Rubble.
1201	7	Ash and rubble.	1239	8	Flags.	1277	8	Flags.	1315	8	Rubble.
1202	8	Buttress.	1240	8	Floor.	1278	8	Post setting.	1316	7	Buttress.
1203	"	Wall.	1241	7/8	Ditch fill - earth and charcoal.	1279	"	Entrance.	1317	8	Wall.
1204	"	Entrance.	1242	7/8	Ditch fill - shell midden.	1280	"	Floor deposit.	1318	8	Wall.
1205	"	Flags.	1243	7	Earth floor.	1281	7	Earth floor.	1319	8	Earth and flag floor.
1206	7	Pit.	1244	7	Shillet.	1282	7	Rubble.	1320	-	Scrapped.
1207	7	Stone setting.	1245	"	Doorway.	1283	8	Rubble.	1321	8	Earth floor.
1208	"	Paving.	1246	"	Paving and charcoal.	1284	5/6	Rampart revetment.	1322	-	Scrapped.

PHASED LAYER LIST

1323	7	Rubble.	1361	7	= 1401.	1399	7	Orthostats.	1437	7	Paving.
1324	8	Paving and sill.	1362	7	Furnace dump.	1400	7	Rubble.	1438	7	Collapse rubble.
1325	6	Wall.	1363	7	Wall.	1401	7	Earth and rubble.	1439	5/6	Revetment of clay mound.
1326	7	Levelling rubble.	1364	7	Flag floor.	1402	8	Paving.	1440	6	Cell.
1327	8	Paving.	1365	-	Scrapped.	1403	7	Clay loam.	1441	7	Outer wall face, repaired.
1328	8	Hearth.	1366	-	Scrapped.	1404	7	Ground surface.	1442	7	Inner wall face.
1329	7	Earth floor.	1367	7	Hearth.	1405	7	Broch II wall core.	1443	7	Wall core.
1330	8	Rubble.	1368	8	= 979.	1406	6	Broch I wall core.	1444	7	Wall core.
1331	7	Wall.	1369	-	Scrapped.	1407	7	Rubble.	1445	6	Stair.
1332	7	Wall.	1370	8	Hearth.	1408	7	Clay shimp.	1446	7	Ash and rubble.
1333	7	Wall.	1371	8	Hearth.	1409	8	Buttress.	1447	7	Wall face.
1334	7	Silt and rubble.	1372	8	Stone setting.	1410	8	Paving.	1448	7	Wall face.
1335	7	Wall.	1373	7	Wall.	1411	8	Hearth.	1449	7	Post setting.
1336	7	Wall.	1374	8	Sill.	1412	7	Wall core.	1450	7	Hearth.
1337	7	Entrance.	1375	7	Ash and charcoal.	1413	7	Paving.	1451	-	Scrapped.
1338	7	Wall.	1376	7	Rampart facing.	1414	7	Packing stones.	1452	7	Stone setting.
1339	7	Paving.	1377	7	Earth floor.	1415	7	Rubble.	1453	7	Silt and rubble.
1340	7	= 1323.	1378	8	Paving and sill.	1416	7	Earth levelling.	1454	7	Clay and rubble.
1341	8	Wall.	1379	8	Buttress.	1417	7	Rebuild.	1455	6	Wall core.
1342	7	Wall.	1380	5/6	Rampart facing.	1418	7	Rampart face.	1456	7	Wall core and outer face.
1343	7	Wall.	1381	8	Wall.	1419	7	Rampart face.	1457	7	Inner wall face.
1344	7	Entrance.	1382	8	Hearth.	1420	7	Rampart core.	1458	7	Wall rebuild.
1345	7	Paving.	1383	7	Hearth.	1421	7	Hearth.	1459	-	Scrapped.
1346	7	Paving.	1384	7	Tank.	1422	7	Rubble.	1460	-	Scrapped.
1347	5	Rampart facing.	1385	7	Upper fill in it.	1423	7	Wall.	1461	7	Ash.
1348	7	Buttress.	1386	7	Lower fill in it (Tank 1384).	1424	7	Wall.	1462	7	Ash.
1349	7	Clay 'luting'.	1387	7	Wall.	1425	7	Post packing.	1463	6	Broch I stairs.
1350	7	Wall collapse.	1388	7	Ground surface.	1426	7	Silled entrance.	1464	8	Buttress.
1351	7	Wall.	1389	5/6	Rampart revetment.	1427	7	Paving.	1465	8	Orthostat.
1352	8	Floor.	1390	7	Clay refacing of rampart.	1428	8	Buttress.	1466	7	Ash.
1353	8	Floor.	1391	7	Rampart revetment.	1429	7	Ash.	1467	7	Wall = 1322.
1354	8	Wall.	1392	7	Wall = 1760.	1430	7	Cupboard.	1468	6	Cell.
1355	7	Double silled doorway.	1393	5-7	Clay rampart core.	1431	7	Wall facing.	1469	7	Rubble fill.
1356	7	Earth floor.	1394	7	Rubble.	1432	8	Buttress.	1470	7	Wall.
1357	7	Earth floor.	1395	7	Earth floor.	1433	7	Ash.	1471	7	Wall.
1358	7	Stone setting.	1396	7	Cupboard.	1434	7	Rubble.	1472	7	Buttress.
1359	8	Rubble.	1397	7	Alcove.	1435	8	Collapsed orthostat.	1473	7	Paving.
1360	8	Hearth deposits.	1398	7	Sill.	1436	7	Earth floor.	1474	7	West side of Broch II entrance, bar hole.

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1475	7	Earth ditch fill.	1513	7	= 1403.	1551	7	Ash.	1589	7	Furnace.
1476	7	Entrance.	1514	7	Flagging.	1552	7	Blocking.	1590	7	Rubble ditch fill.
1477	7	Silled doorway.	1515	7	Shell midden.	1553	7	Clay.	1591	7	Earth floor.
1478	7	Sill.	1516	8	Packing.	1554	7	Wall.	1592	6	West staircell.
1479	7	Path.	1517	7	Earth floor.	15555	7	Ash and charcoal.	1593	7	Wall.
1480	7	Rubble.	1518	7	Sill.	1556	7	Rubble and silt.	1594	7	Wall.
1481	7	Earth floor.	1519	7	Partition.	1557	7	Earth and flag floor.	1595	7	Earth floor.
1482	7	= 1481.	1520	7	Clay.	1558	7	Flagging.	1596	6	Plinth.
1483	7	= 1481.	1521	-	Scrapped.	1559	7	Wall.	1597	7	Rubble.
1484	7	Partition.	1522	7	Floor.	1560	7	Wall.	1598	7	Robber trench.
1485	7	Sill.	1523	7	Rubble surface.	1561	7	Earth floor.	1599	7	Clay 'luting'.
1486	7	1326.	1524	7	Clay earth floor.	1562	7	Wall.	1600	7	Clay.
1487	7	Buttress.	1525	7	Wall.	1563	7	Rebuild of wall.	1601	7	Paving.
1488	5/6	Rubble.	1526	7	Ash.	1564	7	Levelled rubble.	1602	7	Soakaway.
1489	7	Orthostat.	1527	7	Ditch fill - silt stone.	1565	7	Socket.	1603	7	Soakaway capping.
1490	7	Earth and rubble floor.	1528	7	Earth floor.	1566	5/6	Rampart facing (= 1567)	1604	7	Paving.
1491	7	Floor.	1529	8	Buttress.	1567	5/6	Rampart facing (= 1566).	1605	7	Hearth.
1492	7	Orthostat screen, (includes 1489).	1530	7	Ash.	1568	7	Paving.	1606	7	Ash.
1493	8	Wall.	1531	7	Clay floor.	1569	7	Wall.	1607	7	Clay.
1494	7	Partition.	1532	7	Packing.	1570	7	Sandy clay.	1608	7	Tank.
1495	8	Rubble.	1533	7	Hearth.	1571	7	Rubble.	1609	6	Wall.
1496	7	Rubble.	1534	7	Paving.	1572	7	Posthole.	1610	7	Earth floor.
1497	7	Stone slab.	1535	7	Paving.	1573	5	Ditch revetment.	1611	6	Inner wall face.
1498	7	Burnt roofing material.	1536	7	Paving.	1574	5	Fill behind 1573.	1612	7	Wall rebuild.
1499	7	Rubble.	1537	7	Paving.	1575	3	Silt.	1613	5/6	Rubble.
1500	7	= 1351.	1538	-	= 1282.	1576	7	Wall.	1614	7	Stakeholes.
1501	7	Rampart facing.	1539	7	Midden.	1577	7	Wall.	1615	7	Stakeholes.
1502	6	Wall core.	1540	8	Buttress.	1578	7	Flag surface.	1616	7	Stakeholes.
1503	7	Bolt hole east.	1541	8	Entrance.	1579	7	Wall core.	1617	7	Stakeholes.
1504	7	Midden.	1542	7	Blocking.	1580	7	Cupboard.	1618	7	Stakeholes.
1505	7	Shell midden.	1543	7	Earth and flag floor.	1581	6	Eastern entrance cell.	1619	7	Furnace.
1506	7	Cupboard.	1544	7	Hearth.	1582	7	Broch II wall core.	1620	7	Claysilt.
1507	7	Earth floor.	1545	7	Earth floor.	1583	7	Earth floor.	1621	7	Rubble.
1508	7	Rubble surface.	1546	7	Sill.	1584	5	Outer face of roundhouse.	1622	7	Rubble.
1509	7	Levelling rubble.	1547	7	Paving.	1585	7	Partition.	1623	7	Rubble.
1510	7	Partitions.	1548	7	Paving.	1586	7	Silled doorway.	1624	7	Hearth.
1511	7	Paving.	1549	7	Tank cover.	1587	7	Paving.	1625	7	Silt and rubble - ditch fill.
1512	7	Silled doorway.	1550	7	Levelling.	1588	7	Clay floor.	1626	-	Natural clay.

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1627	7	Ash.	1665	7	Hearth.	1703	7	Entrance.	1742	7	Earth floor.
1628	7	Clay and stone.	1666	7	Pink ash.	1704	6	Stairs.	1743	7	Burnt clay.
1629	7	Ash and charcoal.	1667	6	Wall.	1705	7	Tank cut.	1744	7	Ash.
1630	7	Clay and charcoal.	1668	7	Ash.	1706	7	Oven.	1745	7	Fill of tank.
1631	7	Clay.	1669	7	Rubble.	1707	5	Wall face.	1746	7	Tank
1632	7	Socket.	1670	7	Rubble.	1708	5/6	Clay slip.	1747	7	Stakeholes.
1633	7	Hearth.	1671	6	Stairs.	1709	7	Levelling rubble.	1748	7	= Wall 1271/1373.
1634	7	Furnace.	1672	7	Buttress.	1710	2	Inner cairn of tomb.	1749	7	Clay floor.
1635	7	Rubble.	1673	7	Fill of soakaway.	1711	5	Silt.	1750	7	Clay floor.
1636	7	Porch.	1674	7	Ash.	1712	7	Charcoal and ash.	1751	7	Sill.
1637	7	Ash and earth floor.	1675	7	Ash.	1713	7	Clay and ash.	1752	7	Stakeholes.
1638	7	Clay and earth floor.	1676	8	Sill.	1714	5	Roundhouse masonry.	1753	7	Stakeholes.
1639	7	Orthostat.	1677	7	Hearth.	1715	5	Roundhouse masonry.	1754	7	Stakehole.
1640	7	Wall.	1678	7	Socket.	1716	7	Ash.	1755	7	Stakehole.
1641	7	Paving.	1679	7	Setting.	1717	7	Ash and stone chips.	1756	7	Stakeholes.
1642	-	Scrapped.	1680	7	Clay.	1718	7	Furnace remnant or post hole.	1757	7	Stakeholes.
1643	7	Paving.	1681	7	Floor.	1719	7	Earth floor.	1758	7	Stakehole.
1644	7	Paving.	1682	7	Paving.	1720	7	Ash.	1759	7	Levelling rubble.
1645	-	Scrapped.	1683	7	Paving.	1721	7	Ash.	1760	7	Wall.
1646	7	Earth and flag floor.	1684	7	Clay floor.	1722	7	Paving.	1761	7	Hearth.
1647	7	Wall.	1685	7	Clay floor.	1723	7	Pit.	1762	7	Wall.
1648	7	Buttress.	1686	7	Clay floor.	1724	7	Ash and charcoal.	1763	5/6	Rampart revetment.
1649	7	Orthostat.	1687	5/6	Silt.	1725	7	Clay and rubble floor.	1764	5/6	Cross wall.
1650	7	Doorway.	1688	7	Clay.	1726	7	Earth floor.	1765	5/6	Silts.
1651	7	Orthostats.	1689	7	Floor.	1727	7	Ash.	1766	5/6	Rubble.
1652	7	Orthostats.	1690	7	Partition.	1728	7	Gravel spread.	1767	5	Wall.
1653	7	Clay.	1691	7	Clay.	1729	7	Rubble and earth.	1768	7	Ash.
1654	7	Wall.	1692	7	Earth floor.	1730	7	Tank fill.	1769	7	Hearth.
1655	7	Rubble and ash.	1693	7	Posthole or pit.	1731	5/6	Hearth.	1770	7	Hearth.
1656	7	Hearth.	1694	7	Hearth.	1832	5/6	Earth surface.	1771	7	Hearth.
1657	7	Hearth.	1695	7	Stakeholes.	1733	5/6	Paving.	1772	7	Ash.
1658	7	Paving.	1696	7	Ash.	1734	7	Rubble.	1773	7	Hearth.
1659	7	Clay.	1697	7	Floor.	1735	5-8	Ash surface.	1774	5	Silt.
1660	7	Floor.	1698	7	Ash.	1736	7	Clay floor.	1775	2	Tomb facade.
1661	7	Cell.	1699	7	Clay.	1737	3/4	Pit fill.	1776	7	Earth floor.
1662	7	Slab.	1700	7	Setting.	1738	7	Levelling rubble.	1777	7	Gravel spread.
1663	2	Wall = 1775.	1701	7	Ash.	1739	7	Clay floor.	1778	6/7	Revetment.
1664	7	Floor.	1702	7	Tank.	1740	7	Hearth.	1779	7	Floor silts.
						1741	7	Ash			

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1780	7	Soakaway.	1817	5/6	Revetment.	1855	-	Scrapped = 2000.	1893	2	Tomb cairn revetment.
1781	5/6	Ash and burnt clay.	1818	5/6	Shillet.	1856	5/6	Rampart revetment.	1894	5	Clay over earth-house.
1782	7	Fill of soakaway.	1819	7	Sill.	1857	5/6	Ditch silt.	1895	5	Wall.
1783	7	Partition.	1820	7	Hearth.	1858	5/6	Ditch silt.	1896	5	Wall.
1784	7	Oven.	1821	7	Grey ash.	1859	7	Clay surface.	1897	5	Wall.
1785	7	Partition.	1822	7	Clay levelling.	1860	5/6	- 1875.	1898	5	Wall.
1786	7	Hearth kerbing.	1823	5	Clay behind 305.	1861	5	Rubble.	1899	6	Repair to earth-house steps.
1787	7	Clay levelling.	1824	7	Tank fill.	1862	3	Well steps.	1900	5	Cut earth-house.
1788	7	Rampart revetment.	1825	7	Clay.	1863	7	Rubble.	1901	4-6	Well silt.
1789	7	Wall.	1826	7	Paving.	1864	7	Levelling rubble.	1902	8	Earth floor = 574.
1790	5	Revetment	1827	7	Hearth.	1865	7	Levelling rubble.	1903	-	Scrapped.
1791	5	Clay bank.	1828	7	Wall.	1866	7	Clay.	1904	8	Earth floor = 933.
1792	5	Clay bank.	1829	7	Earth floor.	1867	5	- 305.	1905	7	Paving.
1792	2/3	Ditch silts.	1830	7	Rubble levelling.	1868	5/6	Levelling rubble.	1906	5/6	Well cut fill.
1793	5	Shillet bank.	1831	7	Clay.	1869	5	Silt clay loam.	1907	5/6	Well cut fill.
1794	-	Scrapped = 1202.	1832	7	Fill of cut 1833.	1870	5	Ditch revetment.	1908	7	Partition.
1795	8	Buttress.	1833	7	Tank cut.	1871	7	Clay.	1909	7	Partition and sill.
1796	8	Partition.	1834	7	Clay.	1872	7	Orthostats.	1910	7	Paving.
1797	-	Scrapped = 871.	1835	7	Clay floor.	1873	7	Paving.	1911	7	Wall.
1798	~	Collapse.	1836	7	Clay.	1874	5	Clay surface.	1912	7	Oven.
1799	7	Gravel and clay.	1837	5/6	Rubble.	1875	5/6	Rubble.	1913	5/6	Rampart face - 1975.
1800	7	Clay and earth floor.	1838	7	Earth floor.	1876	5/6	Rampart revetment.	1914	5/6	Clay wash.
1801	7	Partition.	1839	7	Paving.	1877	3	Well wall.	1915	7	Partition.
1802	7	Partition.	1840	7	Rubble.	1878	7	Floor.	1916	7	Partition.
1803	7	Rubble.	1841	7	Earth floor.	1879	4	Well.	1917-1921	2	Central stone cairn.
1804	7	Clay floor.	1842	7	Pit.	1880	5	- 1974.	1922	3	Surface.
1805	7	Rubble.	1843	7	Gravel layer.	1881	7	Collapsed wall.	1923	7	Tank.
1806	5/6	Revetment.	1844	5/6	Silty clay.	1882	7	Masonry.	1924	7	Hearth.
1807	7	Wall.	1845	5/6	- 1856.	1883	7	Charcoal and paving.	1925	5	Rubble.
1808	5/6	Rubble.	1846	5/6	- 1856.	1884	5	Rubble.	1926	7	Ash and charcoal.
1809	-	Scrapped.	1847	7	Ash.	1885	5	Ditch revetment.	1927	3	Well silt.
1810	8	"	1848	5/6	Silts.	1886	3	Silt.	1928	3	Well wall.
1811	8	"	1849	7	Clay.	1887	7	Hearth.	1929	3	Rubble collapse.
1812	6	Cell.	1850	7	Ash and clay.	1888	7	Clay surface.	1930	7	Earth floor.
1813	7	Earth floor.	1851	7	Levelling rubble.	1889	5	Rampart clay.	1931	7	Clay and ash.
1814	4	Wall 90.	1852	7	Clay.	1890	3	Clay wash.	1932	7	Clay.
1815	5	Shillet bank, = 1793	1853	5/6	Ash, silt, clay.	1891	2	Tomb cairn revetment.	1933	5	Rubble.
1816	7	Rubble surface.	1854	7	Clay.	1892	2	Tomb cairn revetment.	1934	5	Silt.

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1935	5	Earth-house roof.	1984	5/6	Rubble.	2022	4	Drain or soakaway.	2060	2/3	Ditch silts.
1936-1947	2	Central stone cairn.	1985	5	Clay loam.	2023	4	Sill.	2061	3	Clay wash.
1948	7	Levelling rubble.	1986	5	Clay silt.	2024	5	Drain fill.	2062	3	Rubble.
1949	5	Rubble = 359.	1987	5/6	Clay floor.	2025	5/6	Clay.	2063	3	Cut/pit.
1950	5/7	Pit.	1988	2	Wall.	2026	3	Midden.	2064	4	Gully.
1951	5/7	Pit.	1989	4	Wall.	2027	4	Silt clay.	2065	1	Flagged entrance.
1952	7	Levelling rubble.	1990	4	Wall.	2028	3	Silt clay.	2066	1	Flagged entrance.
1953	7	Flags.	1991	4	Tank.	2029	5/6	Ditch fill.	2067	1	White clay, foundation.
1954	5/6	Silt.	1992	4	Wall.	2030	4	Wall.	2068	3	Gully.
1955	5/6	Wall.	1993	4	Floor.	2031	4	Wall.	2069	4	Wall.
1956	5	Platform.	1994	4	Ash and charcoal.	2032	4	Clay.	2070	3(?)	Ashy spread.
1957	4	Wall and flagging.	1995	4	Hearth.	2033	5	Backing of 305.	2071	1	Hearth.
1958	7	- 1977.	1996	4	Ashy surface.	2034	5	Ditch revetment.	2072	1	Pre-Neolithic surface.
1959	5	Drain.	1997	4	Setting.	2035	5/6	Ditch revetment.	2073	3	Midden.
1960	4	Silt clay.	1998	3/4	Rubble and clay.	2036	5-7	Ditch revetment.	2074	4	Ditch fill.
1961	4	Clay.	1999	4	Wall.	2037	7	Rampart.	2075	3	Well wall.
1962	7	Surface.	2000	4	Paving.	2038	7	- 2041	2076	4	Wall.
1963	7	Rampart.	2001	4	Clay.	2039	3	'Feature'.	2077	7	Hearth.
1964	5/6	Wall.	2002	4	Ash.	2040	3	Well wall backing.	2078	4	Wall.
1965	5/6	Hearth.	2003	4	Paving.	2041	7	Ditch fill.	2079	4	Floor with partitions.
1966	5/6	Kerbed feature.	2004	4	Surface.	2042	7	Ditch fill.	2080	5/6	Wall.
1967	5/6	Earth surface.	2005	3	Top of 2061.	2043	3	Rubble surface.			
1968	5/6	Hearth.	2006	3	Disturbed natural clay.	2044	2/3	Ditch silts.			
1969	4	Wall.	2007	-	Natural clay.	2045	5/6	Clay and rubble.			
1970	5/6	Clay/earth surface.	2008	3	Well wall.	2046	3	Midden.			
1971	5/6	Kerbing.	2009	4	Pea gravel.	2047	3	Tank.			
1972	5/6	Tank?	2010	4	Hearth.	2048	3	Paving.			
1973	5	Rubble.	2011	4	Uprights.	2049	3	Silt.			
1974	5	Rampart face.	2012	4	'Settings'.	2050	3	Hearth.			
1975	5/6	Rampart face.	2013	7	Packing.	2051	3	Gully.			
1976	1	Silt in pit.	2014	3	Silt clay.	2052	4	Gully.			
1977	7	Rubble and clay.	2015	4	Fill of well cut.	2053	3	Hearth.			
1978	4	- 1980.	2016	2	Surface under tomb.	2054	5	Cut (and its fill).			
1979	4	- 1989.	2017	4	Sill.	2055	3	Pit fill.			
1980	4	Tank?	2018	5/6	Paving.	2056	3	Ditch silts.			
1981	5/6	Clay loam.	2019	7	= 2041	2057	1	Clay surface.			
1982	5	- 1985.	2020	4	Clay.	2058	2	Facade.			
1983	5/6	Earth and charcoal.	2021	5/6	Clay.	2059	1	Hearth contents.			

## 7.2.1 PLANT REPORT

### NOTES ON THE IDENTIFICATIONS

Fruit, seeds and charcoal were compared with those from a modern reference collection. The cell pattern of some of the carbonized seeds was examined using a Zenith metallurgical microscope with direct illumination at x200 magnification. This was particularly useful in distinguishing the nutlets of *Carex* species for which reference was also made to the characters used by Nilsson and Hjelmquist (1967). The same microscope was used to view the longitudinal faces of the charcoal.

*Avena fatua* (wild oats). The identification is based on the horseshoe shape of the floret base; the rachilla, when preserved, has hairs along its entire length.

*Avena* sp (wild or cultivated oats). It does not seem possible to identify an oat grain to the species level unless it is accompanied by a floret base or complete lemma. Pure samples of oat grains such as those from the late sample are more likely to have been cultivated and fourteen of these grains measure 5.0 (3.2-7.0) x 1.8 (1.2-2.4) x 1.6 (1.2-2.5)mm.

*Hordeum vulgare var nudum* (naked six-row barley). The naked grain was identified by its rounded shape in transverse section, plump apex, absence of dorsal ridges and the clear longitudinal cells of the epicarp which are seen as fine longitudinal wrinkles usually covering the cross cells of the pericarp. Under-developed grains often keep their glumes and it was sometimes possible to use the disappearance of the glume hairs leaving only a basal socket on carbonized glumes as shown by Körber-Grohne and Piening (1980), to distinguish the grain from that of hulled barley. It was possible to measure 100 grains from the later Phase 7 barley ears, they average 4.9 (4.2-6.0) x 3.3 (2.4-4.0) x 2.4 (1.7-3.3)mm. The few grains, which are not puffed or damaged, measured from Phase 5/6, early Phase 7 and Phase 8 were similar in size to those above. There was no evidence of grain becoming larger or smaller through time. The average size for fossil naked barley is 5.2 x 2.58 x 1.97mm whilst that for carbonized naked recent grain is 6.49 x 3.41 x 2.97mm (Renfrew 1973, 13).

*H vulgare var vulgare* (hulled six-row barley). Although little of the hulled barley is well preserved, the angular cross section, dorsal ridges, slightly tapered apex and closely adherent glume fragments enabled definite identification of some of the grain.

*H. vulgare* s.l. (hulled or naked six-row barley). Grain which is poorly preserved but retains the elliptical barley shape when viewed from the side and contains a proportion of asymmetric grains is named *H. vulgare* s.l. All the grain from Phase 4 to late Phase 7 determined thus is probably of naked barley; that from Phase 8 is of either naked or hulled barley.

*Hordeum* sp. (barley). These are occurrences of one or two symmetrical grains only which cannot certainly be distinguished from those of *H. distichon* (two-row barley).

Cereal straw. Many of the straw fragments have the shiny appearance of barley straw, long and short cells can sometimes be distinguished; where the stomata can be measured a tentative identification has been made. A small proportion of the straw has longer stomata resembling those of oats, probably wild oats.

*Linum usitatissimum* (flax, linseed). Six of the flax seeds measure 3.3-3.6 x 1.7-2.0mm, similar to those from the Norse houses at Saevan Howe, Birsey, Orkney (Dickson 1983).

*Ranunculus ficaria* (lesser celandine). Five well-preserved carbonized fusiform to clavate root tubers range from 2.9-3.7 x 0.9-1.4mm (illus 80). The epidermal cells are polygonal with raised margins and measure between 30 and 85µm in diameter. Lengthwise splitting of one of the tubers showed well preserved polygonal parenchyma cells measuring 75-115 x 65-95µm. The shape and cells match those of the smallest reference tubers of the lesser celandine. Some poorly preserved small tubers lack epidermal cells and are tentatively identified.

Roots. A single incomplete root, probably a tap root, had been split in two lengthwise before it was carbonized (illus 80), each half measured 29 x 10mm. Several rootlet bases were visible and starch cells and vascular strands were preserved. A second incomplete root, in fragments, was of similar appearance and dimensions.

Rhizomes. These are fragments, 10mm in diameter at most; it is likely that they originate from vegetation brought into the settlement, for example as part of heathy turf, and not from deliberate collection.

*Larix* (larch). Fragments of c10 x 10mm were found in one sample only. They are characterized by a sharp transition from early to late wood, biseriate tracheid pits and resin canals with ten or more epithelial cells. Although some of these cells are fused, as many as twenty small cells seem to be present in some canals. *Larix decidua* (European larch) has usually seven to twelve epithelial cells whereas *L. laricina* (American larch) is illustrated by Greguss (1955) with more than twelve small cells. Although the several species of larch are not clearly separable these fragments most resemble the American larch. The

outer rings of this charcoal show an increment of twenty-two years in only 5mm; fragments of the inner wood have an annual increment of 1-1.5mm.

*Picea* (spruce). The charcoal is identified as spruce by the presence of resin canals with usually seven to nine epithelial cells; if the epithelial cells are not countable it is designated of *Picea*.

*Coniferae* (conifer). These are very small fragments of charcoal with clear bordered pits but lacking other distinguishing characters.

Burnt plant. Fragments of burnt plant material, the presence of which has been noted in the list of plants from each sample, were present in nearly fifty samples. All were of small fragments only a few mm in diameter, stem-like fragments could be seen in some of them and some were layered and more or less compressed. Unhumified peat could be present as could litter accumulated in the heathy turves, although the latter were only attested from later Phase 7 onwards. The burnt friable dung of weaned animals and humans could also have contributed.

Burnt dung. The largest fragment from Howe seems to have been very soft, the consistency of thick cream, before carbonizing into a smooth surfaced rather amorphous shape; some others from the same context, consisted of broken irregularly club-shaped ends (illus 78). These resemble the tapered ends of faeces and are a common feature of droppings of many mammals. All the fragments are strongly vesicular inside; the vesicles measure from less than 0.1mm upwards and irregularly shaped cavities are often present (illus 78b). The inside of the vesicles and cavities are smooth (viewed x200). Some of the fragments have adherent straw, wood or stems and clearly must have been soft when carbonized.

Plant and animal products likely to have been present at the site were carbonized and compared with the fragments. Barley grains, when cooked for a long time before carbonizing, develop vesicles from cells containing starch grains which partly fuse; however, these as described elsewhere are generally smaller, smooth walled cavities do not seem to develop. Prolonged heating and then carbonizing of milk can produce vesicles and cavities but the surface of the milk is usually rather rough. Beef flesh heated in water can form rather similar vesicles and cavities. Human faeces resulting from a mixed diet are friable, lack vesicles and contain plant fragments. Those from cows eating grass and straw are rather similar in internal appearance to the human faeces. Calves which are partly suckled but also eating hay produced faeces with vesicles but these also contain some plant fragments coated with an amorphous substance. Suckling babies and young animals produce faeces with a similar appearance to the Howe fragments; those from a

calf are of a thick creamy consistency and particularly similar in the appearance of the vesicles and internal cavities to the Howe fragments. It seems therefore that when the 'tail' is present with internal vesicles and cavities there can be little doubt that it represents dung, probably calf dung. However most of the material lacks the 'tails' and is sometimes of fragments of less than 10mm diameter, it cannot then be readily distinguished from the other substances discussed. The frequently adherent straw and other plant material increases confidence in the determination but nevertheless the bulk of the identifications must remain tentative. It may be noted that dried faeces do not produce vesicles when carbonized.

Burnt deposits on pot sherds. Burnt deposits which showed possible cell structure were scraped from pot sherds covering all contexts from Phase 3 to 8. They showed more or less rounded vesicles ranging from 60-300um in diameter. Occasionally cell walls were seen but often these appear to have fused with starch grains, thickening the wall and having a glassy appearance. Reference grains were prepared by heating in water for about two hours before boiling dry and carbonizing, starch grains seem to largely disappear on carbonization but the remaining parenchyma cells were very similar to those from the deposits. From a Phase 7 context, a tiny fragment resembling aleurone cells, 25-30um diameter, and another resembling the transverse pericarp cells of barley were found. Other sherds had vesicular deposits which may have been of either plant or animal origin. In conclusion, it seems probable that some of the pots were used for cooking cereals, presumably as broth or gruel but with one possible exception it has not proved possible to identify the cereal on this material. (For a complete list of seed impressions and carbon deposits on the pottery sherds, see Table 8, 9 1:D1-D2).

### Key to plant tables

ab	abundant	n	nut or nutlet
a	achene	oc	occasional
adh	adherent	oo	oospore
ba	base	pe	perianth
bs	budscale	pl	plant
ca	caryopsis	rac	rachis segment
carb	carbonized	r	rare
ch	chaff	rh	rhizome
c	charcoal	ro	root
cy	cypsela	s	seed
f	fruit	sh	shoot
fi	fibre	sp	spindle from leaf base
fl	floret	ste	stem
fr	fragment	str	straw
fq	frequent	th	thallus
fst	fruit-stone	t	tuber
g	grain	unc	uncarbonized
gl	glume	unident	unidentified
h	hulled six-row barley	w	wood
l	leaf or leafy	+	present
m	megaspore	++	barley, more than 50 grains
na	naked six-row barley	++	straw, more than 1/3 of sample

Table 1mf - Pollen analysis from the original ground surface below the chambered tomb mound. Pollen expressed as a percentage of the identified pollen and spores.

	SF	7299	7302
	Context	2016	2016
Sum of identified pollen and spores		555	513
<u>Betula</u> (Birch)		2.5	0.9
<u>Pinus</u> (Pine)		1.4	1.1
<u>Ulmus</u> (Eln)		-	0.2
<u>Quercus</u> (Oak)		0.5	-
<u>Alnus</u> (Alder)		1.8	1.3
Coryloid (Hazel or Bog Myrtle)		6.3	6.2
<u>Betula</u> / Coryloid		3.9	6.8
<u>Lonicera</u> (Honeysuckle)		-	0.2
Total trees and shrubs		16.4	16.7
Gramineae (Grass family)		50.4	54.0
Cyperaceae (Sedge family)		1.3	2.3
<u>Calluna</u> (Heather)		6.1	5.2
<u>Artemisia</u> (Mugwort or Wormwood)		0.2	-
Compositae (Daisy family)			
Tubuliflorae		1.1	1.1
Liguliflorae		0.9	0.4
<u>Epilobium</u> (Willow Herb)		-	0.2
<u>Filipendula</u> (Meadowsweet)		0.2	0.2
<u>Plantago lanceolata</u> (Ribwort)		7.4	1.3
<u>P. major</u> (Rat-tail Plantain)		+	-
<u>P. maritima</u> (Sea Plantain)		+	+
<u>Plantago</u> spp		2.0	1.7
<u>Potentilla</u> (Cinquefoil or Tormentil)		0.9	0.2
Ranunculaceae (Buttercup family)		2.0	0.9
<u>Scabiosa/Succisa</u> (Scabious)		0.2	0.4
<u>Stellaria</u> (Chickweed or Stitchwort)		0.5	0.2
<u>Filicales</u> (Fern)		8.8	14.0
<u>Botrychium</u> (Moonwort)		0.4	-
<u>Ophioglossum</u> (Adder's Tongue)		+	0.2
<u>Polypodium</u> (Common Polypody)		0.9	0.8
<u>Sphagnum</u> (Bog moss)		0.4	+
Unidentified (crumpled or degraded) as percentage of identified grains		72.0	89.4

Table 3mf Plant material and possible dung, Phases 4 to 6

Context	Provenance	Barley	Weeds	Heather	Willow	Spruce	cf Dung	Other
681	Phase 4/5 Ground surface		+	+				cf ember wheat
1894	Phase 5 Clay sealing earth house	cf na		+	+			
1901	Phase 4-6 Silt within well	na		+				mosses, ls
1020	Phase 5/6 Roundhouse/Broch 1 earth floor	na		+	+	cf	+str	ash,c; birch,c
1857	Phase 5/6 Ditch fill	c2000na				+		
1837	Phase 5/6 Ditch fill	c4000na			+	+		
1875	Phase 5/6 Rubble in ditch between revetment walls	c-500na			+	+		alder,c
2045	Phase 5/6 Clay and rubble below late revetment (s end of drain)	cf na	+	+				straw
1468	Phase 6 Broch 1, W entrance cell	cf na			+			

Table 4mf Plant remains and dung from early Phase 7  
Early settlement

Context	Provenance	Barley	Wild/Cult Oats	Straw	Weeds	Heather	Willow	Peat	cf Dung	Other
Broch tower										
751	Cupboard	+				+				cf dead-nettle,n; sheep's sorrel,n, spruce,c; cf common skull-cap;n.
978	Layer of burning in passage						+	+		
754	Floor of blocked intra-mural cell	cf na		+	+	+	+	+	straw	birch,c; cf lesser celandine,a,t; spruce,c.
S W building										
1735	Yard, Phases 5-7	+	+	++	+	+	+	cf	+	straw
1216	Entrance paving	cfna++		+	+	+	+			cf lesser celandine,t. stoneworts, oo.
1386	Tank fill		+							
1498	Possible roofing ?	na	Wild	++	+		+			shaped willow, c.
1429	Ash overlying 1498			++		+	+			
1349	Rubble, earth and underlying deposits	+	+	+	+	+	+	+	+	straw brackish water,f; discrete lump of dung; larch,c.
S building										
1103	Occupation debris in levelling rubble		+	+	+	+	+			brackish water,f; rowan,s;
E building										
1292	Double cupboard	na				+	+			
1312	Oven					+		+		
1615	Stake-holes									cf alder,w.
S E building										
1266	Ash dump/deposit	cfna++			+					
1346	Paving	+	+			+	+			

TABLE 5MF - PLANT REMAINS FROM PHASE 7,  
LATER SETTLEMENT, AND PHASE 7/8

Contact	Provenance	Barley	Oats	Straw	Chaff	Seeds	Heathy Turf	Heather	Willow	Spruce	Peat	
Broch tower, later Phase 7												
952	Floor 1, levelling below floor 2								+	+		
906	Floor 2, occupation deposit								+	+		
876	Floor 2, clay floor	cfna		+	+	+			+			
861	Floor 2, burning layer, ash floor	na		+	+	+			+			alder wood vessel c; shaped alder c; heather basket c; shaped willow, c; cf dung and straw
	whole ears of barley	na++		+	+	+						
866	Floor 2, ash fill of kiln	na	+			+	+	+				
838	Floor 2, ash fill of kiln 837	na++						+				
981	Dump outside tower, underlying 883	na										
883	Rubble underlying 867							+	+		cf	
867	Ground surface	cfna		+		+	+	+				
S W building												
1223	Levelling over top of yard								+	+		
S building												
1047	Paving								+			
1017	Earth floor	+				+	+	+	+			+ including willow roundwood (quern 2721)
E building												
1356	Earth floor around hearth	na					+	+	+			split root
1481	Yard, earth floor	+				+		+	+		+	brackish water f (quern fragment 4971)
N E building												
1583	Earth floor of cell	h,na++			+			+				
1362	Yard, furnace dump							+	+	cf	+	
Broch tower, Phase 7/8												
843	Floor 3, furnace contents								++			including roundwood; rush 1/st
826	Floor 4, earth floor								+			including roundwood.

Table 6mf Plant remains and possible dung,  
from early Phase 8 buildings, stages 1-4

Context	Provenance	Barley	Wild/Cult Oats	Woods	Straw	Heathy Turf	Heather	Willow	Peat	cf	Dung
	Stalled building										
786	Floor levelling below paving	na		+	+	+	+	+			+ alder, c; flax/linseed s; seaweed, th, fr.
765	Earth floor	+		+	+	+	+	+			+
734	Rubble over 765							+			
775	Hearth							+			alder, c, shaped.
784	Hearth deposits	cfh, cfna	+	+	+	+	+	+	cf		
783	Ash	+	+								
790	Soakaway							+			stoneworts, co.
	NE building										
1352	Earth floor	+				+	+	+	+		heather-cottongrass peat
1371	Hearth					+	+	+			
1183	Flagged floor							+			
1098	S annexe, earth floor	na		+		+	+	+	cf		
1353	E cell, earth floor			+			+	+			seaweed, th, fr.
1198	Yard in E, hearth	+		+		+	+	+			
	W building										
984	Demolition deposit							+			
	E building										
736	Hearth	na, ++	+	+			+		+		ocean/bird-cherry, c; juniper, fst..

Table 7af Plant remains from Phase 8  
Later settlement, Stages 5-10

Stages	Context	Provenance	Barley	Wild/Cult Oats	Woods	Heathy Turf	Heather	Willow	Peat
5	376	Hearth deposit					+	+	
	284	Earth floor	h,na++	+	+	+	+	+	Flax/linseed, s.
	304	Earth floor	na	+			+		
	356	Earth floor					+	+	Flax/linseed, s.
	378	Earth floor	na	+	+		+	+	
	383	Earth floor	cfh,cfna		+	+	+	+	
	614	Floor deposit	+				+		conifer, c.
	644	Floor, ash dump under hearth		+		+	+		lesser celandine, t; seashore, plants, f.
6	1043	Hearth	h,na				+		cf
	257	Hearth deposit	na	+	+	+	+	+	
	303	Hearth deposit					+		crowberry, fst; whortleberry/ cowberry, s.
	494	Hearth deposit					+	+	
	595	Hearth deposit	na	+		+	+	+	
	581	Earth floor				+	+	+	heather peat.
	615	Earth floor	cfh,na			+	+	+	seashore plant, f.
	636	Earth floor	+				+		spruce, c.
	250	Yard, S of N room, flags	h,na		+	+	+		ash, c; spruce, c; seashore plants, f.
7	298	Hearth deposit	na				+	+	black bearberry, fst; broad-leaved dock, 43n; crowberry, fst; juniper, fst; whortleberry/cowberry, s.
	357	Hearth deposit	na	+	+		+		
	551	Earth floor	na		+		+	+	conifer, c.
8	346	Earth floor	+				+		
	350	Earth floor						+	
	370	Hearth deposit					+		
9	605	Hearth deposits	na	+	+	+	+		
	611	Earth floor					+		cf
	604	Silt	+				+		Flax/linseed, s.
	609	Levelling under floor					+		cf Flax/linseed, s.
	901	Ground surface	na++	+	+		+	+	
10	481	Hearth deposit					+	+	hazel, n, fr.
	653	Hearth deposit	na	+	+		+		
		Hearth deposits (12 contexts)					+		
	886	Earth floor	na++	+			+	+	
	429	Ground surface					+	+	
	612	Wall core							root

Table 8mf Seed impressions on pottery sherds

Phase	SF No	Context	Description
1	7373	2057	unidentified, possibly spikelet base of grain or grass
2	6680	1946	deep unidentified impression, possibly grain or seed. ? monocot stem frag.
3	6553	1922	unidentified ribbed impression
	6956	2056	unidentified ? stems/leaves
4	7360	2052	ridged stems of possible cereal straw
5/6	3452	1020	unidentified small 'holes' not necessarily seeds
	6494	1875	unidentifiable
	6918	2045	unidentified - possible stem fragment
6-9	4400	807	unidentified impression and carbonised remains, could be cereal
7	2896	1067	unidentified impression and carbonised remains
	2954	1076	unidentified ? small seed
	4535	1219	unidentified 'v' shaped impression
	5672	1539	a well preserved impression of a leafy shoot of <u>Calluna vulgaris</u>
8	58	16	<u>Hordeum vulgare</u> cf <u>var vulgare</u> - grain impression
	765	590	<u>Hordeum</u> sp part of a carbonised grain
	1149	644	unidentified probably grass or cereal grain
	4533	1352	unidentified ? grass or cereal glume base
	5635	1410	possible grass impressions
9	860	1	cf <u>Hordeum</u> sp cf base of rachis segment
	934	335	unidentifiable

Table 9mf Carbon deposits on pottery sherds

See Plant report for notes on identifications and burnt deposits on sherds

Phase	SF No	Context	Description
3	7412	2068	cf cereal starch cells
	7412	2068	cf animal, ? meat
4	6722	1969	plant or animal
	6767	2031	cf cereal starch cells
5/6	2781	1020	amorphous
	2784	1020	amorphous
	3452	1020	no plant impressions seen
	5393	1708	amorphous
	7283	1875	plant or animal
	6569	1906	barley grain starch?
7	2130	804	cf cereal starch cells
	3670	1115	plant or animal
	5554	1216	? possible starchy substance
	5522	1664	? possible starchy substance
	6946	2037	cf barley pericarp and aleurone cells
7/8	4278	1195	plant or animal
8	3755	1353	cf cereal starch cells
	5635	1410	cf cereal starch cells
	3736	1304	cf cereal starch cells
	1972	736	cf cereal starch cells
	3087	785	cf cereal starch cells

BONE	MEASUREMENTS				PHASE
	GL	Bp	Bd	msw	
Radius	244	†	65	-	4
	285	85	†	-	5/6
	247	†	GR	-	7
	253	73	G	-	7/B
Metacarpal	169	49	50	28	7
	179	*	*	30	7
	176	55	†	†	7
	176	45	56	29	8
	183	*	63	33	8
	176	49	52	26	8
	178	50	50	25	8
	167	*	51	26	8
	191	57	58	31	8
	178	51	54	30	8
	Metatarsal	189	44	51	25
195		42	47	†	7
193		†	†	-	7
189		*	47	21	7
197		39	44	22	8
201		43	*	25	8
203		42	50	25	8

Abbreviations

- † = butchered
- G = gnawed
- GR = gnawed by rodents
- \* = eroded

Table 15mf Dimensions of complete cattle long bones

SITE	LENGTH RANGE	n	AUTHOR
Skara Brae (Neolithic)	201-203	3	Watson (1931)
Skara Brae (Neolithic)	183-202	4	Noddle (1983)
Jarlshof, Shetland (LBA/EIA)	175-183	2	Platt (1933-4)
Skaill (Pictish) Orkney	160-165	2	Noddle (1983)
Skaill (Viking) Orkney	182	1	Noddle (1983)
Buckquoy (Pre Norse) Orkney	172-178	5	Noddle (1976-7)
Howe of Howe	169-191	10	

Table 16mf Cattle metacarpal lengths from North Scottish sites

POSITION	NO	%
SF	19	38
DM	38	56
SF and DM	2	4
AP	1	2

Note:

SF = above supracondylar fossa  
DM = medial to supracondylar fossa  
AP = anterior proximal

Table 17mf Position of nutrient foramen of cattle femora

CATEGORY	NO OF BONES	%
F	77	2.5
J	15	0.5
J/I	1,244	40.0
I/A	937	30.1
A	839	27.0
TOTAL	3,112	

CATEGORY	AGE GROUP	CRITERIA USED
F	Foetal/neonate	All epiphyses unfused; All diaphyses small.
J	Juvenile	Scapula fused. All other epiphyses unfused.
J/I	Juvenile/immature	Late and intermediate fusing epiphyses unfused (eg proximal and distal femur and tibia, distal metapodials, tuber calcis etc).
I/A	Immature/adult	Early and intermediate epiphyses fused (eg scapula, distal humerus, proximal radius).
A	Adult	Late fusing epiphyses fused.

Comparable ages in modern terms would be:

J = up to c 18 months, I = 18 months-4 years, A = 4 years and over.

Table 18mf Number of cattle bones in each age category

CATEGORY	NO OF MANDIBLES	%
F	54	38.6
J	15	10.7
J/I	41	29.3
I/A	10	7.1
A	5	3.6
A+	15	10.7
TOTAL	140	

CATEGORY	DENTAL CHARACTERISTICS
F	Deciduous dentition unworn
J	Deciduous dentition only; in wear. 1st molar not yet erupted
J/I	1st molar erupted
I/A	2nd molar erupted
A	3rd molar erupted
A+	3rd pillar (5th cusp) of 3rd molar in wear

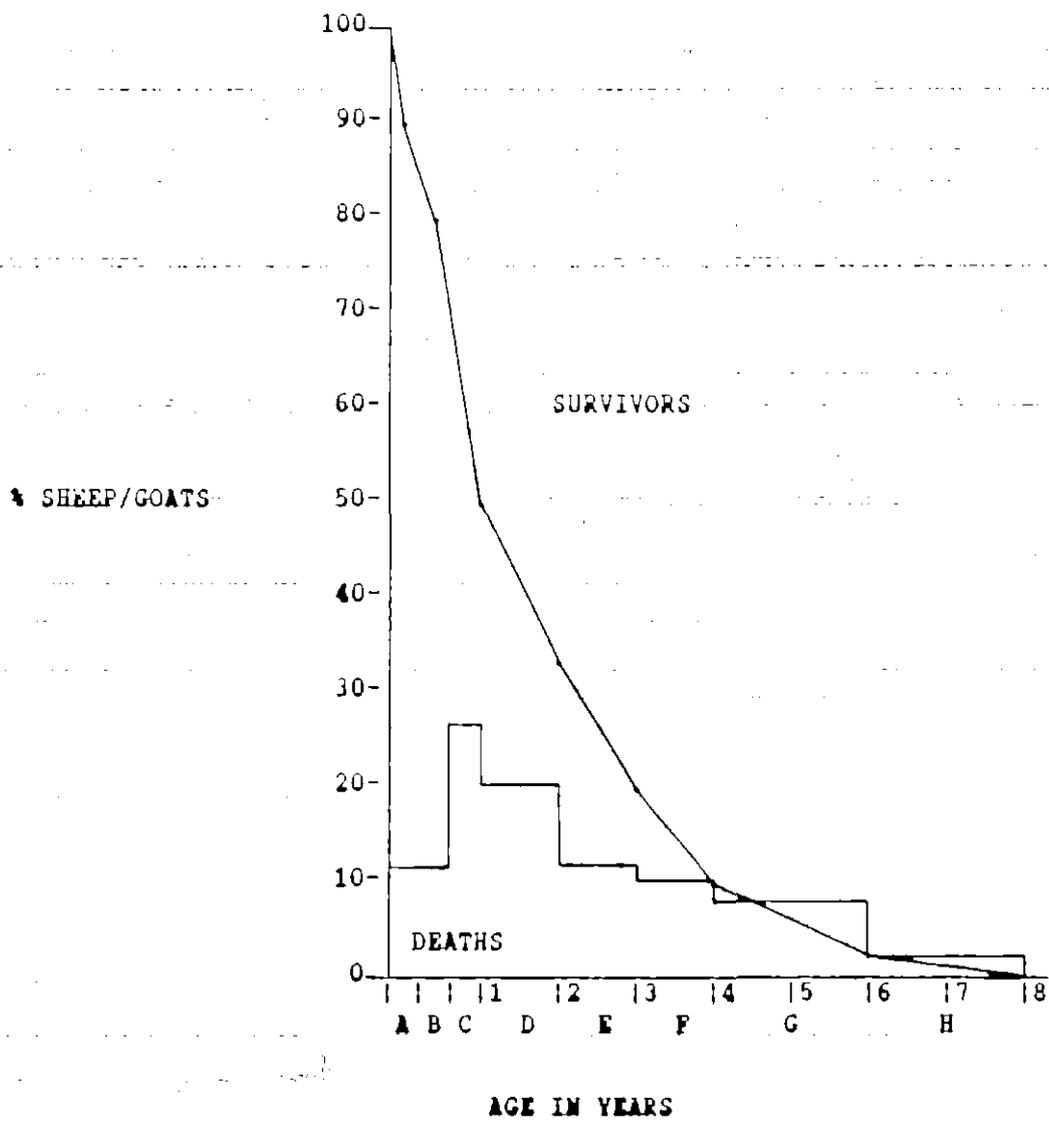
Table 19mf Number of cattle mandibles in each age category

	PHASE	GL	Ep	Ed	msw
HUMERUS		123	40	†	-
	8	128	32	25	-
	8	126	*	26	-
	8	146	40	†	-
	Soay	139	40	29	-
RADIUS	3	136	†	23	-
	4	129	25	25	13
	7	147	27	24	*
	7	143	30	26	-
	7	147	27	*	-
	8	147	†	27	-
	8	133	26	25	15
	8	132	26	*	G
	8	144	*	27	15
	8	141	*	25	14
	8	141	27	25	14
	8	157	†	29	-
	8	141	29	24	14
8	145	27	30	16	
8	146	29	28	16	
	Soay	146	29	29	17
METACARPAL	5	119	20	22	11
	5/6	125	22	23	12
	5/6	111	20	22	12
	7	121	20	23	GR
	7	115	20	22	14
	7	128	22	†	14
	7	111	20	22	10
	7	120	20	22	12
	7	119	20	23	13
	7	118	21	23	13
	7	118	21	23	14
	7	117	20	22	12
	8	119	20	23	13
	8	122	24	*	15
	8	107	19	*	*
	8	122	22	23	11
	8	117	21	23	13
	8	108	19	*	12
	8	104	19	21	12
	8	114	20	23	12
8	121	22	22	13	
8	114	20	23	12	
7/8	110	19	22	12	
7/8	117	20	22	12	
	Soay	119	22	24	13
FEMUR	3	157	37	33	-
	7	154	41	33	14
	7	177	46	†	-
	Soay	166	43	37	15
TIBIA	7	197	37	24	-
	8	213	†	25	-
	Soay	196	40	Note	13
METATARSAL	3	142	20	24	11
	7	129	18	20	†
	7	129	18	20	11
	7	115	17	20	10
	7	135	20	24	12
	7	125	16	19	10
	7	125	18	21	10
	7	118	18	21	10
	7	120	19	21	11
	8	127	18	21	11
	8	127	18	21	11
	8	137	18	21	11
	8	129	19	21	10
	8	137	19	22	12
	8	124	18	21	10
	8	128	18	21	11
	8	118	16	*	10
8	126	18	22	11	
	Soay	132	19	23	11

Table 20mf Dimensions of complete sheep long bones

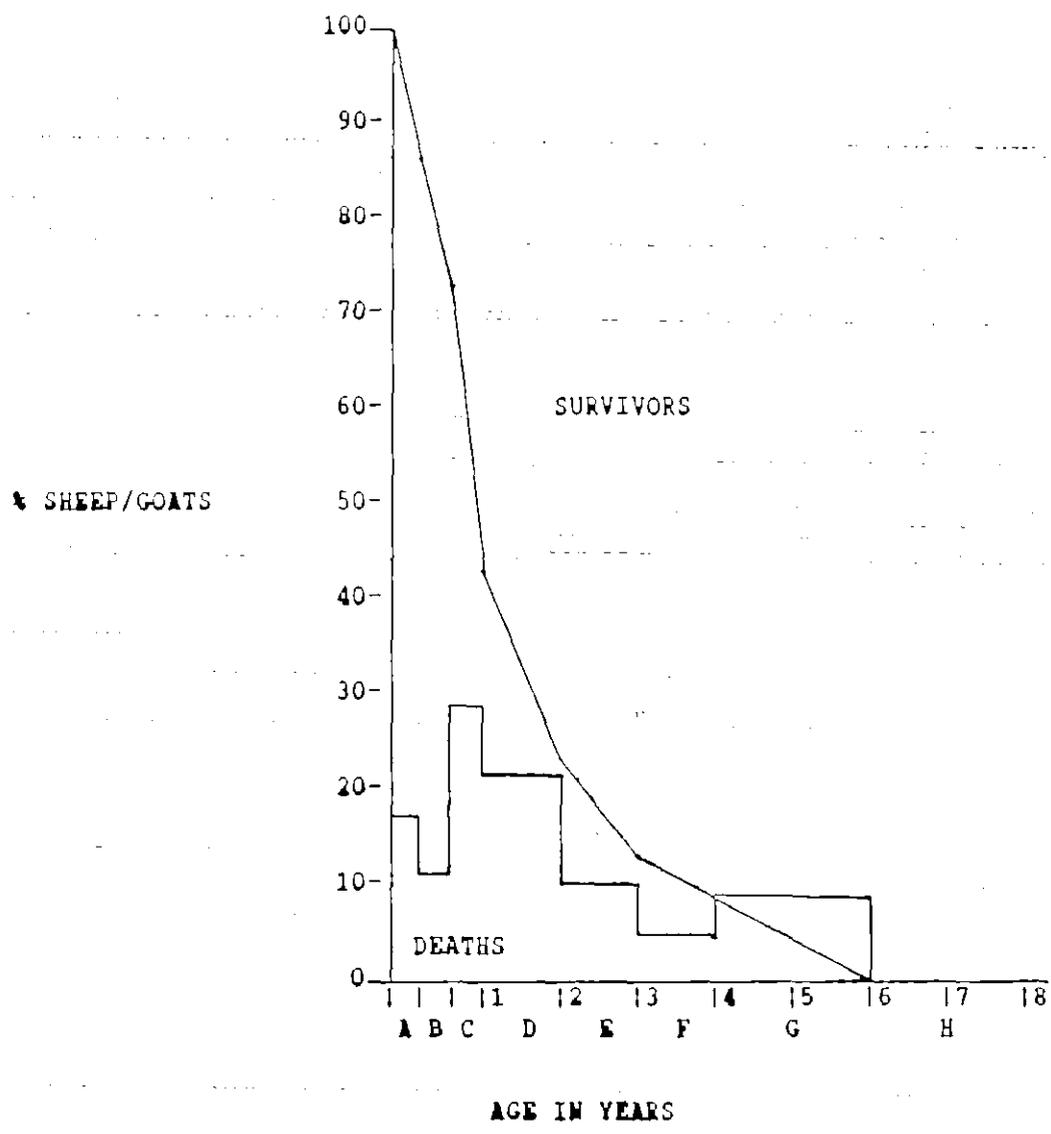
Position	3	Howa			7/8	Skail Pictish	Skail Viking	Skara Brae (Neo)	Soay
		5/6	7	8					
AP	100	80	58.3	47.8	50	50	80	24	85
PD	-	20	11.1	13.0	25	50	20	31	14
PM	-	-	16.7	19.6	-	-	-	45	1
APx2	-	-	2.8	-	-	-	-	-	-
AP&PD	-	-	5.6	10.9	25	-	-	-	-
AP&PM	-	-	5.6	8.7	-	-	-	-	-
Sample No	2	5	36	46	4	26	15	112	79

Table 21mf Percentage of nutrient foramen of sheep femora in each position



N=176	A	B	C	D	E	F	G	H
% DEATHS	11.4	11.4	26.1	19.3	11.9	9.7	8.5	1.7
% SURVIVORS	88.6	77.2	51.1	31.8	19.9	10.2	1.7	0

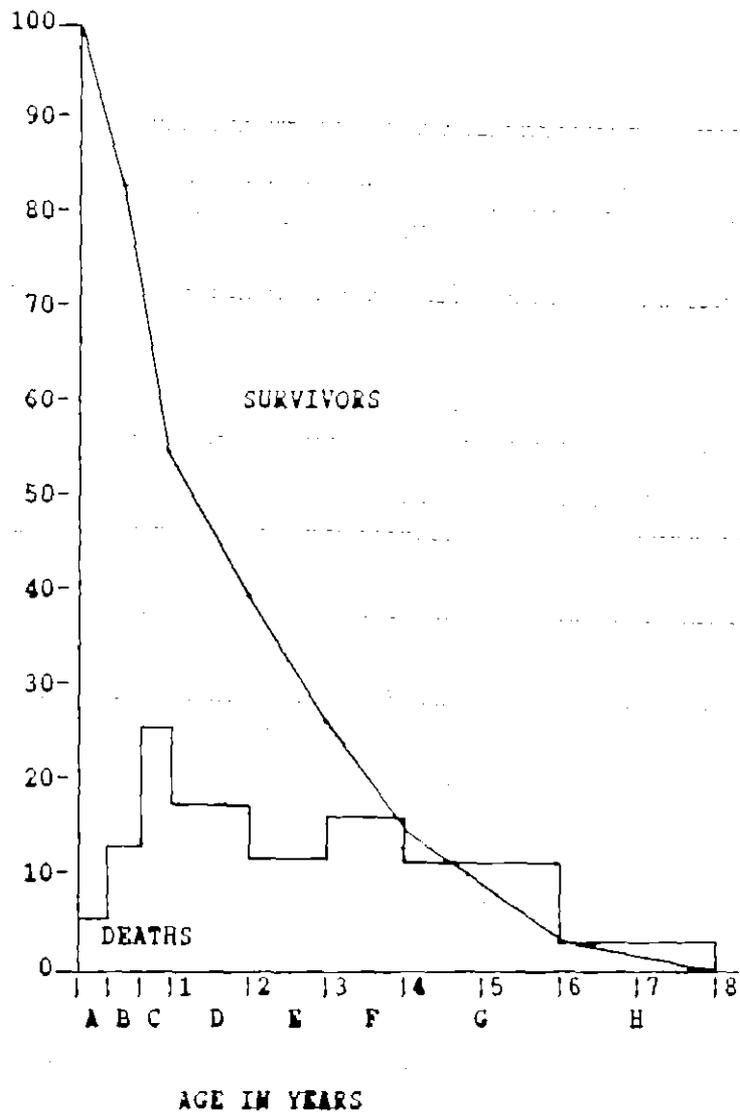
Table 22mf Sheep goat kill off pattern - whole site



N=84	A	B	C	D	E	F	G	H
% DEATHS	16.7	10.7	28.6	21.4	9.5	4.8	8.3	
% SURVIVORS	83.3	72.6	44.0	22.6	13.1	8.3	0	-

Table 23mf Sheep goat kill off pattern - Phase 7

\* SHEEP/GOATS



N=72	A	B	C	D	E	F	G	H
* DEATHS	5.6	12.5	25.0	16.7	11.1	15.3	11.1	2.8
* SURVIVORS	94.4	81.9	56.9	40.2	29.1	13.8	2.7	0

Table 24mf Sheep goat kill off pattern - Phase 8

Table 25mf Measurements of complete pig skeleton. (Phase 7, layer 863, small find nos. 2152 + 3011)

BONE		MEASUREMENT		
L	Scapula	SLC	21	
		GLP	35	(Arthritic glenoid)
R.	Scapula	SLC	21	
		GLP	32	
L	Humerus	GL	170	
		Bp	41	(eburnation of proximal articular surface corresponds with scapula)
		Bd	34	
		msw	15	
R.	Humerus	Bd	35	
L	Radius	GL	124	
		Bp	25	
		Bd	29	
		msw	16	
R.	Radius	GL	124	
		Bp	25	
		Bd	30	
		msw	17	
L	Ulna	DPA	31	
		SDO	26	
R.	Ulna	GL	171	
		DPA	31	
		SDO	26	
R.	Metacarpal III	GL	63	
		Bp	14	
		Bd	15	
L	Metacarpal IV	GL	63	
		Bp	13	
		Bd	14	
R.	Metacarpal IV	GL	63	
		Bp	13	
		Bd	15	
L	Innominate	LAR	25	
R.	Innominate	LAR	25	
		LFo	38	
L	Femur	GL	180	
		Bp	46	
		Bd	36	
		msw	15	

Table 25mf contd  
BONE

		MEASUREMENT			
L	Tibia	GL	165		
		BP	40		
		Bd	8		
R	Tibia	msw	18		
		GL	165		
		BP	40		
L	Astragalus	Bd	25		
		msw	18		
L	Astragalus	GL	35		
		GLm	32		
R	Astragalus	GLE	35		
		GLm	32		
L	Calcaneum	GL	65		
R	Calcaneum	GL	64		
L	Metatarsal III		(Arthritis)		
		GL	71		
		BP	14		
R	Metatarsal III	Bd	14		
		GL	77		
R	Metatarsal III	BP	13		
		Bd	14		
R	Metatarsal IV	GL	71		
		BP	13		
		Bd	14		
R	Metatarsal II	GL	51		
		Bd	8		
R	Metatarsal V		(Arthritis)		
		GL	56		
R	Metatarsal V	Bd	8		
		GLP*	BP		
1st Phalange (3rd/4th digit)		33	14	Bd	13
		32	14		13
		33	13		13
		30	14		13
		31	15		13
1st Phalange (2nd/5th digit)		21	10		8
		21	9		7
		19	9		6
		21	10		8
2nd Phalange (3rd/4th digit)		21	14		12
		21	14		11
		21	14		12

GROUP	DENTAL CHARACTERISTICS	NO OF MANDIBLES	%
A	Deciduous teeth only; molars unerupted	31	30.7
B	1st molar erupted, 2nd molar unerupted	22	21.8
C	2nd molar erupted, 3rd molar unerupted	33	32.7
D	3rd molar erupted	15	14.9

A corresponds to less than c8 months

B corresponds to c8 months

C corresponds to c13 months

D corresponds to c20 months and over

(after Habermehl (1975) and Payne & Bull (1982))

Table 26mf Pig mandibles - wear and eruption

SITE	%	AUTHOR
Warebeth Broch	42.9	Seller, TJ (1982?)
Bu Broch	49.0	Noddle, B (forthcoming?)
Buckquoy (Iron Age only)	38.8	Noddle, B (1976-7)
Howe of Howe	52.5	

Table 27mf Percentage of pigs killed in age range 0-1 year

	GL	Bp	Bd	msw	Phase
RADIUS	264	51	47	33	7
	256	50	44	29	7
METACARPAL	218	34	33	20	7
	222	*	34	18	7
	217	33	36	18	7
	230	34	36	20	7
	213	*	34	18	7

Table 28mf Dimensions of complete red deer bones

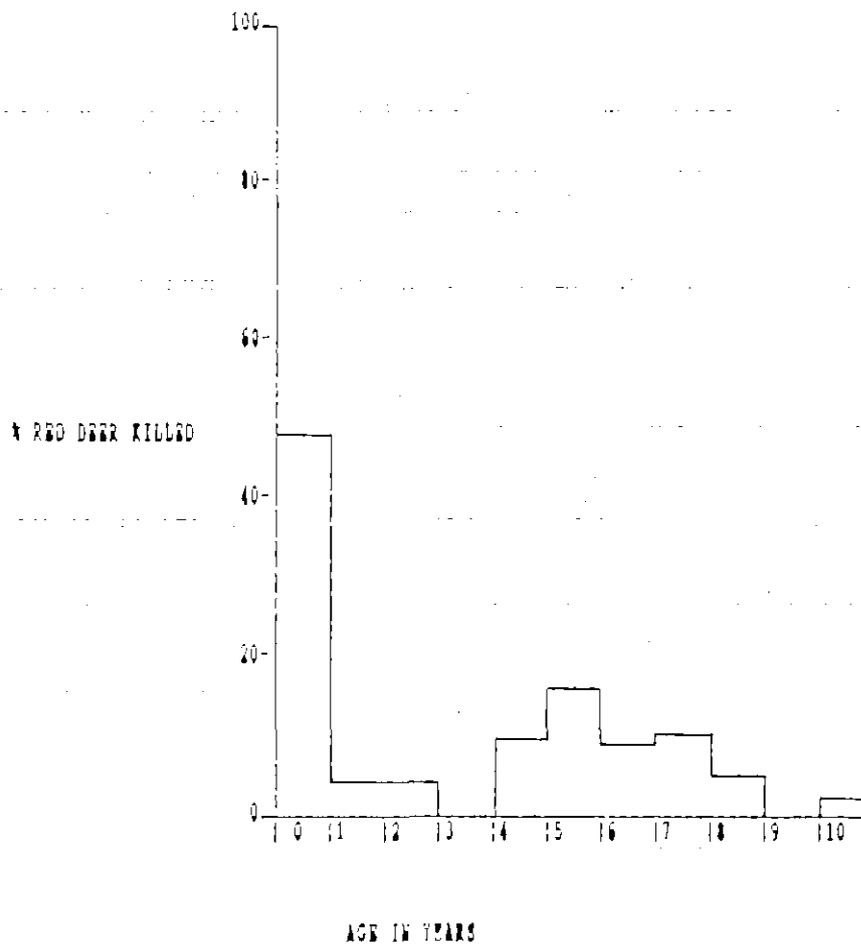
1 : D13

SCAPULA	SLC	29	HUMERUS	GL	219
	GLP	48		Bp	60
				Bd	51
RADIUS	GL	233	ULNA	DPA	41
	Bp	47		SDO	38
	Bd	44			
	msw	24			
METACARPAL	GL	211	FEMUR	GL	253
	Bp	35		Bp	70
	Bd	36	Bd	60	
	msw	19			
TIBIA	GL	295	ASTRAGALUS	GLe	46
	Bp	63		Bd	29
	Bd	42			
CALCANEUM	GL	94	METATARSAL	Bp	32
				Bd	35
1st PHALANGE	GLpe	48 - 50	2nd PHALANGE	GLpe	NA
	Bp	17 - 19		Bp	
	Bd	17 - 18		Bd	
3rd PHALANGE	DLS	41 - 46			
	Ld	37 - 39			

Table 29mf Dimensions of modern adult (4.5 year old) red deer

AGE CLASS	NO	%
O/F	28	32.6
0	12	14.0
1	3	3.5
2	3	3.5
3	-	-
4	7	8.1
5	13	15.1
6	7	8.1
7	8	9.3
8	4	4.7
9	-	-
10	1	1.2
TOTAL	86	100.1

Table 30mf Number and percentages of red deer half mandibles in each age class.



N=16

AGE CLASS	0/P	0	1	2	3	4	5	6	7	8	9	10
% DEATHS	32.6	14.0	3.5	3.5	-	8.1	15.1	8.1	9.3	4.7	-	1.2

Table 31mf Percentage of red deer killed by probable age

MINIMUM AGE	TINES PRESENT	NUMBER OF FRAGMENTS
2nd year	Brow tine	38
3rd year	Brow and trez	12
4th year	1 or 2 crown tines	12
5th year	Brow and bez	2
6th year	3 crown tines	1

Table 32mf Minimum age of the shedding of 65 cast/indeterminate antler frags

UNFUSED BONE	PROPORTION	AGE OF FUSION
Dist radius	1/4	3½ years
Prox femur	4/9	3-3½ years
Prox and dist femur	1/9	3-3½ years
Calcaneum (tuber calcis)	1/9	3 years
Dist tibia	1/6	20-24 months

Table 33mf Proportions of unfused horse long bones

	GL	Bp	BFp	Bd	BFd
RADIUS	281	76	71	72	60
	GL	Bp	Dp	Bd	SD
METATARSAL	250	46	36	46	29
	245	47		44	30

Table 34mf Dimensions of complete horse long bones

MEASUREMENT		PHASE 7		PHASE 8	
		DOG 5959	DOG/WOLF 3867	FOX 2605	DOG JARLSHOF
I	Length	133	-	-	176
II	Occipital-nasion	76	-	76	90
III	Nasion-alveolare	67	-	-	93
IV	Max. zygomatic width	75.5	-	-	101
IX	Palatal length	67	-	-	83
X	Palatal width	47	76.2	39	57
XI	Max. cheek tooth row length	35.5	-	49	62
XII	Snout width	28	-	22 est	34
INDICES					
$\frac{IV}{I} \times 100$	Cephalic Index	56.8	-	-	57
$\frac{III}{I} \times 100$	Snout index	50.4	-	-	53
$\frac{XII}{III} \times 100$	Snout width Index	41.8	-	-	36

Table 35mf Dimensions of complete dog bones

Table 36mf Measurements of Dog/Wolf skull SF 3867 and comparative wolf skulls

MEASUREMENT	1	2	3
Length of upper PM4	22.1	24.5	24.0
Breadth of upper PM4	12.1	12.7	10.3
Length of upper M1	15.0	15.9	15.0
Breadth of upper M1	17.3	17.9	20.0
Length of upper M2	18.2	18.3	-
Breadth of upper M2	10.7	11.9	-
34. Palatal breadth	76.2	76.0	-
22. Greatest diameter of auditory bulla	25.3	27.1	1
1	Skull SF 3867		
2	Female wolf of French origin in the collection of the British Museum (Natural History), No 1843.12.29.7.		
3	Iberian wolf (von den Driesch 1972, 121)		

ATLAS	GL 18	GB 33	BFcr 25	BFcd 18	
AXIS	LCDe 24	BFcr 14	BPacd 14	SBV 11	BFcd 9
SCAPULA	HS 64	SLC 13	GLP 14		
RADIUS	GL 102 95 93	Bp 9 8 8	Bd 14 13 12	SD 6 6 6	
FEMUR	104 104	20 19	17 17		
TIBIA	109	19	14		

Table 37mf Dimensions of complete cat bones

BONE	PROPORTION UNFUSED
Scapula	1/9
Radius, prox and dist	2/10
Femur, prox and dist	3/8
Femur, dist	1/6
Tibia, prox	2/6

Table 38mf Unfused cat bones

BONE	% UNFUSED
Humerus, prox	83.1
Humerus, dist	14.1
Radius, prox	3.0
Radius, dist	83.3
Femur, prox	4.1
Femur, dist	56.0
Tibia, prox	84.8
Tibia, dist	4.1

Table 39mf Percentage of unfused small mammal bones

Table 40mf COPROLITE IDENTIFICATIONS

PHASE	CONTEXT	DESCRIPTION
4-6	1901 E well silt (2 samples)	Contains animal bone and shell 1 sample possibly human
5-6	1906 E well cut (3 samples)	Contains bone
7 Early	1048 SE building ash 1664 NE building floor 1709 NE building rubble 1759 NE building rubble 1830 E building yard	Contains bone Contains bone Contains bone and hair Contains fish bone
7 Late	955 rubble (2 samples) 972 SE workshop floor 973 SE workshop clay  1067 S workshop rubble 1087 S workshop rubble 1323 NE workshop rubble	Contains bone Contains bone - animal or human Contains no noticeable bone - human? Contains bones - human? Contains animal bone Contains much bone - dog or animal
8	839 abandonment rubble	Contains bone - dog or animal
9	913	Contains bone

Table 41mf List of pathological specimens

## I CATTLE

Layer	SF	Phase	Bone	
1539	5662	7	L. mandible	<u>Congenital anomaly</u> No alveolus for 2nd premolar present. Bone not roughened.
729	1989	7/8	R. mandible	Absence of 2nd premolar, as above.
1566	5731	5/6	L. mandible	Reduction of 3rd pillar (5th cusp) of 3rd molar.
981	3135	7	R. mandible	Exostosis of condyle.
1868	6472	5/6	L. calcaneum	<u>Exostosis</u> Tuber calcis has proliferative bony spicules. Interarticular lesions.
383	831	8	L. naviculo-cuboid	<u>Spavin</u> Lateral cuneiform (tarsal) fused on.
1848	6463	5/6	1st phalanage	" <u>Degenerative arthritis</u> " (osteoarthrosis) Lipping and polishing (eburnation) at prox. end, peripheral half. Slight polishing at dist. end, achsial half.
1190	4235	9 (recent burial)	R. mandible	Periodontal disease = erosion of alveolar bone between 1st molar and 4th premolar.
981	3135	7	L. mandible	Has 2 mental foramina instead of one. (Baker & Brothwell (1980:35), mention similar examples from Skara Brae.)
1081	3472	7	L. mandible	2 mental foramina, as above.

## II SHEEP

715	1976	8	L. mandible	Probable <u>congenital anomaly</u> . 2nd premolar missing. Jaw bone slightly rough, therefore <u>may</u> have been present and subsequently lost.
1412	5608	7	L. mandible	Congenital absence of 2nd premolar.
631	1351	8	R. humerus (distal)	? <u>Osteoarthrosis</u> Some lipping at distal end. Lesions on caudal surface above trochlea.
1304	8722	8	L. radius (prox.)	? <u>Healed injury</u> Callus formation at midshaft. No apparent fracture line.

Table 41 contd

Layer	SF	Phase	Bone	
1402	5690	8	L. radius & ulna (pair)	?Osteoarthritis Prox. facet of radius with arthritic lipping. Coronoid process of ulna and interarticular region thickened - Volar surface of ulna distorted.
922	3347	8	L. metacarpal (prox.)	Osteoarthritis, or infective arthritis? Proximal surface greatly distorted. Bone deposition (knife cuts present).
1157	3607	7	R. metacarpal (prox.)	Proximal surface twisted at 45° to normal direction. Shaft twisted. (Animal was J/l at death).
722	1920	8	R. lunar & scaphoid	2 carpal's completely fused; junction almost completely obliterated.
722	1920	8	R. femur (prox.) (prox. epiph. unfused)	Possible infection introduced by traumatic damage. Shaft with swelling and lesion. Distal end missing, but must have been twisted away from normal direction.
37	3009	8	L. naviculo-cuboid	Spavin Lateral cuneiform fused on. Junction still visible.
1357	3691	7	L. metatarsal and naviculo-cuboid.  L. calcaneum	Osteoarthritis/Spavin. Prox. surface of metatarsal completely fused with nav.-cub. and lateral cuneiform - whole structure massively deformed with heavy bone outgrowths. Prox. surface of nav.-cub. grooved. Calcaneum from same animal (not fused) has spicules and altered articulatory surface.
1456	3800	7	L. metatarsal	?Osteoarthritis Prox. surface shows interarticular lesions. Spicules and distortion of shape. (Knife cuts at prox. end.)
1458	5889	7	1st phalange	Exostosis Spicule at dist. end.
1251	3773	7	1st phalange	Exostosis Spicules at prox. end.
1319	3700	8	2nd phalange	Exostosis Spicules near dist. end.
724	1987	9 (Recent)	L. Scapula	Osteoarthritis Glenoid greatly distorted, with some lipping. Lesion in glenoid cavity, with some polishing.

Table 41 contd

Layer	SF	Phase	Bone	
335	933	9	L. innominate	(Congenital?) dislocation of hip. Acetabulum grossly distorted. Second false acetabulum with eburnation placed posterior to original; bony outgrowths posterior to false acetabulum shows fusion line and may be remains of fused-on trochanter of femur.
<hr/>				
III PIG				
1086	3479	7	Skull fragment (young animal)	Healed fracture. Large hole/lesion above R. orbit. Small channel is evidence of blood vessel leading to fracture.
883	3101	7	L. mandible	Tooth crowding. 2nd molar apparently unable to erupt because of proximity of 1st molar.
1173	3605	Scraped Context	L. maxilla	Tooth crowding. 1st premolar rotated at right angles to normal direction.
863	2152	7	L. Scapula	Osteoarthritis. Glenoid cavity with arthritic lipping.
863	2152	7	L. humerus	Same animal. Proximal articular surface shows corresponding eburnation.
863	3011	7	R. calcaneum	Same animal. Exostosis of tuber calcis.
863	3011	7	R. M/T II	Same animal. Eburnation and erosion of distal condyle.
<hr/>				
	126 ex 68			<p>Partial skeleton of newborn piglet showing probable symptoms of rickets. L. femur (prox), L. humerus (dist), L. tibia (prox) and L. and R. illum all show lipping of metaphyses.</p> <p>L. femur (dist) shows swelling of shaft near distal end.</p> <p>L. tibia (prox.) shows flaring of metaphysis.</p> <p>L. and R. radli show erosion of shaft.</p> <p>All of the shafts of the above bones are comparatively thicker with respect to length than normal foetal pig. There is some evidence of osteoporosis.</p>

Table 41 contd

Layer	SF	Phase	Bone	
				The condition of the bones may have been due to a deficiency of phosphorus relative to calcium, associated with a lack of Vitamin D (Baker, J. & Brothwell, D., 1980:49) perhaps before birth.
<b>IV RED DEER</b>				
1067	3382	7	Mandible or loose lower 3rd molar	<u>Congenital abnormality.</u> Greatly reduced third pillar (5th cusp) on 3rd molar. In addition, 2 specimens with reduced 3rd pillar have evidence of periodontal disease between the third and fourth premolar with associated roughening and erosion of the jaw bone between the teeth.
1901	6630	5/6	"	
1906	6567	5/6	"	
1906	6567	5/6	"	
1906	6567	5/6	"	
978	3375	7	"	
1081	3472	7	"	
1088	3401	7	"	
1323	3711	7	"	
1323	3711	7	"	
2041	6924	7	"	
867	3139	7	"	
973	3359	7	"	
1737	3693	3/4	"	
955	3355	7	"	
981	3135	7		<u>Periodontal disease</u> occurring between 3rd and 4th premolars as above.
1051	3377	7		
2028	6779	3	Mandibles	
1115	3683	7		
1496	5794	7	R. tibia and Os malleolare	Os malleolare fused to distal tibia. Junction still visible. (Astragalus separate; not affected.)
1868	6472	5/6	R. naviculo-cuboid	<u>Spavin.</u> Lateral cuneiform fused on. Junction still visible.
1086	3479	7	L. naviculo-cuboid	<u>Spavin.</u> Lateral cuneiform fused on, as above.
729	1989	7/8	R. naviculo-cuboid	<u>Spavin.</u> Lateral cuneiform fused on. Some exostosis evident.
1323	3711	7	R. naviculo-cuboid	<u>Spavin.</u> Lateral cuneiform fused on. Junction obliterated. Some exostosis.
1323	3711	7	L. metatarsal (prox.)	<u>Exostosis.</u> Spicules at prox. end.
1067	3382	7	L. metatarsal (prox.)	? <u>Osteoarthritis.</u> Proximal facet shows eburnation.

Table 41 contd

Layer	SF	Phase	Bone	
<b>V DOG</b>				
1458	5959	7	Skull	<u>Congenital anomaly or traumatic tooth loss?</u> No alveoli for 2nd premolars.
1170	3946	8	R. mandible	Traumatic tooth loss. 1st premolar missing. Alveolus resorbed - jawbone roughened.
26	1794	9	R. radius	<u>Osteoarthritis</u> . Exostosis and erosion of proximal facet, with small patch of eburnation; ring of exostosis distal to prox. facet. Shaft slightly swelled. Exostosis at dist. end.
<b>VI CAT</b>				
1410	5654	8	L. femur	<u>Healed fracture</u> . Distal end of femur massively deformed. Bone deposition and erosion taking place. Part of fibula fused to shaft. Line of fracture not visible. (Knife cuts on other bones from same animal.)
535	1257	8	R. tibia	<u>Healed fracture</u> . Midshaft callus/swelling. Line of fracture still partially visible.
462	982	8	R. innominate	<u>Osteoarthritis</u> of acetabulum (hip joint).
<b>VII FOX and cf FOX</b>				
<b>FOX</b>				
770	3041	8	L. & R. mandibles (condition identical in both)	Third molar (M3) never present - not resorbed. First premolar (PM1) possibly resorbed. (L. & R. dist. radii from same animal have exostoses).
767	3052	7	L. mandible	M3 probably never present - not resorbed.
876	3086	7	R. mandible	M3 never present - not resorbed. PM1 resorbed - roughness of jawbone and remains of alveolus.
1085	3400	7	L. mandible	M3 never present - not resorbed.

Table 41 contd

Layer	SF	Phase	Bone	
981	3135	7	L. & R. mandibles (condition identical in both)	M3 never present - not resorbed. PM1 never present - not resorbed.
580	3786	9 Recent	R. mandible	M3 never present - not resorbed.
-	126 ex 68	w/s	R. mandible	M3 never present - not resorbed.
<b>cf FOX</b>				
1868	6472	5/6	1st phalange	<u>Exostosis</u> of distal end.
863	2152	7	5 metacarpals 1 metapodial	Metacarpals - one affected by exostosis on shaft; others affected at prox. end. Metapodial - distorted at dist. end by exostosis and small lesion. Cause = infectious arthritis?
			L. calcaneum	Exostosis
			L. astragalus & tarsal	Slight bone deformation and erosion.
			1st phalange	Four affected by exostosis at prox. end and one at distal end.
			2nd phalange	Two affected by exostosis at prox. end.
<b>VIII OTTER</b>				
1844	6438	5/6	Skull	<u>Dental pathology</u> of R. maxilla. R. PM4 broken during life. One PM4 alveolus on buccal aspect resorbed. One root on buccal side and lingual part of tooth remaining. Also, PM lost during life and alveolus resorbed. In addition, an (unhealed) circular hole above the L. orbit may indicate that the animal was killed by a blow to the head.
1830	6459	7	L. innominate.	<u>Exostosis</u> of acetabulum.
<b>IX MRD</b>				
1251	3773	7	L. Tibio-tarsus	<u>Probable healed fracture</u> . Distal end bent up towards proximal end at 45° to vertical. Callus formation at angle. Leg probably not functional.

BONE	EXPECTED		CATTLE		SHEEP	
	NO	%	NO	%	NO	%
Skull	1	1.1	312	3.4	374	5.0
Horn Core	2	2.2	100	1.1	163	2.2
Premaxilla	2	2.2	41	0.4	60	0.8
Maxilla	2	2.2	129	1.4	211	2.8
Mandible	2	2.2	930	10.1	650	8.6
Atlas	1	1.1	73	0.8	80	1.1
Axis	1	1.1	82	0.9	59	0.8
Scapula	2	2.2	690	7.5	507	6.7
Humerus	2	2.2	514	5.6	580	7.7
Radius	2	2.2	442	4.8	495	6.7
Ulna	2	2.2	276	3.0	183	2.4
Carpals	10	10.8	362	3.9	132	1.7
Innominate	2	2.2	556	6.0	426	5.6
Femur	2	2.2	576	6.2	505	6.7
Tibia	2	2.2	685	7.4	625	8.3
Patella	2	2.2	50	0.5	64	0.8
Os mall.	2	2.2	61	0.7	5	0.1
Astragalus	2	2.2	248	2.7	282	3.7
Calcaneum	2	2.2	269	2.9	225	3.0
Nav.-cuboid	2	2.2	106	1.1	70	0.9
Lat. cuneiform	2	2.2	37	0.4	6	0.1
Metapodial	4	4.3	1,097	11.9	970	12.9
Phalange I	8	8.6	605	6.5	553	7.3
Phalange II	8	8.6	455	4.9	206	2.7
Phalange III	8	8.6	221	2.4	106	1.4
Sesamoid	18	19.3	324	3.5	10	0.1
<b>TOTAL</b>	<b>93</b>		<b>9,241</b>		<b>7,547</b>	

Table 42mf Expected and actual numbers and percentages of bones from cattle and sheep

Table 43mf Animal burials - Appendix 2

Phase	Layer	SF	
<b>CATTLE</b>			
9	146	118	"Circular pit dug through ploughsoil L110." Heavily eroded partial skeleton of newly born or foetal calf. No evidence of butchery.
9	734	1,919	"S. Area, Trench G" Burial of nearly complete J/I calf with evidence of at least one other calf. No evidence of butchery.
9	735	1,998	"S. Area, Trench G" Burial of 2 newly born or foetal calves. No evidence of butchery.
9	802	2,119	"Cow? burial in pit (beneath L750 & above broch age rubble". Nearly complete Juvenile calf. No evidence of butchery.
9	900	2,534	"Trench K" Well preserved burial of immature/adult Individual. Evidence of butchery: L. horn core sawn off at base; otherwise unbutchered.
9	1,027	2,785	"Modern cow burial pit fill Trench K." Friable skeleton of juvenile animal. No evidence of butchery.
9	1,190	4,235	"Fill of cow burial pit. Trench K." Well preserved burial of adult (A+) animal. Some evidence of periodontal disease between 1st molar and 4th premolar of R. mandible. The tibiae showed deep muscle attachment scars. The R. metacarpal was 4 mm longer than the L. metacarpal. The majority of the vertebrae were entire, but 2 were sawn in the sagittal plane. In addition the sternum was sawn neatly in half but the animal was otherwise unbutchered and all the long bones were entire. The animal must have been sliced open at the sternum before being dumped, perhaps as unfit meat.
7	1,076	3,379	"Mid-brown silty loam. Trench K." Possible intrusive burial of unbutchered cattle hind quarters (including innominates, tarsals, metatarsals and phalanges. Tibiae and femora not present).
8	765	3,150	"Remains of charcoaly occ. debris in a broch age building. Trench G, S. Area". Partial, possibly intrusive, calf burial (mainly fore limbs). Age - juvenile. Unbutchered.
8/9	731	1,933	"Large expanse of rubble and plough-soil (contaminated) Trench G, S. Area". Calf burial. Age - juvenile Unbutchered.

Table 43 contd

Phase	Layer	SF	
SHEEP			
9	158	152	"Scrapped - topsoil". Burial of sheep. Age - c 2 years (tooth stage D/E). Evidence of butchery: skull split sagittally; knife marks at bases of both horn cores. Otherwise the animal was unbutchered.
5/6	1,818	6,458	"Shillet." Nearly complete skeleton of sheep aged 1-2 years. Unbutchered, but 7 bones were gnawed by rodents.
7	883	3,101	"Levelling rubble. Trench S". Nearly complete, unbutchered skeletons of 2 newly born lambs (or fetuses), recovered along with large amount of typical animal bone refuse.
8	923	3,221	"Ground surface. Trench J". Burial of adult sheep aged 2-3 years. (Tooth stage E). Unbutchered, but 2 bones gnawed by rodents.
PIG			
7/8	858	2,221	"Floor level assoc. with hearth L840. Trench Z". Burial of nearly complete immature pig. Age - 13 months, approx. Unbutchered.
7	863	2152 3011	"Rubble collapse from E. side of broch entrance. Trench Z". Burial of complete, well preserved adult pig. Unbutchered. (See Table 25mf for measurements.)
Scrapped	1,018	3,259	"Rubble. Trench J". Burial of unbutchered pig. Age - c8-13 months.
HORSE			
9	145	117	"Friable grey silt. Trench G". Burial of foal aged 1-5 months. Evidence of deciduous canines inconclusive of sex.
DOG			
9	110	122 450	"Occ. small rubble ... ploughsoil. Trench G". Burial of nearly complete adult dog. Est. shoulder height (based on humerus and radius - 53.5 cm). (Harcourt, 1974). Sex unknown.
CAT			
8	462	982	"Rubble. Trench G". Partial cat skeleton; adult. No evidence of butchery. Osteoarthritis of acetabulum of innominate, Tibia and radius gnawed by rodents.
8	537 604	1,210 1,214	"Earth floor. AG Bulk". "Mid brown friable sandy loam. AG Bulk". Same animal; found in layers 537 & 604. Adult.
8	1,269	3,687	"Floor. Trench J". Partial skeleton of kitten.

Table 44mf Bone size range summaries - Appendix 1

All measurements are in mm.

Measurements are, with a few exceptions, in accordance with the scheme proposed by von den Driesch (1976).

Other abbreviations:

max - maximum

min - minimum

B.C. - basal circumference

O.C. - outer curvature

msw - midshaft width

n - sample number

1. CATTLE

Bone	Measurement	Range	n
Horn core	max	25-59	20
	min	19-47	20
	B.C.	73-173	19
	O.C.	23-138	5
Atlas	GL	43-83	8
	GB	115-120	2
	BFcr	71-95	7
	BFcd	69-97	6
Axis	BFcr	64-86	11
	LCDe	101-106	3
	SBV	42-49	11
	BPacd	61	1
	LAPa	80	1
Scapula	SLC	35-61	89
	GLP	47-74	53
Humerus	Bp	82-95	4
	Bd	66-80	23
Radius	GL	244-285	4
	Bp	59-85	19
	Bd	52-73	37
Ulna	DPA	41-61	27
	SDO	37-54	36
Carpals: magnum unciform	GB	22-35	34
	GB	25-37	44
Metacarpal	GL	167-191	10
	Bp	42-57	50
	Bd	48-63	37
	msw	25-31	10
Innominate	LAR	37-54	11
	LA	62-66	2

Table 44 contd

Bone	Measurement	Range	n
Femur	Bp	100	1
	Bd	61-86	15
Patella	GL	43-61	7
	GB	33-50	12
Tibia	Bp	55-89	9
	Bd	45-64	68
Os malleolare	GD	23-32	28
Astragalus	GL1	48-74	100
	Bd	30-48	95
Calcaneum	GL	108-133	29
Naviculo-cuboid	GB	34-58	45
Metatarsal	GL	189-203	7
	Bp	37-49	30
	Bd	44-57	42
	msw	21-26	7
1st phalange	GLpe	45-63	147
	Bp	18-36	169
	Bd	19-31	136
2nd phalange	GL	28-43	123
	Bp	19-33	205
	Bd	19-28	127
3rd phalange	DLS	40-72	60
	Ld	32-54	57

Table 44 contd

## 2. SHEEP

Bone	Measurement	Range	n
Skull	Driexch 24	34.2	1
	25	32.0	1
	27	36.7-41.0	6
	28	48.0-55.8	5
	29	16.4-20.5	6
	30	15.0-18.0	6
Horn core	max	19-51	45
	min	14-45	39
	B.C.	43-152	37
	O.C.	23-195	10
Atlas	GL	34-55	8
	GB	43-69	4
	BFcr	39-48	14
	BFcd	35-48	17
Axis	LCde	53-57	3
	LApA	32-44	4
	BFcr	33-45	25
	BPacd	22-32	12
	SBV	18-27	27
	BFcd	20	1
Scapula	SLC	22-32	136
	GLP	24-34	56
Humerus	GL	123-146	4
	Bp	30-40	10
	Bd	23-31	105
Radius	GL	129-157	15
	Bp	21-32	66
	Bd	22-30	56
	msw	13-16	8
Ulna	DPA	14-27	63
	SDO	13-24	74
Metacarpal	GL	104-128	24
	Bp	16-24	119
	Bd	21-25	27
	msw	11-15	20
Innominate	LAR	20-27	28
	Lfo	31-38	6
Femur	GL	154-177	3
	Bp	36-46	21
	Bd	30-38	20
Patella	GL	26-29	3
	GB	16-22	21

Table 44 contd

Bone	Measurement	Range	n
Tibia	GL	197-213	2
	Bp	34-39	8
	Bd	20-27	82
Astragalus	GL1	20-30	162
	Bd	15-20	149
Calcaneum	GL	46-57	52
Naviculo-cuboid	GB	19-23	42
Metatarsal	GL	115-142	18
	Bp	16-20	92
	Bd	19-24	31
	msw	10-12	17
1st phalange	Glpe	28-37	232
	Bp	9-13	277
	Bd	9-13	265
2nd phalange	GL	17-23	128
	Bp	9-13	151
	Bd	7-10	147
3rd phalange	DLS	21-32	72
	Ld	13-30	72

Table 44 contd

## 3. PIG

Bone	Measurement	Range	n
Atlas	GL	26-35	8
	GB	52	1
	BFor	37	1
	BFcd	47	1
Axis	LAPa	18-32	4
	SBV	26-32	4
	BFor	35-44	2
	BFcd	29-30	2
	BPacd	23-26	2
Scapula	SLC	17-24	12
	GLP	27-35	12
Humerus	GL	170	1
	Bp	41-42	2
	Bd	33-39	23
	msw	15	1
Radius	GL	125-132	3
	Bp	20-28	30
	Bd	21-31	24
	msw	16-17	3
Ulna	GL	171	1
	DPA	15-34	29
	SDO	13-27	51
Metacarpal II	GL	49	1
	Bd	10	1
Metacarpal III	GL	62-66	4
	Bp	11-17	29
	Bd	15-16	4
Metacarpal IV	GL	63-68	4
	Bp	9-14	32
	Bd	14-17	5
Innominate	LAR	25-30	10
	LFo	38	1
Femur	GL	180	1
	Bp	46	1
	Bd	36-45	11
	msw	15	1
Patella	GL	24-36	20
	GB	11-19	19
Tibia	GL	167	2
	Bp	25-42	10
	Bd	20-28	15
	msw	18	2

Table 44 contd

Bone	Measurement	Range	n
Astragalus	GL1	29-41	52
	GLm	27-36	42
Calcaneum	GL	64-71	4
Metatarsal II	GL	51	1
	Bd	8	1
Metatarsal III	GL	67-77	4
	Bp	12-15	29
	Bd	12-15	5
Metatarsal IV	GL	71-81	6
	Bp	12-16	29
	Bd	14-17	8
Metatarsal V	GL	56	1
	Bd	8	1
1st phalange (3rd or 4th digit)	GL/p	29-37	50
	Bp	11-16	80
	Bd	6-15	111
1st phalange (2nd or 5th digit)	GL	19-23	20
	Bp	9-12	20
	Bd	6-10	32
2nd phalange (3rd or 4th digit)	GL	18-31	85
	Bp	11-17	130
	Bd	9-17	113
2nd phalange (2nd or 5th digit)	GL	12	2
	Bp	8-9	2
	Bd	7-9	2
3rd phalange (3rd or 4th digit)	DLS	17-36	48
	Ld	16-28	48
3rd phalange (2nd or 5th digit)	DLS	16	1
	Ld	12	1

Table 44 contd

## 4. RED DEER

Bone	Measurement	Range	n
Atlas	GI	64-82	5
	BFer	61-76	7
	BFcd	57-65	5
Axis	LCDe	88-92	4
	LAPa	60-76	2
	BFer	55-65	8
	BPacd	41-49	4
	SBV	31-44	8
	BFcd	31-34	2
Scapula	SLC	26-35	50
	GLP	46-57	35
Humerus	Bp	53-64	12
	Bd	45-55	40
Radius	GL	256-264	2
	Bp	44-55	27
	Bd	39-49	33
	msw	29-33	2
Ulna	DPA	38-51	10
	SDO	35-47	10
Metacarpal	GL	213-230	5
	Bp	26-38	29
	Bd	32-41	26
	msw	18-20	5
Innominate	LFo	56-62	2
Femur	Bp	68-77	5
	Bd	43-63	14
Patella	GL	41-49	5
	GB	32-37	6
Tibia	Bp	62-67	7
	Bd	37-45	39
Astragalus	GL1	42-53	43
	Bd	27-34	52
Calcaneum	GL	94-111	21

Table 44 contd

Naviculo-cuboid	GB	31-42	34
Metatarsal	Bp	27-34	29
	Bd	35-40	27
1st phalange	GLpe	45-56	59
	Bp	16-21	75
	Bd	15-20	74
2nd phalange	GL	35-43	37
	Bp	14-21	54
	Bd	12-19	50
3rd phalange	DLS	33-52	37
	Ld	30-48	36

Table 44 contd

## 5. HORSE

Bone	Measurement	Range	n
Atlas	BFCr	80	1
	GB	96	1
Scapula	SLC	58	2
	GLP	68-84	2
Humerus	Bd	69-75	2
Radius	GL	281	1
	Bp	76	1
	BFp	71	1
	Bd	65-72	4
	BFd	55-60	3
Ulna	DPA	54-57	2
	SDO	45	1
Metacarpal	Bd	43-46	2
	Dp	29-30	2
	Bd	44	1
	Dd	32	1
Innominate	LAR	52	1
	LA	55	1
	LFo	63	1
	SB	20	1
Femur	Bp	105	1
	Bd	93	1
Patella	GL	55-60	3
	GB	57-60	2
Tibia	Bd	63-70	4
	Dd	44	1
Astragalus	GH	51-62	6
	GB	53-63	6
	LmT	50-57	4
	BFd	45-50	2
Calcaneum	GL	93-105	7
	GB	43-55	5
Navicular tarsal	GB	43-50	5
Lateral cuneiform	GB	41-46	6
Metatarsal	GL	245-250	2
	Bp	42-48	5
	Dp	36-42	4
	Bd	44-46	2
	SD	29-30	2

Table 44 contd

Bone	Measurement	Range	n
Distal sesamoid	GB	30	1
1st phalange	GL	71-81	3
	Bp	43-56	5
	BFp	47-48	2
	Dp	27-38	4
	Bd	40-44	2
	BFd	39-41	3
	SD	28-35	6
2nd phalange	GL	37-46	5
	Bp	42-48	6
	BFp	42	3
	Dp	28-31	4
	Bd	40-46	4
	SD	36-42	5
3rd phalange	GI	60	1
	GB	63	1
	LF	24	1
	BF	46	1
	Ld	45-53	2

Table 44 contd

6. DOG

Bone	Measurement	Range	n
Scapula	SLC	20-28	4
	GIP	24-32	3
Humerus	Bd	35	1
Ulna	GL	185 (estimate)	1
	DPA	26	1
	SDO	22	1
Femur	Bp	32	1
	DC	16	1

Table 44 contd

## 7. CAT

Bone	Measurement	Range	n
Atlas	GL	18-34	3
	GB	19-33	2
	BFcr	25	1
	BFcd	18	1
Axis	LCde	24	1
	BFcr	14-16	2
	BPacd	14	1
	SBV	11	1
	BFcd	9	1
Scapula	HS	64	1
	SLC	10-14	7
	GLP	14-15	6
Humerus	Bp	16-17	3
	Dp	20-21	3
	Bd	15-20	3
Radius	GL	93-102	3
	Bp	8-9	7
	Bd	12-14	3
	SD	6	2
Ulna	DPA	10-12	5
	SDO	9-11	5
Innominate	LAR	12-13	2
Femur	GL	104	2
	Bp	19-20	2
	Bd	17	2
Tibia	GL	109	1
	Bp	18-19	2
	Bd	14-15	5
Fibula	GL	100	1
Astragalus	GL	15	1
Calcaneum	GL	26-27	3
1st phalange	GL	13-17	6
	Bp	4-6	8
	Bd	4-5	6
2nd phalange	GL	9-11	3
	Bp	4-5	4
	Bd	4	2

Table 45mf

Anatomical distributions of bones over the whole site  
(excluding Phase 9) - Appendix 3

BONE	1. CATTLE				2. SHEEP			
	L	R	L/R	TOTAL	L	R	L/R	TOTAL
Horn Core	17	11	72	100	39	26	98	163
Skull Frags	-	-	312	312	-	-	374	374
Premaxilla	17	21	3	41	31	29	-	60
Maxilla	46	54	29	129	109	90	12	211
Max/Mand	-	-	8	8	-	-	-	-
Mandible	309	296	317	922	264	287	99	650
Atlas	-	-	73	73	-	-	80	80
Axis	-	-	82	82	-	-	59	59
Scapula	216	216	258	690	226	235	46	507
Humerus prox	33	36	48	117	65	46	29	140
dist	108	75	19	202	142	135	9	286
shaft	86	66	42	194	69	74	6	149
ent	-	1	-	1	2	3	-	5
Radius prox	74	82	25	181	69	77	6	152
dist	61	63	10	134	67	75	5	147
shaft	32	27	64	123	74	61	46	181
ent	2	2	-	4	8	7	1	15
Ulna	107	132	37	276	86	84	13	183
Carpal	145	205	12	362	57	66	9	132
Metacarpal prox	86	88	21	195	79	81	10	170
dist	17	20	65	102	25	16	14	55
shaft	14	9	58	81	9	5	37	51
ent	4	7	-	11	10	15	-	25
Innominate	193	185	178	556	184	208	34	426
Femur prox	36	47	95	178	61	55	81	197
dist	79	71	64	214	80	76	23	179
shaft	36	46	102	184	47	46	33	126
ent	-	-	-	-	2	1	-	3
Patella	19	27	4	50	34	24	6	64
Tibia prox	90	95	33	218	43	64	5	112
dist	80	91	27	198	90	97	20	207
shaft	92	94	83	269	110	100	94	304
ent	-	-	-	-	2	-	-	2
Fibula/Os Malleolare	35	23	3	61	4	1	-	5
Astragalus	114	123	11	248	140	135	7	282
Calcaneum	119	129	21	269	128	90	7	225
Naviculo-Cuboid	47	55	4	106	42	28	-	70
Tarsal = Lateral Cuneiform	18	14	5	37	1	1	4	6
Carpal/Tarsal								
Metatarsal prox	60	66	45	171	62	80	33	175
dist	22	20	55	97	17	15	16	48
shaft	5	7	82	94	6	3	79	88
ent	5	6	-	11	9	9	-	18
Metapodial	-	-	335	335	-	-	340	340
1st Phalange	-	-	605	605	-	-	553	553
2nd Phalange	-	-	455	455	-	-	206	206
3rd Phalange	-	-	221	221	-	-	106	106
Sesamoid	-	-	324	324	-	-	10	10
TOTAL	2,424	2,510	4,307	9,241	2,493	2,445	2,609	7,547

Table 45 contd

BONE	3. PIG				4. RED DEER			
	L	R	L/R	TOTAL	L	R	L/R	TOTAL
Tine	-	-	-	-	-	-	-	858*
Skull Frags	-	-	306	306	-	-	90	90
Premaxilla	-	-	-	-	-	-	-	-
Maxilla	128	104	22	254	30	27	3	60
Max/Mand	-	-	2	2	-	-	-	-
Mandible	137	116	27	280	157	162	14	333
Atlas	-	-	38	38	-	-	14	14
Axis	-	-	15	15	-	-	12	12
Scapula	91	73	-	164	66	64	9	139
Humerus prox	21	34	7	62	14	15	-	29
dist	50	45	2	97	57	54	5	116
shaft	46	39	1	86	21	9	-	30
ent	1	-	-	1	-	-	-	-
Radius prox	18	27	2	47	40	39	2	81
dist	17	28	4	49	35	44	1	80
shaft	18	17	9	44	26	22	16	64
ent	1	2	-	3	1	1	-	2
Ulna	66	62	-	128	60	52	-	112
Carpal	44	47	9	100	55	30	1	86
Metacarpal prox )					34	24	3	61
dist )					3	5	43	51
shaft ) (PIG)					1	1	48	50
ent )	51	59	20	130	3	2	-	5
Innominate	63	58	1	122	76	77	4	157
Femur prox	35	28	18	81	16	15	12	43
dist	40	39	8	87	33	27	7	67
shaft	47	56	7	110	13	22	6	41
ent	1	-	-	1	-	-	-	-
Patella	17	12	-	29	6	10	-	16
Tibia prox	37	34	4	75	36	26	3	65
dist	30	28	5	63	62	37	6	105
shaft	36	41	1	78	27	24	2	53
ent	1	1	-	2	-	-	-	-
Fibula/Os Malleolare	15	13	54	82	8	3	-	11
Astragalus	44	48	1	93	53	51	-	104
Calcaneum	38	35	1	74	52	47	1	100
Naviculo-Cuboid					31	21	-	52
Tarsal	34	51	5	90	5	2	2	9
Carpal/Tarsal	-	-	3	3	-	-	-	-
Metatarsal prox )					40	42	4	86
dist )					14	11	48	73
shaft ) (PIG)					1	-	96	97
ent )	41	43	14	98	-	-	-	-
Metapodial			209	209			105	105
1st Phalange			304	304			187	187
2nd Phalange			185	185			143	143
3rd Phalange			98	98			58	58
Sesamoid			6	6			18	18
<b>TOTAL</b>	<b>1,168</b>	<b>1,140</b>	<b>1,388</b>	<b>3,696</b>	<b>1,076</b>	<b>966</b>	<b>963</b>	<b>3,005*</b>

\*Excludes 858 Cast Antler Frags

Table 45 contd

BONE	5. HORSE				6. DOG & cf DOG			
	L	R	L/R	TOTAL	L	R	L/R	TOTAL
Horn Core/Tine								
Skull			1	1			2	2
Premaxilla								
Maxilla		2		2	1			1
Max/Mand								
Mandible	1			1	4	1		5
Atlas			1	1				
Axis								
Scapula	6	2		8	2	2		4
Humerus prox	1			1				
dist	1	1		2	1			1
shaft	2	1		3	2			2
ent								
Radius prox	1	1	1	3				
dist	2	2		4				
shaft								
ent	1			1	1			1
Ulna	1	2		3	1			1
Carpal			10	10			2	2
Metacarpal prox	2	1		3				
dist	1			1				
shaft								
ent								
Innominate	3	3		6				
Femur prox	7	3		10	1			1
dist		1		1				
shaft	2	2		4				
ent								
Patella	1		3	4				
Tibia prox	2			2				
dist	5	1		6	1			1
shaft								
ent								
Fibula/Os Malleolare								
Astragalus	5	2		7				
Calcaneum	6	3		9				
Navicular/Tarsal		2	4	6				
Tarsal	2	5	3	10				
Carpal/Tarsal			4	4				
Metatarsal prox	3	1		4				
dist								
shaft								
ent	1	1		2				
Metapodial			4	4			4	4
1st Phalange			10	10				
2nd Phalange			8	8				
3rd Phalange			5	5				
Sesamoid			11	11				
Splint			9	9				
TOTAL	56	36	74	166	13	4	8	25

Table 45 contd

BONE	7. CAT				8. FOX AND cf FOX			
	L	R	L/R	TOTAL	L	R	L/R	TOTAL
Horn Core/Tine								
Skull and Skull Frags	-	-	5	5			7	7
Premaxilla					-	-	-	-
Maxilla	3	5	-	8	1	2	-	3
Max/Mand	-				-	-	-	-
Mandible	2	6	-	8	6	7	-	13
Atlas			3	3	-	-	2	2
Axis			2	2	-	-	5	5
Scapula	3	6	-	9	5	3	-	8
Humerus prox	3	2	-	5	3	-	-	3
dist	3	-	-	3	2	2	-	4
shaft	3	1	-	4	2	1	-	3
ent	2	1	-	3	1	-	-	1
Radius prox	2	3	-	5	3	3	-	6
dist					1	3	-	4
shaft	1	2	-	3	-	-	-	-
ent	2	1	-	3	1	2	-	3
Ulna	4	5	-	9	3	6	-	9
Carpal					-	-	-	-
Metacarpal prox								
dist								
shaft								
ent								
Innominate	5	2	-	7	3	2	-	5
Femur prox	1	-	-	1	-	3	-	3
dist	2	-	-	2	2	2	-	4
shaft	1	2	-	3	-	2	-	2
ent	1	1	-	2	-	-	-	-
Patella								
Tibia prox	-	2	-	2	2	3	-	5
dist	1	2	-	3	2	2	-	4
shaft					1	1	-	2
ent	1	1	-	2	2	-	-	2
Fibula	2	3	-	5	-	-	4	4
Astragalus	-	1	-	1	4	2	-	6
Calcaneum	1	2	-	3	3	3	-	6
Naviculo-Cuboid								
Tarsal								
Carpal/Tarsal	-	-	4	4	-	-	5	5
Metatarsal prox								
dist								
shaft								
ent								
Metapodial	-	-	23	23	-	-	44	44
1st Phalange	-	-	11	11	-	-	16	16
2nd Phalange	-	-	5	5	-	-	6	6
3rd Phalange					-	-	3	3
Sesamoid					-	-	-	-
Sacrum					-	-	3	3
TOTAL	43	49	53	144	47	49	95	191

Table 45 contd

BONE	9. OTTER				10. SEAL			
	L	R	L/R	TOTAL	L	R	L/R	TOTAL
Horn Core/Tine								
Skull	-	-	2	2				
Premaxilla								
Maxilla	1	-	-	1				
Max/Mand								
Mandible	1	2	-	3	1	1	-	2
Atlas								
Axis								
Scapula					1	-	1	2
Humerus prox					2	1	-	3
dist	1	-	-	1				
shaft								
ent								
Radius prox								
dist								
shaft	-	1	-	1				
ent	-	2	-	2				
Ulna	-	3	-	3				
Carpal								
Metacarpal prox								
dist								
shaft								
ent								
Innominate	2	1	-	3	1	1	1	3
Femur prox					1	-	-	1
dist	1	-	-	1				
shaft								
ent	1	-	-	1				
Petalle								
Tibia prox	2	1	-	3				
dist								
shaft					1	-	-	1
ent								
Fibula								
Astragalus								
Calcaneum								
Naviculo-Cuboid								
Tarsal								
Carpal/Tarsal					-	-	2	2
Metatarsal prox					-	-	1	1
dist								
shaft								
ent					-	-	1	1
Metapodial	-	-	2	2	-	-	5	5
1st Phalange					-	-	3	3
1st or 2nd Phalange					-	-	6	6
3rd Phalange					-	-	6	6
Sesamoid								
TOTAL	9	10	4	23	7	3	26	36

Table 45 contd

BONE	11. SMALL MAMMAL (= PROB VOLE)				12. VOLE			
	L	R	L/R	TOTAL	L	R	L/R	TOTAL
Horn Core/Tine								
Skull					-	-	289	289
Premaxilla								
Maxilla					19	13	11	43
Max/Mand					-	-	16	16
Mandible					162	144	18	324
Atlas	-	-	12	12				
Axle	-	-	9	9				
Scapula	11	11	4	26				
Humerus prox	19	12	14	45				
dist	39	40	11	90				
shaft	2	1	18	21				
ent	1	2	-	3				
Radius prox	1	1	28	30				
dist	-	-	14	14				
shaft	-	-	5	5				
ent	1	-	-	1				
Ulna	20	28	6	54				
Carpal								
Metacarpal prox								
dist								
shaft								
ent								
Innominate	46	43	3	92				
Femur prox	61	91	6	158				
dist	8	9	41	58				
shaft	7	9	-	16				
ent	10	8	-	18				
Patella								
Tibia prox	33	27	9	69				
dist	41	46	15	102				
shaft	6	9	7	22				
ent	4	4	-	8				
Fibula								
Astragalus	6	4	1	11				
Calcaneum	12	9	-	21				
Naviculo - Cuboid								
Tarsal								
Carpal/Tarsal	-	-	1	1				
Metatarsal prox								
dist								
shaft								
ent								
Metapodial	-	-	154	154				
1st Phalange	-	-	28	28				
2nd Phalange	-	-						
3rd Phalange								
Sesamoid								
TOTAL	328	354	386	1,068	181	157	334	672

Table 45 contd

BONE	13. FIELD MOUSE				14. PYGMY SHREW			
	L	R	L/R	TOTAL	L	R	L/R	TOTAL
Horn Core/Tine								
Skull			2	2				
Premaxilla								
Maxilla	8	5	-	13				
Max/Mand								
Mandible	9	9	-	18	-	1	-	1
Atlas								
Axis								
Scapula								
Humerus prox								
dist								
shaft								
ent								
Radius prox								
dist								
shaft								
ent								
Ulna								
Carpal								
Metacarpal prox								
dist								
shaft								
ent								
Innominate								
Femur prox								
dist								
shaft								
ent								
Patella								
Tibia prox								
dist								
shaft								
ent								
Fibula/OS Malleolare								
Astragalus								
Calcaneum								
Naviculo - Cuboid								
Tarsal								
Carpal/Tarsal								
Metatarsal prox								
dist								
shaft								
ent								
Metapodial								
1st Phalange								
2nd Phalange								
3rd Phalange								
Sesamoid								
TOTAL	17	14	2	33	-	1	-	1

Table 45 contd

BONE	15. BROWN RAT				16. RABBIT*			
	L	R	L/R	TOTAL	L	R	L/R	TOTAL
Horn Core/Tine								
Skull	-	-	1	1				
Premaxilla								
Maxilla								
Max/Mand								
Mandible	-	1	-	1				
Atlas								
Axis								
Scapula								
Humerus prox								
dist						1		1
shaft								
ent								
Radius prox								
dist						1		1
shaft								
ent								
Ulna								
Carpal								
Metacarpal prox								
dist								
shaft								
ent								
Innominate								
Femur prox		1		1				
dist						1		1
shaft								
ent								
Patella								
Tibia prox								
dist						1		1
shaft								
ent								
Fibula/OS Malleolare								
Astragalus								
Calcaneum					1			1
Naviculo - Cuboid								
Tarsal								
Carpal/Tarsal								
Metatarsal prox								
dist								
shaft								
ent								
Metapodial							5	5
1st Phalange								
2nd Phalange								
3rd Phalange								
Sesamoid								
TOTAL	-	2	1	3	1	4	5	10

\*All bones came from Phase B

Table 45 contd

## 17. BIRD

BONE	L	R	L/R	TOTAL
Cranium/Premaxilla	-	-	50	50
Mandible	5	7	31	43
Clavicle	-	-	17	17
Sternum	-	-	59	59
Coracoid	34	44	4	82
Scapula	16	15	10	41
Humerus	128	96	4	228
Radius	12	18	26	56
Ulna	80	75	9	164
Carpometacarpus	27	36	1	64
Innominate	14	10	54	78
Femur	69	62	5	136
Tibiotarsus	78	69	63	210
Fibula	-	-	7	7
Tarsometatarsus	77	56	16	149
Phalange 1 (Anterior of 2nd Digit)	-	-	13	13
Phalange (Other)	-	-	30	30
TOTAL	540	488	399	1,427

## 18. FROG/TOAD

BONE	L	R	L/R	TOTAL
Coracoid	-	-	2	2
Scapula	6	2	1	9
Humerus	40	31	-	71
Radio - Ulna	10	10	8	28
Illum	14	16	-	30
Urostyle	-	-	6	6
Femur	31	49	5	85
Tibio - Fibula	2	2	99	103
Astragalus/Calcaneum	-	-	7	7
Metatarsal	-	-	1	1
Metapodial	-	-	1	1
Phalange	-	-	12	12
TOTAL	103	110	142	355

Table 46mf Bird bone species by their numbers and phase

Species	2	3	4	4/5	5	5/6	5/7	6	6/9	7	7/8	8	8/9	9
Great Northern Diver					2							2		
Slavonian Grebe												1		
Fulmar										3		1		
Sooty Shearwater										1				
Manx Shearwater										3	1			
Gannet						15		1		26*	1	16	1	10
Cormorant										15	2	6		4
Shag					2	4				15		6		2
Grey Heron										1				
Mute Swan										1		1		
Whooper Swan		2								9	2	5		1
White-Fronted Goose?												1		
Greylag Goose										11		3		1
Barnacle Goose										2				
Brent Goose										1		1		
Domestic/Greylag Goose										1		6		
Goose sp.										4				
Shelduck										1		1		
Wigeon										1		2		
Gadwall?										4		1		
Teal										2	1			1
Mallard?										5				
Mallard/Pintail										1	1	2		
Mallard/Domestic Duck														1
Pintail?							1					1		
Shoveller														2
Pochard										1				
Eider										3		2		
Long-Tailed Duck										1		1		
Common Scoter										1		1		
Velvet Scoter										1				
Goldeneye										4		3		
Smew										1				
Red-Breasted Merganser										2		4		1
Goosander										1				
Duck sp.		4								1		3		
Preditor sp.										1				
Red Kite												1		2



Table 46a Bird bone species by their numbers and phase (cont'd)

Species	2	3	4	4/5	5	5/6	5/7	6	6/9	7	7/8	8	8/9	9
Black Guillemot										1		6		
Little Auk						1				6	2	5		1
Puffin										2	1	5		
Auk sp.										1				1
Rock Dove								1	1	6	3	6		2
Stock Dove												1		
Tawny Owl										1				
Short-Eared Owl											7	17*		1
Skylark										1		4		1
Swallow												6		
Pipit?												1		
Great Grey Shrike/ Eastern European Thrush										4				
Waxwing										1		1		
Wren					1									
Warbler sp.										1				
Ringouzel												4		
Ringouzel/Blackbird										4		1		
Blackbird										1		7		1*
Fieldfare								2		5		2		1*
Song Thrush										8		7		
Song Thrush/Redwing						1				19		2		1
Redwing										2	2	5		
Mistle Thrush										1		8		
Thrush sp.										9*		13		1
Thrush/Starling										8		20		2*
Great Tit										6				
Rock/Crow										1		7		
Raven					2	11				19	21	10*		17
Starling	1					3			8*	108*	2	127*		40
Chaffinch										1				
Snow Bunting										1				
Reed Bunting										3				
Corn Bunting										1				
Lark/Bunting										2				
Finch sp.												1		
Small Passerine												1		
Domestic Duck											2			1
Domestic Powl										5		3		58*
Domestic Goose										1				1

HOWE

B BALLIN SMITH (Ed)

FICHE 2 CONTENTS LIST

A3-G14 | 8.3.1 Stone artefact report  
Catalogue

Incised Stones

SF	Context	Phase	Description
700	514	8	Large flat stone with 7 horizontal and 7 vertical lines scratched on one surface to form a series of small rectangles (approx 15 x 15 mm). Small circles (4-5 mm dia) noticed at 11 central intersections of the lines. Siltstone. (illus 106) ML 190 mm MW 147 mm MT 25 mm
2034	715	8	Irregular piece of stone. Incised on one surface with the initials AM and underlined twice. Shaly fine grained sand stone. ML 248 mm MW 148 mm MT c40 mm
2175	811	8	Stone with mark cut from larger block. Mark only fragmentary. Fan-shaped with 3 segments delineated by 4 grooves. Most of top of fan is missing. ML 23 mm MW 40 mm MDepth of grooves 1 mm MW of lines c1 mm
4304	714	9	Incised stone with a double bow shaped design cut into the face. Stone cut from a larger block. Calcareous fine grained sandstone. ML 98 mm MW 40 mm MDepth of line c2 mm MW of line 3 mm
4933	1456	7	Fragment of flat stone with 10 parallel lines scratched on one surface. No cross scratching. Siltstone. ML 150 mm MW 150 mm MT 34 mm
<b>Armlets</b>			
2087	786	8	Yellow sandstone with a dark surface application which is naturally shiny or polished. Semi circular in section, with a rounded under side. Carve marks and scratches on surface. Surface material also applied after fracture. Black coated fine-grained sandstone. (illus 107) Est MD 80 mm ML 65 mm MW 19 mm MT 13 mm
4594	1403	7	Fragment of polished jet. Probably semi-circular in section. Piece broken at both ends. Surface suffered from chipping and presence of cut mark ML 14 mm x MDepth 2 mm. Jet. (illus 107) MD c90 mm MW 13.5 mm MT preserved 14 mm

SF	Context	Phase	Description
7082	1335	7	Fragment of stone armlet. Semi-circular in section. Surface marked and pecked. Not polished. Fine-grained sandstone. Est D 60 mm ML 31 mm MW 15 mm MT 10.5 mm
7236	1958	7	Fragment of jet armlet, also split longitudinally. Probably semi-circular in section. Polished. Jet/shale. Est D 60 mm ML 69 mm MW 10 mm MT 10 mm
<b>Counters</b>			
4221	1182	7	Circular disc, rounded edges, sides ground smooth. Highly polished. Siltstone. MD 22 mm MT 5 mm
4343	715	8	Irregular circular disc. Edges ground to shape. Surfaces uneven. Siltstone. (illus 106) MD 26.5 mm MT 8 mm
4619	1410	8	Small irregularly rounded disc. Edges ground smooth. Siltstone. MD 27 mm MT 4 mm
5167	1491	7	Small flat disc, with rounded edges. Slightly damaged. Fine-grained sandstone. MD 24 mm MT 5.5 mm
7391	2046	3	Sub-oval and irregular disc. One flat surface, sides ground squarely. One small hole 1.5 mm MD on irreg surface. Fine grained sandstone. ML 24 mm MW 20 mm MT 10 mm
<b>Stone balls</b>			
17	1	9	Highly polished slightly irregular spherical stone ball. Fine grained buff coloured sandstone, artificially coloured with black oily film. (illus 106) MD 37 mm
2746	737	7	Worked stone roundel, sides smoothed and surfaces roughly flattened. Fine grained buff coloured sandstone. MD 35 mm MT 23.5 mm
4047	1076	7	Steatite subspherical stone ball MD 22 mm (illus 106)
4710	1	9	Flattened spherical polished stone roundel. Highly polished on part of surface. Siltstone. (illus 106) MD 26 mm MT 16.5 mm

SF	Context	Phase	Description
Small Miscellaneous			
120	142	8/9	Polished rounded jet object. Semi-circular in section with flat base. Has small hole in centre of base. Pin head. MD 23.5 mm MT 11.5 mm MD of hole 3.5 mm MDepth of hole 5.5 mm
605	1	9	Red oval and banded carnellan, translucent. Base is flat and well polished. In section appears as a flat dome. Sides are well polished but the upper surface is slightly abraded. Has an eagle engraved into the upper surface. ML 9 mm MW 7.5 mm MT 4 mm ML of bird 4.5 mm
2015	722	8	'Slate' pencil. Oblong with square section. Has been cut to shape and the end trimmed to a point. Silicified siltstone. (illus 106) ML 35 mm MW 5 mm MT 3.5 mm
2200	826	7/8	Egg-shaped quartzite pebble. Has a central band of applied colour round its middle (MW 8.5 mm). Also has 3 prominent and 2 faded irregular dots at one end and 5 irregular dots at the other. May have been repainted as the central band links up 2-3 earlier dots. Pinkish white quartzite. (illus 106) ML 32 mm MW 20 mm
4397	1264	8	Flat mica-schist disc, probably a beach pebble. Edges partly ground smooth. Hornblende-mica-schist. Basement complex? MD 59 mm MT 5.5 mm
4563	1352	8	Greeny/silver metallic coloured mica schist disc. Edges ground and slightly chipped. Hornblende-mica-schist - Basement complex. MD 59 mm MT 5.5 mm
4965	1480	7	Small triangular shaped stone. Slightly chipped at both ends. One end is roughly squared off. At the other end a semi-circular hollow has been shaped at one edge to form a rounded, hooked end. All edges are smoothed. Siltstone. (illus 109) ML 53 mm MW 17 mm MT 18 mm ML of hole 15 mm
5458	1313	7	Polished jet ring. Round in section. Only 1/2 present, and part of surface damaged. (illus 107) EstD 53 mm MT 13 mm MD of central hole c24 mm

SF	Context	Phase	Description
<b>Beads</b>			
733	545	8	Small round bead fragment. Hole possibly waisted. Approximately 20 per cent present. Fine grained sandstone. EstMdia 25 mm MT 10 mm
4506	1353	8	Small stone whorl. Edges and one face damaged. Split through width. Has a central hole. Shaly sandstone. MD 29 mm MT 6 mm MD of hole 7 mm
4511	1358	8	Spherical steatite bead with central hole. (illus 107) MD 18 mm MT 12.5 mm MD of hole 9.5 mm
5457	1271	7	Irregular squarish bead. Edges and one surface damaged. Central hole waisted. Fine grained sandstone. DL 22 mm MW 21 mm MT 7 mm MD of hole 5 mm
7031	1638	7	Irregular shaped stone with waisted central hole. Possibly a split pebble. Thin bedded fine-grained yellow sandstone. MD 38 mm MT 6 mm MD of hole 7 mm
7091	1759	7	Fragment of rounded red sandstone bead. Centrally perforated with waisted hole. Fine grained sandstone (burnt). ML 19.5 mm MW 14 mm MT 11 mm
<b>Spindle Whorls</b>			
681	1	9	Rounded whorl, with straightened sides. Hole slightly off centre. Ferruginous siltstone. MD 23 mm MT 12 mm MD of hole 7.5 mm
1831	399	8	Roughly rounded whorl. Hole slightly off centre and elliptical. Spindle would have been angled in hole. Fine grained sandstone. (illus 110)
1865	729	8/9	Rounded whorl, sides dressed and one face has striation marks. Central waisted hole, chipped slightly round edges and sides of whorl. Siltstone. (illus 110) MD 59 mm MT 13 mm MD of hole 21.5 mm
2097	399	8	Rounded whorl, central hole, slightly elliptical. Siltstone. MD 30 mm MT 17 mm MD of hole 10 mm
2171	814	9	Rounded whorl with straight sides. Waisted hole slightly off centre. Fine grained micaceous silty sandstone. MD 30 mm MT 10 mm MD of hole 8 mm

SF	Context	Phase	Description
2278	858	7/8	Burnt rounded pebble. Hole off centre, splayed on one face. Rounded edges. Fine grained micaceous sandstone. MD 43 mm MT 18 mm MD of hole 15 mm
2545	912	8	Rounded whorl. One surface is completely missing. Central hole presumably waisted. Fine grained micaceous sandstone. MD 35 mm MT present 8.5 mm MD of hole 8 mm
2704	747	7	Circular stone whorl. Lost 90 per cent of one face and 60 per cent of other. Laminated sandstone. Small central hole. Fine grained micaceous sandstone.
2780	924	8	MDia 48 mm MT 8 mm Hole MDia 6 mm Irregular rounded whorl, dressed sides. Off centre waisted hole. Limonitic sandy siltstone. MD 34 mm MT 14 mm MD of hole 11 mm
2951	1082	7	Rounded pebble. Hole slightly off centre and splayed on one face only. Shaly sandstone. MD 43.5 mm MT 15 mm MD of hole 15 mm
3912	unstrat	9	Steatite, rounded whorl. One edge damaged. Roughly shaped to a round. Central hole slightly waisted. MD 35 mm MT 14 mm MD of hole 12 mm
4023	871	8	Split circular whorl, one face lost. Central hole. Silty micaceous sandstone. MD 27 mm MT 12 mm MD of hole 9.5 mm
4195	1060	7	Circular polished jet whorl with rounded edges. Central hole with slightly splayed apertures. MD 37 mm MT 9.5 mm MD of hole 15 mm (111us 110)
4255	25	7	Sub-circular, irregular sandstone whorl. Smooth and waisted central hole. Fine grained micaceous sandstone. MD 50 mm MT 20 mm MD of hole 18 mm
4274	1116	8	Rounded whorl, flattened surfaces. Hole slightly off centre. Fine grained sandstone. MD 38 mm MT 15 mm MD of hole 10 mm
4300	1181	8	Roughly rounded whorl. Straight sides. Slightly damaged. Central hole splayed on one side. Fine grained micaceous sandstone. MD 30 mm MT 11 mm MD of hole 10 mm

SF	Context	Phase	Description
4528	1352	8	Irregular shaped stone whorl. Sides straight. Central hole elliptically splayed. Spindle would have been angled in hole. Fine grained micaceous sandstone. MD 31 mm MT 27 mm MD of hole 9 mm
4540	1353	8	Small round and flat whorl with rounded edges and central hole. Fine grained sandstone. MD 41 mm MT 11 mm MD of hole 8 mm (illus 110)
4889	1410	8	Small rounded whorl with waisted central hole. Fine grained silty sandstone. MD 27.5 mm MT 12 mm MD of hole 13 mm
5080	1583	7	Small rounded and flat whorl. One face damaged. Waisted central hole. Fine grained ferruginous sandstone. MD 34 mm MT 12 mm MD of hole 12 mm
5219	1457	7	Small red whorl with rounded edges and waisted central hole. Fine grained micaceous sandstone-burnt. MD 42 mm MT 18 mm MD of hole 17 mm (illus 110)
5270	1470	7	Small circular stone, rounded edges and dressed sides. Waisted central hole. Fine grained ferruginous sandstone. MD 36 mm MT 15 mm MD of hole 15 mm
5294	1491	7	Rounded flat whorl with central hole. Limonitic fine-grained sandstone. MD 42 mm MT 13.5 mm MD of hole 11 mm
5335	1491	7	Small rounded whorl with central hole. Fine grained limonitic sandstone. MD 40 mm MT 14 mm MD of hole 11 mm
5341	1583	7	Rounded whorl with slightly waisted central hole. Fine grained sandstone, burnt. MD 43 mm MT 20 mm MD of hole 12 mm

SF	Context	Phase	Description
5366	1373	7	Small circular stone with rounded edges and waisted central hole. Sandy silt stone. MD 38 mm MT 109 mm MD of hole 13 mm (illus 110)
7027	1830	7	Sub-rounded whorl, rough body and off centre waisted hole. Fine grained silty ferruginous sandstone. MD 47 mm MT 16 mm MD of hole 15 mm
7055	1851	7	Irregular shaped stone with waisted hole. Fine grained silty sandstone, porous. ML 44 mm MW 33 mm MD of hole 16 mm
7136	1879	4	Sub-rounded whorl with slightly off-centre elliptical hole which is waisted. Fine grained ferruginous silty sandstone. ML 47 mm MT 16 mm MD of hole 18 mm
7268	1	9	Irregular whorl with damaged edges. Splayed central hole. Burnt. Limonitic siltstone. MD 47 mm MT 13 mm MD of hole 16 mm
7367	2046	3	Rounded steatite whorl with straight sides and central hole. MD 37 mm MT 15 mm MD of hole 10 mm (illus 110)
Fragmentary spindle whorls, (or incomplete)			
2157	770	7/8	Burnt. Only part of one face and side present. Stone pecked to shape, hole presumably central and waisted. MD 49 mm MT 17 mm MD of hole 22 mm Weight 21.8 grams. Fine grained red sandstone.
2637	981	7	Rounded pebble split in half. Central hole partially waisted. Burnt. Siltstone. MD 36 mm MT 21 mm MD of hole 13 mm Weight 16.6 grams.



SF	Context	Phase	Description
2729	883	7	Rounded whorl, sides slightly squared. Some edges rounded. Both faces drilled c4 mm deep for central hole. Medium grained sandstone. MD 32 mm MT 20 mm MD of unfinished holes 8 mm Weight 38.7 grams.
4180	1076	7	Flat, with roughly chipped sides and edges. On each surface the beginning of a splayed hole c5 mm deep. Fine grained sandstone. MD 47 mm MT 13 mm of unfinished holes 13 mm Weight 36.6 grams.
4621	1410	7	Five fragments. Half the diameter present. Shattered across its width. Fine grained micaceous sandstone. MD 33 mm MT present 7 mm MD of hole 10 mm
<i>Perforated stone</i>			
29	1	9	Incomplete sandstone pebble. Semi-circular fragment present, approximately 50 per cent of whole. Waisted central hole. Hole and stone pecked. Fine grained sandstone. ML 190 mm MW 100 mm MT 51 mm. Hole: Est Dia 50 mm MT 50 mm
4176	1088	7	Oval pebble with convex faces. Centrally perforated by a waisted hole, pecked to shape and slightly worn. Stone damaged on one face. May have originally been a quernstone rubber, utilised later as a loom weight. Medium-grained grey sandstone. (illus 111) ML 176 mm MW 142 mm MT c55 mm hole MD 74 mm
5154	1545	7	Circular rounded stone, fractured along edges and one face badly damaged. May have originally been pecked to shape around edges. Central pecked waisted hole, worn. Coarse grained micaceous sandstone. (illus 111) MDia 158 mm MT 49 mm MDia of hole 60 mm

SF	Context	Phase	Description
5400	1692	7	<p>Large rectangular pebble, badly fractured at one end, as if used as hammerstone. Waisted central hole with surface peck marks. Interior of hole worn or ground smooth. Fine grained micaceous sand stone. (illus 111)</p> <p>ML 206 mm MW 110 mm MT 33 mm MDia of hole 45 mm</p>
7042	1837	5/6	<p>Incomplete sand stone pebble. Semi-circular fragment present, approximately 50 per cent of whole. Waisted central hole. Medium grained grey sandstone (burnt).</p> <p>Mdia 198 mm MT 69 mm Hole: Mdia 60 mm MT 67 mm</p>
7246	1962	7	<p>Flattened and rounded pebble with central waisted hole, pecked and scored to shape. Slight signs of wear around edges of hole. Stone slightly pecked to shape around ends, and partially damaged on one face. Limonitic siltstone. (illus 111)</p> <p>ML 185 mm MW 165 mm MT c40 mm Hole: MD 52 mm</p>
7311	1960	4	<p>Flattish round stone with waisted central hole, pecked and worn. Medium grained sandstone with fish fragments. (illus 111)</p> <p>Mdia 70 mm MT 13 mm Hole: MDia 23 mm</p>
<b>Axes</b>			
7392	2072	1	<p>Camptonite stone axe, oval in section. Narrow and severely chipped, as if used as a hammer. Secondary flaking present on both surfaces, mainly down one side and less severely on the other. Other end has been ground to a cutting edge, which is worn, and later slightly damaged. Axe polished smooth. Monchlnquite. (illus 109)</p> <p>ML 109 mm MT 28 mm MW 56 mm</p>

SF	Context	Phase	Description
7407	2072	1	Hand axe fragment of Camptonite with olivines. Oval in section. Ground and polished cutting edge at one end. The other end is broken. One edge at right angles to the cutting edge has a 75° chamfer. Other edge has secondary chipping. Camptonite. (illus 109)
<b>Skull Knife</b>			
7419	2072	1	Split beach pebble. Bulbous end has percussion indentation from shattering. Opposite worked edge is curved with one hinged fracture. Edge has been used and worn, with chipping due to wear. One other edge (the thinnest) seems used, with wear marks and some slight chipping. Medium-grained micaceous sandstone. ML 113 mm MW 123 mm MT 14 mm
<b>Hammer stones</b>			
<b>Single ended</b>			
470	133	8	L shaped pebble. Bifacially flaked on short arm. Fine-grained sandstone. ML 107 mm MW 62 mm MT 19 mm
1877	722	8	Most of worked end has been shattered and severely chipped away. Some peck marks on body. Fine-grained sandstone. ML 112 mm MW 56 mm MT 38 mm
2002	725	7	Elongated pebble. Shattered at point of wedge-shaped wider end. One face partially burnt. May have also been used as a polisher. Fine and medium grained sandstone (burnt?) ML 252 mm MW 70 mm MT 25 mm
2159	826	7/8	Rounded pebble. Flaked irregularly round edges. Some pecking on body. Medium-grained sandstone. ML 79 mm MW 65 mm MT 32 mm
2220	813	8	Irregular pebble. Bifacially shattered at one end at an opposing corner. Pink granite (from glacial drift?) ML 106 mm MW 80 mm MT 28 mm

SF	Context	Phase	Description
2331	883	7	Rounded pebble. Substantially fractured at one end only. Weathered pink granite (?glacial drift). ML 123 mm MW 57 mm MT 50 mm
2484	912	8	Rounded pebble. Well flaked at one end. Felsite (from glacial drift?) ML 123 mm MW 103 mm MT 55 mm
2496	912	8	Coarse tool. Bifacially flaked at one end, one side sheared away and part of one face. Some pecking on body and one linear indent near butt end. Fine grained micaceous sandstone. ML 165 mm MW 44 mm MT 37 mm
2526	923	8	Slightly elongated pebble. Shattered at one end. Weathered granite - ? Basement complex. ML 152 mm MW 41 mm MT 35 mm
2571	894	7/8	Irregular shaped pebble. Bifacially flaked on one edge. Pink granite, flow banded (from glacial drift?)
2653	883	7	Large pebble. Bifacially flaked at one end. Pink granite (from glacial drift?) ML 173 mm MW 85 mm MT 51 mm
2808	1020	5/6	Pear shaped pebble. Seems to have been flaked at one end to a rough point. Slightly burnt. Medium grained sandstone, burnt? ML 65 mm MW 41 mm MT 25 mm
4060	1106	8	Beach pebble of Felspar porphyry shattered at one end. Porphyritic felsite (found in drift deposit). ML 113 mm MW 41 mm MT 31 mm
4144	1150	8	Elongated pebble. Fractured at wider end. Shaly siltstone. ML 227 mm MW 63 mm MT 24 mm
4218	1098	8	Triangular sectioned pebble. Well flaked at one end and burnt. Some pecking down one edge and on one side. Other end naturally square ended. Fine grained sandstone. ML 137 mm MW 71 mm MT 50 mm
4390	1292	7	Elongated square sectioned pebble. Bifacially flaked at one end. Mottled siltstone. ML 167 mm MW 36 mm MT 32 mm

SF	Context	Phase	Description
4514	807	6-9	Wedge shaped pebble. Severely fractured at wider end, down one side and on both faces. Weathered granite - Basement complex? ML 199 mm MW 74 mm MT 41 mm
4944	1423	7	Dense pebble, well flaked and fractured at one end. Fine grained sandstone. ML 113 mm MW 79 mm MT 48 mm
5147	1491	7	Pear shaped pebble. Lightly flaked at one end. Some pecking on one face and down one side. Also patch of flaking on one edge where stone has been used as a hammer. Siltstone. ML 117 mm MW 54 mm MT 18 mm
5320	1457	7	Chipped at one end. Fine grained shaly sandstone. ML 183 mm MW 88 mm MT 61 mm
5336	1667	6	Wedge-shaped pebble. Fractures at wider end. Mottled siltstone. ML 204 mm MW 80 mm MT 41 mm
5350	1468	6	Sub-rounded pebble. Severely fractured at one end and down one side. Surface of pebble partially lost on 2 faces because of pecking. Fine grained micaceous sandstone. (illus 112) ML 128 mm MW 68 mm
6929	2042	7	Slightly elongated pebble. Shattered at one end and partially down one face. Fine-grained sandstone. ML 133 mm MW 49 mm MT 35 mm
7005	1813	4	Large elongated but irregular shaped pebble. Fractured at broad end. Fine-grained sandstone with occasional quartzite pebbles. ML 225 mm MW 80 mm MT 56 mm
7184	1604	7	Large fragment. Broken butt end. Worked end flaked from 3 directions. Siltstone. ML 146 mm MW 68 mm MT 68 mm
<b>Double ended (Hammer stones)</b>			
3	1	9	Triangular shaped stone chipped on all 3 apices. Fine-grained sandstone. ML 165 mm MW 76 mm MT 24 mm

SF	Context	Phase	Description
10	1	9	Rounded beach pebble. Heavily chipped at both ends. Siltstone. ML 117 mm MW 74 mm MT 49 mm
155	133	8	Shattered bifacially at both ends. Fine-grained sandstone. (also used as a hole?) (illus 112) ML 108 mm MW 45 mm MT 30 mm
2017	733	8	Severely shattered at both ends and down one side. Fine-grained sandstone. ML 123 mm MW 80 mm MT 65 mm
2189	811	8	Shattered at both ends. Granite (pebble from glacial drift?) ML 144 mm MW 75 mm MT 53 mm
2284	1	9	Shattered at both ends. Granite (pebble from glacial drift?) ML 190 mm MW 87 mm MT 62 mm
2443	876	7	Shattered at both ends and very severely at one end. Pecked very roughly on one side and in centre of stone. Siltstone, and very fine-grained sandstone. ML 185 mm MW 77 mm MT 50 mm
2468	876	7	Wedge-shaped stone. Shattered at both ends. Burnt. Fine grained shaly sandstone - burnt. ML 142 mm MW 55 mm MT 50 mm
2551	912	8	Elongated tool shattered at both ends and into body at one end. Fine-grained shaly sandstone. ML 160 mm MW 37 mm MT 25 mm
2554	912	8	Flat stone shattered at both ends. Fine-grained sandstone. ML 143 mm MW 64 mm MT 24 mm
2826	1020	5/6	Chipped at both ends. Possible polish marks on body. Bostonite. ML 195 mm MW 122 mm MT 63 mm
2828	1020	5/6	Well shattered at both ends. Fine-grained shaly sandstone. ML 72 mm MW 68 mm MT 47 mm
2889	973	7	Irregular flat pebble. Finely shattered at both ends. Siltstone. ML 71 mm MW 63 mm MT 12 mm

SF	Context	Phase	Description
2984	1088	7	Elongated thin stone. Shattered at both ends. Shaly siltstone. ML 186 mm MW 73 mm MT 20 mm
2995	1082	7	Well shattered at both ends. Fine-grained sandstone. ML 135 mm MW 61 mm MT 61 mm
4165	1	9	Shattered at both ends. Pecked down one side. Fine-grained sandstone. ML 221 mm MW 94 mm MT 61 mm
4275	1252	8	Bifacially flaked at both ends and into body. Fine-grained sandstone. ML 121 mm MW 61 mm MT 40 mm
4317	733	8	Well shattered at both ends and into body of tool. Fine-grained sandstone. ML 118 mm MW 72 mm MT 60 mm
4428	1326	7	Well shattered at both ends. Fine grained sandstone. ML 115 mm MW 50 mm MT 41 mm
4869	63	7	Flat pebble, shattered at both ends. Fine-grained micaceous sandstone. ML 110 mm MW 60 mm MT 20 mm
4895	61	7	Shattered at both ends and more severely at broad end. Fine-grained sandstone. ML 135 mm MW 66 mm MT 28 mm
4928	1313	7	Flaked and shattered both ends. Peck marks on both sides and one one face. Fine-grained sandstone. ML 82 mm MW 46 mm MT 25 mm
4929	1543	7	Shattered bifacially at both ends. Fine-grained sandstone. ML 159 mm MW 96 mm MT 43 mm
5022	1	9	Shattered at one end and flaked and shattered on the other and partially down one side. Fine-grained sandstone. ML 190 mm MW 94 mm MT 83 mm
5338	1583	7	Flaked and shattered at both ends. Siltstone. ML 172 mm MW 55 mm MT 30 mm

SF	Context	Phase	Description
5384	1597	7	Elongated stone. Chipped at both ends. Fine-grained mottled sandstone. ML 166 mm MW 42 mm MT 18 mm
7080	1355	7	Shattered at both ends and into body at one end. Medium-grained sandstone. ML 170 mm MW 67 mm MT 48 mm
7153	1914	5/6	Flaked at both ends. One side shattered away. Banded, siltstone and fine-grained sandstone. ML 185 mm MW 87 mm MT 73 mm
7234	1958	7	Severely shattered at both ends. Granite-pebble from glacial drift? ML 142 mm MW 95 mm MT 50 mm
7247	716	5/6	Chipped at both ends and pecked down both sides. Pecking is much earlier. Fine-grained sandstone. ML 120 mm MW 62 mm MT 40 mm
7320	1998	3/4	Flaked and shattered both ends. Siltstone. ML 193 mm MW 85 mm MT 46 mm
7388	2056	3	Flaked and shattered both ends. Bostonite, weathered. ML 172 mm MW 89 mm MT 60 mm
7514	923	8	Shattered both ends. Granite-gneiss (from glacial drift?) ML 103 mm MW 74 mm MT 60 mm
7534	1993	4	Bifacially shattered at both ends. One end may have been pecked. Fine-grained sandstone. ML 202 mm MW 84 mm MT 44 mm
125	133	6	Shattered at both ends and half thickness of stone shattered away by blows. Fine grained sandstone. ML 158 mm MW 80 mm MT 36 mm
1166	402	8	Flaked at surviving end. Sandstone. ML 89 mm MW 45 mm MT 48 mm
4102	1132	7	Flaked at surviving end. Medium granite sandstone. ML 85 mm MW 47 mm MT 50 mm
4725	1251	7	Flaked at the one end. Broken across width. Elongated pebble. Fine grained sandstone (hone?) ML 130 mm MW 47 mm MT 31 mm

SF	Context	Phase	Description
5465	1747	7	Elongated tool flaked at surviving end. Fine grained sandstone. ML 127 mm MW 41 mm MT 35 mm
5511	1170	8	Shattered at surviving end. ML 58 mm MW 71 mm MT 57 mm
7121	1864	7	Flaked at surviving end. Broken across body. Medium-grained sandstone. ML 106 mm MW 99 mm MT 75 mm
7800	1776	7	Flaked at surviving end. Burnt. Possibly pecked down one side. Fine-grained sandstone (burnt?)
<b>Grinders</b>			
<b>Single ended</b>			
3815	1080	7	Fragment of faceted grinder. Fine-grained sandstone. ML 58 mm MW 40 mm MT 25 mm
5095	1545	7	Fragment of grinder. Fine-grained sandstone. ML (present) 63 mm MW 60 mm MT 32 mm
5133	1504	7	Tip of faceted grinder. Fine-grained sandstone. ML 36 mm (present) MW 54 mm MT 41 mm
5214	1491	7	Triangular shaped pebble. Ground at narrow end. Fine-grained sandstone. ML 116 mm MW 71 mm MT 20 mm
5277	1545	7	Ground and faceted at end. Fine-grained sandstone. ML 132 mm MW 64 mm MT 60 mm
5513	1787	7	Ground and faceted at one end. Stone burnt and shattered. Fine-grained micaceous sandstone. (burnt?) ML (present) 97 mm MW 66 mm
<b>Double ended</b>			
2216	37	8	Ground and faceted on end with some slight flaking round edges of ground surface. Other end ground over earlier pecked area. Some pecking down one side. Fine-grained sandstone. ML 108 mm MW 72 mm MT 38 mm
2450	876	7	Ground and faceted one end. Partially ground at the other. Medium-grained quartzite sandstone. ML 135 mm MW 76 mm MT 66 mm

SF	Context	Phase	Description
2454	904	7	Rounded pebble. Ground and faceted both ends. One end ground over earlier pecking. Fine-grained sandstone. ML 95 mm MW 77 mm MT 58 mm
2461	876	7	Round pebble. Well faceted at both ends. fine-grained sandstone. (illus 113) ML 95 mm MW 49 mm
2932	1067	7	Ground and faceted at both ends. Slight pecking on body. Fine-grained sandstone. ML 100 mm MW 60 mm MT 48 mm
4337	715	8	Ground and faceted both ends. Shattered diagonally. Fine-grained sandstone. ML 205 mm MW 63 mm MT 70 mm
4361	1281	7	Ground and faceted at both ends, with slight pecking at apexes. Superficial wear from grinding and pecking down both sides. Fine-grained sandstone. (illus 113) ML 98 mm MW 73 mm MT 45 mm
4829	1513	7	Cylindrical pebble. Both ends faceted with grinding. Well pronounced ends. Some pecking as hollowing on 2 adjacent sides of the stone. fine-grained sandstone. ML 90 mm MD 57 mm
5442	1730	7	Ground at both ends and slightly faceted. Very slight flaking at one end. Fine-grained sandstone. ML 105 mm MW 72 mm MT 51 mm
5484	1720	7	Ground and faceted at both ends with some pecking down one side. One end may have some slight secondary pecking. Fine-grained sandstone. (illus 113) ML 110 mm MW 57 mm MT 38 mm
5512	1787	7	Ground and faceted at both ends and ground down one side. Fine-grained sandstone. ML 96 mm MW 75 mm MT 51 mm
7180	1924	7	Well faceted through grinding. Areas of pecking on 2 faces. Fine-grained sandstone. ML 115 mm MW 64 mm MT 66 mm

SF	Context	Phase	Description
7186	1604	7	Ground and faceted both ends. Fine-grained sandstone. ML 95 mm MW 82 mm MT 56 mm
7243	1952	7	Ground and faceted both ends. Fine-grained sandstone. ML 90 mm MW 47 mm MT 40 mm
7794	1692	7	Ground and facet at both ends. Fine-grained sandstone. ML 113 mm MW 49 mm MT 39 mm
<b>Pestles</b>			
1839	25	7	Well faceted through grinding at one end. Pecked at the other. Siltstone. (illus 113) ML 126 mm MW 67 mm MT 45 mm
2588	952	7	Pecked and ground at both ends. Some peck marks on body. Siltstone. ML 126 mm MW 75 mm MT 60 mm
2590	952	7	Large pebble, pecked at broad end and on one side, ground into facets at other end. Siltstone. ML 155 mm W 93 mm MT 49 mm
2793	985	7	Ground and pecked at both ends. Pecked on one side and on body. Fine grained sandstone. ML 105 mm MW 96 mm MT 70 mm
2830	1020	5/6	Elongated pebble, pecked at one end, ground and pecked at the other. Some concentrated pecking on sides and faces of body. Fine grained sandstone. ML 144 mm MW 46 mm MT 55 mm
3278	1015	7	Large rounded pebble. Pecked and ground at both ends and on part of one face. Siltstone. ML 198 mm MW 85 mm MT 50 mm
4100	1080	7	Pebble. Ground with some pecking at one end, pecked and smoothed at other end. Siltstone. ML 101 mm MW 77 mm MT 65 mm
4202	1008	8	Faceted, ground and pecked at both ends. Fine-grained sandstone. ML 98 mm MD 55 mm

SF	Context	Phase	Description
4348	1276	7	Pebble pecked and ground at both ends. Fine grained sandstone ML 98 mm MW 70 mm MT 50 mm
4536	1080	7	Rounded pebble. Pecked at one end, ground at the other with some pecking in centre of ground area. Siltstone. ML 124 mm MW 71 mm MT 57 mm
4625	1394	7	Pecked and ground at both ends. Pecked down both sides. Fine-grained sandstone. ML 90 mm MW 75 mm MT 51 mm
4707	1429	7	Rounded pebble, extensively pecked at one end. Ground and pecked at the other. Peck marks down one side and on body. Fine-grained sandstone. ML 110 mm MW 86 mm MT 76 mm
4730	1287	5/6	Rounded pebble. Ground and faceted at one end and ground and pecked at the other. Fine-grained sandstone. (illus 113) ML 103 mm MW 79 mm MT 54 mm
4994	1491	7	Pecked and slightly flaked at one end. Pecked and ground at the other. Ground down one side and on both surfaces (one concave, the other convex). Some pecking in centre of convex face. Fine-grained sandstone. ML 123 mm MW 69 mm MT 51 mm
5021	1	9	Elongated pebble, ground with some pecking at both ends. Pecking in patches down sides. Fine-grained sandstone. ML 119 mm MW 43 mm MT 34 mm
5954	1331	7	'Diamond' shaped stone. Pecked at one end and bifacially ground at the other. Some peck marks on ground area. Siltstone. ML 172 mm MW 91 mm MT 40 mm
5096	1545	7	Faceted through grinding at one end, some flaking. Ground and pecked at the other end and some pecking down one side. Fine-grained sandstone. ML 107 mm MW 62 mm MT 54 mm

SF	Context	Phase	Description
5098	1590	7	Ground and faceted at one end, pecked at the other. Pecked around the body. Fine-grained sandstone. ML 103 mm MW 60 mm MT 50 mm
5244	1644	7	Two joining fragments. Ground one end and pecked at the other. Some pecking on surface. Fine-grained sandstone (burnt?) ML 116 mm MW 71 mm
5412	1692	7	Pecked and ground and faceted at both ends. Some pecking down both sides. Siltstone. ML 117 mm MW 58 mm MT 43 mm
7048	1851	7	Pebble, pecked at one end and ground at the other. Medium and coarse grained banded sandstone, with feldspathic layers. ML 129 mm MW 63 mm MT 34 mm
7122	1868	5/6	Fractured pebble. Pecked and ground at both ends. Siltstone. ML 128 mm MW 64 mm MT 55 mm
7289	1968	5/6	Badly weathered pebble. Faceted and ground at one end and pecked at the other. Medium-grained sandstone with bands of haematite, from Hoy? ML 126 mm MW 66 mm MT 44 mm
7336	2028	3	Elongated pebble. Well ground and faceted at one end and pecked at the other. Slight pecking down sides. Siltstone. ML 148 mm MW 57 mm MT 39 mm (111 us 113)
7349	2041	7	Pecked and ground at both ends. Some slight pecking on body. Pebble fractured. Fine grained sandstone. ML 124 mm MW 76 mm MT 65 mm
<b>Pestle fragments</b>			
4781	1067	7	Pecked and partially ground at surviving end. Fine-grained sandstone - burnt? ML 104 mm MW 75 mm MT 51 mm
4885	63	7	Ground and pecked both ends and down both sides. Fine grained calcareous sandstone. ML (present) 97 mm MW 92 mm MT 45 mm

SF	Context	Phase	Description
5444	1719	7	Pecked and partially ground at surviving end. Fine-grained sandstone. ML 79 mm MW 68 mm MT 35 mm
6913	305	5	Pecked at both ends. Partially ground smooth at one end. Fine-grained sandstone. ML 93 mm MW 74 mm MT 24 mm
7169	1534	7	Two fragments of possibly the same tool. One fragment with faceted and ground end with pecking. The other fragment has pecked and ground end. Fine-grained sandstone. 1. ML 98 mm MW 76 mm MT 42 mm (present) 2. ML 58 mm MW 75 mm MT 40 mm (present)
5298	1491	7	Wedge shaped pebble. Pecked at flat end and on body. Fine-grained sandstone. ML 127 mm MW 56 mm MT 55 mm
7135	1901	4-6	Pecked lightly at narrow end. Fine-grained quartzite sandstone, (from drift?) ML 182 mm MW 85 mm MT 78 mm
7410	2072	1	Pecked lightly at one end. Medium grained quartzite sandstone (from drift?) ML 74 mm MW 60 mm MT 51 mm
<b>Double ended pounders</b>			
377	284	8	Rounded pebble, flattened ball. Pecked all over except part of one face. Camptonite. MD 73 mm MT 59 mm
2763	1015	7	Heavily pecked round edges and sides. Surfaces pecked and flaked. Some faceting. Fine grained sandstone. MD 92 mm MT 60 mm
2800	1020	5/6	Pecked continuously round sides and ends, causing an indentation on part of one side. One face also indented with pecking. Foliated granite - ?Basement complex. MD 93 mm MT 78 mm
3279	745	7	Half (length wise) of double ended pounder. Pecked at both ends. Fine micaceous sandstone. ML 154 mm MW 67 mm MT 32 mm

SF	Context	Phase	Description
4185	unstrat	9	One end faceted, but severely pecked at both ends and down both sides, to produce a wedge shape. Pecked in centre of both faces. Fine-grained sandstone. ML 90 mm MW 62 mm MT 90 mm
4405	1315	8	Pecked at both ends. Possible polish marks on body. Fine-grained sandstone. ML 69 mm MW 48 mm MT 52 mm
4436	1329	7	Pecked at both ends and down surviving side. Fine-grained sandstone. ML 84 mm MW 56 mm MT 31 mm
4517	1165	9	Pecked all round circumference and slightly in centre of both faces. Some flaking due to pecking. Medium-grained sandstone. MD 110 mm MT 66 mm
4642	1394	7	Pecked at both ends and partially on both sides in centre. Medium grained sandstone. ML 162 mm MW 84 mm MT 60 mm
4690	1414	8	Pecked at both ends and all round body. One end faceted. Elongated pebble. Mottled shaly fine-grained sandstone. ML 120 mm MW 48 mm MT 39 mm
4984	1491	7	Pecked at both ends and partially down one side. One face very smooth. Fine-grained sandstone. ML 100 mm MW 80 mm MT 70 mm
5012	1462	7	Pecked at both ends and severely on body. Fine-grained sandstone. ML 117 mm MW 67 mm MT 48 mm
5073	1216	7	Elongated pebble. Pecked at both ends and down one side and partially both faces. Burned dyke rock-comptonite or bostonite. ML 205 mm MW 78 mm MT 54 mm
5074	1216	7	Pecked round circumference (sides and ends continuously). Granite - from drift(?). ML 122 mm MW 100 mm MT 52 mm

SF	Context	Phase	Description
5189	1623	7	Pecked and indented at both ends and pecked round half of body. Medium grained sandstone. MD 87 mm MT 89 mm
6919	2045	5/6	Pecked continuously from ends to down sides. Perhaps some grinding on one end. Fine grained quartzose sandstone, (from drift?) ML 79 mm MW 75 mm MT 55 mm
6943	2059	1	Pecked at ends and on body near ends. Fine grained sandstone. ML 76 mm MW 37 mm MT 31 mm
7005	716	5/6	Rounded pebble, pecked all round edges and is slightly faceted. One surface slightly indented. Medium grained sandstone. MD 65 mm MT 47 mm
7092	1759	7	Pecked at both ends. Burnt and shattered. Burnt dyke rock, probably Camptonite. ML 104 mm MW 73 mm MT 49 mm
7140	1844	5/6	Pecked at one end and partially at the other. Some pecking on the body. Fine-grained sandstone. ML 121 mm MW 61 mm MT 51 mm
7165	1930	7	Pecked at both ends and has peck marks all over body, giving a spotty appearance. Bostonite. ML 85 mm MW 36 mm MT 30 mm
7183	1604	7	Flattened at both ends by peckling. Possibly some peckling down sides. Medium grained sandstone. ML 104 mm MW 79 mm MT 61 mm
7230	1948	7	Pecked and faceted at both ends. Fine-grained sandstone. ML 98 mm MD 74 mm
7359	2052	4	Pecked at both ends. One end slightly flaked. Pecked in centre of both sides. Fine grained sandstone. ML 162 mm MW 94 mm MT 66 mm

SF	Context	Phase	Description
7364	2057	1	Badly eroded pebble, possibly burnt and partly shattered. Pecked at both ends and all over body. Surface loss from stone due to shattering. Fine-grained sandstone. ML 105 mm MD 52 mm
7394	1991	4	Pecked(?) at with ends. Slightly faceted. Ends may have been smoothed. Body pecked. Fine grained quartzose sandstone (drift?) MD 87 mm MT 77 mm
7510	1924	7	Well pecked at both ends. Some pecking on body and one face partially flaked with hammering. Fine grained sandstone. ML 98 mm MW 76 mm MT 68 mm
Fragmentary pounders			
1845	85	8	Pecked and slightly flaked at surviving end. And some pecking down one side. Fine grained sandstone, micaceous. ML 89 mm MW 78 mm MT 36 mm
2550	-925	7	Pecked at surviving end. Burnt and possibly polished. Body shattered. Burned dyke rock, Bostonite? ML 96 mm MW 60 mm MT 70 mm
4044	1109	8	Lightly pecked at one end. Granite, probably from glacial drift, Sutherland origin. ML 84 mm MW 96 mm MT 72 mm
4634	1394	7	Pecked and slightly flaked at surviving end. Burnt(?) Fine-grained sandstone. ML 120 mm MW 75 mm MT 28 mm
4864	1326	7	Pecked at surviving end. Fine-grained micaceous sandstone, burnt and heat shattered. ML 47 mm MW 57 mm MT 25 mm
5226	1628	7	Pecked at surviving end. Fine-grained sandstone. ML 72 mm MW 71 mm MT 46 mm
6714	1964	5/6	Pecked at surviving end and burnt. Burned dyke rock, probably Bostonite. ML 73 mm MW 65 mm MT 49 mm

SF	Context	Phase	Description
Grinders/hammerstones single ended			
2446	876	7	Faceted and ground at one end, and flaked at the same end. Polish marks on one face and edge. Granite. ML 116 mm MW 51 mm MT 50 mm
2510	876	7	Irregular shaped pebble, severely flaked and chipped at broad end, with use as a hammer. Used from both sides. Other end slightly faceted but well used as a grinder. Some pecking on body of stone and evidence of use as a polisher. Fine-grained quartzose sandstone. ML 146 mm MW 87 mm
2533	867	7	Ground and faceted at one end. Shattered at other. Burnt and possibly polished? Irregular shaped pebble. Monchiquite. ML 91 mm MW 84 mm MT 59 mm
2698	875	8	Pebble with flaking at one end. Other end partially smoothed and has superficial flake marks. Fine-grained current bedded sandstone. ML 107 mm MW 46 mm MT 48 mm
4065	1087	7	Ground and smooth at one end, possibly over previous pecking. Shattered at both ends. Siltstone. ML 175 mm MW 79 mm MT 54 mm
4862	63	7	One end ground and both ends shattered. Bostonite. ML 130 mm MW 62 mm MT 58 mm
4865	63	7	Facet and ground at one end. Flaked and shattered at other. Polish marks on both faces. Siltstone. ML 125 mm MW 48 mm MT 41 mm
5146	1692	7	Elongated pebble. Ground and flaked at one end. Possibly some pecking on body. Siltstone. ML 171 mm MW 66 mm MT 55 mm
7130	1888	7	Probably ground at one end and shattered. Flaked at the other end. Granitic gneiss. ML 117 mm MW 57 mm MT 42 mm

SF	Context	Phase	Description
7286	1998	3/4	Ground and flaked at one end. Flaked at other end. Medium grained sandstone. ML 162 mm MW 73 mm MT 38 mm
7535	2041	7	Shattered both ends. One end originally ground. Fine-grained sandstone. ML 111 mm MW 78 mm MT 52 mm
<b>Double ended</b>			
121	107	8	Ground at one end. Flaked and shattered at the other. This end possibly originally ground. Some pecking on body. Fine-grained sandstone. ML 130 mm MW 54 mm MT 41 mm
2394	858	7/8	Facet and ground at both ends. Flaked at both ends and down one side. Polish marks on one face. Siltstone. ML 121 mm MW 45 mm MT 37 mm
2406	861	7	Ground and faceted at both ends. Flaked at one end. Siltstone. ML 130 mm MW 62 mm MT 41 mm
2439	876	7	Beach pebble. One end ground and slightly faceted. Other end was originally ground but later used as a hammerstone and heavily chipped. Quartzose siltstone (from drift dps?) ML 130 mm MW 60 mm MT 47 mm
2456	876	7	Ground at both ends. Shattered at one end. Grinding marks down part of one side. Siltstone. ML 125 mm MW 68 mm MT 44 mm
2728	882	7	Ground and shattered at both ends. Fine-grained sandstone. ML 94 mm MD 66 mm
2791	981	7	Faceted and ground both ends. Shattered down through stone. Some hammer marks at tip at one end. Micaceous siltstone. ML 167 mm MW 66 mm

SF	Context	Phase	Description
4568	807	6-9	Both ends ground, one end over earlier pecking. Shattered down through length of pebble. Polish marks on both faces. Peck marks in centre of one side. Fine grained ferruginous sandstone. ML 155 mm MW(P) 51 mm MT 61 mm
4814	1496	7	Ground and faceted at both ends. Flaked at one end. Some peck marks down one side. Siltstone. ML 131 mm MW 83 mm MT 44 mm
4874	63	7	Both ends worn by grinding. One end with facets. Both ends have been shattered by hammer blows. Some pecking around body and especially on one edge. Fine grained sandstone. ML 103 mm MW 51 mm (illus 114)
5392	1583	7	Elongated pebble. Ground and faceted at both ends. Flaked at one end. Polish marks on body and on face and 2 sides. Fine-grained sandstone. ML 153 mm MW 43 mm MT 35 mm
6922	2041	7	Ground at both ends, faceted at one end and flaked at other. Elongated pebble. Siltstone. ML 141 mm MW 48 mm MT 48 mm
7090	1875	5/6	Ground at both ends. Flaked at one end and shattered at the other. Some pecking on body. Fine-grained sandstone. ML 118 mm MW 65 mm MT 51 mm
<b>Fragmentary</b>			
2428	25	7	Ground and faceted and severely shattered at one end. Flaked and shattered at other end. Fine-grained sandstone. ML 118 mm MW 83 mm MT 55 mm
2792(1)	981	7	Ground and faceted at one end. Ground at the other and shattered. Shattered through length of stone. Micaceous siltstone - burnt. ML 110 mm MW 60 mm MT(p) 30 mm
2852	361	7	Faceted and ground, then shattered at one end. Other end missing. Stone cracked. Feldite. ML(P) 73 mm MW 59 mm MT 51 mm

SF	Context	Phase	Description
2921	981	7	Ground at both ends and flaked. Shattered down through half of pebble. Fine-grained sandstone. ML 99 mm MW 65 mm MT 30 mm
2931	979	8	Ground and faceted and flaked at surviving end. Polish marks on both faces and possibly pecked down sides. Pebble broken across width. Fine-grained sandstone. ML(P) 60 mm MW 59 mm MT 42 mm
4574	1403	7	Ground and flaked at surviving end. Pecked on both sides. One face smoothed. Burnt. Fine-grained sandstone, burnt. ML 83 mm MW 52 mm MT 35 mm
5311	1583	7	Ground at surviving end and shattered. Pebble broken across width. Peck marks on sides. Fine grained micaceous sandstone. ML(P) 73 mm MW 46 mm MT 39 mm
7069	1539	7	Ground and flaked at surviving end. Pebble split across width. Siltstone, burnt. ML 57(P) mm MW 78 mm MT 63 mm
<b>Pestle/Hammerstone</b>			
7	1	9	Pecked and possibly ground at both ends. Flaked and shattered at one end. Ground and pecked down both sides. Polish marks on body. Siltstone. ML 167 mm MW 70 mm MT 35 mm
21	1	9	Two joining halves. Both ends faceted and ground and pecked. One end flaked. Peck marks on one side and face. Siltstone. ML 114 mm MW 73 mm MT 57 mm
465	131	9	Ground and flaked at one end. Pecked and flaked at the other. Some polish marks on the body. Felsite. ML 123 mm MW 51 mm MT 48 mm
2452	904	7	Faceted, ground and flaked at one end. Pecked at the other end. Some surface erosion of stone. Siltstone. ML 113 mm MW 65 mm MT 45 mm

SF	Context	Phase	Description
2540	914	7	Pecked and flaked at one end. Pecked down both sides. Ground and shattered by hammering at other end. Polish marks on body especially towards one side. Fine-grained sandstone. ML 135 mm MW 80 mm MT 48 mm
2541	883	7	Ground, pecked, slightly faceted and flaked at one end. Some pecking on body. Other end pecked and shattered. Siltstone. ML 125 mm MW 70 mm MT 55 mm
2564	952	7	Pecked and ground at one end. Probably pecked at the other and bifacially shattered. Possible polish marks on the body. Siltstone. ML 142 mm MW 75 mm MT 50 mm
2629	955	7	Ground and faceted and shattered at one end. Probably pecked (over earlier ground surface) and flaked. Siltstone. ML 110 mm MW 62 mm MT 50 mm
2779	1020	5/6	Ground and faceted at one end with slight flaking other end pecked, flaked and shattered down one side. Fine-grained sandstone. ML 114 mm MW 80 mm MT 69 mm
2809	1020	5/6	Ground and pecked at one end. Pecked and flaked at the other. Shattered well into the body. Siltstone. ML 115 mm MW 65 mm MT 61 mm
2825	1020	5/6	Ground and pecked at narrow end and slightly faceted. Pecked down both sides. Bifacially flaked at broad end. Fine-grained sandstone. ML 200 mm MW 111 mm MT 49 mm
4368	1281	7	Ground and pecked and well faceted at one end. Flaked at the other end and shattered down one face. Siltstone. ML 166 mm MW 56 mm MT 53 mm

SF	Context	Phase	Description
4465	1340	7	Ground over earlier pecking at one end, then shattered from end down through side by hammering. Pecked with some grinding and flaking at other end. Polish marks on body and peck marks down one side. Siltstone. ML 114 mm MW 86 mm MT 48 mm
4578	1403	7	Badly shattered stone. Pecked ground and shattered at one end. Shattered at other end. Peck marks down one side. Possibly burnt. Fine grained sandstone, burnt. ML 128 mm MW 78 mm MT 59 mm
4805	1067	7	Ground and faceted and pecked at one end. Pecked on both sides. Lower end faceted and ground and shattered through hammering. Fine grained sandstone. ML 90 mm MW 95 mm MT 75 mm
4866	63	7	Ground and faceted at one end. Pecked and shattered at the other. Peck marks down sides and polish marks on body near narrower end. Siltstone. ML 149 mm MW 63 mm MT 47 mm
5115	1545	7	Pecked and faceted at one end. Ground and shattered at the other. Siltstone. ML 166 mm MW 50 mm MT 33 mm
5150	1469	7	One end ground and shattered through to other end. Peck marks on side and surviving face. Other end pecked and flaked. Siltstone. ML 105 mm MW 94 mm MT 62 mm
5255	1470	7	Ground at one end. Flaked and possibly pecked at the other. Fine grained sandstone. ML 127 mm MW 46 mm MT 54 mm
5391	1583	7	Pecked and flaked at one end. Ground, faceted and well flaked at the other end. Polish marks on edge of body. Siltstone. ML 170 mm MW 72 mm MT 41 mm

SF	Context	Phase	Description
5431	1721	7	Pecked and ground (with facets) at both ends. Shattered at one end by some flaking. Pecked down one side. Granite gneiss. ML 46 mm MW 73 mm MT 40 mm
5440	1730	7	Ground and pecked at both ends. Flaking due to hammering at both ends. Flaking on body. Siltstone. ML 146 mm WM 80 mm MT 70 mm
5441	1719	7	One end of pebble faceted by grinding, then fractured by hammering. Other end, both pecked and ground at lower extremities of surface. Latterly disfigured by hammering and part of one face is fractured. Both sides of body are pecked. Fine-grained sandstone. ML 123 mm MW 88 mm
5475	1736	7	Pebble, pecked at either end, some faceting. May be slightly ground at one end. Other end, pecked surface obliterated with use as a hammerstone. Slight pecking on body. Fine grained sandstone. ML 95 mm MD 61 mm
5480	1727	7	Ground, faceted and shattered at one end. The shatter continues down one face. Slight pecking down both sides. Other end pecked and ground and flaked due to hammering. Possible polish marks on body. Fine grained sandstone. ML 127 mm MW 86 mm MT 58 mm
5508	1776	7	Pecked and possibly ground at both ends. Shattered by later hammering. Polish marks on body. Fine grained sandstone. ML 107 mm MW 81 mm MT 54 mm
6787	2019	7	Ground and pecked at one end. Pecked at the other and shattered at both ends and into one face. Siltstone. ML 126 mm MW 66 mm MT 58 mm
7025	1838	7	Ground and pecked at both ends. Shattered from one end. Polish marks on one face. Granite. ML 92 mm MW 71 mm MT 63 mm

SF	Context	Phase	Description
7062	1848	5/6	Rounded hump-backed stone. One end pecked and ground around the edges of pecking. Is also shattered down one face. Other end is ground over earlier pecking. Siltstone. ML 103 mm MW 74 mm MT 70 mm
7151	975	7	Ground and pecked at one end. Peck marks at the other and severely shattered. Part of one face lost. Peck marks on body. Siltstone. ML 107 mm MW 73 mm MT 47 mm
7170	1930	7	Ground and pecked at one end and shattered into face. Other end almost shattered completely away. Polish marks on one face. Siltstone. ML 177 mm MW 67 mm MT 60 mm
7532	1914	5/6	Ground and pecked at one end, and slightly faceted and flaked. Other end possibly pecked and then shattered. Siltstone. ML 130 mm MW 78 mm MT 53 mm
<b>Fragmentary</b>			
2727	882	7	Ground and flaked at one end. The other end ground, pecked and shattered. (One face lost). Siltstone. ML 118 mm MW 66 mm MT(P) 43 mm
7158	1879	4	Ground and pecked and flaked at surviving end. Pebble shattered across width. Pecked down one side. Granite. ML(P) 67 mm MW 81 mm MT 78 mm
1860	722	8	Pecked at one end. Well shattered at one end and down sides. Fine grained sandstone. ML 129 mm MW 56 mm MT 40 mm
1882	722	8	Pecked and flaked at one end. Flaked and shattered at the other. Siltstone and fine grained sandstone. ML 108 mm MD 50 mm

SF	Context	Phase	Description
2257	859	7/8	One end flattened by pounding and some secondary flaking by hammering. Other end is severely shattered by hammering. Evidence on body of use as a polisher. Fine grained sandstone. ML 119 mm MD 65 mm
2568	952	7	Pecked and flaked at one end. Flaked and shattered at the other. Some pecking down sides. Siltstone. ML 142 mm MW 62 mm MT 24 mm
2707	1017	7	Shattered at one end and pecked at the other. Fine grained sandstone. ML 107 mm MW 36 mm MT 25 mm
2730	1002	7	Pecked at one end then well flaked into body. Other end well shattered. Siltstone. ML 145 mm MW 99 mm MT 76 mm
4033	1111	8	Pecked and shattered at one end. Flaked and shattered at other. Some pecking on body. Stone may have been broken in half length wise and smoothed over. Fine grained sand stone. ML 163 mm MW 70 mm MT 42 mm
4259	1223	7	Pecked at one end. Shattered at other and flaked. One face smoothed. Fine grained sandstone. ML 137 mm MW 100 mm MT 55 mm
4268	1199	8	Pecked and flaked at one end. Peck marks down one side. Bifacially chipped at other end. Polish marks on one face. Fine grained sandstone. ML 127 mm MW 86 mm MT 46 mm
440	1233	7	Pecked at one end, flaked at the other. Possible polish marks on one face. Siltstone. 121 mm MW 48 mm MT 53 mm
4845	1509	7	Pecked around edges of one end. Flaked and severely shattered at other end. Fine grained sandstone. ML 127 mm MW 75 mm MT 53 mm

SF	Context	Phase	Description
4943	1525	7	Pecked and flaked at one end. Shattered at the other. Polish marks on shattered face. Peck marks down both sides. Fine grained micaceous sandstone. ML 91 mm MW 48 mm MT 38 mm
5280	1655	7	Pecked at one end. Bifacially chipped at the other. Fine grained Ilmonitic sandstone. ML 106 mm MW 58 mm MT 47 mm
5361	1677	7	Pecked and flaked at surviving end. Totally shattered at other. Fine grained sandstone - burnt. ML(P) 90 mm MW 65 mm MT 49 mm
5379	1589	7	Pecked and flaked at both ends. Peck marks down both sides. Fine grained sandstone. ML 106 mm MW 76 mm MT 48 mm
6622	330	7	Pecked at one end. Flaked at both ends. Most of surface of stone destroyed by pecking? Elongated stone. Bostonite. ML 156 mm MW 51 mm MT 28 mm
7007	1792	2/3	Pecked and flaked at one end. Flaking at other. Peck marks concentrated on one face. Fine grained sandstone, with worm traces. ML 136 mm MW 52 mm MT 58 mm
7215	1001	5	Dense pebble. Well flaked at one end. Slight peck marks at other. Partially burnt. Medium grained sandstone, burnt. ML 161 mm MW 87 mm MT 59 mm
7235	1958	7	Beach pebble. One end shattered through hammering, other end has a small area pecked. Some flaking on body due to hammering. Mostly shaly sandstone. ML 129 mm MW 52 mm MT 34 mm
7811	1730	7	Pecked and faceted at one end. Flaked at both ends and down one side. Fine grained sandstone. ML 128 mm MW 70 mm MW 55 mm

SF	Context	Phase	Description
			<b>Double ended</b>
1897	25	7	Pecked and shattered at both ends. Peck marks on sides and on faces. Polish marks on both faces. Fine grained sandstone. ML 132 mm MW 62 mm MT 42 mm
2267	859	7/8	Pecked at both ends. One end smoothed. Flaked and shattered at both ends. Hornblendic - granite - gneiss (Basement complex?) ML 139 mm MW 78 mm MT 66 mm
2296	714	9	Pecked at both ends. One end flaked and the other end shattered. Peck marks all over body. Fine grained sandstone. ML 160 mm MW 84 mm MT 52 mm
2724	882	7	Pecked at both ends. Flaked t one end. Body possibly polished. Siltstone. ML 94 mm MW 58 mm MT 24 mm
2731	973	7	Pecked and flattened at both ends. One end may have been smoothed. Shattered at the other end. Pecked down sides and in centre of both faces. Fine grained sandstone. ML 140 mm MW 67 mm MT 45 mm
2778	1001	5	Pecked at both ends then shattered well into one face. Fine grained sandstone. ML 140 mm MW 62 mm MT 52 mm
2806	1020	5/6	Pecked and shattered at both ends. Pecked in centre of both sides and faces. Fine grained sandstone. ML 120 mm MW 90 mm MT 64 mm
2810	1020	5/6	Pecked at both ends then flaked by hammering. Pecked down one side. One face disturbed by flaking. Fine grained sandstone, burnt. ML 133 mm MW 87 mm MT 47 mm
2888	1067	7	Pebble. Flaked at one end, which may have been originally pecked. Superficial pecking at other end. Fine grained sandstone. ML 139 mm MW 53 mm MT 34 mm

SF	Context	Phase	Description
4046	1076	7	Pecked at both ends, flaked and shattered through hammering. Peck marks down one side and one face smoothed with polish marks at the long edges. Fine grained sandstone. ML 160 mm MW 76 mm MT 37 mm
4501	1324	8	Pecked at both ends and shattered at one end. Pecked down one side. Surface of one face and side possibly removed by grinding. Fine grained sandstone. ML 104 mm MW 76 mm MT 47 mm
4572	1403	7	Flaked and pecked at both ends. Siltstone. ML 167 mm MW 72 mm MT 50 mm
4902	1539	7	Pecked at both ends then shattered by hammering and flaked into body of the tool. Pecked in centre of one face at an end of one side. Medium grained sandstone. ML 190 mm MW 100 mm MT 61 mm
5000	1556	7	Pecked and flaked at both ends. Ends flattened. Felsite. ML 120 mm MW 87 mm MT 70 mm
5316	1583	7	Pecked at both ends and shattered at one end. Mottled fine grained sandstone. ML 151 mm MW 78 mm MT 52 mm
5358	1396	7	Pecked and smoothed at one end and shattered at the other. Well pecked down both sides and in centre of both faces. Fine grained sandstone. ML 177 mm MW 89 mm MT 77 mm
5429	1721	7	Pebble with one end faceted through pounding, with some flaking due to hammering. Other, broader end, originally pecked then severely flaked through hammering. Body of stone well pecked throughout and especially in the middle. Fine grained sandstone. ML 110 mm MD 72 mm

SF	Context	Phase	Description
5454	1458	7	One pecked end, faceted and shattered. Other end pecked and shattered. Possibly some grinding over peck marks at this end. Fine grained sandstone. ML 126 mm MW 82 mm MT 67 mm
7004	1558	7	Pecked and smoothed both ends with some secondary flaking as used as a hammer on edges. Some pecking on body. Fine grained sandstone. ML 107 mm MD 64 mm
7112	1813	7	Pecked both ends then shattered through hammering. Fine grained sandstone, burnt. ML 110 mm MW 80 mm MT 70 mm
7342	2011	4	Pecked and shattered at both ends. Peck marks in centre of one side. Fine grained sandstone. ML 151 mm MW 110 mm MT 72 mm
7533	1993	4	Pecked at both ends and shattered at one end. Fine grained micaceous sandstone. ML 81 mm MW 54 mm MT 44 mm
<b>Fragmentary</b>			
1889	734	9	Pecked at one end. Totally shattered at the other. Fine grained sandstone. ML 126 mm MW 100 mm MT(P) 55 mm
5237	1643	7	Fragment of flat pebble. Polish marks on one face and especially towards edges on both faces. Pecked at end, down one side and intermittently on other side. Medium grained sandstone. ML 58 mm MW 76 mm MT 20 mm
5347	1583	7	Pecked at one end. Totally shattered at other. Polish marks on body. Fine grained sandstone - burnt? ML 180 mm MW 78 mm MT 58 mm (P)
<b>Polishers</b>			
<b>Pebble Polishers - unaltered</b>			
372	390	8	Rounded, well polished on one surface. Blackened round edges. Granite-stained black. ML 59 mm MW 40 mm MT 23 mm

SF	Context	Phase	Description
1840	25	7	Rounded pebble. Highly polished all over. Fine grained sandstone - artificially colour banded. ML 93 mm MW 50 mm MT 35 mm
2039	764	7	Irregular pebble well polished on 2 surfaces. Fine grained quartzose sandstone. ML 58 mm MW 45 mm MT 36 mm
2542	952	7	Irregular pebble. Burnt. Polished on 2 surfaces. Bostonite, burnt. ML 89 mm MW 60 mm MT 32 mm
2575	952	7	Rounded pebble. Used as a polisher on all surfaces. Granite. ML 63 mm MW 55 mm MT 30 mm
3286	858	7/8	Round. Polish marks on body and on one side. Fine grained sandstone. ML 57 mm MW 40 mm MT 35 mm
4671	1402	8	Rounded. Well polished on both sides and one surface. Siltstone. ML 109 mm MW 58 mm MT 15 mm
4820	1498	7	Rounded. Well polished on one surface and partially on other. Siltstone. ML 46 mm MW 41 mm MT 12 mm
5001	1491	7	Rounded. Polish marks on one surface and intermittently around the edges. Siltstone. ML 100 mm MW 60 mm MT 26 mm
5380	1583	7	Rounded stone. Polish marks on both edges and partially on adjoining surfaces. Felsite. ML 73 mm MW 47 mm MT 25 mm
5418	1583	7	Elongated rounded pebble. Polish marks all round body but not at ends. Siltstone. ML 95 mm MW 32 mm MT 24 mm
<b>Elongated</b>			
856	390	8	Polish marks on one face towards an edge. Siltstone. ML 91 mm MW 38 mm MT 11 mm

SF	Context	Phase	Description
2173	770	7/8	<p>a. Some polish marks on body with a small deposit of grey material at one end. Siltstone. ML 104 mm MW 31 mm MT 25 mm</p> <p>b. Some polish marks on body. Fine grained feldspathic sandstone. ML 81 mm MW 34 mm MT 17 mm</p>
2243	826	7/8	<p>a. Polish marks round body. ML 89 mm MW 41 mm MT 23 mm</p> <p>b. Some polish marks on body. ML 91 mm MW 26 mm MT 14 mm</p> <p>Both - siltstone.</p>
2650	883	7	<p>a. Smoothed pebble. ML 126 mm MW 34 mm MT 29 mm</p> <p>b. Polished marks around body. One end shattered. ML 114 mm MW 32 mm MT 30 mm</p> <p>Both - siltstone.</p>
2762	883	7	<p>Polish on body. Siltstone. ML 93 mm MW 29 mm MT 27 mm</p>
3858	883	7	<p>Polished on one face and down one side. Siltstone. ML 130 mm MW 39 mm MT 22 mm</p>
4601	1352	8	<p>Polished on body especially near edges. Very slight peckmarks at one end. Fine grained sandstone. ML 118 mm MW 44 mm MT 20 mm</p>
4898	1410	8	<p>Polish marks on body. Siltstone. ML 75 mm MW 21 mm MT 10 mm</p>
4923	1541	8	<p>Polished on body. Part of one face seems flattened with wear. Siltstone. ML 68 mm MW 28 mm MT 16 mm</p>
5408	1583	7	<p>Polish marks on body. Siltstone. ML 85 mm MW 27 mm MT 20 mm</p>
7381	2056	3	<p>Irregular shaped stone. Polish marks round body, one surface especially smoothed. Chipped superficially on sides. Fine grained sandstone. ML 117 mm MW 34 mm MT 25 mm</p>

SF	Context	Phase	Description
<b>Fragmentary Elongated</b>			
329	370	8	Polish marks all round body. Siltstone. ML 82 mm MW 46 mm MT 13 mm
2410	267	7/8	Polish marks all round body. Fine grained sandstone. ML 87 mm MW 56 mm MT 18 mm
<b>Worn</b>			
635	437	8	Fragment of pebble shattered at both ends, one end shattered through hammering. One surface and one side very smooth, with polish marks. Fine grained sandstone. ML 128 mm MW 73 mm MT 42 mm
826	284	8	Irregular pebble. One end faceted and worn smooth. Both faces worn smooth and one side faceted with wear. Other side worn smooth. Polish marks on the faceted side. Medium grained sandstone. ML 72 mm MW 55 mm MT 36 mm
1091	298	8	Very irregular stone with one concave, smooth face. Fine grained sandstone. ML 61 mm MW 60 mm MT 46 mm
2024	25	7	Sounded pebble, with flattened face. Wear marks on edge. Decayed on one side. Medium grained sandstone. ML 100 mm MW 70 mm MT 26 mm
2299	858	7/8	Rounded but irregular pebble. Smoothed convex surface. Flaked around the edges as if hammered. Lower flat surface seems gouged as if struck laterally from the centre outwards. Medium grained sandstone. ML 90 mm MW 70 mm MT 28 mm
2462	876	7	Irregular shaped but rounded pebble. Used on both surfaces as a polisher. One end hollowed with use. Fine grained sandstone. (111us 115) ML 102 mm MW 75 mm

SF	Context	Phase	Description
2465	876	7	Rounded pebble with one smooth and worn face. Medium-coarse grained sandstone. ML 88 mm MW 60 mm MT 31 mm
2476	876	7	Rounded pebble. One surface flattened and polished. Bostonite. ML 73 mm MW 62 mm MT 38 mm
2803	1020	5/6	Rounded pebble with one smooth and concave face. Slightly shattered around half of circumference, as if by hammering. Medium grained sandstone. MD 75 mm MT 45 mm
2834	1020	5/6	Rounded pebble with one flattened and smoothed face. Medium grained sandstone. ML 84 mm MW 71 mm MT 34 mm
4016	946	8	Rounded thin pebble, with one smoothed and very slightly concave face. Edges shaped with wear. Medium grained sandstone. ML 66 mm MW 51 mm MT 14 mm
4020	1103	7	Smooth pebble with one convex and one concave face. Possibly burnt on one edge. Both faces used for polishing. Medium grained sandstone. ML 89 mm MW 71 mm MT 25 mm
4179	1076	7	Rounded pebble. One surface flattened and polished. Granite. MD 59 mm MT 37 mm
4229	716	5/6	Rounded pebble with one smooth and one slightly concave face. Medium grained sandstone. ML 89 mm MW 49 mm MT 33 mm
4585	1251	7	Irregular stone. One face chipped. One face worn convex with polishing. Slightly smooth. medium grained sandstone. ML 100 mm MW 90 mm MT 80 mm
5191	1475	7	Flattened pebble. One worn and smooth face and one edge on the reverse with polish marks. Medium grained sandstone. ML 113 mm MW 92 mm MT 26 mm

SF	Context	Phase	Description
5614	1310	7	Small flat pebble. One smooth face and one edge chamfered. Fine grained sandstone. ML 72 mm MW 55 mm MT 11 mm
6527	1848	5/6	Probably polished on flat surface. Covered with a black deposit. Medium grained sandstone, artificially blackened. ML 73 mm MW 60 mm MT 44 mm
7820	25	7	One whole and one fragmentary pebble. Well polished on flattened surfaces. ML 55 mm MW 40 mm MT 18 mm
<b>Grinder</b>			
2460	876	7	Elongated pebble ground and faceted both ends. Polish marks on both faces close to one end. Siltstone. ML 141 mm MW 50 mm MT 35 mm
2649	883	7	Ground both ends. Polishing on body over earlier slight pecking. Fine grained sandstone. ML 98 mm MW 52 mm MT 26 mm
2897	1067	7	Grinder facet at both ends. Body may have been used as a polisher. Siliceous sandstone (?from drift deposit). ML 119 mm MW 63 mm MT 33 mm
4230	716	5/6	Ground and faceted at one end. Polish marks on one face near edge. Siltstone - colour banded. ML 126 mm MW 70 mm MT 56 mm
4579	807	6-9	Ground and faceted end. Ground over earlier pecking at other end. Some polish marks on body. Fine grained sandstone. ML 109 mm MW 58 mm MT 44 mm
<b>Pestle</b>			
32	1	9	Rounded pebble with one end faceted by grinding. Other slightly faceted but is pecked. May have been ground initially. One surface worn smooth with polishing - has some surface deposits. Medium grained sandstone. ML 90 mm MW 66 mm MT 48 mm

SF	Context	Phase	Description
217	143	9	Ground and pecked at both ends. Pecked down on one face and on edge. Slightly shattered through flaking at both ends. Polish marks on body. Fine grained sandstone. ML 126 mm MW 70 mm MT 55 mm
2292	74	9	Pebble - triangular in section. Both ends pecked, other end ground. Pecked down 2 sides. Used as a polisher on one face and partially on the other. Fine grained sandstone. ML 76 mm MW 43 mm
2372	858	7/8	Round pebble. One end faceted and ground, the other ground and pecked. Polish marks on one surface. Siltstone. ML 108 mm MW 63 mm MT 50 mm
2447	876	7	Elongated and round pebble. Faceted with grinding at one end from 4 directions, pecked at other end. Has polish marks on body. Siltstone. ML 111 mm MW 51 mm MT 40 mm
2703	747	7	Fragment of pestle - polisher. Tip ground, pecked and faceted. One surface smoothed and flat. Fine grained micaceous sandstone, burnt? ML(P) 58 mm MW 65 mm MT 40 mm
2820	1020	5/6	Round pebble. Possibly smoothed on one face. Pecked at both ends. Ground and slightly shattered at one end. Some pecking on body. Fine grained sandstone. ML 118 mm MW 72 mm MT 44 mm
2847	1017	7	Ground and faceted and pecked both ends. Polish marks on body, especially towards one edge. Fine grained sandstone. ML 102 mm MW 58 mm MT 44 mm
2922	981	7	Pebble with concave polished and worn face. Other face convex with polish marks. One end of pebble slightly ground (faceted) and pecked. Other end pecked and slightly shattered as if through hammering. Fine grained sandstone. ML 97 mm MW 68 mm

SF	Context	Phase	Description
3278	1051	7	Wedge shaped pebble. Polished on both surfaces, and especially to narrow end. Ground and pecked at this end and at broad end and partially down sides. Fine grained purple sandstone. ML 78 mm MW 78 mm MT 42 mm
4214	1115	7	Round and smooth pebble. Ground and faceted at one end, other end worn through a combination of grinding and pecking. Polish marks on body. Fine grained sandstone. ML 108 mm MW 61 mm MT 39 mm
4245	1115	7	Ground, pecked and faceted at both ends. Pecked down both sides. Polish marks in the centre of one face. Granite gneiss. ML 126 mm MW 80 mm MT 59 mm
4303	1257	8	Irregular shaped stone. Ground at one end, lightly pecked at the other. Polish marks on one surface and one side. Possible hammer marks on the other side. Medium grained sandstone. ML 210 mm MW 81 mm MT 37 mm
4457	Unstrat	9	Ground and faceted both ends. One end also pecked, ground or pecked down both sides. One face used as a polisher. Camptonite or Bostonite. ML 97 mm MW 70 mm MT 50 mm
4951	1423	7	Flat pebble, ground one end and pecked at the other, body possibly polished. Siltstone. ML 108 mm MW 55 mm MT 21 mm
5163	1610	7	Fragment of split pebble. Ground one end and pecked the other and on one surface. Also polish marks on the same surface. Siltstone. ML 153 mm MW 71 mm MT(P) 33 mm
5398	1583	7	Rounded pebble. Flat lower surface polished. Some pecking at one end and some grinding. Peck marks down one edge. Other edge broken off. Medium grained sandstone. ML 97 mm MW 68 mm MT 31 mm

SF	Context	Phase	Description
5505	1682	7	Oval sectioned pebble. One end heavily pecked, and partially pecked down both sides. Other end is ground toward edges of worked area and pecked in centre. One surface may have been used for polishing. Fine grained sandstone. (illus 114) ML 99 mm MW 88 mm MT 54 mm
7003	1164	7	Round pebble, ground and pecked at one end and predominately at the other. Pecked in centre of both faces. Polish marks down one side. Fine grained sandstone. ML 95 mm MW 85 mm MT 72 mm
7159	1868	5/6	Hump-backed stone. One end flattened by pecking, other end faceted by grinding, pecked in the centre of both sides. Flat surface probably sused as a polished. Siltstone. ML 114 mm MW 77 mm MT 69 mm
7166	1930	7	Pecked both ends and partially down the sides. One face has polish marks. One face ground round edges. Fine grained sandstone. ML 98 mm MW 78 mm MT 65 mm
<b>Hammerstone</b>			
2641	955	7	Flaked at one end and shattered at the other. Has polish marks on body and fine, linear grooves on both faces, formed 2 directions. Possibly pecked down one side. Siltstone (burnt?) ML 109 mm MW 68 mm MT 16 mm
2715	982	8	Shattered at both ends and into body on one side. Burnt and has polish marks on one side. Medium grained sandstone (burnt?) ML 94 mm MW 58 mm MT 42 mm
2880	1055	6	Large fragment. Broken butt end. Fractured work end, light chipping round edge of fracture. Some polish marks on the body. Sandy siltstone. ML 131 mm MW 42 mm MT 47 mm

SF	Context	Phase	Description
3673	1167	8	Bifacially shattered at one end through hammering. Other end is shattered away. Polish marks on one face. Medium grained sandstone. ML 165 mm MW 67 mm MT 26 mm
4070	979	8	Flaked slightly at both ends. Polish marks on both faces. Pecked on one side and ground down the other. Fine grained sandstone. ML 131 mm MW 58 mm MT 21 mm
<b>Pounder/Polishers</b>			
112	108	9	Pecked at one end. Polish marks on one face. Fine grained sandstone. ML 152 mm MW 73 mm MT 46 mm
119	135	7/8	Rounded flat stone. Polished and intermittently pecked on both surfaces. Pecked down one edge and intermittent pecking at both ends and down other end. Shattered in part. Felsite (from glacial drift). ML 73 mm MW 62 mm MT 19 mm
1859	1	9	Elongated pebble. Pecked lightly at both ends. One face very smooth, polish marks on one edge and near one end. Siltstone. ML 123 mm MW 41 mm MT 26 mm
2001	25	7	Rounded pebble, polished on parts of surface. Pecked at one end and on one surface. Fine grained sandstone. ML 80 mm MW 65 mm MT 50 mm
2004	25	7	Rounded and flattened pebble. Polish marks on both edges. Some polish marks on convex face. Coarse limonitic sandstone.
2383	883	7	Elongated pebble. Polish marks on one face towards edges and on one side. Pecked on other surface. Fine grained sandstone. ML 115 mm MW 38 mm MT 24 mm

SF	Context	Phase	Description
2544	952	7	Rounded pebble with one flattened face worn towards the edges. Other face polished along one edge. Pecked down one side. Medium-coarse grained banded sandstone. ML 96 mm MW 50 mm MT 19 mm
2547	952	7	Rounded and flat pebble. Polished on both faces towards one edge. Pecked at one end. Medium grained sandstone. ML 108 mm MW 78 mm MT 17 mm
2562	952	7	Small pebble. One face and one edge have polish marks and partially on second face. Pecked at both ends and partially down both sides. Slight flaking at narrow end. medium grained sandstone. ML 116 mm MW 59 mm MT 25 mm
2710	755	7	Large rounded pebble. Well polished in centre and towards one edge of one face. Polished towards edges of second face. Faceted through pecking at both ends. Well pecked in centre of both sides. Some peck marks on faces. Fine grained pink sandstone. (Hoy)? ML 129 mm MW 81 mm MT 35 mm
2711	1015	7	Small rounded pebble. One face and part of one edge polished. Polish marks lie on top of earlier pecking. Pecking at both ends and partially down both edges. Fine grained pink sandstone. (Hoy)? ML 73 mm MW 44 mm MT 21 mm
2738	985	7	Elongated smooth pebble. Possibly on both surfaces. Pecked at both ends and down both sides. Medium grained sandstone. ML 130 mm MW 49 mm MT 30 mm
2786	883	7	Rounded pebble. Polished round body. Pecked at one end and in centre of one surface. Fine grained sandstone ML 71 mm MW 46 mm MT 32 mm

SF	Context	Phase	Description
2829	1020	5/6	Large flattened pebble. Smoothed on one face especially towards edges. Edges slightly chamfered with intermittent peck marks. Pecked on other surface. Shattered near one end. Fine grained sandstone. ML 147 mm MW 97 mm MT 29 mm
2883	1067	7	Rounded pebble. Polish marks on one face. Pecked at ends and down sides. One end flaked slightly through pecking. Slight pecking on both faces. Fine grained sandstone. ML 106 mm MW 77 mm MT 32 mm
2900	1067	7	Pecked at both ends and on both sides and one face in middle. Other face smoothed with polish marks. Quartzose siltstone. ML 139 mm MW 64 mm MT 51 mm
2915	1067	7	Pecked at both ends. Faceted at one end. Polish marks on body. Elongated pebble. Fine grained sandstone. ML 177 mm MW 75 mm MT 43 mm
2949	1080	7	Rounded pebble. Polish marks towards edges on both surfaces. Pecked at narrow end, partially down both sides and at round end. Fine grained sandstone. ML 88 mm MW 63 mm MT 21 mm
4025	1103	7	Rounded pebble. Polished on surfaces towards edges. Pecked around sides and across ends. Flaked slightly at one end. Medium grained pink sandstone. (Hoy)? ML 96 mm MW 70 mm MT 35 mm
4038	1103	7	Rounded pebble. Slightly ground or pecked at both ends. Intermittent polish marks on body. Medium and coarse grained quartzose sandstone. ML 88 mm MD 48 mm
4282	1181	7	Pecked at both ends. Slightly pecked on one face and down both sides. One face flattened with polish marks round edges. Fine grained sandstone. ML 123 mm MW 80 mm MT 51 mm

SF	Context	Phase	Description
4362	1281	7	Flat but sub-oval pebble. Pecked at ends and down edges. Worn smooth on both faces, especially close to edges. Medium grained sandstone. ML 85 mm MW 64 mm MT 17 mm
4363	1881	7	Rounded pebble. Polished on both faces towards one edge. Pecked lightly at ends and in centre of both faces. Medium grained sandstone, micaceous. ML 95 mm MW 82 mm MT 22 mm
4369	1281	7	Rounded pebble. Smoothed in centre of both surfaces, well pecked at one end and in centre of 2 sides. Also pecked in centre of one face. Partially burnt. Fine grained micaceous sandstone. ML 87 mm MW 72 mm MT 41 mm
4519	1080	7	Pecked and smoothed one end, faceted and pecked at other. Also probably flaked. Black deposit due to burning or polishing. Fine grained sandstone. ML 189 mm MW 90 mm MT 67 mm
4630	1410	8	Round pebble. Smoothed on surfaces. Pecked at both ends. Gneissose granite. Basement complex? ML 73 mm MD 48 mm
4692	1422	7	Small rounded pebble. Smoothed at ends and down edges of 2 faces. Pecked at one end and down one edge. Siltstone. ML 57 mm MW 40 mm MT 28 mm
4765	1313	7	Elongated pebble. Polished on both surfaces. Pecked at both ends. Fine grained sandstone. ML 106 mm MW 43 mm MT 17 mm
5139	1491	7	Elongated pebble. Polished all round body but especially towards the edge. Slight pecking at one end. Siltstone. ML 138 mm MW 58 mm MT 25 mm
5388	1583	7	Pecked at both ends. Has polish marks on the body. Medium grained sandstone. ML 113 mm MW 42 mm MT 23 mm

SF	Context	Phase	Description
5389	1583	7	Double ended faceted pounder. Used as a polisher on the body and on one edge. Medium grained sandstone. ML 106 mm MD 68 mm (illus 115)
5415	1692	7	Rounded and elongated pebble. Polish marks on one surface, especially towards edges. Possibly smoothed on other surface. Pecked at ends and down one side. Fine grained sandstone. ML 108 mm NW 49 mm MT 27 mm
5449	1719	7	Rounded pebble, has one concave and polished face and one convex surface with polish marks. Slight pecking at either end. Fine grained sandstone. ML 85 mm MW 49 mm MT 27 mm
5483	1720	7	Smooth pebble. Polish marks on one face. Pecked at ends and in middle of both sides. Medium grained sandstone. ML 100 mm MW 54 mm MT 34 mm
6963	2057	1	One flattened and polished surface. Pecked at ends and severely around body. Fine grained sandstone. ML 96 mm MW 56 mm MT 31 mm
7056	1161	7	Rounded flat pebble. Very highly polished on one face with deposit of black material. Polished slightly other face. Pecked intermittently down both sides and flaked at both ends by pecking? Pecking is secondary to polishing. Fine grained sandstone. ML 98 mm MW 72 mm MT 23 mm
7057	1078	7	Rounded pebble. One flat surface polished. Slight pecking across one end. Medium grained colour-banded sandstone - red to white. ML 87 mm MW 67 mm MT 52 mm
7238	1864	7	Pecked at both ends. Some flaking at one end. Polish marks on 2 faces and one side. Siltstone. ML 139 mm MW 90 mm MT 67 mm

SF	Context	Phase	Description
7403	2072	1	Elongated but thin pebble. Superficial pecking at either end. Convex surface worn smooth with dark deposits from polishing. Fine grained sandstone.  ML 295 mm MT 28 mm MW 63 mm
7511	1930	7	Rounded pebble. Pecked at one end. One face has polish marks. One side is part chamfered. Medium grained sandstone.  ML 72 mm MW 45 mm MT 15 mm
<b>Whetstones</b>			
123	138	9	Rectangular sectioned elongated stone with square ends. Polished slightly on one face and on one edge. Other surfaces used as a whetstone. Chipped on one edge. Micaceous siltstone. (illus 115)  ML 96 mm MW 27 mm MT 13 mm
381	245	8	Fragment of pebble. One face and edge used. Face has a convex surface. Siltstone.  ML 86 mm MW 33 mm MT 26 mm
492	160	8	Rectangular stone, both faces used. One face concave some polish marks on body. Fine grained sandstone.  ML 82 mm MW 51 mm MT 22 mm
2120	714	9	Elongated pebble with one flat, worked face. Polish and score marks visible. Siltstone.  ML 170 mm MW 54 mm MT 29 mm
2405	267	7/8	Long thin pebble, roughly square ended. One face smoothed and very slightly convex. Edge shaped with wear. Calcareous siltstone.  ML 88 mm MW 35 mm MT 15 mm
2612	883	7	Small fragment of squared stone. One face well worn. Micaceous siltstone.  ML 37 mm MW 23 mm MT 9 mm
3852	37	8	Fragmented pointed oval pebble. Chipped at point. One face and one edge flattened with use. Some score marks. Fine grained green sandstone. (?Triassic). (illus 115)  ML 96 mm MW 36 mm MT 18 mm

SF	Context	Phase	Description
4115	1144	8	Triangular sectioned piece of stone. Both surfaces used. One end partially ground smooth. Other end worn smooth after fracture. Fine grained sandstone, red. ML 50 mm MW 34 mm MT 18 mm
4196	1041	8	Rectangular pebble. One face only worn smooth. Siltstone. ML 82 mm MW 34 mm MT 11 mm
4299	1	9	Fragment of pebble. One surface and one edge used. Some slight and superficial flaking at rounded end. Fine grained sandstone. ML 112 mm MW 62 mm MT 15 mm
4972	1	9	Squared block. One face used at whetstone. Slightly hollowed in centre of face. Calcareous siltstone. ML 120 mm MW 55 mm MT 42 mm
<b>Possible whetstones</b>			
11	1	9	Fragment of thin tapering pebble. One surface flat and smooth. Pebble flaked at one end. Micaceous siltstone. ML 67 mm MW 17 mm MT 18 mm
131	scattered	8 or 9	Rounded pebble. One flattened face may have been utilised. Siltstone. ML 129 mm MW 46 mm MT 26 mm
702	441	8	Irregular shaped pebble. One surface possibly utilised. Siltstone. ML 141 mm MW 48 mm MT 15 mm
1083	298	8	Fragment of rectangular sectioned pebble. Sides, ends surfaces smoothed and squared. Light pecking on body. Siltstone. ML 62 mm MW 27 mm MT 16 mm
1143	630	8	Fragment of wedge shaped pebble. One face flattened and smoothed. Siltstone. ML 75 mm MW 27 mm MT 24 mm
1148	644	8	Fragment of square sectioned tapering pebble. One surface smoothed. Micaceous siltstone. ML 56 mm MW 18 mm MT 14 mm

SF	Contact	Phase	Description
2316	863	7	Wedge shaped stone. One surface smoothed. Siltstone. ML 114 mm MW 27 mm MT 28 mm
4170	1	9	Rounded and elongated pebble. One end may have been utilised. Siltstone ML 83 mm MW 22 mm MT 17 mm
4294/ 4358	785 adjoining	8	Elongated round-ended pebble. One face and one edge may have been utilised. Micaceous siltstone. ML 151 mm MW 31 mm MT 14 mm
<b>Cleavers</b>			
4010	1047	7	Reconstructed flagstone cleaver. Straight upper edge. Bifacially chipped along work edge. Fine grained sandstone, mottled grey and buff. (illus 116) ML 278 mm MW 153 mm MT 21 mm
6737	1977	7	Naturally shaped handled stone, adapted for use, worked end rounded, bifacially chipped along edge and worn. Slight pecking on one face may be recent. Fine grained micaceous sandstone. (illus 116) ML 199 mm MW 78 mm
7145	1912	7	Complete flagstone cleaver. Chipped bifacially at either end, and chipped down one side. The worked edge is worn. Fine grained silty sandstone. (illus 116) ML 190 mm MW 110 mm MT 19 mm
7175	1930	7	Incomplete flagstone chopping tool. Chipped around entire edge, waisted towards narrow end for handle. Shaly siltstone. ML 180 mm MW 125 mm MT 20 mm
<b>Mattocks</b>			
6439	1842	7	Thin flagstone mattock. Chipped along sides. Worked end damaged. Tool incomplete, broken across width, and possibly reworked along broken edge. Grey siltstone. ML 100 mm MW 82 mm MT 13 mm

SF	Context	Phase	Description
7150	359	5	Flagstone mattock. Probably complete. Rounded end and sides chipped bifacially and worn. Grey shaly siltstone. (illus 117) ML 150 mm MW 94 mm MT 21 mm
7346	1858	5/6	Pointed stone tool which has been bifacially chipped around sides and point to produce a work edge. Edges well worn. Grey siltstone. (illus 117) ML 178 mm MW 102 mm MT 26 mm
7395	1848	5/6	This flagstone tool, waisted or notched on either side. Longer and bifacially chipped and worn along edges. Shorter and chipped to shape. Grey shaly siltstone. (illus 117) ML 176 mm MW 76 mm MT 11 mm
<b>Shovels</b>			
<b>Pointed-</b>			
2459	876	7	Complete flagstone tool. Chipped bifacially along all edges. Shaly siltstone. (illus 118) ML 350 mm MW 175 mm MT 14 mm
7032	1837	5/6	Three reconstructed fragments of complete flagstone tool. Bifacially chipped at pointed end only. Micaceous shaly siltstone. ML 242 mm MW 158 mm MT 15 mm
<b>Oval-</b>			
4270	1115	7	Complete oval flagstone shovel. Bifacially chipped around circumference. Shaly siltstone. (illus 118) ML 254 mm MW 170 mm MT 15 mm
5221	1059	7	Complete. Chipped along most of edge. Fine grained micaceous sandstone. ML 254 mm MW 160 mm MT 17 mm
5498	1742	7	Complete. Straight base edge, partially chipped sides and oval end with some evidence of wear. Tool possibly unfinished. Flaggy siltstone with mud cracks. ML 202 mm MW 161 mm MT 11 mm

SF	Context	Phase	Description
7081	330	7	Incomplete. Split across width, and one edge possibly broken off longitudinally. Approx 70 per cent present. Chipped along most of curved edge. Siltstone, mottled and banded grey and buff. ML 255 mm MW 132 mm MT 20 mm
2434	876	7	Complete thin flagstone shovel. Round end, chipped along entire edge. Fine grained micaceous sandstone. ML 230 mm MW 140 mm MT 20 mm
4107	1088	7	Rectangular. Bifacially chipped along 3 worked edges, and slightly worn. Marginal waisting on the long edges. Shaly siltstone. (illus 118) ML 246 mm MW 148 mm MT 15 mm
4884	63	7	Thin. Chipped and rounded along edge, but with part straight and unworked. Siltstone. ML 255 mm MW 115 mm MT 11 mm
5401	1686	7	Thin. Chipped around edge and broken at one end. Shaly siltstone. ML 157 mm MW 136 mm MT 16 mm
7124	384/1149	7	Incomplete, thin. Chipped and worn edges. Rounded end. Broken across breadth. Siltstone. ML 150 mm MW 148 mm MT 9 mm
<b>Strike-a-lights</b>			
326	304	8	Rounded pebble. Ground one end and possibly pecked at the other. One smooth face has a linear indent, 15 mm L x 7 mm W. Fine grained micaceous sandstone. ML 120 mm MW 67 mm MT 36 mm
2683	982	8	Fragment of pear-shaped pebble with linear deep groove in one surface. 24 x 9 x 9 mm. Burnt. Fine grained sandstone, burnt. ML 41 mm MW 31 mm MT 20 mm

SF	Context	Phase	Description
4321	714	9	Rounded but flattened quartz pebble. Ground, slightly faceted all round edges. Surfaces may be polished. A linear groove is present in each surface, surrounded by iron scratches. Quartzose sandstone. (illus 109) ML 59 mm MT 21 mm ML of grooves 22 mm
4393	1303	8	Irregular pebble, one face hollowed with a broad but linear groove. Coarse red sandstone - upper old-red? ML 80 mm MW 69 mm MT 43 mm ML 25 mm MW 13 mm MDepth 9 mm - groove
1895	25	7	One stone may be polisher. Two Bostonite. One fine grained sandstone, all water worn.
2503	876/861	7	Four pebbles have polish marks - pebble polishers? Two pebbles are pecked and have polish marks - pounder/polishers. One is worn polisher with polish marks on 2 faces. One is an irregular marked hammerstone. 1 granite, 2 coarse grained and 2 medium grained sandstone. 3 siltstone, 1 quartzose sandstone, all water worn.
4558	1395	7	One pounder/polisher, pecked at both ends and polished on both surfaces. ML 81 mm MW 38 mm MT 30 mm Also, 3 split pebbles and 2 very small pebbles. 1 granite, 1 medium grained sandstone, 3 siltstone, 1 shaly siltstone, all water worn.

SF	Context	Phase	Description
5094	1545	7	<p>Includes 2 miscellaneous pebbles. One grinder with faceting at both ends.</p> <p>ML 117 mm MW 62 mm MT 38 mm</p> <p>1 double-ended grinder with polish marks on one face.</p> <p>ML 101 mm MW 68 mm MT 59 mm</p> <p>1 hammerstone-pestle. Pecked and ground and shattered at one end, pecked and hammered at the other. One face damaged.</p> <p>ML 119 mm MW 85 mm MT 49 mm</p> <p>5 fine grained sandstone - all water worn.</p>
5403	1692	7	<p>1. Worn polisher with polish marks on both faces, well used on lower surface.</p> <p>ML 110 mm MW 72 mm MT 28 mm</p> <p>2. Possibly a whetstone. One very smooth and severely chamfered edge. Lower and upper surface also worn smooth and slightly hollowed.</p> <p>ML 95 mm MW 53 mm MT 17 mm</p> <p>3. Pecked polisher - pecked all round edge and both surfaces with polish marks. One surface worn with wear.</p> <p>ML 68 mm MW 58 mm MT 25 mm</p> <p>4. Pecked polisher - pecked on edge and at one end. Lower surface with polish marks.</p> <p>ML 72 mm MW 55 mm MT 25 mm</p> <p>5. One smooth pebble possibly polished on one surface.</p> <p>ML 118 mm MW 55 mm MT 19 mm</p> <p>2 med and 2 fine grained sandstone. 1 siltstone.</p> <p>(1+4)                      (2 and 3)                      (5)</p>

SF	Context	Phase	Description
5404	1700	7	1. Is a quartzite which is pecked around its edge and used as a strike-a-light on both faces. Fine grained sandstone. MD 60 mm MT 19 mm
			2. Is a pebble-polisher with a smooth lower surface with polish marks. Med/coarse grained sandstone. ML 63 mm MW 48 mm MT 27 mm
			3. Is a pecked-polisher which is pecked partially around the edges. Has polish marks in the centre of both faces. Fine grained sandstone. ML 85 mm MW 61 mm MT 34 mm
7293	1994	4	Includes 5 unworked pebbles, one possible polisher, one pebble-polisher - pecked at one end and the body possibly used as a polisher. Also one pebble fractured by hammering at one end, with the lower, flat surface possibly used as a polisher. 7 Bostonite. 1 fine grained sandstone of similar colour to above.
<b>Pot lids</b>			
2	1	9	Complete (with subsequent chip?) Decorated on both sides. MD 75 mm MH 9 mm
12	3	8	Complete. MD 95 mm MT 15 mm
20	1	9	Complete. MD 80 mm MT 6 mm
22	3	8	Complete. Split rock. MD 100 mm MT 6 mm
65	34	8	Complete. MD 55 mm MT 6 mm
279	302	5/6/7	Complete with 2 small dressed edges. MD 70 mm MT 9 mm
819	447	8	Complete. One dressed edge. MD 90 mm MT 12 mm
1084	298	8	Complete, 2 fragments reconstructed. MD 75 mm MH 4 mm

SF	Context	Phase	Description
1890	734	8	Complete. MD 230 mm MT 17 mm
2026	735	9	Complete, with small dressed edge. MD 110 mm MT 7 mm
2071	786	8	Complete, rough surfaces. MD 130 mm MT 16 mm
2198	733	8	Complete, with several small straight cuts around edges. MD 95 mm MT 9 mm Thin beaded micaceous sandstone.
2112	399	8	Incomplete, approx 90 per cent present. MD 170 mm MT 12 mm
2255	826	7/8	Complete. MD 225 mm MT 21 mm
2436	904	7	Complete. Poorly rounded, possibly unfinished. One straight cut edge. MD 290 mm MT 24 mm
2448	876	7	Incomplete and reconstructed. Approx 90 per cent present. Split rock with one dressed edge. MD 240 mm MT 15 mm
2457	876	7	Complete. MD 200 mm MT 16 mm
2499	906	7	Complete and reconstructed with 3 dressed edges. Split rock. MD 240 mm MT 17 mm
2596	952	7	Complete, with one dressed edge. MD 130 mm MT 9 mm
2700	809	8	Complete, with small dressed edge. MD 105 mm MT 8 mm
2723	976	8	Complete. MD 90 mm MH 15 mm
2816	765	8	Complete. MD 70 mm MT 5 mm
2957	1082	7	Complete, split rock MD 220 mm MT 24 mm
2971	785	8	Complete. MD 120 mm MT 19 mm

SF	Context	Phase	Description
2972	785	8	Complete, with 3 dressed edges. MD 105 mm MT 14 mm
2979	979	8	Complete. MD 80 mm MT 8 mm
2993	1088	7	Complete, reconstructed. Split rock. MD 270 mm MT 24 mm
4091	1130	7	Complete. MD 220 mm MT 10 mm
4131	1131	7	Complete. MD 240 mm MT 17 mm
4163	821	8	Complete. MD 85 mm MH 8 mm
4232	378	8	Incomplete, approx 95 per cent present. MD 225 mm MT 16 mm
4240	Unstrat	9	Complete. MD 112 mm MT 11 mm
4241	1225	8	Complete. MD 150 mm MT 7 mm
4281	1195	7/8	95 per cent complete, small chip missing. MD 80 mm MT 5 mm
4353	1281	7	Complete. MD 115 mm MT 14 mm
4409	1264	8	Complete, poorly rounded. MD 80 mm MT 9 mm
4429	1165	9	Complete. MD 100 mm MT 8 mm
4485	1340	7	Complete. MD 100 mm MT 10 mm
4491	1340	7	Complete. MD 110 mm MT 7 mm
4493	1332	7	Complete. Poorly rounded with very rough surfaces. MD 230 mm MT 9 mm
4556	1080	7	Complete. MD 100 mm MH 8 mm
4562	1352	8	Complete. MD 120 mm MT 10 mm

SF	Context	Phase	Description
4626	1323	7	Complete. MD 100 mm MT 8 mm
4759	1475	7	Complete. MD 105 mm MT 8 mm
4773	1410	8	Complete. MD 105 mm MT 11 mm
4776	1410	8	Complete. MD 110 mm MT 14 mm
4777	1410	8	Complete. Very rough surface. MD 100 mm MT 15 mm
4970	1491	7	Complete. MD 120 mm MT 8 mm
5160	1509	7	Complete, split rock, poorly rounded. MD 190 mm MT 11 mm
5369	1583	7	Incomplete and reconstructed, approx 90 per cent present. MD 400 mm MT 23 mm
5395	1583	7	Reconstructed; complete. MD 370 mm MT 12 mm
5396	1626	7	Complete MD 260 mm MT 15 mm
5399	1583	7	Reconstructed fragments, approx 95 per cent present. MD 410 mm MT 19 mm
5407	1597	7	Complete. MD 165 mm MT 17 mm
5437	1737	3/4	Complete, reconstructed. MD 140 mm MT 6 mm
7022	1838	7	Reconstructed, complete. MD 300 mm MT 11 mm
7024	1837	5/6	2 Fragments reconstructed, approx 90 per cent present. MD 300 mm MT 16 mm
7035	1638	7	Incomplete, reconstructed, approx 95 per cent present. MD 485 mm MT 10 mm

SF	Context	Phase	Description
7068	1539	7	Complete. Split rock with very rough finish. MD 130 mm MT 18 mm
7103	1868	5/6	Complete, very smooth surfaces. MD 65 mm MT 7 mm
7123	384/1149	7	Complete. MD 130 mm MT 8 mm
7187	1895	5	Complete. MD 110 mm MT 9 mm
7188	1932	7	Complete. MD 150 mm MT 23 mm
7216	1864	7	Complete. (illus 119) MD 135 mm MT 9 mm
7220	1906	5/6	Complete. MD 160 mm MT 12 mm
207	250	8	Incomplete, approx 50 per cent present. Split rock. EstD 250 mm MH 23 mm
1894	733	8	Incomplete. Approx 35 per cent present. EstD 360 mm MT 14 mm
2050	786	8	Incomplete, approx 50 per cent present. MD 200 mm MT 15 mm
2315	863	7	Incomplete fragment. Approx 20 per cent present. EstD 440 mm MT 7 mm
2387	858	7/8	Split rock fragment, approx 30 per cent present. EstD 280 mm MT 11 mm
2397	858	7/8	Reconstructed fragment, approx 20 per cent present. MD 260 mm MT 10 mm
2570	952	7	Approx 50 per cent present. EstD 220 mm MT 18 mm
2691	952	7	Approx 85 per cent. MD 175 mm MT 11 mm
2885	1067	7	Reconstructed, c25 per cent present. EstD 760 mm MT 25 mm
2966	876	7	Approx 60 per cent present. EstD 170 mm MT 13 mm
2991	785	8	Approx 30 per cent present. EstD 290 mm MT 13 mm

SF	Context	Phase	Description
3676	1167	8	Approx 80 per cent present. MD 115 mm MT 14 mm
4064	1103	7	Approx 75 per cent present. Very brittle. MD 160 mm MT 7 mm
4371	1281	7	Approx 40 per cent present. Split rock. EstD 720 mm MT 26 mm
4432	1326	7	Approx 35 per cent. Central hole chipped into lid. EstMD 200 mm MT 6 mm MDia of hole 40 mm
4942	1550	7	Approx 45 per cent. Split rock. EstD 270 mm MT 10 mm
5065	1545	7	Approx 50 per cent present. Split rock. EstD 270 mm MH 27 mm
5176	2509	7	Approx 60 per cent present. EstD 200 mm MT 11 mm
5200	1606	7	Approx 80 per cent present. MD 110 mm MT 10 mm
5284	1664	7	Approx 30 per cent present. EstD 305 mm MT 14 mm
5339	1583	7	Approx 25 per cent present. EstD 305 mm MT 14 mm
5342	1533	7	Approx 25 per cent present. MD 320 mm MT 15 mm
5345	1583	7	Approx 20 per cent present. Very brittle. EstD 220 mm MT 10 mm
7191	1946	2	Broken and reworked. EstD 180 mm MT 17 mm
7192	1604	7	Incomplete. c40 per cent present. Split rock. EstD 318 mm MT 17 mm
7295	1999	4	Reconstructed. c60 per cent present. MD 310 mm MT 26 mm
<b>Unfinished pot lids</b>			
2308	863	7	Broken edge. EstD 335 mm MT 16 mm
2563	1021	8	Dressed stone. Part worked, but unfinished, and with slight scratching on one surface. ML 245 mm MW 172 mm MT 10 mm

SF	Context	Phase	Description
2586	952	7	Not rounded. EstD 190 mm MT 12 mm
2692	952	7	70 per cent of edge still unworked. MD 190 mm MT 15 mm
5452	1686	7	Three complete, but unfinished. 1. MD 225 mm MT 15 mm 2. MD 210 mm MT 9 mm 3. MD 245 mm MT 16 mm
<b>Handled pot lids</b>			
2115	399	8	Complete. MD 142 mm MT 13 mm Handle approx. 55 mm x 40 mm (illus 119)
4119	949	8	With pointed handle extension. MD 155 mm MT 7 mm
<b>Quernstones: Non Rotary</b>			
<b>Flat topped/rounded</b>			
4917	1067	7	Complete boulder. Slightly concave face pecked and well worn in the middle, with damage from re-pecking at centre (poss unfinished pivot stone). Semi spherical btm. Pecked all over. Med grn sandstone. ML 371 mm MW 246 mm MH 153 mm
4988	1	9	Incomplete. Boulder, approx 30 per cent of whole. Plan-concave face, pecked. Surface also damaged, by chipping. Underside, roughly hewn into shape, rounded. Medium grained sandstone. ML 263 mm MW 176 mm MH 140 mm
5344	1571	7	Small fragment. Flat face pecked. Underside well rounded (semi-spherical) and pecked. Medium grained sandstone. ML 172 mm MW 109 mm MH 122 mm
5504	1736	7	Large incomplete sandstone boulder. Flat oval face, pecked and worn. Under surface semi-spherical and partially pecked. Medium grained sandstone. ML 372 mm MW 238 mm MH 166 mm

SF	Context	Phase	Description
7013	1215	7	Oval boulder. Concave longitudinally, convex across breadth of upper surface which is pecked and worn. Sides and ends pecked. Bottom roughly hewn to a semi-spherical shape. Half of upper surface is heavily worn. Medium grained sandstone. ML 400 mm MW 255 mm MH 120 mm
7172	1924	7	Boulder. Plano-convex face, well pecked surface, oval in shape. Under surface semi-spherical and pecked. Medium-coarse sandstone. ML 408 mm MW 247 mm MH 160 mm
<b>Convex faces</b>			
2051	738	7	Kidney shaped, broken along its length. Slightly convex face pecked and one end damaged. Underside pecked to a round shape. Medium grained sandstone. ML 448 mm MW 197 mm MH 102 mm
2737	1014	7	Complete. Plano-convex face, pecked and worn. Underside pecked and worn. Underside pecked to a round shape. Medium grained sandstone. ML 418 mm MW 227 mm MH 74 mm
4295	1243	7	Semi-circular fragment. Approx 30 per cent present. Slightly convex face, pecked and worn. Roughly curved underside sides pecked. Upper surface badly eroded. Medium grained sandstone. ML 254 mm MW 133 mm MH 75 mm
4682	1429	7	Oval. Plan-convex surface, badly eroded and burnt. Part remaining is pecked and worn. Lower surface pecked to a round shape. Medium grained sandstone. ML 285 mm MW 218 mm MH 102 mm
5486	1511	7	Incomplete. Plan-convex face, pecked and well worn. Underside rounded and pecked smooth to shape. Medium grained sandstone. ML 268 mm MW 250 mm MH 118 mm

SF	Context	Phase	Description
5110	1536	7	Incomplete. Approx 20 per cent present. Plan-convex face, pecked and worn, rounded lower surface, pecked to shape. Medium grained sandstone. ML 272 mm MW 198 mm MH 98 mm
5359	1677	7	Rectangular. Plan-convex surface, worked, pecked and worn smooth. One end broken. Sides pecked. Lower surface pecked and worn smooth. Possibly the original quern face but flawed. Stone turned over and other surface used. Burnt. Medium grained sandstone. ML 344 mm MW 192 mm MH 106 mm
4372	733	8	Irregular. Plan-convex face pecked and worn smooth. Rounded lower surface pecked to shape. Coarse grained sandstone. ML 361 mm MW 232 mm MH 87 mm
2395	769	7/8	Incomplete, approx 80 per cent present. Plano-convex face, pecked and well worn. Bottom naturally rounded, some slight pecking around sides. Medium grained sandstone. ML 320 mm MW 248 mm MH 94 mm
2165	770	7/8	Incomplete. Plano-convex face pecked and worn. Curved underside, partially pecked to shape. Pecked and chipped along edges. Approx 25 per cent present. Medium grained sandstone. ML 172 mm MW 192 mm MH 105 mm
2525	883	7	Incomplete quern in 2 fragments. Plano-convex surface pecked and worn. Curved lower surface pecked to shape. Approx 45 per cent present. Medium grained sandstone. ML 190 mm MW 220 mm MH 90 mm
2473	904	7	Incomplete. Approx 40 per cent present. Plan-convex face, pecked and well worn. Slightly curved lower surface, smoothed. Medium grained sandstone. ML 282 mm MW 210 mm MH 117 mm

SF	Context	Phase	Description
2480	906	7	Complete. Plano-convex face, pecked and well worn, chipped along edge. Sides pecked. Bottom flat. medium grained sandstone. ML 416 mm MW 258 mm 88 mm
2633	955	7	Incomplete. Flat face pecked and well worn. edges chipped. Curved edges pecked. Lower surface curved and worn very smooth, may have been partially polished. Medium grained sandstone. ML 255 mm MW 208 mm MH 74 mm
2453	876	7	Small fragment. Rounded and pecked sides and possibly base. Top pecked and damaged. Also broken off at the sides. Ferruginous feldspathic fine grained sandstone. ML 124 mm MW 132 mm MT 97 mm
4930	1543	7	Narrow tapering end, sides pecked and rounded. Broken across width and along one side. Face convex, pecked and smoothed and partially pecked away. Bottom roughly flattened, originally a rounded pecked bottom. Small dimple near one side. Medium grained sandstone. ML 242 mm MW 235 mm MT 64 mm
4581	1051	7	Pecked to a round bottom. Top slightly concave longitudinally and convex across width, pecked and partially smoothed. One edge pecked to shape. Medium grained sandstone. ML 300 mm MW 237 mm MT 80 mm
4947	1	9	Incomplete. Approx 50 per cent present. Plano-convex face, pecked and worn. Underside pecked to a round shape. Medium grained sandstone. ML 195 mm MW 192 mm MH 76 mm
7036	1837	5/6	Incomplete. Two joining fragments. One missing. Slightly convex face, pecked and worn. Deeply rounded underside, partially pecked to shape. Medium grained sandstone. ML 380 mm MW 230 mm MH 115 mm

Concave faced

SF	Context	Phase	Description
697	421/40	8	Irregularly shaped. Plano-convex surface, pecked and worn. Under surface roughly hewn. Two cut marks present on edge of upper surface. Medium grained sandstone. ML 410 mm MW 262 mm MH 138 mm
2123	399	8	Incomplete. Concave worked surface, well worn. Flat bottom and edges roughly pecked. Fine grained sandstone. ML 312 mm MW 166 mm MH 112 mm
2218	715	8	Incomplete. Upper surface plano-concave, pecked and worn. Lower surface roughly flat. Edges pecked all round. App 50 per cent of whole. Medium grained sandstone. ML 242 mm MW 197 mm MH 54 mm
2396	769	7/8	Concave face pecked and worn. Chipped at edge of upper face. Curved underside slightly pecked. Medium grained sandstone. ML 343 mm MW 228 mm MH 73 mm
2823	1020	5/6	Large fragment of oval boulder. Plan-concave upper surface, pecked, and worn, some chipping round edges and on surface. Under-side slightly flat and partially pecked. One end rounded by pecking. Medium grained sandstone. ML 358 mm MW 237 mm MH 91 mm
4040	1130	7	Incomplete. Concave face, pecked and well worn, with part of surface burnt. Pecked edge. Bottom flattened by pecking. Medium grained sandstone. ML 234 mm MW 146 mm MH 86 mm
4499	1080	7	Rectangular. Plan-concave worked surface, well pecked and worn at edges. Roughly pecked and flattened lower surface. Sides pecked and damaged at one corner. Medium grained sandstone. ML 364 mm MW 231 mm MH 76 mm
4662	1415	7	Plano-concave across length and convex across width. Face pecked and worn, heavy wear in centre. Flat bottom. Medium grained sandstone. ML 380 mm MW 250 mm MH 91 mm

SF	Context	Phase	Description
7037	1336	7	Upper face longitudinally plano-concave, convex across breadth. Pecked and well worn. Roughly flattened lower surface, sides pecked all over. Medium grained sandstone. (illus 120) ML 530 mm MW 262 mm MH 120 mm
7171	1924	7	Plano-concave face, pecked and well worn, slightly chipped at ends and sides. Flat lower surface, partially pecked. Medium grained sandstone. ML 377 mm MW 191 mm MH 98 mm
7277	1965	5/6	Concave face pecked and worn. Edges pecked to produce an overall oval shape. Flat bottom, hollowed and roughly pecked. Medium grained sandstone. ML 405 mm MW 224 mm MH 62 mm
2049	776	8	Incomplete. Approx 75 per cent present. Concave worked face, pecked and well worn, and with 90 mm dia. drilled and pecked central hole from reusage as drain. Pecked edges. Fine grained sandstone. (illus 122) ML 548 mm MW 362 mm MH 127 mm
2208	37	8	One end of quernstone. Approx 60 per cent present. Concave worked face, pecked, worn and repecked around top edges. Medium grained sandstone. ML 325 mm MW 316 mm MH 148 mm
2400	769	7/8	Complete. Concave worked face, pecked and well worn. Irregular sides. Fine grained sandstone. ML 652 mm MW 375 mm MH 170 mm
2625	955	7	Incomplete, one end rounded, one end chamfered. Approx 95 per cent present. Concave worked face, pecked and well worn. Pecked edges. Medium grained sandstone. (illus 121) ML 625 mm MW 350 mm MH 119 mm

SF	Context	Phase	Description
2721	1017	7	End section. Approx 35 per cent present. Concave worked face, pecked and worn. End chipped to a rounded profile. Sides straightened by pecking. Medium grained sandstone. ML 336 mm MW 250 mm MH 112 mm
2773	747	7	Joined to 5459. Incomplete. Approx 75 per cent present. Deeply concave worked face, pecked and well worn. Rough sides, part pecked. Medium grained sandstone. ML 510 mm MW 382 mm MH 195 mm
2884	360	7	Relatively flat bottomed quern stone, broken across width. Sides and one end not straightened. Worked surface concave. Pecked and smoothed. Coarse grained yellow sandstone. ML 238 mm MW 304 mm MT c74 mm
2973	1065	7	Incomplete. Approx 70 per cent present. Concave worked face, pecked and well worn. Pecked edges. medium grained sandstone. ML 435 mm MW 350 mm MH 103 mm
4146	805	7	One end of quernstone from sandstone boulder. Approx 55 per cent present. Slightly concave worked face, pecked and well worn in centre. Medium grained sandstone. ML 305 mm MW 260 mm MH 112 mm
4247	1172	7	Rounded top of stone. less than 30 per cent present. Deeply concave worked face, pecked and worn. Edges pecked. Medium grained sandstone. ML 280 mm MW 224 mm MH 102 mm
4251	37	8	End of quernstone from sandstone boulder. Less than 40 per cent present. Concave worked face, pecked and well worn. Rounded edge, pecked to shape. Medium grained sandstone. ML 270 mm MW 261 mm MH 174 mm

SF	Context	Phase	Description
4349	37	8	One end from sandstone boulder. Approx 30 per cent present. Deeply concave worked face, pecked and well worn, particularly at centre. Rounded end; straightened sides, pecked to shape. Medium grained sandstone. ML 285 mm MW 278 mm MH 172 mm
4425	1181	8	Corner section. Approx 25 per cent present. Concave worked face, pecked and well worn. Squared end and sides, pecked and possibly repecked. Fine grained sandstone. ML 280 mm MW 171 mm MH 138 mm
4979	1491	7	Corner. Approx 25 per cent present. Concave worked face, pecked, worn and repecked. Rounded edge, pecked. Medium grained sandstone. ML 262 mm MW 194 mm MH 126 mm
5031	1	9	Quernstone end from sandstone boulder. Less than 15 per cent present. Concave worked face pecked and well worn. Rounded edge, pecked. Medium grained sandstone. ML 175 mm MW 130 mm MH 128 mm
5296	1655	7	Incomplete, with one deeply rounded end. Approx 80 per cent present. Slightly concave worked face, pecked and worn, with slight twist. Fine grained sandstone. ML 546 mm MW 311 mm MH 112 mm
7010	1558	7	Incomplete. Approx 80 per cent present. Slightly concave face, pecked and worn, and with lateral flaw. Rough and irregular shaped sides. Medium grained sandstone. ML 490 mm MW 320 mm MH 156 mm
7086	330	7	Incomplete. Approx 70 per cent present. Concave worked face, pecked worn and part burnt, and with some repecking. Pecked edges. Medium grained sandstone. ML 365 mm MW 251 mm MH 102 mm

SF	Context	Phase	Description
7096	1830	7	Corner fragment of quernstone. Less than 20 per cent present. Concave worked face, pecked and well worn. Squared sides and part of rounded end pecked. Fine grained sandstone. ML 310 mm MW 140 mm MH 90 mm
7149	1915	7	Corner. Less than 40 per cent present. Concave worked face, pecked, worn but flawed. Possibly repecked. Rounded edges, pecked. Medium grained sandstone. ML 406 mm LW 193 mm MH 171 mm
7297	58	7	Incomplete rectangular quernstone. Approx 85 per cent present. Deeply concave worked face, pecked and well worn. Rough sides, part pecked. Medium grained sandstone. ML 572 mm MW 326 mm MH 191 mm

**Sub-rectangular fragments**

28	17	8	Fragment. Roughly fattened bottom. Fragment of one end possibly present. Face flat and smooth. Has raised striation marks from rubbing up and down from surviving end. Fine grained sandstone. ML 262 mm MW 246 mm MT 55 mm
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**Rotary Querns**

**Concave faced**

2197	714	9	Incomplete upper quernstone. Approx 30 per cent present. Concave working face, pecked well worn, and with concentric grooving and some shininess towards outer edge. Edge rounded by pecking. Curved upper face, pecked, and with pecked, oblong, handle recess. Medium grained sandstone.  Stone: ML 321 mm MW 223 mm MH 60 mm Central hole: EstD 62 mm MH 38 mm Handle recess: ML 142 mm MW 31 mm MH 40 mm
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SF	Context	Phase	Description
4434	1346	7	<p>Reconstructed incomplete upper stone. Approx 55 per cent present. Plano-concave working surface, pecked and worn, particularly worn at centre. Waisted central hole drilled, pecked and worn. Off-centre handle hole, drilled and worn. Rough flattened upper surface.</p> <p>Fine grained sandstone.</p> <p>Stone: ML 46 mm MW 187 mm MT 70 mm  Central hole: M Dia 60 mm MT 60 mm  Handle hole: M Dia 55 mm MT 53 mm</p>
4716	1251	7	<p>Incomplete fragment from quarried stone. Approx 35 per cent present. Slightly concave working face, pecked and worn. Underside, part pecked. Waisted central hole, drilled and pecked. Medium grained sandstone.</p> <p>Stone: ML 210 mm MW 192 mm MH 68 mm  Stone: ML 210 mm MW 192 mm MH 65 mm</p>
5439	1730	7	<p>Incomplete upper quernstone. Approx 50 per cent present. Slightly concave working face, pecked and worn. Flatish top face, pecked in parts. Edge rounded by pecking. Waisted and worn central hole with slight slant, drilled and pecked. Fine grained sandstone.</p> <p>Stone: ML 492 mm MW 266 mm MH 54 mm  Central hole: M dia 48 mm MH 50 mm</p>
7294	1733	5/6	<p>Incomplete lower quernstone. Approx 60 per cent present. Concave working face, pecked and well worn, particularly worn toward centre. Underside flattened by pecking. Edge pecked. Slightly waisted central hole, drilled, pecked and worn smooth. Medium grained sandstone.</p> <p>Stone: ML 492 mm MW 260 mm MH 104 mm  Central hole: M dia 33 mm MH 58 mm</p>

SF	Context	Phase	Description
7308	2018	5/6	<p>Incomplete reconstructed upper stone. Approx 95 per cent present. Concave working face, pecked, worn, and partly chipped at edge. Other side flattened by pecking with damaged pecked hollow for handle. Central hole with slight check, drilled, pecked, and with evidence of wear. Medium grained sandstone. (111 us 123)</p> <p>Stone: ML 556 mm MW 463 mm MH 80 mm            Central hole: Mdia 51 mm MH 78 mm            Handle recess: ML 170 mm MW - MH 34 mm (MW is unattainable as break is along recess).</p>
7370	2061	3.	<p>Incomplete upper quernstone. Approx 30 per cent present. Slightly concave working face, pecked, worn, and partly damaged. Edge, pecked. Upper surface flattened by pecking. Waisted central hole, drilled, pecked, and worn. Pecked rectangular shallow hand recess in upper face. Medium grained sandstone.</p> <p>Stone: ML 368 mm MW 260 mm MH 78 mm            Central hole: Mdia 33 mm MH 39 mm            Handle recess: ML 130 mm MW 62 mm MH 26 mm</p>
Flat-faced			
2202	37	8	<p>Incomplete upper. Less than 20 per cent. Flat working face entirely damaged. Edges rounded by pecking. Off-centre V-shaped handle hole, drilled and pecked. Medium grained sandstone.</p> <p>Stone: ML 331 mm MW 150 mm MH 40 mm            Handle hole: Mdia 49 mm MH 40 mm</p>
2305	863	7	<p>Incomplete upper. Approx 20 per cent present. Flat working face, pecked, worn and re-pecked. Curved upper face. Waisted central hole, pecked. Waisted off-centre handle hole, drilled, pecked and worn. Fine grained sandstone.</p> <p>Stone: ML 210 mm MW 150 mm MT 67 mm            Central hole: MDia 48 mm MT 61 mm            Handle hole: Mdia 37 mm MT 35 mm</p>

SF	Context	Phase	Description
2497	914	7	Incomplete. Approx 40 per cent present. Flat working face, pecked, smoothed and concentrically grooved. Edges chipped. Waisted central hole, drilled, pecked and worn. Fine grained sandstone. Stone: ML 165 mm MW 150 mm MH 76 mm Central hole: Est Dia 42 mm MH 72 mm
2574	817	8	Incomplete. Approx 20 per cent present. Flat working face, pecked, worn and repecked. Other surface rounded and flattened by pecking. Edge pecked. Coarse grained sandstone. Stone: ML 225 mm MW 165 mm MH 76 mm
4319	714	9	Incomplete upper quernstone concretion. Approx 30 per cent present. Flat working face, pecked and chipped, and worn. Other surface unevenly pecked, and with oblong pecked handle recess. Waisted central hole, drilled pecked and worn. Tuffaceous acidic conglomerate. Stone: ML 352 mm MW 228 mm MH 70 mm Central hole: EstD 65 mm MH 50 mm Handle recess: ML 102 mm MW 49 mm MH 24 mm
4520	1080	7	Incomplete lower quernstone. Less than 20 per cent present. Flat working face, pecked, worn (partially toward centre), and repecked. Edge pecked. Waisted central hole, drilled and pecked. Fine grained sandstone. Stone: ML 226 mm MW 163 mm MH 72 mm Central hole: 46 mm MH 54 mm
4851	1509	7	Incomplete upper quernstone. Under 20 per cent present. Flat working face, pecked and worn. Flat upper side partly pecked. All edges damaged. Waisted central hole, with lipped recess. Medium grained sandstone. Stone: ML 260 mm MW 128 mm MH 89 mm Central hole: Dia 58 mm MH 71 mm

SF	Context	Phase	Description
4866	1415	7	<p>Incomplete upper quernstone. Less than 25 per cent present. Flat working surface, pecked, worn and damaged. Curved upper face, pecked and worn. Waisted off-centre handle hole, drilled, pecked and well worn. Medium grained sandstone.</p> <p>Stone: ML 240 mm MW 160 mm MT 76 mm  Central hole: Est dia 50 mm MT 70 mm  Handle hole: Mdia 65 mm MT 60 mm</p>
4927	1326	7	<p>Incomplete upper quernstone. less than 20 per cent present. Flat working surface, pecked and smoothed. Other side rough and irregular. Rounded edge, pecked. Waisted off-centre handle hole, drilled, pecked and worn. Medium grained sandstone.</p> <p>Stone: ML 150 mm MW 110 mm MH 65 mm  Handle hole: set.D 35 mm MH 51 mm</p>
4958	1473	7	<p>Incomplete quernstone. Approx 45 per cent present. Flat working face. Pecked and worn. Other side roughly flat and pecked. Edge dressed and pecked. Waisted central hole, pecked and worn. Medium grained sandstone.</p> <p>Stone: ML 350 mm MW 190 mm MH 68 mm  Central hole: Mdia 42 mm MH 58 mm</p>
5161	1508	7	<p>Incomplete upper quernstone. Approx 15 per cent present. Flat working face, pecked, worn and with concentric grooves towards edge. Edge pecked. Waisted central hole, drilled, pecked and worn. Waisted off-centre handle hole, drilled, pecked and worn. Medium grained sandstone.</p> <p>Stone: ML 220 mm MW 130 mm MH 84 mm  Central hole: Mdia 40 mm MH 56 mm  Handle hole: Mdia 44 mm MH 51 mm</p>

SF	Context	Phase	Description
5385	1705	7	Incomplete lower. Approx 50 per cent present. Flat working face, pecked and worn. Underside flat and partly pecked. Rounded edge dressed and pecked. Central hole with waist, drilled, pecked and worn smooth. Medium grained sandstone.  Stone: ML 520 mm MW 330 mm MH 140 mm Central hole: Mdia 53 mm MH 140 mm
5485	1	9	Incomplete. Less than 20 per cent. Flat, pecked working face. Other side rough, partly pecked. Rounded edge, pecked, waisted central hole, drilled, pecked and worn. Medium grained sandstone.  Stone: ML 232 mm MW 135 mm MH 70 mm Central hole: EstD 50 mm MH 55 mm
5676	1020	5/6	Incomplete upper. Less than 20 per cent present. Flat working face pecked and worn. Flat upper surface. Edge dressed and pecked. Fine grained sandstone.  Stone: ML 165 mm MW 160 mm MH 54 mm
7009	1637	7	Incomplete upper. Approx 40 per cent present. Flat working face, pecked and smoothed. Edge rounded by pecking. Waisted central hole, drilled, pecked, and worn. Small off-centre handle hole, drilled, pecked and worn smooth. Medium grained sandstone.  Stone: ML 306 mm MW 180 mm MH 65 mm Central hole: Mdia 58 mm MH 62 mm Handle hole: Mdia 34 mm MH 60 mm

SF	Context	Phase	Description
7106	1868	5/6	Incomplete upper quern. Approx 40 per cent present. Flat working face, pecked, worn and cracked. Upper surface, rounded, pecked and smoothed. Rounded edge, pecked and smoothed. Central hole, drilled, pecked and well worn. Drilled and pecked handle hole incorporated in edge. Medium grained sandstone. Stone: ML 215 mm MW 163 mm MH 67 mm Central hole: Mdia 60 mm MH 56 mm Handle hole: Mdia 40 mm MH 62 mm
<b>Fragments</b>			
27	1	9	Incomplete upper. Approx 10 per cent present. Worked surface damaged but with evidence of pecking and wear. Pecked upper surface. Rounded edges, pecked. Waisted central hole, pecked and worn. Medium grained sandstone. Stone: ML 154 mm MW 104 mm MH 80 mm Central hole: EstD 40 mm MH 80 mm
4971	1481	7	Incomplete upper. Approx 20 per cent present. Worked surface pecked and worn; upper surface pecked. Waisted central hole, drilled, pecked and worn. Medium grained sandstone. Stone: 191 mm MW 122 mm MH 83 mm Central hole: EstD 42 mm MH 58 mm
7142	1910	7	Incomplete upper. Approx 20 per cent present. Worked surface damaged but with evidence of pecking and wear. Edge rounded and worn. Waisted central hole, drilled, pecked and worn. Medium grained sandstone. Stone: ML 210 mm MW 190 mm MH 66 mm Central hole: EstD 45 mm MH 53 mm
7237	1958	7	Incomplete upper. Approx 15 per cent present. Working surface damaged although signs of previous pecking and wear. Other surface rounded. Medium grained sandstone. Stone: ML 182 mm MW 156 mm MH 45 mm

SF	Context	Phase	Description
<b>Miscellaneous Quernstone Fragments</b>			
4620	1323	7	Possibly worn through. Flat base and very concave surface. Roughly straightened side. Medium grained calcareous sandstone. ML 180 mm MW 147 mm MT 67 mm
4987	1	9	One end squared. Both faces flat and pecked. Biotite granite. ML 230 mm MW 162 mm MT 68 mm
5231	1470	7	Irregular weathered bottom. Top surface pecked and smoothed. Plano-convex in appearance. Silicious fine grained sandstone. ML 200 mm MW 173 mm MT 67 mm
7095	1054	7	Probably part of a quern fragment. Roughly squared sides. Slightly concave and smooth surface with rub marks across the widest part. Possibly broken in half. Medium grained sandstone. ML 345 mm MW 280 mm MT 100 mm
7098	1875	5/6	Round bottomed fragment of quern stone. Surviving bit of surface is pecked. Medium grained calcareous sandstone with comminuted fish fragments. ML 200 mm MW 105 mm MT 63 mm
<b>Rubbers</b>			
24	3	8	Incomplete rubber. Convex face, pecked and worn. Upper surface roughly chipped. Fine grained sandstone. ML 160 mm MW 155 mm MH 78 mm
42	34	8	Incomplete rubber. Convex face, pecked and well worn in centre, chipped along edges. Curved upper surface, roughly pecked. Fine grained sandstone. ML 221 mm MW 180 mm MH 63 mm

SF	Context	Phase	Description
2096	786	8	Incomplete rubber. Plano-concave face, pecked and well worn, also re-pecked. Rounded and pecked upper surface with some chipping. Also concentrated pecking producing a slight hollow off-centre in the upper surface. Evidence of burning. Fine grained sandstone. ML 238 mm MW 140 mm MH 91 mm
2458	267	7/8	Complete rubber. Slightly concave working face, pecked, worn to a polish. Top domed. Medium grained sandstone. ML 288 mm MW 134 mm MH 122 mm
2822	1020	5/6	Convex face, well pecked and worn. Granite. (illus 121) ML 230 mm MW 186 mm MH 62 mm
5023	1	9	Fragment: approx 20 per cent of whole. Slightly convex face, pecked and well worn on edge. Curved upper surface, roughly pecked. Medium grained sandstone. ML 153 mm MW 65 mm MH 81 mm
5024	1557	7	Incomplete rubber. Plano-concave face, pecked and worn. Rounded upper surface, roughly pecked. Fine grained sandstone. ML 221 mm MW 162 mm MH 82 mm
7028	1830	7	Incomplete, one end chamfered by pecking. Worked surface flat, pecked and worn smooth. One end broken. Rounded top partially smoothed. Fine grained sandstone. ML 300 mm MW 182 mm MH 100 mm
<b>Knocking stone</b>			
2837	956	7	Very large, coarse boulder. Incomplete, approx 70 per cent present. Deep sub-oval, central hollow, with flattened top and base, all pecked. Medium grained sandstone. Stone: ML 426 mm MW 335 mm MH 268 mm Hollow: ML 274 mm MW 213 mm MH 146 mm

SF	Context	Phase	Description
<b>Mortars</b>			
2311	103	5/6	Rounded boulder. Incomplete, approx 60 per cent present. Central hollow pecked in bottom, and smoothed below curved rim. Fine grained sandstone. ML 271 mm MW 194 mm MH 123 mm
2767	1020	5/6	Squared fragment. Central pecked hollow. Rim smooth and rounded. Medium grained sandstone. ML 162 mm MW 74 mm MH 98 mm
4101	1132	7	Large squared boulder. Reconstructed, but incomplete, approx 80 per cent present. Central pecked hollow, with squared pecked rim. Flat base with secondary pecked pivot hollow. Fine grained sandstone. ML 358 mm MW 246 mm MH 162 mm Pivot hole: Mdia 66 mm MH 21 mm
5061	1331	7	Small round boulder. Incomplete, approx 40 per cent present. Central pecked hollow, smoothed with use. Rounded rim, pecked. Medium grained sandstone. Stone: ML 218 mm MW 97 mm MH 116 mm Hollow: EstD 152 mm MH 58 mm
5487	1511	7	Large circular boulder. Incomplete, approx 85 per cent present. Central pecked hollow. Rounded rim. Flat base. medium grained sandstone. Stone: ML 371 mm MW 365 mm MH 170 mm Hollow: 262 mm MH 91 mm
7045	1648	7	Large sub-circular boulder. Approx 75 per cent present. Pecked central hollow, with bottom worn smooth. Rounded rim, pecked. Flat base. Fine grained sandstone. (illus 124) Stone: ML 388 mm MW 252 mm MH 160 mm Hollow: ML 268 mm MW 213 mm MH 102 mm

SF	Context	Phase	Description
<b>Pecked and Hollowed stones</b>			
<b>Smoothed</b>			
70	1	9	Rounded fragment c40 per cent present. Round, deep central pecked and smoothed hollow in pecked upper face. Medium grained sandstone. ML 170 mm MW 100 mm MH 105 mm Hollow: EstMD 90 mm MDepth 56 mm
2061	753	7	Rounded smooth fragment. c25 per cent present. Round and smooth flat bottomed central hollow. Pecked outer surface and pecked and flattened base. medium grained sandstone. ML 170 mm MW 124 mm MH 80 mm Hollow: EstD 125 mm Est Depth 40 mm
2584	952	7	Burnt but complete vessel from boulder. Has central hollow which is pecked and smoothed. Medium grained sandstone. (illus 125) ML 155 mm MW 136 mm MH 80 mm Hollow: MD 100 mm Depth 44 mm
4291 7063	1254 59	8 7	Two adjoining fragments of lamp. Rounded vessel, probably pecked to shape. Rounded rim to interior hollow. Stone burnt on exterior surface. c45 per cent of lamp present. Coarse grained yellow sandstone. Est MD 124 mm MDepth 102 mm Hollow: Est MD 85 mm MDepth 58 mm
4505	1080	7	Rounded pecked pebble. Incomplete dome-shaped pecked hollow in upper face. Rim and sides broken away. Burnt outer surface with iron? Deposits in hollow. Medium grained sandstone - burnt. ML 130 mm MW 118 mm MH 58 mm Hollow: EstD 65 mm
4807	1496	7	Rounded fragment. c10 per cent present. Round and smooth central hollow. Pecked outer surface. Coarse grained sandstone. ML 122 mm MW 60 mm MH 70 mm

SF	Context	Phase	Description
5114	1545	7	Small rounded lamp fragment. Rounded central pecked and smoothed hollow. Part burnt. Pecked and rounded outer surface, burnt and cracked. Medium grained micaceous sandstone. ML 88 mm MW 74 mm MH 69 mm Hollow: Est MD 75 mm Est Depth 42 mm
5217	1582	7	Rounded fragment. c20 per cent present. Rounded central hollow, smoothed in pecked and flat upper face. Medium grained sandstone. ML 120 mm MW 110 mm MH 108 mm Hollow: MD 65 mm(est) Est Depth 40 mm
5242	1643	7	Rounded coarse boulder. c50 per cent present. Central hollow pecked and smoothed, located in flat upper face. Pecked outer surface. Medium grained sandstone. ML 170 mm MW 85 mm MH 87 mm Hollow: MD 88 mm MDepth 45 mm
7050	1830	7	Rounded fragment. c30 per cent. Large round pecked central hollow. Burnt outer and inner surfaces. Fine grained sandstone. ML 136 mm MW 48 mm MH 64 mm Hollow: EstD 105 mm Est Depth 52 mm
7120	1864	7	Rounded fragment, c20 per cent present. Very smooth, round and deep central hollow. Pecked outer surface. Fine grained sandstone. ML 108 mm MW 70 mm MH 93 mm Hollow: MD 140 mm(est) Est Depth 50 mm
7265	1984	5/6	Two joining fragments of lamp. Incomplete, c75 per cent present. Rounded boulder with flattened base. Centre hollowed to a smooth cup shape. Cut marks around inside of vessel. Rounded rim, but only 50 per cent of surviving vessel. Micaceous sandstone - burnt. MD 98 mm MH 47 mm Hollow: MH 70 mm MDepth 33 mm

SF	Context	Phase	Description
7267	1984	5/6	Cracked coarse boulder c75 per cent present. Round pecked and smoothed hollow in upper face. Pecked outer surface and rim. Medium grained micaceous sandstone. ML 210 mm MW 115 mm MH 97 mm Hollow: MD 116 mm MDepth 44 mm
7269	1	9	Pecked and rounded fragment c35 per cent present. Round, pecked central hollow in upper face. Burnt exterior surface and within hollow. Fine grained sandstone burnt. ML 120 mm MW 60 mm MH 35 mm Hollow: EstD 70 mm MDepth 22 mm
Rough			
2199	715	8	Irregular rough block. Round shallow pecked hollow in upper face. Fine grained sandstone. ML 86 mm MW 72 mm MH 31 mm
2227	817	8	Incomplete rough pebble. Round, flat, bottomed pecked hollow in upper face, c75 per cent present. Fine grained sandstone. ML 110 mm MW 92 mm MH 45 mm Hollow: MD 78 mm MDepth 22 mm
2712	982	8	Irregular fragment, c80 per cent present. Sub-rectangular pecked hollow in upper face. Fine grained micaceous sandstone. ML 224 mm MW 93 mm MH 40 mm Hollow: 126 mm MW 64 mm MDepth 15 mm
4516		9	Irregular pebble. Two pecked hollows and one cut mark. Medium grained sandstone. ML 110 mm MW 70 mm MH 50 mm 1. MD 44 mm MDepth 12 mm 2. MD 32 mm MDepth 5 mm
4635	807	6-9	Rounded and deep hollow pecked to shape. One end pecked to shape. c30 per cent present. Medium grained sandstone. ML 142 mm MW 50 mm MH 68 mm Hollow: EstD 90 mm MDepth 65 mm

SF	Context	Phase	Description
4784	1242	7/8	Irregular block with small pecked hollow in either face. Poss an unfinished perforated stone. Fine grained sandstone. ML 105 mm MW 82 mm MH 42 mm 1. MD 28 mm MDepth 26 mm 2. MD 13 mm MDepth 11 mm
5003	1063	7	Small stone block with flat base. Upper surface hollowed by pecking to form a circular depression. Lip of hollow reddened and blackened by burning. A natural nick in the stone at one end may have formed a spout. Siltstone, burnt. (illus 125) Stone: ML 95 mm MW 79 mm MT 60 mm Hollow: MDia 65 mm MDepth 17 mm
7008	1816	7	Irregular block. Rounded pecked hollow in upper face. Burn marks on inside of hollow. Fine grained sandstone, burnt. (illus 125) ML 140 mm MW 121 mm MH 78 mm Hollow: MD 77 mm MDepth 20 mm
7207	1865	7	Irregular boulder. Dome-shaped pecked hollow in upper face. Fine grained sandstone. ML 89 mm MW 76 mm MH 26 mm Hollow: MD 31 mm MDepth 14 mm
7312	1960	4	Irregular block. Pecked conical hollow in upper face. Fine grained sandstone (limonitic). (illus 125) ML 77 mm MW 73 mm MH 28 mm Hollow: MD 47 mm MDepth 15 mm
7393	2025	5/6	Squared block with pecked conical hollow in upper face. Hollow smooth towards bottom. Fine grained sandstone. ML 126 mm MW 103 mm MH 60 mm Hollow: MD 82 mm MDepth 34 mm
2063	25	7	Triangular block, with large shallow flat-bottomed pecked hollow in upper face. medium grained sandstone. Stone: ML 310 mm MW 230 mm MT 125 mm Hollow: ML 150 mm MW 110 mm MDepth 17 mm

SF	Context	Phase	Description
2656	977	8	<p>Wedge shaped boulder. One one surface 2 irregular pecked hollows 60 x 40 x 15 mm and 50 x 45 x 10 mm plus other surface peckings. On top of wedge a deeper and larger pecked and partially smoothed hole MD 90 MDepth 55 mm. Again other shallow surface peck marks, including semi-circular linear marks. Base of stone probably pecked to a flat surface. Medium grained sandstone.</p> <p>ML 410 mm MW 400 mm MH 280 mm. Stone not kept.</p>
2693	923	8	<p>Irregular quarried block. The worked face is very irregular, but contains one partial and 2 pecked hollows. Fine grained sandstone.</p> <ol style="list-style-type: none"> <li>1. MD 85 mm x 25 mm deep</li> <li>2. 80 x 90 x 15 mm</li> <li>3. cMD c53 mm</li> </ol> <p>Stone dimenslons.</p> <p>ML 320 mm MW 280 mm MT 120 mm</p>
2720	883	7	<p>Irregular block. Small round conical pecked hollow in upper face. Medium grained flaggy sandstone.</p> <p>Stone: ML 230 mm MW 170 mm MT 74 mm</p> <p>Hollow: MDia 45 mm MDepth 19 mm</p>
923	979	8	<p>Pecked block. Large round shallow pecked hollow in upper face with cut marks in rim (1). Dome shaped pecked hollow in adjacent side (2). Medium grained sandstone.</p> <p>Stone: ML 176 mm MW 162 mm MT 105 mm</p> <p>Hollow: 1. MDia 105 mm MDepth 15 mm</p> <p>Hollow: 2. MDia 70 mm MDepth 18 mm</p>
4442	1340	7	<p>Irregular boulder. Round pecked hollow in one face. Siltstone.</p> <p>Stone: ML 215 mm MW 180 mm MT 8 mm</p> <p>Hollow: MDia 60 mm MDepth 24 mm</p>

SF	Context	Phase	Description
4539	1	9	Irregular block. Incomplete, approx 60 per cent present. Central round pecked hollow. Medium grained sandstone. Stone: ML 175 mm MW 160 mm MT 98 mm Hollow: MDia 90 mm MDepth 42 mm
5455	1287	5/6	Irregular shaped boulder. Chisel(?) marks on one side. Hollowed on both faces by a roughly pecked recess - as if stone was to have a central hole. Medium grained sandstone. 1. cMD c80 mm MDepth 27 mm 2. MD 240 mm MW 60 mm MDepth 38 mm ML 240 mm MW 220 mm MT 200 mm
7193	1851	7	Dressed sandstone block. Conical pecked hollow in upper and lower faces. Both faces pecked to flatten. Fine grained sandstone. Upper hollow 1: MDia 58 mm MDepth 28 mm Lower hollow 2: MDia 64 mm MDepth 30 mm Stone: ML 210 mm MW 165 mm MT 66 mm
7270	1	9	Irregular block. Dome-shaped pecked hollow in upper face. Medium grained sandstone. Stone: ML 190 mm MW 173 mm MT 112 mm Hollow: MDia 90 mm MDepth 25 mm
7315	1960	4	Hollowed fragment. Irregular sides roughly squared and bottom flat. Pecked hollow 35 mm deep in upper surface. Medium grained sandstone. MD of hollow 130 mm ML 21 mm MW 155 mm MT 75 mm
7338		7	Rectangular block with the upper face containing 2-3 pecked hollows at one end, and possibly a fourth near one edge. Also random peck marks on surface. Base pecked flat for balance. Fine grained sandstone. Largest hollow 70 x 80 x 35 mm deep. ML 590 mm MW 160 mm MH 180 mm

SF	Context	Phase	Description
<b>Pecked and decorated</b>			
4043	1088	7	Cut from large block. Pecking at one end, in form of a zig-zag and linking lines, plus a little cross-shape and 2 pecked areas. Part of a zig-zag is curved. ML 132 mm MW 62 mm MW of lines c9 mm. Medium grained sandstone. (illus 127) Little cross 29 mm x 31 mm Stone: ML 195 mm MW 235 mm
7309	1993	4	Cut from block in 2 joining pieces. Very irregular face to stone, was set vertically in the earth floor. On face a central to NNE group of 14 pecked wedge-shaped hollows cMD 19 mm x c4 mm deep. In NNW corner of rock a group of 7 hollows, possibly incomplete because of shattered face. To immediate E of group of 14 is a very shallow group of c6 dots and 2 linear dots. Possibly a group of 3 towards WSW edge of rock. May be more but surface of rock is poor. Fine grained sandstone. MW 460 mm ML 380 mm (illus 127)
<b>Pivot Stones</b>			
109	93	8	Stone completely pecked on one side, with shallow pear-shaped pivot hollow, pecked and well worn. Other side with large pecked circular hollow with all edges broken away. Medium grained sandstone. Stone: ML 305 mm MW 285 mm MH 80 mm Pivot holes: 1. ML 130 mm MW 95 mm MH 17 mm 2. MDia 140 mm MH
110	Unstrat	9	Pecked upper face of stone with shallow, circular, flat-bottomed pivot hollow, pecked and well worn. Fine grained sandstone. Stone: ML 270 mm MW 162 mm MH 89 mm Pivot hole: MDia 84 mm MH 15 mm
124	134	9	Quarried and dressed. Circular, shallow, pecked and worn pivot hollow in top of stone. Fine grained sandstone. Stone: ML 250 mm MW 182 mm MH 270 mm Pivot hole: MDia 77 mm MH 15 mm

SF	Context	Phase	Description
2399	876	7	Stone with round deep pivot hollow, pecked and very well worn, with part of side broken away. Fine grained sandstone. Stone: ML 280 mm MW 197 mm MH 140 mm Pivot hole: MDia 110 mm MH 60 mm
2403	199	8	Squared boulder. Upper face pecked with round off-centre conical pivot hollow, pecked and worn. Fine grained sandstone. Stone: ML 286 mm MW 163 mm MH 155 mm Pivot hole: MDia 114 mm MH 35 mm
2807	1020	5/6	Stone completely pecked to shape. Upper face with large shallow, circular, flat, pecked hollow, with central shallow pivot hole, pecked and worn. Fine grained sandstone. Stone: ML 252 mm MW 208 mm MH 174 mm Pivot hole: MDia 80 mm MH 20 mm Pecked hollow: MDia 186 mm MH 5 mm
4253	959	7	Stone pecked over sides and upper face. Upper face with large round concentrically grooved pivot hollow, highly worn and smoothed. Medium grained sandstone. Stone: ML 280 mm MW 205 mm MH 161 mm Pivot hole: MDia 142 mm MH 34 mm
4458	1311	7	Quarried and dressed stone. Pecked upper side with large, round shallow pivot hollow, pecked and well worn. Flat underside with inverse pyramid shaped pecked hollow - possible unfinished pivot hole. Medium grained sandstone. Stone: ML 210 mm MW 194 mm MH 173 mm Pivot hole: MDia 145 mm MH 23 mm
4688	1378	8	Smooth of stone with central, round, shallow pivot hollow, pecked and worn. Fine grained sandstone. Stone: ML 263 mm MW 240 mm MH 132 mm Pivot hole: MDia 79 mm MH 12 mm

SF	Context	Phase	Description
4709	1213	7	Stone completely pecked to shape. Oval, conical, pivot hollow in upper side, pecked and worn. Fine grained sandstone. Stone: ML 270 mm MW 210 mm MH 138 mm Pivot hole: MDia 86 mm MH 31 mm
4751	1453	7	Stone with pecked face encompassing deep conical pecked and worn pivot hollow. Medium grained sandstone. Stone: ML 250 mm MW 218 mm MH 156 mm Pivot hole: MDia 86 mm MH 45 mm
4903	1067	7	Quarried pivot stone. Upper face with shallow rounded pivot hollow, pecked and worn. Fine grained sandstone. Stone: ML 308 mm MW 182 mm MH 54 mm Pivot hole: MDia 70 mm MH 18 mm
5174	1216	7	Upper face of stone pecked and flattened, with round central, shallow pivot hollow, pecked and worn. Medium grained sandstone. Stone: ML 305 mm MW 300 mm MH 138 mm Pivot hole: MDia 105 mm MH 15 mm
5196	1586	7	Stone with large round shallow pivot hollow, pecked and well worn. Fine grained sandstone. Stone: ML 270 mm MW 252 mm MH 182 mm Pivot hole: MDia 110 mm MH 24 mm
5297	1672	7	Upper face of stone pecked leaving slight lip at edge, and with central, deep, pecked and worn pivot hollow. Medium grained sandstone. Stone: ML 320 mm MW 228 mm MH 160 mm Pivot hole: MDia 93 mm MH 38 mm
5494	1512	7	Small, round, shallow pivot hollows in upper and lower faces of stone. Upper hollow pecked and well worn; lower hollow pecked (unused?). Fine grained sandstone. Stone: 330 mm MW 290 mm MH 172 mm Pivot holes: 1. MDia 66 mm MH 17 mm 2. MDia 70 mm MH 20 mm

SF	Context	Phase	Description
7040	1548	7	Pecked upper side of stone with circular, shallow pivot hollow, pecked and well worn and shiny where quartzite seam is reached. Medium grained sandstone. Stone: ML 565 mm MW 288 mm MH 174 mm Pivot hole: MDia 86 mm MH 16 mm
7087	1211	7	Quarried and dressed block. Two pivot hollows side-by-side. Both round, shallow, pecked and worn, one particularly worn. Fine grained flaggy sandstone - quarried? Stone: ML 370 mm MW 274 mm MH 118 mm Pivot holes: 1. MDia 66 mm MH 10 mm 2. MDia 58 mm MH 8 mm
7144	1905	7	Stone completely pecked, with large, round, deep, pivot hollow, pecked and worn. Fine grained sandstone. (illus 126) Stone: ML 292 mm MW 253 mm MH 116 mm Pivot hole: MDia 180 mm MH 57 mm
7152	1210	7	Stone completely pecked to shape. Large, deep, elliptical, central pivot hollow in upper face, pecked and well worn toward centre. Fine grained sandstone. (illus 126) Stone: ML 280 mm MW 203 mm MH 130 mm Pivot hole: ML 190 mm MW 132 mm MH 48 mm
7231	1864	7	Upper face of stone pecked to produce shallow indeterminate pivot hollow, very well worn and concentrically grooved. Fine grained sandstone. Stone: ML 312 mm MW 260 mm MH 208 mm Pivot hollow: MDia 90 mm MH 28 mm
7278	1896	5	Deep circular central pivot hollow in upper face, highly smoothed but not pecked. Fine grained sandstone. Stone: ML 244 mm MW 180 mm MH 127 mm Pivot hole: MDia 90 mm MH 23 mm

SF	Context	Phase	Description
<b>Reused Stones</b>			
7131	1510	7	Incomplete re-used boulder. Approx 40 per cent present. Concave face, pecked and worn. Pecked and rounded. Underside with round pecked dome-shaped pivot hollow. Coarse grained sandstone. ML 220 mm MW 209 mm MT 112 mm Pivot hole: MDia 70 mm MDepth 14 mm
7176	1924	7	Ninety per cent complete reused sandstone quernstone. Pecked and rounded underside. Flat face, pecked and smoothed and with central round pecked pivot hollow. Reused as hearth kerbing. Medium grained sandstone. ML 295 mm MW 200 mm MT 84 mm Pivot hole: MDia 72 mm MDepth 11 mm
7258	1784	7	Ninety five per cent complete reused quernstone. Rounded underside, pecked. Plano-concave face, pecked and smoothed and with large area subsequently repecked and hollowed - possible unfinished pivot stone. Medium grained sandstone. ML 355 mm MW 237 mm MT 16 mm
7380	1865	7	Reused boulder. Originally quernstone, with flat, pecked, worn and partly damaged face. Centrally repecked and hollowed for pivot hole, round and worn. Medium grained sandstone. ML 390 mm MW 225 mm MT 140 mm Pivot hole: MDia 110 mm MDepth 24 mm
<b>Miscellaneous Stones</b>			
280	302	5/6/7	Small fragment of squared vessel, with rounded base. Part of one side and the central hollow survives. Flat top to vessel is pecked. Interior hollow is fairly shallow but worn very smooth. Finely executed. Medium grained pink sandstone (?Hoy). ML 70 mm MW 65 mm MDepth 86 mm MDepth of hollow: 55 mm

SF	Context	Phase	Description
412	1	9	Irregular piece of stone, with pecked and curved lower surface. In upper surface a small hollow. Medium grained sandstone. ML 82 mm MW 77 mm MT 39 mm
705	427	8	Rectangular block of stone, with v-shaped to semi-circular notch cut into one side, and cutting through 2 edges. Notched is pecked and chipped to shape. Medium grained micaceous sandstone. Notch: ML 37 mm MW 25 mm MDepth 11 mm ML 115 mm MW 25 mm MT 47 mm
864	1	9	Fragment of curved stone. Either fragment of vessel, rim and interior, or whetstone with 2 worked surfaces. Medium grained micaceous sandstone. ML 75 mm MW 35 mm MT 21 mm
1153	644	8	Rounded pebble, well pecked at both ends. Waisted quite severely by pecking half way down both sides. On both surfaces pecked in middle and one surface has polish marks. Coarse grained sandstone. ML 114 mm MW 60 mm MT 35 mm
1400	140	5/6	Bifacially chipped at one end. Fractured at the other. Chipped away at both sides producing a concave surface (for hafting the tool?) ML 196 mm MW 103 mm MT 81 mm
2048	1	9	Rounded pebble. Upper surface has 6 striations. Steatite. ML 47 mm MW 43 mm MT 26 mm
2567	912	8	Fragment, a pointed pebble with rounded edges. On both sides an indented circle has been pecked to leave a central knob. On one side the knob and circle are larger than the other. Stone is broken near the pecked circles. Coarse grained sandstone. ML 85 mm MW 80 mm 1. MD of circle and knob 58 mm 2. MD of circle and knob 44 mm
2668	912	8	Rounded pebble. One surface pecked round a central harder piece of rock to leave a raised knob. Fine grained sandstone. ML 73 mm MW 52 mm MT 28 mm

SF	Context	Phase	Description
2741	991	7	Irregular shaped thin flagstone pebble. Chipped bifacially at narrow end. Siltstone/mottled shaly sandstone. ML 138 mm MW 58 mm MT 11 mm
2855	1017	7	Small fragment of stone vessel, with roughly dressed exterior. Has a concave interior surface which is very smooth. Rim may also have been straight and smoothed. Medium grained yellow sandstone. ML 111 mm MW 108 mm MT 42 mm
4150	1151	8	Fragment of curved stone. Top and bottom pecked to a flattish surface and side pecked to a smooth surface. May be part of a circular mould or weight. Coarse grained sandstone. ML 72 mm MW 37 mm MT 30 mm
4302	1240	8	Irregular and incomplete sandstone fragment. Upper surface smoothed and contains the remains of a ring cut into the block. The circle is not complete. Probably used in the manufacture of ring-headed pins. Fine grained red sandstone. (Eday Mari?). (illus 109) ML 51 mm MW 30 mm MT 25 mm Circle: MD 16.5 mm MDepth 2.5 mm MT 3 mm
4318	1218	7	Long thin spatulate pebble. Narrow end forms a natural handle with bifacial flaking at end. Other end is broader and rounded, bifacial chipping round end and partially down one side. Very worn. Shaly sandstone. ML 240 mm MW 56 mm MT 12 mm
4737	1448	7	Large boulder with 7 cut marks along one side and across tip of one end. Top possibly pecked before weathering. Deepset cut c6 mm x 90 mm x 6 mm. Discarded after recording. Ferruginous coarse-grained sandstone. ML 500 mm MW 300 mm MT 110 mm
4901	1491	7	Beach pebble. Slightly flaked at one end, and fractured at the other. One flat surface is highly polished. Fine grained sandstone - part of surface polished. ML 276 mm MW 115 mm MT 67 mm

SF	Context	Phase	Description
4985	1491	7	Long triangular flat pebble. Ends and edges partially chipped. One surface may have been used as a whetstone. Shaly siltstone. ML 125 mm MW 40 mm MT 8 mm
5198	1606	7	Large double ended hammerstone. One end shattered, the other end well flaked and shattered. Weathered granite (from drift). ML 254 mm MD 109 mm
5374	1583	7	Round ended stone with oval shaped body. Pecked intermittently round body. One concave face well pecked. Medium grained calcareous sandstone. cp7098. ML 330 mm MW 200 mm MT 145 mm
5376	1689	7	Large elongated rounded boulder with one flat surface. Possibly pecked to shape. Ends are rounded. Location on workshop floor beyond rampart implies it is an anvil? Granite. ML 570 mm MW 280 mm MT 300 mm
5394	1583	7	Large oval stone. Part of one end is shattered away. Pecked and scored along one side. Other side pecked, scored and straightened as if a whetstone. Upper surface is smoothed and very smoothed towards whetted edge. Has deep incision towards one end, 120 mm x 7 x c3 mm. Lower surface of stone is very smooth where it survives, and is then shattered. Medium grained pink sandstone. ML 445 mm M 250 mm MT c80 mm
5509	1759	7	Boulder pecked across one flat surface, sides originally squared but indented twice down each side with semi-circular chipped recesses. Medium grained sandstone. ML 257 mm MW 182 mm MT 80 mm
6985	2046	3	Reconstructed stone point. Made from a thin, irregular sliver of laminated rock. But end has its edges smoothed. Stone narrows to the pointed end where the end has been worn and smoothed. Siltstone. (111uB 109) ML 91 mm M 10 mm MT 5.5 mm

SF	Context	Phase	Description
7181	1221	5/7	Wedge shaped and round ended stone. End and sides pecked to a rounded shape. Both sides flat, one side only pecked and smooth. Other side and end natural. Chipped on narrow edge. Medium grained yellow sandstone. ML 255 mm MW 155 mm MT 130 mm
7209	1851	7	Irregular stone with egg-shaped depression in upper surface. Porous fine grained sandstone. ML 58 mm MW 62 mm MT 25 mm
7271	1879	4	Three reconstructed stone fragments with 8 concentric grooves, all highly smoothed. Calcareous fine grained sandstone. (illus 128) Stone: ML 900 mm MW 670 mm MT 90 mm Grooves: ML 510 mm MW 30 mm MDepth 5 mm
7536	2042	7	Small stone block with a 'U' shaped notch worn into one side at an angle. Notch 38 mm ML x 13 mm deep x 14 mm wide. Fine grained porous sandstone. ML 84 mm MW 71 mm MT 36 mm
<b>Unworked stone</b>			
328	370	8	Burnt and cracked pebble with slight pecking or chip marks on edges. Bostonite. ML 111 mm MW 96 mm MT 38 mm
2917	1067	7	Beach pebble, burnt, shattered and cracked, with some pecking or chipping around edges? Bostonite. ML (p) 86 mm MW 82 mm MT 38 mm
2969	981	7	Burnt and cracked pebble. Underside very smooth. Bostonite. ML 136 mm MW 110 mm MT 47 mm
3832	807	6-9	Small rounded pebble, burnt, cracked and partially shattered. Incomplete. Granite. (illus 109) ML 56 mm MW 48 mm
4134	1131	7	Camptonite.
4541	1170	8	Piece of Monochiquite.
7049	1851	7	Egg shaped pebble, burnt, severely cracked and shattered. Fragmented. Bostonite or camptonite. (illus 109) ML 54 mm MW 38 mm

HOWE  
B BALLIN SMITH (Ed)

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Howe Excavation 1978-1982

Bone Artefacts

Bird Bone

SF	Context	Phase	Description
1958	399	8	Gannet ulna, sub triangular in section and hollowed. Broken along its length. Possible faint knife marks on surface which is highly polished. The complete end is polished smooth. (illus 88) ML 65 mm MD 9 mm
1976	715	8	Gannet ulna shaft, from a similar piece to SF 1958. Fragment.
3326	360	7	Right ulna shaft of greylag (?) goose, sawn across and rubbed smooth at cut end. Other end is shattered. Shaft is smoothed. (illus 89) ML 75 mm MD 19 mm
3398	1084	7	Greylag size goose, ulna prox, juvenile. May have been rubbed down to a square section.

Bone artefacts

Counters

2137	798	7	Irregular bone roundel with smooth edges. Surface of bone used as the upper surface of counter. Scored by 5 roughly parallel grooves across the surface and by 2 grooves in shape of an off-centre cross. The grooves are not symmetrical. (illus 106) MD 23 mm MT 4 mm
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Toggles

916	451	8	Proximal end of left metatarsal of sheep/goat, with a bored hold through the length of the shaft. The shaft has been cut off close to the proximal end. ML 30 mm MW 20 mm MT 18 mm MD of hole 7 mm
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SF	Context	Phase	Description
2486	883	7	Highly polished piece of mammal long bone shaft, cut diagonally at the ends. Flat on one side, convex on the other. At mid point on convex side is a notch 8 x 1.55 mm with 4 slightly deeper grooves within the notch. (illus 92) ML 77 mm MW 11 mm MT 6 mm
2680	883	7	Piece of cattle metatarsal shaft, cut at both ends and marrow cavity hollowed out. All the bone surface, including the ends is smoothed. (illus 92)
3361	981	7	Piece of large mammal long bone shaft broken at both ends and longitudinally. Smooth exterior bone surface. Two incised grooves cross the exterior surface close to one broken end. ML 532 mm MW 21 mm MT 7 mm Lines c1.5 mm wide and 1 mm deep
4271	1	9	Piece of large mammal long bone shaft, broken at both ends and longitudinally. V-shaped groove crosses the width of the remaining exterior bone surface, c5 mm wide and 2 mm deep. ML 55 mm MW 21 mm MT 8 mm
<b>Beads</b>			
845	423	8	Small piece of long bone sawn from centre of shaft. Cut ends smoothed and polished. The piece is broken longitudinally, and originally would have been a hollowed cylinder. Exterior surface is smoothed and polished. ML 36 mm MW 18 mm MT 6.5 mm
2011	161	8	Cattle femur head, smoothed after surface bone had been almost completely removed. The dome shape has been reduced with a cut round the diameter, straightening the sides. A hole 7 mm in diameter is bored through the bone and a smaller elliptical hole 4 x 5 mm has been bored diagonally through the bone from the edge of the straight side to merge with the larger hold. MD 29 mm MT 20 mm

SF	Context	Phase	Description
2516	894	7/8	Small piece of mammal long bone shaft, flattened on one side and semi-circular. Has been broken across its length and width. Other surface smooth and polished. Remains of a hole 4 mm in diameter on flat side, bored through thickness of bone. (illus 107) ML 22 mm MW 15 mm MT 7 mm
2598	960	8	Similar to SF 2516. A rounded piece of bone, flattened on one side, broken through the bone and lengthways. Surface smooth. Remains of a hole through flat side. ML 27 mm MW 16 mm MT 7 mm MD of hole 6 mm
5841	1550	7	Small piece of burnt long bone shaft, broken irregularly at both ends. Smooth surface. Hole down centre of bone. May have been a bead. ML 24 mm MD 12 mm MD of hole 4 mm
7264	1906	5/6	Thin bone sliver. Rounded but with warped surfaces. Has central hole. MD 21.5 mm MT 1.5 mm MD of hole 6 mm
<b>Spindlewhorls</b>			
52	28	9	Proximal epiphysis of cattle or deer humerus, broken across the centre hole, leaving a semi-circular indentation in the broken surface. Bone surface worn at one place with 2 cut marks at this point. MD 41 mm MT 20 mm MD of hole 15 mm
4260	336	8	Cattle femur head with a worn surface and large central hole. Bored vertically through the dome. MD 38 mm MT 21 mm MD of hole 12 mm
4523	1352	8	Femur head. Conically rounded with slightly flattened base. Pierced at apex and base by a central rounded shaft through the bone. - Polished. (illus 110) MD 33 mm MT 27 mm MD of hole 9.5 mm
4934	1456	7	Cattle femur epiphysis, incomplete. Off-centre hole 7 mm in diameter, bored through thickness of bone. MD 39 mm MT 27 mm

SF	Context	Phase	Description
5293	1491	7	Cattle femur head. Surface bone almost completely worn away. Large central hole also worn. (illus 110) MD 40 mm MT 21 mm MD of hole 12 mm
7316	2020	4	Cattle femur head with a small hole bored through from top to bottom. Very worn with virtually no surface bone surviving. MD 38 mm MT 28 mm MD of hole 6 mm
7397	1993	4	Cattle femur head, very worn with much surface bone lost. Small hole bored through the bone and hollowed at the base. MD 40 mm MT 31 mm MD of hole 6 mm-15 mm
7853	722	8	Femur head broken across through a large hole bored through the bone. ML 40 mm MW 30 mm MT 16 mm MD of hole 15 mm
7873	1306	7	Cattle femur head sawn from the femur. A hole has been bored through the bone from the top of the dome and worn into an oval. MD 44 mm MT 23 mm MD of hole 6 mm
<b>Perforated bone</b>			
335	349	9	Shaped and smoothed flake of large mammal long bone shaft, has broken through a deliberately bored hole, c10 mm in diameter. ML 28 mm MW 28 mm MT 7 mm
394	363	8	Small piece from proximal end of a small long bone and broken longitudinally to end in a point. Near the remains of the articulation is an arc of a hole. ML 31 mm MW 14 mm MD of arc 4.5 mm
397	335	9	Proximal end and part of shaft of right metacarpal of sheep/goat. Surface smooth and polished. A hole was bored through the shaft from front to back and the bone has broken at this point. Bobbin.
544	204	8	Proximal end and c/ of shaft of left metacarpal of sheep/goat. Bone surface smooth and a hole was bored through the shaft from front to back. Bone has broken at this point. Bobbin. ML 65 mm MW 20 mm MT 14 mm MD of hole 5 mm

SF	Context	Phase	Description
835	204	8	Small eroded fragment of large mammal rib, smooth on flat side. One end has broken at a deliberately bored hole. Perforated plate. ML 45 mm MW 27 mm MT 6 mm MD of hole 6 mm
1169	491	8	Bone plate joined to another by 2 iron rivets. Incomplete. ML 39 mm MW 11 mm Rivets 10 mm long
1861	633	8	Part of shaft of sheep/goat metapodial, both ends have broken off. Circular hole bored through shaft from front to back in centre of shaft. Bobbin. ML 77 mm MW 17 mm MT 10 mm MD of hole 6 mm
1924	722	8	Small piece of sheep/goat metapodial shaft, broken at both ends and longitudinally. Remains of a circular hole through bone, and piece broken at this point. Bobbin. ML 50 mm MW 13 mm MT 3 mm MD of hole 4.5 mm
3671	1352	8	Sheep/deer metapodial, slightly damaged at one end. Pierced through by off-centre hole. Bobbin. (illus 94) ML 98 mm MW 21 mm MD of hole 4.5 mm
3765	1	9	Distal articulation and shaft of sheep/goat long bone. The articulation is worn and broken. Broken across and along shaft. Central hole pierced through shaft from front to back. Bobbin. ML 98 mm MW 22 mm MT 9 mm MD of hole 6 mm
4492	1340	7	Small sheep/goat tibia. Broken at both ends but half of one articulation still surviving. Hole pierced from front to back at this end. The articulation has broken off across the hole. ML 68 mm MW 12 mm MT 8 mm MD of hole 6 mm
4956	1458	7	Metapodial. One end damaged. Shaft pierced through by off centre elongated hole. Bobbin. (illus 94) ML 103 mm MW 20 mm ML of hole 13 mm

SF	Context	Phase	Description
5097	1545	7	Flake cut longitudinally from large long bone shaft, and broken at both ends through bored holes. One other hole remains intact. Perforated plate. (illus 94) ML 79 mm MW 26 mm MT 7 mm MD of hole 7 mm
5728	1583	7	Wedge shaped bone fragment, possibly unfinished artefact. One end not cut through completely. Other end has cut marks, as well as on body. Central hole. (illus 94) ML 68 mm MW 25 mm MD of hole 11 mm
7250	1287	5/6	Pig metapodial, hollowed and ends cut and polished. Body highly polished. Off-centre rounded hole cut in one surface. ML 43 mm MW 12 mm MT 12 mm MD of hole 6 mm (illus 92)
<b>Needles</b>			
2694	912	8	Distal end of pig fibula shaped to a point. Wide end had a hole bored through. Bone surface polished and smoothed apart from pointed end. ML 51 mm MW 6 mm MT 4 mm MD of hole 5 mm
2850	1017	7	Broad and flat needle made of a sliver of ox long bone shaft. Broken across through a hole at one end. Hole was linear. Surface smooth and polished except at hole. (illus 95) ML 59 mm MW 9 mm MT 4 mm MW of hole 3 mm
3580	1046	7	Double pointed flake of rib bone with square hole cut through at widest part. Bone surface very smooth. ML 97 mm MW 14 mm MT 4 mm MW of hole 5 mm (illus 95)
6222	839	8	'Eye' of a needle, probably from a pig fibula. Needle broken along shank. Bone surface smooth. ML 31 mm MW 8 mm MT 3.5 mm Hole 3.5 x 2 mm

SF	Context	Phase	Description
6897	1198	8	Small piece of burnt bone, cylindrical and flattened at one end. Has broken across the hole at the slightly flattened end. Mammal long bone shaft or antler cortex. ML 23 mm MW 4.5 mm MT 4 mm
7102	1868	5/6	Flat, thin tapering sliver of long bone shaft well polished. One end is a sharp flat point, the other end has broken across a hole cut through the bone. ML 60 mm MW 12.5 mm MT 2 mm
<b>Pins</b>			
2113	711	8	Broken pin shaft of ox long bone shaft. Cylindrical in section and cut to a sharp point. ML 32 mm MD 3.5 mm
2145	826	7/8	Eroded pin with tip broken off. No original surface bone left. ML 91 mm MW 10 mm MT 10 mm
2557	912	8	Splinter of mammal long bone shaft, broken at both ends. Tapers slightly towards one end. Smoothed and polished surface. ML 65 mm MW 5 mm MT 4 mm
2559	912	8	Broken pin from mammal ulna or fibula. Pointed end remains and surface is well polished. ML 56 mm MW 4 mm MT 3 mm
2902	973	7	Broken pin from a pig fibula. Pointed end remains. Surface smoothed and polished. ML 37 mm MW 4.5 mm MT 3.5 mm
2919	1067	7	Pig fibula broken in half across shaft. At the distal end the shaft has been cut across diagonally forming a blunt point. ML 127 mm
4129	917	8	Pin from ox-sized long bone shaft. One end has a flat blunt point. The other end is cut and shaped, and may have carried a terminal. Shaft cylindrical and smoothed. ML 67 mm MD 4 mm

SF	Context	Phase	Description
4211	37	8	Pig fibula shaped as a pin. Distal end cut longitudinally to make a flat fan shaped terminal. Proximal end of shaft to a fine point. Surface well polished. ML 92.5 mm MW 14 mm MT 3.5 mm
4307	1181	8	Pointed end of shaft of pin of ox-sized long bone shaft. Pin cylindrical in section and surface is smoothed and well polished. ML 44 mm MD 4 mm
4415	580	9	Pig fibula. Tapering pin with slightly curved point. Polished shank. ML 87 mm MW 13 mm MT 3 mm
4463	1326	7	Long cylindrical shaft of pin from an ox-sized long bone shaft. Blunt point at one end and shaft cut across at the other. Smooth and well polished surface. ML 70 mm MD 5 mm (illus 95)
4722	1326	7	Slightly curved square shanked pin. Pointed at one end, square at the other. Polished. (illus 95) ML 75 mm MW 3 mm
4790	1326	7	Proximal end and part of shaft of left ulna of a ?lamb. Shaft smoothed and polished in part. ML 45 mm MW 15 mm MT 8 mm
4890	61	7	Long tapering and pointed flake of a cattle or red deer metatarsal shaft. Cut cleanly at one end and sharpened to a point at the other. Whole surface smoothed and polished. (illus 95) ML 133 mm MW 13 mm MT 7 mm
5067	1583	7	Flake of large mammal long bone shaft, tapering slightly at both ends. One end is pointed, although extreme tip of point broken off. Surface is worn smooth and but not polished. ML 113 mm MW 7.5 mm MT 6 mm

SF	Context	Phase	Description
5179	1491	7	Curved and cylindrical piece of long bone shaft, possibly sheep. Tapers to a point at one end, though both ends are broken. Shaping rough and pin not polished. ML 57 mm MD 4 mm
5186	1594	7	Fragment of pin from a pig fibula. Ovoid in section with a well polished surface. Broken at both ends. Tapers slightly from end to end. ML 39.5 mm MW 5.5 mm MT 4 mm
5340	1468	6	Tapering bone with a slight curve. Broad end, wedge shaped and slightly rectangular in section. Point of pin missing. Highly polished. (illus 95) ML 56 mm MW 5.5 mm
5822	1	9	Very thin and sharp-pointed length of pig fibula. Broken to show ovoid section. Highly polished. ML 49 mm MW 4 mm MT 3 mm
6887	1242	7/8	Thin sliver of bone, broken at both ends. Roughly shaped to almost cylindrical section. ML 23 mm MD 3 mm
7100	1868	5/6	Pig fibula sliced at the distal end to a broad flat fan shaped terminal with a small hole bored through at the centre of the 'fan'. Proximal end of shaft sharpened to a point. Shaft broad and flat, smooth but not polished. (illus 95) ML 79 mm MW 13 mm MT 4 mm
7108	1881	7	Pig fibula. Slightly curved bone pin. Point broken off. Highly polished and pierced at broad end by off centre hole. (illus 95) ML 79 mm MW 10 mm MD of hole 3 mm
7398	1883	4	Thin curved piece of sheep long bone shaft, tapering to a sharp point at one end. Other end rounded. Smooth and polished surface. ML 40 mm MD 3.5 mm

SF	Context	Phase	Description
7832	834	8	Pointed end of shaft of sheep sized long bone. Ends in a curved point. Cylindrical in section. Surface smooth and polished. Other end broken. ML 23 mm MD 3 mm
78333	1594	7	Pig fibula broken part way down shaft. Extreme end of distal end broken off. Shaft smooth and polished. ML 46 mm MW 9 mm MT 3 mm
7855	883	7	Pig fibula? Tapered, almost circular shaft, broken at both ends. Surface smoothed but not polished. ML 57 mm MD 5 mm
7856	979	8	Pig fibula with distal end shaped to a point and proximal articulation shaved and flattened. Surfaces smoothed but not polished. ML 87 mm MW 8 mm MT 4 mm
7877	894	7/8	Worked pig fibula. Shaft smooth and worn, broken at both ends. ML 94 mm MW 12 mm MT 5 mm
Points			
203	237	8	Two pieces of mammal long bone worked to a point at one end and broken at the other. The point is worn smooth and the extreme tip is broken off. ML 81 mm MW 19.5 mm MT 7 mm
221	298	8	Flake of cattle/red deer metatarsal shaft. Broken longitudinally and at one end. Other end worn into a blunt point. ML 170 mm MW 17 mm MT 7 mm
340	346	8	Small piece of mammal long bone shaft, pointed at both ends. One point sharp, the other blunt. ML 60 mm MW 7 mm MT 5 mm
1984	722	8	Left ulna of sheep/goat, sharpened distally along shaft to form a fragile point. ML 69 mm MW 12 mm MT 12 mm
2006	25	7	Piece of mammal long bone shaft formed into a sharp point at one end. Exterior surface smoothed at point. ML 67 mm MW 12 mm MT 9 mm (illus 95)

SF	Context	Phase	Description
2008	25	7	Point from left ulna of a sheep/goat. Point formed at distal end of shaft. V-shaped notch cut into the bone at olecranon process and shaft's bulge above articulation cut off. ML 119 mm MW 19 mm MT 12 mm
2016	25	7	Flake of mammal long bone shaft pointed at one end. Broken irregularly at other end but bears traces of cut marks close to break. ML 42 mm MW 12.5 mm MT 5.5 mm
2018	25	7	Mammal right ulna broken irregularly at the thicker end. Opposite end cut to a point. Bone broken longitudinally, and edges of break are flattened and smoothed. ML 72 mm MW 21 mm MT 13 mm
2019	25	7	Right tibia of sheep/goat broken at proximal end. Distal end worked to a point, tip broken. Bone surface smooth and polished but with many shallow cut marks. ML 112 mm MW 24 mm MT 21 mm
2074	786	8	Two small pieces of mammal long bone shaft. One piece long and thin and pointed at both ends. The other piece is almost triangular with one broad and sharp point. 1. ML 38 mm MW 7 mm MT 4 mm 2. ML 27 mm MW 11 mm MT 3 mm
2106	786	8	Shaft of sheep/goat left tibia with proximal end cut off and shaft cut longitudinally into a broad and blunt point. (illus 95) ML 90 mm MW 21.5 mm MT 15.5 mm
2805	1	9	Sheep/goat tibia. Shaft cut longitudinally and fashioned into a broad blunt point. ML 79 mm MW 21 mm MT 18 mm
2845	956	7	Small piece of shaft of metapodial of sheep/goat, broken irregularly at one end and cut into a blunt point at the other. ML 60 mm MW 12 mm MT 10 mm

SF	Context	Phase	Description
2890	973	7	<p>Piece of flat and longitudinally broken piece of long bone shaft. The unbroken side has been shaved to form a narrow sharp point, slightly curved and smoothed.</p> <p>ML 105 mm MW 8.5 mm MT 7 mm</p>
4222	1182	7	<p>Small piece of mammal long bone shaft, broken at one end and also longitudinally. Other end pointed, worn and smoothed.</p> <p>ML 38 mm MW 8 mm MT 4 mm</p>
4608	1326	7	<p>Longitudinally cut flake of mammal long bone shaft, broken at one end and fashioned into a blunt point at other. Edges of point smoothed.</p> <p>ML 60 mm MW 8.5 mm MT 3 mm</p>
4611	1323	7	<p>Point made from a flake of right tibia shaft of sheep/goat. The flake flares from point to base and has a worn wide V-shaped notch at the base. The surface is worn, smooth and shiny at the point.</p> <p>ML 82 mm MW 21 mm MT 5.5 mm</p>
4732	1406	6	<p>Small triangular flared flake of long bone shaft of large mammal which has been fashioned to a rounded point at one end. The cut long edges and the remains of the point are worn and smoothed. The artefact is burnt.</p> <p>ML 59 mm MW 17 mm MT 5.5 mm</p>
4753	1456	7	<p>Shaft of right tibia of sheep/goat broken at proximal end and fashioned to a point at the other. Cut edges smooth and rounded with wear. Surface of bone smooth.</p> <p>ML 122 mm MW 26 mm MT 22.5 mm</p>
4758	1457	7	<p>Two bone points found together</p> <p>a. Smallest piece is a thin sliver of surface bone with a long sharp point, with worn smoothed edges. Broken at other end.</p> <p>ML 55 mm MW 8 mm MT 3 mm</p>

SF	Context	Phase	Description
			b. Larger piece is from a metapodial broken longitudinally. The broken end of the shaft has been shaved into a very sharp curved point. Point smooth and worn. ML 99 mm MW 20 mm MT 16 mm
4852	1509	7	Piece of thin slender bone ending in a point and cut from a large mammal long bone. The bone is burnt or stained and is highly polished and smooth. (illus 95) ML 58 mm MW 9 mm MT 4.5 mm
4918	1067	7	A long piece from the shaft of a large mammal metatarsal. The piece has been fashioned into a sharp rounded point at one end. All cut or broken edges are smooth and worn. ML 88 mm MW 16.5 mm MT 9 mm
5266	1470	7	Large piece of cattle tibia shaft cut longitudinally and fashioned to a broad blunt point at the distal end. (illus 95) ML 147 mm MW 25 mm MT 9 mm
5278	1470	7	Flared piece of large mammal long bone shaft, fashioned to a long rounded point at one end, the tip of which is missing. The piece is highly polished and smoothed. ML 84 mm MW 12 mm MT 6 mm
6995	2046	3	Small thin flake from a mammal long bone shaft, worked to a sharp point at one end. The point is smoothed. ML 59 mm MW 7 mm MT 4 mm
7313	2019	7	Flake from a large mammal rib irregularly broken at one end and worked to a long sharp point at the other. Point worn and smooth. ML 76 mm MW 13 mm MT 4 mm

SF	Context	Phase	Description
7376	1	9	<p>Piece of right tibia shaft of sheep/goat split sagittally. The proximal end is broken off and the distal end tapers to a rounded sharp point. The surface and the cut edges around the point are worn and smooth.</p> <p>ML 97 mm MW 22 mm MT 17 mm</p>
7448	1287	5/6	<p>Possible point cut from a mammal long bone shaft. Shaped and smooth. May have ended in a sharp point but the tip is now missing.</p> <p>ML 72 mm MW 8 mm MT 3 mm</p>
7818	1077	8	<p>Broken metacarpal shaft of sheep/goat which tapers to a point. Marks towards the point suggest deliberate working.</p> <p>ML 110 mm MW 25 mm MT 9.5 mm</p>
7838	2045	5/6	<p>Flat piece of cattle ulna fashioned to a point at one end. The surface is smooth and worn all over and the tip of the point is missing.</p> <p>ML 90 mm MW 16 mm MT 17 mm</p>
7839	2046	3	<p>Small and narrow flake of mammal rib(?) bone, pointed at one end and broken at the other. Smooth edges and surface.</p> <p>ML 29 mm MW 5 mm MT 3 mm</p>
7840	2046	3	<p>Long, thin flake of large mammal ulna(?) shaft worked to a rounded sharp point at one end. Smooth and worn around point and along edges.</p> <p>ML 76 mm MW 7 mm MT 4.5 mm</p>
7841	1868	5/6	<p>Flake cut from ox-sized long bone. Surface worn and smooth around the point. Extreme tip of point broken off.</p> <p>ML 63 mm MW 8 mm MT 6 mm</p>
7842	1906	5/6	<p>Small flake cut longitudinally from a long bone shaft of a large mammal, broken at one end and worked into a flattish point at the other. Smoothed and worn at point although extreme tip broken off.</p> <p>ML 50 mm MW 10 mm MT 4 mm</p>

SF	Context	Phase	Description
7846	722	8	Small thin curved flake of mammal long bone shaft broken at one end and pointed at the other. Surface around the point is worn and smooth. ML 59 mm MW 6 mm MT 3.5 mm
7857	981	7	Rounded length of cattle ulna(?), slightly curved and eroded. Cut to a blunt rounded point at one end. Broken across at the other. ML 63 mm MD 6 mm
7858	979	8	Proximal end and part of shaft of left metacarpal of sheep/goat. Shaft has been cut longitudinally leaving a 'blade' which ends in a sharp curved point. ML 94 mm MW 15 mm MT 11 mm
7859	1017	7	Half of proximal end and small portion of shaft of sheep/goat metacarpal. Small extant proportion of shaft cut to a sharp point. ML 48 mm MW 11 mm MT 6 mm
7878	37	8	Small flake of bone from a long bone shaft, worked to a point at both ends. One point long, narrow and sharp. The other end is less tapered and blunt. Smooth surface is worn. ML 45 mm MW 5 mm MT 2 mm
<b>Awls</b>			
49	8	8	Sheep/goat left tibia broken down through shaft with distal end sharpened to a blunt point. Surface and point are very smooth. (illus 96) ML 139 mm MW 14.5 mm MT 13 mm
2021	25	7	Left tibia shaft of sheep/goat possibly used as a handled awl. Two elliptical holes have been bored through the proximal end. Distal end sharpened to a point, tip of which is missing. Surface of bone is smooth and polished. (illus 96) ML 106 mm MW 21 mm MT 26 mm MD of holes 7 mm x 5 mm

SF	Context	Phase	Description
2178	830	7	Sheep/goat left tibia broken across shaft towards proximal end leaving a splinter which has been sharpened to a point. Edges all smoothed. (illus 96) ML 137 mm MW 24 mm MT 19 mm
2859	1017	7	Right ulna of cattle with distal end removed and shaft brought to a point. Proximal end smooth, possibly from handling (illus 96) ML 208 mm MW 50 mm MT 27.6 mm
4555	1244	7	Sheep/goat metapodial split longitudinally and distal end shaped into a sharp point. The edges of the artefact have been rounded and smoothed by wear. ML 74 mm MW 14 mm MT 6 mm
4726	1251	7	Proximal end of left cattle ulna with distal end of the small piece of shaft worked to a sharp point. Surface of bone is well polished. (illus 96) ML 110 mm MW 54 mm MT 20.5 mm
4789	1208	7	Distal end of young sheep/goat metapodial with distal epiphysis missing. Shaft has been cut to a short point which is well smoothed and rounded. ML 71 mm MW 19 mm MT 12.5 mm
4823	1508	7	Proximal end of shaft of cattle ulna with olecranon roughly broken off. The remainder of shaft has been brought to a sharp point. The surface is smooth and well polished. ML 74 mm MW 22.5 mm MT 13.5 mm
4937	1458	7	Distal end and c1/3 of shaft of sheep/goat metapodial. Proximal end of shaft has been cut to a thin sharp point. Cut edges are smooth and worn, (illus 96) ML 80 mm MW 19.5 mm MT 13 mm
5351	1468	6	Awl from a right tibia of sheep/goat. Distal end intact and shaft sharpened to a point. Bone surface smooth. (illus 96) ML 117 mm MW 23 mm MT 19 mm

SF	Context	Phase	Description
5370	1271	7	Sheep/goat metatarsus with proximal end removed and shaft made into a point. Extreme end of point smooth and edges rounded. (illus 96) ML 108 mm MW 21 mm MT 13 mm
6994	2046	3	A splinter cut longitudinally from the metatarsus of a large mammal, with the distal end of the piece brought to a point. Point rounded and smooth. ML 107 mm MW 21.5 mm MT 9 mm
7843	1881	7	Splinter of a sheep/goat metatarsus with half of distal articulation remaining and the shaft worked to a point. Edges of splinter smoothed around point. ML 96 mm MW 16.5 mm MT 15 mm
<b>Handles</b>			
752	553	6	Small bone socketed handle, squarish in section with incomplete iron blade <u>in situ</u> in socket. The junction of handle and blade is covered with a thin silver trim. The bone is slightly burnt on one side near the blade. (illus 130) ML 48 mm MD 8 mm ML of blade 8 mm MW of blade 6 mm
2022	25	7	Handle made from a cow right metatarsal. The proximal facet has been mostly hacked off. Distal end of the shaft is cut straight and cleanly across and edges of cut slightly smoothed. Socket is cut out at this end. Bone surface is mostly well polished. ML 116 mm MW 32 mm MT 27 mm Diameter of socket 12 x 14 mm Depth of socket 101 mm
2515	923	8	Large mammal rib sawn cleanly at both ends. Core hollowed out at both ends. At widest end the flat surface bears a groove 29 mm long, 3 mm wide and 1 mm deep. Surface eroded. (illus 97) ML 128 mm MW 35 mm MT 15 mm

SF	Context	Phase	Description
4063	1067	7	Fragment of large mammal long bone shaft roughly cut at both ends. Edges eroded and worn as is the surface bone. The bone is hollow and may be a surviving fragment of a handle. ML 51 mm MD 23 mm MD of centre c15 mm
7854	883	7	Piece of cattle metapodial shaft broken across and longitudinally with part of one end showing from being sawn. Bone was hollowed out and the surfaces smoothed. ML 47 mm MW 18 mm MT 16 mm
<b>Spatulate tools</b>			
2881	704	7	Mammal rib bone rounded at one end with a 3 mm diameter hole bored through it. Other end thin, worn and broken. Upper edge smooth and polished, lower edge has lost most of its surface bone. Is worn and pitted. (illus 98) ML 138 mm MW 16 mm MT 5.5 mm
4532	1223	7	Highly polished mammal long bone shaft flake. Broken and flaking at one end, flattened and rounded at the other. (illus 98) ML 127 mm MW 9 mm MT 4.5 mm
7029	1830	7	Rib(?) bone with surface cut away to core on one side. One end broken, the other flattened and rounded. Surface mostly smooth and polished. ML 105 mm MW 8 mm MT 4 mm
7821	1314	7	Piece of large mammal bone, rounded and almost cylindrical in section at one end. Broken at this end. Other end flattened and spatulate. Surface worn away in places, otherwise smooth and polished. ML 104 mm MW 9 mm MT 5.5 mm
7825	1470	7	A shaped sliver of large mammal rib giving the appearance of a miniature shovel. A wide but short end narrows to a longer shaft and then widens to a 'blade'. One side of this piece is surface bone the other side is core. The 'blade' may have been longer. <b>Maybe a bone off-cut.</b> ML 83 mm MW 22.5 mm MT 3 mm

SF	Context	Phase	Description
<i>Scoops/Gouges</i>			
600	368	8	Piece of tibia shaft broken at one end. Cut longitudinally and the non-broken end shaped to a blunt rounded point. ML 77 mm MW 26 mm MT 9 mm
2193	826	7/8	Longitudinally split bone. One end broad and pointed with sides cut back. The other end roughly broken. ML 165 mm MW 35 mm
2228	826	7/8	Cattle tibia shaft, split sagittally and both ends broken. One end rounded and appears worked, but may be due to marrow extraction. ML 123 mm MW 25 mm MT 11 mm
2297	861	7	Cattle tibia or humerus shaft split sagittally with one end broken the other shaped and bevelled to form a scoop or scraper. The outer surface of bone is smooth especially around the shaped end. (illus 98) ML 123 mm MW 42 mm MT 8 mm
2530	912	8	Cattle right metatarsal sliced longitudinally through shaft. Distal end shaped roughly into a scoop and worn. ML 89 mm MW 40 mm MT 20 mm
2525	901	8	Proximal end of cattle right radius with the shaft cut obliquely forming a rounded scoop/gouge. Edges of this end are worn down and broken at one side. ML 85 mm MW 71 mm MT 38 mm
4152	961	7/8	Piece of cattle radius shaft, split sagittally, shaped into a handle(?) at the proximal end. Rounded at distal end and worn. Smooth on exterior surface. ML 117 mm MW 27 mm MT 11.5 mm
4159	961	7/8	Flake of cattle tibia shaft with distal end cut straight across. The proximal end is cut to a rounded blunt point. The exterior surface is smooth and polished. The tool has been burnt. ML 54 mm MW 27 mm MT 8 mm

SF	Context	Phase	Description
4188	1177	7	Piece of large mammal long bone shaft with one end roughly broken and the other cut into a blunted rounded point with the extreme tip broken off. All cut edges are worn and rounded. ML 131 mm MW 22 mm MT 8 mm
4449	1352	8	Cattle femur shaft split sagittally with the distal end rough and broken but proximal and shaped into a rounded scoop. Slightly waisted between broken and rounded ends. Well shaped and almost symmetrical. (illus 98) ML 135 mm MW 35 mm MT 18 mm
4966	1456	7	Sheep tibia used as a gouge. Worked end formed by a diagonal cut across the bone. Worked end rounded and highly polished. (illus 98) ML 111 mm MW 18 mm
7378	1848	5/6	Cattle right tibia shaft flake. Distal end broken irregularly. Proximal end rounded and all edges worn. ML 132 mm MW 29 mm MT 24 mm
7860	1007	8	Flake of large mammal long bone shaft, broken at one end but with smoothed cut longitudinal edges ended at other extremity in a tapered blunted point. Surfaces are worn and smoothed. ML 66 mm MW 18 mm MT 8 mm
<b>Scrapers</b>			
3934	1323	7	Right innominate of red deer cleanly sliced across the acetabulum; the ileum is present and forms the scraper blade. It is worn very thin and is cracked at the edge. ML 183 mm MW 70 mm MT 30 mm
4035	1111	8	Large mammal rib fragment, roughly pointed at one end and broken across the other. Point and side edges all worn. Surface smooth on one side and partly worn away on the other. ML 61 mm MW 22 mm MT 6 mm

SF	Context	Phase	Description
4305	1162	7	Small irregular shaped flake of cattle tibia shaft. One edge may be cut, but no signs of wear. Could also be butchering debris. ML 42 mm MW 32 mm MT 6 mm
4911	1067	7	Large mammal rib fragment founded at one end, and worn along this and along lower edge. Surface bone smooth and polished on one side, worn and breaking away on the other. (illus 98) ML 141 mm MW 32 mm MT 9 mm
5337	1468	6	Right metacarpal of red deer with proximal end intact but shaft cut away close to articulation leaving a blade-like section of shaft which is well worn and polished with a rounded end. The proximal articulation would have acted as a handle. (illus 98) ML 136 mm MW 30 mm MT 21 mm Blade - MT 6 mm MW 16 mm
7861	1116	8	Cattle rib tapered to a blunt point at one end. Worn along its length on both edges. Scratch and cut marks visible on both surfaces. ML 227 mm MW 38 mm MT 6 mm
<b>Shovels</b>			
4027	1111	8	Right scapula of horse(?). Spine intact, whereas normally cut off or at least trimmed if bone was used as a shovel. Edges of the blade at its widest point may have been trimmed. ML 306 mm MW 131 mm MT 39 mm
4940	1503	7	Scapula with rib removed. Bone above socket is well polished. Broad end damaged with use, some fragments of bone chipped off and edges rounded with use. (illus 102) ML 276 mm MW 141 mm
7262	1080	7	Right scapula of cattle, with blade completely broken off. Spine has been cut down to the rest of the bone level. Surface is worn and scratched. ML 138 mm MW 61 mm MT 42 mm

SF	Context	Phase	Description
7881	37	8	Reconstructed fragmentary cattle left scapula. Rib mostly removed and tip worn smooth and chamfered. ML 235 mm MW 70 mm
7882	1259	8	Two irregular adjoining fragments of cattle scapula shovel with rib removed. Some cut marks on opposite surface. ML 136 mm MW 58 mm
<b>Miscellaneous</b>			
71	1	9	Proximal articulation of cattle right metatarsal. Has been cut across at the start of the shaft. The cut is stepped and grooved. May be a decorative end to a knife handle. ML 21.5 mm MW 40.5 mm MT 38 mm
113	54	8	Squared piece of bone. Deeply notched around two-thirds of width by gnawing. Bone hollowed. Gaming piece? (illus 92) ML 28 mm MW 17 mm MD of hole 12.5 mm
114	107	8	Dome-shaped piece of bone with cut sides. Has been hollowed out. Flat base has an almost centrally placed hole bored through it. Another small hole c1 mm in diameter lies close to the first. Pin head, from cattle metacarpus shaft. (illus 92) ML 27 mm MW 19 mm MH 20 mm MD of hole 4 mm
611	362	8	Distal end of large mammal metapodial and small part of shaft. The bone has been cut and broken longitudinally severing part of the articulation. There are also cut marks across the end. On the shaft is a ridged lump of bone core left from sliding vertically through the bone. ML 53 mm MW 22 mm MT 13.5 mm
3006	731	8/9	Piece of a long bone shaft probably a sheep tibia, with both ends cut cleanly. The bone is slightly curved from end to end and hollow. It has a smooth polished outer surface. End blown flute? ML 94 mm MW 15 mm MT 13 mm (illus 92)

SF	Context	Phase	Description
3046	1	9	Elongated bowl and a small part of a handle of a scoop/spoon from a flake of a large mammal long bone shaft. The bowl is elongated and shallow with a rounded end which tapers slightly towards the narrow handle. The whole piece is well polished. ML 57.5 mm MW 19 mm MT 4 mm
4821	1064	5/6	Segment of hollowed long bone, calcined through being burnt. Semi-circular in shape, pierced by a rounded hole in the centre of the base. Bone split at base through hole. Pin head. (illus 92) ML 27 mm MW 13 mm MT c5 mm MD of hole 4.5 mm
4925	1458	7	Irregular and broken piece of long bone shaft. At one end the object has a diagonal worn groove c17 mm long. There are 2 short and shallow worn grooves below the other suggesting that thonging or string was wound round the bone. ML 122 mm MW 21 mm MT 10 mm
5058	1	9	Distal end of red deer metacarpal, the articulation has been neatly sawn off the shaft. The section across the shaft shows 2 holes c4 mm in diameter, either side of the articulation tube. The holes may have helped to fasten this object onto a pin. Pin head?. (illus 92) ML 28 mm MW 36 mm MT 25 mm
5353	1689	7	Small bone peg, bone and species not identified, cut straight across at one end and diagonally at the other. Almost cylindrical in section. ML 21 mm MW 6 mm MT 5 mm
7826	1	9	Large mammal rib bone split longitudinally. Edges and inner surface smoothed. Sliced straight across at one end and cut to a point at the other. Two wedge shaped notches have been cut into both edges of the bone, opposite each other. Rib bone knife? ML 163 mm MW 20 mm MT 3.5 mm
7827	1373	7	Piece from a large mammal long bone shaft, slightly curved with a large central hole c18 mm diameter. ML 38 mm MW 30.5 mm MT 7 mm

SF	Context	Phase	Description
7844	839	8	Small piece of large mammal long bone shaft with a kite-like incised design. ML 37 mm MW 13 mm MT 8 mm ML of design 8 mm
7863	858	7/8	Small scapula, foetal sheep/goat, with central portion of blade cut out in V shape and spine cut down, leaving a fork-shaped artefact. The edges of the blade are also cut back so that the articulation appears to stick out at the sides. Ends of the blade are cut diagonally towards the centre. ML 64 mm MW 33 mm MT 9 mm
7879	985	7	Worked large mammal rib bone flake cut longitudinally. One end worked and tapered into a blunt point. The other end is cut at the edges and across the bone width forming a slight 'tang' to the end of the piece. ML 156 mm MW 23 mm MT 3.5 mm
<b>Others - Horn, Tooth etc</b>			
2069	786	8	A tooth split longitudinally and the root shaved to a point. ML 33 mm MW 9 mm MT 6 mm
3033	826	7/8	Possible pig canine or incisor, with root ending in a point. Root smoothed and polished. ML 45 mm MW 8 mm MT 6.5 mm
4187	785	8	Pig incisor with root sharpened forming a long point. Appears worn and used. ML 45 mm MW 4 mm MT 5.5 mm
4469	1326	7	Dome shaped piece of tooth or ivory. Highly polished all over. Traces of a longitudinal groove on the flat surface in the centre of which is evidence of an iron shank. Pin head. ML 21 mm MW 18 mm T 10.5 mm
4593	1403	7	Probable pig canine, curved and cylindrical in section. Surface highly polished. (illus 99) ML 73 mm MW 13 mm MT 12 mm

SF	Context	Phase	Description
5253	1644	7	Small conical piece, possibly tooth. Ends in a blunt point. Other end broken. Piece burnt and possibly polished. ML 17 mm MD 5 mm
5673	1689	7	Horn core broken at base. A cut groove runs diagonally round the circumference slightly higher than mid-point. On one side the groove is deep and runs from edge to edge. On the other the groove is shallower and does not run the full width of the core. ML 74 mm MW 33 mm MT 22 mm Groove MW 1.5 mm MDepth 1.5 mm

#### Antler Artefacts

##### Combs

307	296	8	Fragment of a double-sided comb. Five teeth and the end piece of one side remaining. The teeth are c17 mm long and 2 fragmentary central rivet holes are 3 mm in diameter. ML 12 mm MW 34 mm MT 3 mm
308	296	8	Fragment of a double-sided comb with 4 complete teeth 17 mm long surviving on one side, and stumps of others on the other. Part of a 3 mm diameter rivet hole remains. Could be a non-joining part of SF 307. ML 10 mm MW 38 mm MT 3 mm
798	525	8	Double-sided hair comb in 2 main fragments which do not join. The largest piece has the remains of 2 convex connecting plates with a double sequence of dot-in-ring decoration and 2 iron rivets. There is a suspension hole at one end, and may have had one at the other end as well. (illus 100) ML 29 mm MW 30 mm MT 6 mm
872	291	8	Fragmentary pieces of bone comb? Pieces decorated on both sides with dot-in-ring decoration. Also the remains of 2 iron rivets. Rivets ML 9 mm MT 3 mm

SF	Context	Phase	Description
1138	525	8	Reconstructed double-sided comb with 2 convex connecting plates joined by 6 rivets. There is no decoration but has suspension holes at both ends. The teeth were probably cut after the connecting plates were attached as the plates have cut marks along their edges. (illus 100) ML 112 mm MW 47 mm MT 9 mm
2177	727	7	Fragment of weaving comb which had broken during manufacture. The piece is curved with one tooth cut and another started. It has broken where the third tooth would have been. ML 57 mm MW 32 mm MT 7 mm
2670	982	8	Weaving comb with a slightly waisted handle. The broad end has 8 small, tapering and pointed teeth. The upper surface is polished. (illus 101) ML 112 mm MW 40.5 mm MT 8 mm ML of teeth 15 mm
3648	923	8	Fragment of handled weaving comb, with the stubs of 9 teeth remaining. Below the teeth is a horizontal groove. The comb is broken across the handle and the surface is badly worn. ML 60 mm MW 30 mm MT 9 mm
3672	1346	7	Handle of a weaving comb broken across the base of the teeth and badly weathered. The handle is curved in section and had at least 7 teeth. At the base of the handle is a worn curved notch. ML 90 mm MW 47 mm MT 11 mm
4178	1093	7	Reconstructed weaving comb with 5 out of 8 long teeth still intact. The handle is slightly waisted. (illus 101) ML 123 mm MW 35 mm MT 10 mm ML of teeth 28 mm
4200	1186	9	Short but broad weaving comb with polished upper surface and edges. Five teeth are intact out of an original 9. (illus 101) ML 95 mm MW 46 mm MT 14 mm ML of teeth 24 mm

SF	Context	Phase	Description
4376	1269	8	Small double sided comb complete apart from one end tooth and a missing facing plate. The surviving facing plate is plain and convex in section with holes at either end. There are corresponding holes on the comb, and as there is no iron staining, bone pegs may have been used to connect the pieces. (illus 100) ML 50 mm MW 43 mm MT 7 mm
4907	61	7	Complete single-sided hair comb. Curved in section with 18 teeth. The top of the comb bears decoration in the form of a band of cross hatching on the convex side and a diagonal zig-zag on the concave side. The suspension hole lies at one end. (illus 100) ML 47 mm MW 31 mm MT 6 mm ML of teeth 15 mm
5157	1456	7	Incomplete handled weaving comb, broken longitudinally through the comb. Only 2 long teeth remain intact and the handle is in the shape of a fish-tail. (illus 101) ML 126 mm MW 30 mm MT 11 mm ML of teeth 27 mm
7018	1838	7	Weaving comb which originally had 6 teeth of which 4 remain. The handle is waisted and has a swallow-tail end of which one tail is broken. The surface of the handle has an incised design of 3 grooves in the shape of a broad arrow. The comb is worn and smooth all over. (illus 101) ML 107 mm MW 48 mm MT 15 mm ML of teeth 34 mm ML of grooves 30 mm
7339	2027	4	Fragment of weaving comb with the remains of 6 teeth, originally would have had 7 or more. The handle is missing, but the surface was polished. The head is slightly curved. ML 46 mm MW 46 mm MT 9 mm ML of teeth 11 mm

SF	Context	Phase	Description
7848	912	8	Part of a handled weaving comb, with the base sawn across. The stumps of 3 teeth remain. The piece is rough with many knife cuts. ML 102 mm MW 30 mm MT 26 mm
<b>Perforated antler</b>			
744	572	8	Slightly curved plate with a rough break at one end. Sides are cut and smoothed. Has 2 rivet holes 3.5 mm in diameter. One hole lies toward the unbroken end the other in the middle and is surrounded by an elongated cut depression in the plate surface. (illus 94) ML 91 mm MW 20 mm MT 6 mm
2490	912	8	Antler tine shaped at its base into a rectangle with cut marks still visible. Tip of the tine is shaped to a point. A hole 7 mm in diameter is bored through the tine close to the base. Surface of the piece is smooth and polished. ML 94 mm MW 18 mm MT 15 mm
2869	1067	7	Rectangular plate with smoothed exterior surface and 2 rivet holes 6 mm in diameter. The remains of another rivet hole lies at the broken end. (illus 94) ML 70 mm MW 24 mm MT 4.5 mm
4021	1107	8	Small piece of badly eroded antler tine, broken at both ends. Small circular hole bored through the tine near the broken tip end, 3 mm in diameter. ML 38 mm MW 14 mm MT 11 mm
4121	1082	7	Slightly curved flake of antler smoothed on both sides and broken at one end. Contains 6 rivet holes of 2 types. Three are 5 mm diameter and the larger 8 mm diameter holes are counter sunk, possibly indicating the piece's reuse. (illus 94) 108 mm MW 24 mm MT 4 mm
4298	1187	7	Cut and rectangular piece of antler flake, broken at both ends through rivet holes. The centre hole is complete and waisted and 8 mm in diameter. ML 68 mm MW 26 mm MT 8 mm

SF	Context	Phase	Description
4443	1352	8	Antler flake roughly cut and smoothed and broken at one end through a rivet hole. Two complete holes remain, both counter-sunk and c6 mm in diameter. The centre hole is rectangular. (illus 94) ML 76 mm MW 19 mm MT 7 mm
4750	1410	8	Antler tine roughly hacked from beam at base and whittled down 20 mm from end. A hole is cut through the shaft at this point 5 x 10 mm. The edges of the shaft are worn and polished smooth. The tip of the tine is missing. ML 67 mm MW 20 mm MT 16 mm
4791	1410	8	A peg shaped piece of antler stem cut immediately above the burr and trimmed to shape. The end of the piece is broken and a hole has been bored through the peg below the head. ML 75 mm MW 31 mm MT 31.5 mm MD of hole 8 mm
7830	1545	7	Slightly convex piece of antler stem, oblong in shape broken at each end through rivet holes. One long side also broken. Both surfaces smoothed and might suggest it was a comb facing plate. ML 45 mm MW 20 mm MT 6 mm MD of holes c 7 mm
<b>Points</b>			
1328	644	8	Small piece of antler beam with one end worked to a blunt point, but badly eroded. Surface slightly faceted. ML 57 mm MW 18 mm MT 8 mm
4151	821	8	Small antler flake pointed at one end, sharp and smooth but with signs of wear. ML 27 mm MW 11 mm MT 4 mm
5168	1491	7	Flat and curved flake of antler pointed at one end and curved at the other. Worn and smoothed. (illus 95) ML 105 mm MW 13 mm MT 6 mm

SF	Context	Phase	Description
5349	1468	6	Well fashioned point, flattened on one side and rounded on the other. At the opposite end of the point is a handle formed by uncut antler jutting out.  ML 80 mm MW 18 mm MT 6 mm
<b>Handles</b>			
375	285	8	Curved and tapering handle, butt end is broken. The bone is hollowed at the blade end and is roughly finished. Two opposing holes are cut through the bone at the blade end, and lie in an elongated groove.  ML 129 mm MW 28 mm MT 16 mm MD of holes 4.5 mm
400	349	9	Cylindrical piece of antler with core hollowed out, and sawn at both ends. Outer surface has been smoothed and polished, and decorated with 2 dot-in-double circle designs. (illus 97)  ML 56 mm MW 18 mm MT 18 mm
714	439	9	Hollowed stem of antler, very broken at one end. Cut marks visible on surface of handle. (illus 97)  ML 116 mm MW 37.5 mm MT 42 mm
1844	25	7	Possible unfinished handle. At the lower end there has been an attempt to tidy and shape the end. At the opposite end the bone has been partially cut through and then broken off. An 8 mm diameter hole has been bored into this centre piece of cortex to a depth of 25 mm.  ML 112 mm MW 34 mm MT 26.5 mm
2005	25	7	Socketed handle, sawn off at the butt end and polished. Handle ends cut to shape. Socket deep. (illus 97)  ML 112 mm MW 39 mm MDepth of socket 22.5 mm

SF	Context	Phase	Description
2007	25	7	Socketed handle, well worn and smooth on the surface, and on inner surface of the socket. Both ends sawn cleanly across. ML 91 mm MW 26 mm MT 31 mm Depth of socket 63 mm
2013	25	7	Socketed handle, poorly preserved with most of outer surface worn away. Core has been removed at cut end. ML 118 mm MW 31 mm MT 38 mm
2164	826	7/8	Curved antler tine, badly worn and eroded on surface, with tip broken off. Base of tine cut cleanly from beam and cortex hollowed out to a depth of c19 mm ML 154 mm MW 24 mm MT 31 mm
2997	1082	7	Unfinished antler handle, from beam. Sawn cleanly at one end. Other end has a central raised lump of cortex, with the beginnings of a hole bored into it. Surface worn but not smooth or polished. (illus 97) ML 117 mm MW 30 mm MT 38 mm MD depth of hollow 9 mm
4189	1076	7	Broken antler tine with cortex hollowed out. The pointed end has been broken off but the base has been sawn. ML 82 mm MD 23 mm MD of socket c15 mm
4373	1269	8	Polished antler, probably a handle, broken longitudinally. The core has been hollowed out, the inner surface of which is smooth and has traces of iron-staining at the open end. The handle is sawn at the other end and the cut edges are worn. The handle tapers from sawn end to socketed end. (illus 97) ML 88 mm MW 14 mm MT 17.5 mm ML of socket 50 mm

SF	Context	Phase	Description
4613	1218	7	Piece of cut and hollowed antler. Probably one half of a handle. Straight cut at one end and an irregular break at the other. 103 mm MW 38 mm MT 11 mm
4652	1394	7	Beam fragment of antler, sawn straight across one end and broken at the other. There may have been an attempt to hollow out the core. (illus 97) ML 120 mm MW 29 mm MT 39 mm
5276	1470	7	Piece of beam with the base ends of 2 crown tines present. The pointed ends of the tines have been broken off. The end of the beam is also broken. The core is hollowed at this end to a depth of c18 mm. ML 190 mm MW 67 mm MT 24 mm
5941	1	9	Fragment of antler beam, hollowed through its length apart from one end. Sawn across at one end and probably broken at the other, although worn smooth. Surface has been worn smooth. (illus 97) ML 75 mm MW 29 mm MT 35 mm
<b>Picks</b>			
2009	722	8	Reconstructed pick of a cast antler. Beam forms the handle and the brow tine as the pick head. The tip of this tine is worn away completely and the surface is scratched 35-40 mm from the point. The other tines have been removed apart from the topmost tine which is also worn. The burr is intact. ML 393 mm MW 44 mm MT 51 mm
2212	37	8	Part of a small pick using a cast antler. The beam is broken close to the base and the brow tine is worn at the point and on its surface. ML 152 mm MW 30 mm MT 36 mm

SF	Context	Phase	Description
2615	955	7	Possible pick using a butchered antler with part of the skull still attached. Broken around the burr and the base of the beam. Upper part of the beam is broken off and the second tine has been sliced off. The large curved brow tine has a smoothed but scratched surface, and the point is broken off. ML 303 mm MW 52 mm MT 55 mm
2646	979	8	Pick from a butchered deer. The long, curved brow tine is worn near the tip and the tip has been worn away. The second tine has been broken off. The beam is also broken but the edges of the break appear worn. (illus 102) ML 296 mm MW 49 mm MT 48 mm
2956	1088	7	Small pick using cast antler. The whole artefact is very worn and smooth all over. The point of the brow tine is worn away and the beam is broken or cut before the second tine branch. ML 148 mm MW 32 mm MT 41 mm
2996	979	8	Large piece of antler with burr still attached. Brow tine very worn and point broken off. A small crescent shaped cut is visible on the brow tine. The main beam is broken irregularly and the second tine is broken off. Other cut marks are also visible on the beam. ML 206 mm MW 41 mm MT 47 mm
4050	1517	7	Fragment of pick. The first tine was used as the pick end, as the tine is worn and the end broken off and the slightly hollowed. The second tine was probably shed. The shaft still has a pedicle and the antler was broken above the second branch. (illus 102) ML 276 mm

SF	Context	Phase	Description
7134	1901	4/6	Well preserved antler pick with complete beam. The second tine was sawn off. Two tines on the top of the beam are sawn off leaving stumps with deep saw cuts. The antler burr has also been cut off, just below the brow tine junctions. The short brow tine is smoothed, polished and the tip is worn away. (illus 102) ML 374 mm MW 27.5 mm MT 39.5 mm
<b>Miscellaneous</b>			
2139	826	7/8	Slice of antler with blunt points at both ends. A non-circular hole is bored through the piece at the widest point and is countersunk on both sides. (illus 95) ML 87 mm MW 16 mm MT 5.5 mm MD of hole 10 mm
3346	912	8	Thin flake of antler with cut edges and slightly tapering. Notches and groove cut across the surface close to the widest end. ML 58 mm MW 11 mm MT 6 mm
44834	1513	7	Small arc of antler, possibly part of a ring or bead. The piece is cylindrical and the surface is smooth. ML 8 mm MD 8 mm
4067	63	7	Tapering and cylindrical piece of antler, cut at one end and broken at the other. The surface is rough and uneven. A peg. ML 38 mm MD 6.5 mm
5840	1550	7	Rounded piece of tine cut at both ends and smoothed on the edges, but broken longitudinally. Core slightly hollowed and the outer surface is smoothed. Possibly a small handle, peg or toggle. ML 53 mm MW 13 mm MT 7 mm
6744	1901	4/6	A piece of smoothed antler, worn with a series of irregular grooves at one end where the object is broken. It may have been a peg. ML 61 mm MW 12.5 mm and 17 mm MT 8 mm

SF	Context	Phase	Description
7247	711	8	Small piece of antler whittled to a point and broken across at the opposite end. ML 38 mm MW 5 mm MT 4 mm
<b>Used tines</b>			
149	135	7/8	Tine cut from a beam with a diagonal stroke, and cut also at this end and a notch. Point is smoothed. (illus 103) ML 99 mm MW 27 mm MT 20 mm
306	309	9	Extreme tip of tine, blunt and smoothed. Cut from the tine. Some of the surface and most of the end has decayed and flaked. ML 18 mm MW 8 mm MT 7 mm
336	357	8	Small curved tine, sawn from beam. Tip appears to have been broken through use. Surface is smoothed with wear around the point. ML 78 mm MW 15 mm MT 11 mm
1035	4	9	End of a small tine. The surface is worn, and the point is blunt. The point may have been shaped, and the tine has been broken at the other end from the beam. ML 53 mm MW 17 mm MT 12 mm
1037	17	8	Small tine with a pronounced curve. Surface completely worn and smooth. Was cut from the beam and a small groove lies close to this end. ML 57 mm MW 14 mm MT 13 mm
1114	538	8	Tine with a worn and smooth blunted point. The tine has been cut from the beam and cut marks are visible parallel to the base on 3 sides. ML 108 mm MW 34 mm MT 19 mm
1158	662	8	Long tine with point broken off, also broken at the base. A number of cut marks above the base suggest that the tine may have been chopped off the beam. Most of the surface is smooth. ML 146 mm MW 19 mm MT 21 mm

SF	Context	Phase	Description
1807	710	8	Small point, blunt and smooth. Partly sawn through tine then broken off. Several cut marks present on point. ML 30 mm MW 12 mm MT 15 mm
1833	722	8	Tine with a pronounced curve. Cut at one end and the point has been sharpened and polished smooth. (illus 103) ML 140 mm MW 20 mm MT 31 mm
2032	722	8	Sawn tine. Slightly polished and point blunted. (illus 103) ML 95 mm MT 49 mm
2160	826	7/8	Tine with broken end and worn point. The point may have been sharpened. Some cut marks on the body. (illus 103) ML 122 mm MW 17 mm MT 18 mm
2304	853	7	Small piece of tine, broken at both ends, but point appears to have been worn away as the surface is smooth. The piece is smoothed and burnt. ML 28 mm MW 8 mm MT 10 mm
2491	906	7	Piece of beam with 2 tines The tine points are worn and one has a 'v' shaped notch cut out of it. The single point is smooth. ML 121 mm MW 44 mm MT 25 mm
2524	867	7	Tine broken irregularly from beam, though partially cut through. Point is worn and smooth. ML 123 mm MW 19 mm MT 19 mm
2597	883	7	tine cut and smooth at the point and sawn from the beam leaving cut marks on the edge. ML 77 mm MW 17 mm MT 19 mm
2726	727	7	Tine with blunt point and worn surface. Part of the core has been hollowed out indicating that it may be a socketed handle rather than a point or awl. Has broken longitudinally. ML 103 mm MW 23 mm MT 21 mm

SF	Context	Phase	Description
2876	1053	7	Broken tine with point shaped and worn smooth. A slice has been cut from the tine flattening one side of it. ML 52 mm MW 13 mm MT 9 mm
2891	973	7	Tine with smooth and broken point. The base is broken but may have been partly cut from the beam. ML 82 mm MW 17 mm MT 19 mm
2895	1067	7	Small tine with flared broken base suggesting that the break was near the junction with the beam. The point is blunt and the surface, smooth. ML 82 mm MW 33 mm MT 15 mm
2903	973	7	End of tine with a heavily worked point. The surface has been faceted by cutting producing a sharp edge at the point. ML 72 mm MW 16 mm MT 16.5 mm
2907	1076	7	Tine possibly used as a point. Has been cut off the main stem and the base shaped. One part of the surface is cut and faceted. Point is smooth. ML 102 mm MW 16 mm MT 17 mm
4024	984	8	Piece of tine with both ends cut. At the wider end the core is slightly hollowed and smoothed. At the narrow end there is a hole bored into the core of the tine 15 mm deep and 7 mm in diameter. The narrow end is cut straight across and the other end is angled. Possibly a small handle. ML 58 mm MW 17 mm MT 16 mm
4073	1048	7	A long tine cut from the main beam. Surface of the antler is black, and greying towards the point, suggesting it was burnt. The point has been sharpened with long cut marks. (illus 103) ML 142 mm MW 20 mm MT 24 mm
4135	1143	8	Poorly preserved tine with surface decayed. Point has been cut off leaving a flat edge. Other end has been cut from the beam, and the core hollowed at this point for c50 mm. Possible a handle. ML 96 mm MW 21 mm MT 20 mm

SF	Context	Phase	Description
4213	1115	7	Tine with a smooth and worn point. Tine partially cut and then broken from the beam. ML 73 mm MW 26 mm MT 18 mm
4293	1252	8	Long tine with a worn surface. Appears to have been broken from the beam. The point is smooth and worn and was sharpened. ML 154 mm MW 18.5 mm MT 22 mm
4381	733	8	Tine broken diagonally from the beam. Also broken longitudinally for about half its length. The point has been sharpened and the surface is worn. ML 125 mm MW 20 mm MT 10.5 mm
4855	63	7	Tine cut from main beam, with other cut marks visible. The pointed end is worn and polished. ML 97 mm MW 22 mm MT 27.5 mm
4864	63	7	Tine broken from beam with surface near and around point worn and smooth. ML 123 mm MW 16 mm MT 20 mm
4916	1323	7	Top-most tine cut from beam with the twin tine also cut off. Surface of the tine is smooth and worn. There are cut marks on the remaining portion of beam. ML 79 mm MW 22 mm MT 16 mm
5190	1457	7	Tine cut from antler with worn point. ML 119 mm MW 46.5 mm MT 33 mm
5479	1766	5/6	Tine cut from beam with a diagonal cut. Five cut marks across the tine near the point. ML 84 mm MW 13 mm MT 11 mm
5684	1768	7	Tine may have been partly sawn from the beam then broken. Has a worn and blunt point. ML 57 mm MW 16 mm MT 11 mm
6389	1646	7	Tine with a cut and shaped lower end and a worn point. One side is cut and grooved and the other has a 'v'-shaped notch. ML 83 mm MW 17 mm MT 14 mm
6538	1830	7	Tine broken at the bottom end and is also broken longitudinally for about half its length. The surface is worn. ML 190 mm MW 19 mm MT 18 mm

SF	Context	Phase	Description
7845	267	7/8	Base of tine cut obliquely with toothed projections. The tip may have been sharpened. ML 53 mm MD 11 mm
<b>Whalebone</b>			
<b>Vessels</b>			
631	451	8	Reconstructed piece forming a flat base with a small portion of the vessel wall. ML 215 mm MW 101 mm MT 19 mm
2702	747	7	Reconstructed hollowed vertebra, probably part of a vessel. The vessel has a thick base with thin walls thickening towards the rim. Cut marks are visible on the interior from the hollowing process. MH of vessel 160 mm MT of base 43 mm MW of rim 31 mm MT of wall c10 mm
5192	1491	7	Angled piece of whalebone vertebra. Probably part of a vessel base and wall. ML 104 mm MW 65 mm MT 24 mm
7115	1875	5/6	Thoracic vertebra hollowed out to form a vessel, and spine cut off. The epiphyses are missing. The internal profile is convex but does not follow the exact curve of the outer profile as the wall becomes thicker towards the base. MH 163 mm MT 23 mm
<b>Lids and Rims</b>			
2054	786	8	Possibly a vessel lid made from a whale vertebral epiphysis. Has a circular hole bored through the centre. Two cut marks are visible one on the smooth upper surface 10 mm long and one on the core surface c15 mm long. MD 97 mm MT 13 mm
4788/7335	1067/2028	7&8	An arc of whale vertebral epiphysis joined from 2 phases. It appears to have been cut from the whole bone. Cut marks are present on the piece. MD 278 mm MW 29 mm MT 31 mm
6760	1884	5	Small square-sectioned curved piece of whale vertebral epiphysis. Possibly a broken rim piece. ML 102 mm MW 30 mm MT 28 mm

SF	Context	Phase	Description
7125	1884	5	Reconstructed vertebral piece forming part of a flat plate-like object which has been cut from the bone, and cut round the edges. Incomplete but possibly a lid. ML 223 mm MW 149 mm MT 27 mm (reconstructed MD c270 mm).
7242	1067	7	An arc of whalebone vertebral epiphysis forming part of a rim, possibly a non-joining part of SF 4788/7335. ML 147 mm MW 25 mm MT 32 mm
7332	1993	4	Reconstructed vertebral epiphysis trimmed around the edge. May be a lid or waste. MD (est) c150 mm MT 12 mm
7852	786	8	Small round plate of vertebral epiphysis, incomplete. Small circular hole c5 mm diameter is bored through the centre. Probably a vessel lid. MD 77 mm MT 7 mm
<b>Mattocks</b>			
19	8	8	Large, flat piece of bone cut longitudinally from the bone and straight across at one end and shaped into a gently curving blade at the other. Bone burnt and brittle. Two walded holes have been cut through the bone on either side of the mid-line and towards the straight edge. Holes splayed and c16 mm in diameter. Incomplete. ML 146 mm MW 134 mm MT 18 mm (illus 104)
2512	901	8	Flat, blade-like piece of whalebone cut longitudinally from the bone. The blade is slightly angled and has one straight edge, the other side is very worn. Cut marks are visible on the surface. At the top edge of the blade is a worn semi-circular groove through the bone, probably the remains of a hole. The implement is broken at this point, and the extreme tip of the blade is worn away. ML 172 mm MW 84 mm MT 24 mm MD of hole c18 mm

SF	Context	Phase	Description
4266	336	8	<p>Small, flat, blade-like piece of whalebone cut longitudinally from the bone. The lower edge of the blade is worn and crumbling. Both long sides are also worn and rounded. The upper part of the artefact has broken away leaving 2 depressions which may have been lower parts of holes. The piece may also have been re-used after it was broken.</p> <p>ML 77 mm MW 71 mm MT 15 mm</p>
5152	1545	-7	<p>Large, heavy blade of whalebone cut longitudinally. The lower curved edge is worn thin and smooth with small breaks at the right hand side. The top edge of the tool is broken cleanly across and through 2 close set holes. The holes are smooth around the edges. Towards the centre of the bone is a large diagonally cut hole. The hole slopes from top back to bottom front with most wear on these 2 edges. (illus 104)</p> <p>ML 237 mm MW 117 mm MT 27 mm</p>
5273	1470	7	<p>Possible mattock. Thick piece of bone with flat faces, thin and worn on curved edge, broken at opposite end and down the right side. Has the remains of 2 large holes cut through the bone at a slant. (illus 104)</p> <p>ML 153 mm MW 87 mm MT 27 mm</p>
7259	1977	7	<p>Part of a square mattock, incomplete. Cut longitudinally from the bone. One side is curved and one edge is worn, broken at other edge and down its length. Broken at a large slanting hole c60 mm long. Grooved on surface.</p> <p>ML 211 mm MW 90 mm MT 35 mm</p>
7310	1960	4	<p>Irregular piece of flat whalebone with an off-centre hole through its thickness. Two sides are curved and worn while the third side is cut straight.</p> <p>ML 165 mm MW 100 mm MT 27 mm</p>
7851	722	8	<p>Piece broken diagonally across at one end and broken at the other rounded edge. A large hole is bored through the bone at mid-point, elliptical in shape c30 x 23 mm.</p> <p>ML 95 mm MW 50 mm MT 21 mm</p>

SF	Context	Phase	Description
7880	1115	7	Fragment of a mattock. One piece has a worn rounded end and the opposite end has been cut diagonally on one side, and shows the curve of a hole on the other. ML 93 mm MW 27 mm MT 17 mm
Miscellaneous Artefacts			
850	179	8	Piece of a vertebra with parts of 2 articulation surfaces present. Peg shaped with a head and a shaft. ML 107 mm MW 47 mm MT 29 mm
2523	923	8	Thoracic vertebra of whale with neural spine removed. Both ends are concave through its use as a chopping block. Many cut marks at both ends. ML 160 mm MW 246 mm MT 98 mm
4502	1353	8	Flat and rectangular flake, very slightly curved and broken diagonally at one end. The other end is cut but worn thin. The sides are also worn. ML 137 mm MW 43 mm MT 7 mm
7020	1830	7	Triangular but broken piece of bone, triangular in section and with 2 smoothed surfaces. On one side is a 3 mm deep groove 5 mm wide and 26 mm long. Fragmentary toggle? ML 78 mm MW 28 mm MT 17 mm
7021	1830	7	Cut piece of bone with flat sides and angular edges. A deep groove runs the length of one side. It has a rounded profile. Ends broken and surface partly unfinished with cut marks. ML 114 mm MW 20 mm MT 21 mm Groove 4 mm wide and 7 mm MD
7248	1284	5/6	Hollowed piece of bone with a rounded and worn end and a pointed end also worn. Surface cut marks. Second piece is triangular forming a blunt point, with a deep gouge. With cut marks, may be a waste piece. ML 172 mm MW 61 mm MT 36 mm
7285	1994	4	Rectangular slab of Whale vertebra, one side cut and the other hacked. There are traces of saw cuts on the longest side leaving an irregular broken bone. The surface is notched and there are cut marks on one short side. ML 133 mm MW 57 mm MT 12 mm

Pumice Pebbles

SF	Context	Phase	Description
59	16	8	Brown-grey pumice with slightly smoothed lower surface. No wear marks. ML 45 mm
193	207	7	Irregular shaped and unworked piece. ML 31 mm
1288	636	8	Rounded pebble, lower surface smoothed. ML 37.5 mm
2539	883	7	Large irregular piece. Part of upper and lower surface smoothed. ML 58 mm
2250	826	7/8	Missing
2556	912	8	Smoothed on both surfaces. ML 34 mm
2631	955	7	Slightly smoothed and hollowed on one surface. ML 42 mm
3277	826	7/8	Highly smoothed and rounded pebble. ML 45 mm
3814	1229	7	Triangular piece, slightly worn all over and especially at apex. End opposite apex, smoothed. ML 35.5 mm
3854	510	8	Irregular and unworked piece. ML 45 mm
4072	1098	8	One piece with a flattened surface. ML 40 mm Triangular piece, smoothed on all surfaces. ML 42 mm
4138	1107	8	Rounded and smoothed pebble. ML 27 mm
4250	1185	7/8	Hollowed on 2 surfaces and partly on a third. Worn thin in middle where broken. MW 33 mm
4287	25	7	Roughly smoothed pebble. ML 56 mm
4489	1340	7	Rounded and smoothed pebble. ML 45 mm
5173	1491	7	Irregular rounded pebble, with one surface worn smooth. ML 67 mm

SF	Context	Phase	Description
5232	1470	7	Rounded pebble, worn smooth on one edge. ML 39 mm
5402	1692	7	Rounded pebble, worn into facets around edges. ML 45 mm
5631	1251	7	Rounded pebble, smoothed along one edge. ML 49 mm
6798	1960	4	Irregular pebble. Upper surface roughly smoothed and hollowed. ML 50 mm
6808	1555	7	Small, smooth, elongated pebble. ML 33 mm
6996	2046	3	Irregular shaped piece. Lower surface flattened and smoothed. ML 46.5 mm
7257	1976	1	Irregular piece. ML 69 mm
7375	2057	1	Large rounded piece, slightly smoothed on one surface. ML 58 mm
7408	2072	1	Large pebble, smoothed on one surface, and hollowed with a linear notch on the opposite surface. ML 66 mm
7418	2072	1	Irregular pebble. ML 44 mm Another pebble, slightly smoothed and rounded. ML 45 mm
7541	1281	7	Smoothed but irregular piece. Slight crosswise smoothed hollow on one surface. ML 52 mm
7883	2027	4	Brown-grey pumice pebble. Lower surface smooth and concave. ML 52 mm
7884	221	8	Unworked irregular shaped piece. Grey colour. ML 30 mm

## FLINT AND CHERT ARTEFACTS

### Arrowhead

SF No	Context	Phase	Description
7353	2016	2	A small, squat leaf-shaped arrowhead, type 4a (Green 1980) made on a flake of dark grey chert. Shallow invasive retouch (pressure flaking) occurs all over both dorsal and ventral surfaces. ML 15mm    MW 13mm    MT 3.3mm

### Knife

13	1	9	Part of a flake of pale grey flint retouched along ventral surface of left side and showing wear along right edge. Hinge fracture at base. Possibly the tip of a knife. ML 22mm    MW 21.5mm    MT 8mm
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### Scrapers

293	335	9	Thumb-scraper, possibly Neolithic or Early Bronze Age, in brown flint. Semi-abrupt retouch round three-quarters of the surface with thinning of the distal end of the ventral surface. ML 18mm    MW 22mm    MT 6mm
4026	1107	8	Possible small button-scraper of red chert with fine semi-abrupt retouch round 2/3 of right side. ML 15mm    MW 11.5mm    MT 3mm
4249	1185	7/8	Button-scraper on a flake of dark, honey-coloured flint. Semi-invasive retouch on the right side of the dorsal surface. Negative bulb of percussion present. Flaking scars on proximal end of dorsal surface. ML 19mm    MW 20mm    MT 4.3mm
5656	1721	7	Thumb-scraper made on a thick flake or possibly a core rejuvenation flake, of honey-coloured chert. Invasive retouch on the dorsal surface could, possibly be pressure flaking. ML 22mm    MW 22mm    MT 11.5mm
6589	1865	7	a. Thumb-scraper made on worn flint pebble. Pale grey chert with white mottle. White cortex on dorsal surface. Semi-abrupt retouch round 2/3 of edge. ML 25mm    MW 23mm    MT 8mm  b. Thumb-scraper on worn flake of grey chert with worn white cortex on dorsal surface. Semi-abrupt retouch on the distal end. ML 17mm    MW 18mm    MT 4mm

SF No	Context	Phase	Description
6945	2059	2/3	e. Possible thumb-scraper on pale brown chert flake with a little white mottle. Semi-abrupt retouch round 2/3 of edge. ML 13mm    MW 16mm    MT 8.5mm
7374	2057	2/3	Small thumb-or button-scraper made on a thick flake of grey flint, burnt, with cortex on the dorsal surface. Semi-abrupt retouch round 3/4 of the edge. ML 16mm    MW 16mm    MT 7.5mm
7389	2046	3	End-scraper on small coarse flint flake, possibly burnt. Retouch down left side. ML 26mm    MW 17mm    MT 18mm
7390	2072	1/2	a. End-scraper in grey chert with paler mottle. Semi-abrupt retouch round 3/4 of the edge. Bulb of percussion present. ML 39mm    MW 27mm    MT 6.3mm  b. Thumb-scraper made on a broken flake of grey chert with pale mottle. Semi-abrupt retouch at working edge which is undercut from use. There is a hinge fracture at the base and blade scars are present on the right side of the ventral surface causing thinning of the tool in this area. ML 27mm    MW 29mm    MT 8.5mm  c. Possible distal portion of broken end-scraper in grey chert with some white mottle. Semi-abrupt retouch at distal end and abrupt retouch on the right side where some cortex remains. Base snapped. ML 22mm    MW 37mm    MT 3.6mm
7406	2072	1/2	Large end-scraper in grey chert with paler mottle. There is abrupt retouch at the distal end but semi-abrupt retouch down the whole of the right side which may indicate multi-purpose use. ML 73mm    MW 35mm    MT 16.5mm
7547	2059	2/3	e. Grey chert flake with pitted scar on dorsal surface and semi-abrupt retouch on two sides to make a thumb-scraper. ML 20mm    MW 15mm    MT 5.5mm

Struck flakes with retouch and/or wear

SF No	Context	Phase	Description
350	368	8	Two small struck chips of a. grey chert with white mottle. ML 6mm MW 10mm MT 2.5mm b. a plain grey chip with slight evidence of burning. ML 7mm MW 11mm MT 2mm
691	434	8	Struck flake of corticated pale grey chert. ML 19mm MW 9mm MT 3.6mm
1040	1	9	Very calcined struck flake. ML 22mm MW 38mm MT 8.7mm
1359	1	9	Struck flake, pale red in colour. ML 11mm MW 6mm MT 0.8mm
2020	1	9	Flint pebble of honey-coloured flint with three small flaking scars on one side. ML mm MW mm MT mm
4075	1098	8	Struck flake of dark amber translucent flint with cortex down the right side. Very light retouch down the left side, probably wear. Bulb of percussion present and flake scars on the dorsal surface. ML 31mm MW 21mm MT 6mm
6152	1126	8	Struck flake of brown flint with black cortex. Wear down the whole of the left side on the ventral surface. No bulb of percussion present but undulations visible. ML 25mm MW 5mm MT 4mm
6441	1208	7	Struck flake of honey-coloured chert with flaking scars on both surfaces. ML 21mm MW 12.5mm MT 3.5mm
6926	2046	3	Struck flake of pale brown chert with a little mottle. Possibly slightly burnt. ML 19mm MW 20mm MT 5mm
7389	2057	2/3	Struck flake of pale brown chert with invasive retouch on the left side. ML 21mm MW 12mm MT 2.5mm
7390	2072	1/2	d. Broken flake with semi-abrupt lateral retouch on the right side, of pale brown translucent flint. Hinge fracture at the distal end and left side snapped in two places. ML 31mm MW 29mm MT 8mm
7423	2070	3	a. Struck flake of pale brown chert with a little lighter mottle. Wear at the tip. ML 22mm MW 16mm MT 3mm b. Struck flake of slightly burnt flint. ML 24mm MW 19mm MT 3mm

Struck flakes (cont'd)

SF No	Context	Phase	Description
7547	2059	2/3	a. Struck flake in grey chert with white mottle. ML 14mm      MW 19mm      MT 3.5mm
			b. Struck flake of grey flint. ML 19mm      MW 16mm      MT 4.2mm
			c. Struck flake of grey chert. ML 22mm      MW 12mm      MT 4mm
			d. Struck flake of pale grey flint ML 14mm      MW 11mm      MT 3mm

Natural flint fragments

214	210	8	Natural flake of grey chert
609	424	8	Chert fragment
684	1	9	Flint fragment
696	514	8	Chert fragment
865	1	9	Flint fragment
706	439	9	Flint fragment
1444	684	2/3	Fragment of burnt pebble, probably flint
1675	226	8	Chert fragment
2359	1	9	Flint fragment found near SF 2020. Some possible plough damage.
6036	757	7	Pale brown chert chip
6883	1240	8	Small flake of honey-coloured chert, possibly struck. ML 6mm      MW 11mm      MT 1.5mm
6945	2059	2/3	3 fragments of which 2 are flawed flakes, one burnt, and one small nodule. Plough damage evident.
7387	2055	3	7 small chert chips showing some evidence of burning.
7872	2056	3	Natural fragment.
7537	1894	6	Small chert chips showing evidence of burning.

Howe Excavation 1978-1982

Metal Finds

Lead

SF	Context	Phase	Description
69	66	5/6	Four pieces of lead associated with 4 small fragments of Iron. Large irregular rounded stud, which has been squashed, probably a decorative head to an iron pin. ML 22 mm MW 24 mm MT c10 mm

Iron

7107	1868	5/6	Bent square shafted nail with corroded head. ML 34.5 mm MW 3-11 mm
7288	1987	5/6	Unconserved lump. ML 30 mm MW 22 mm
50	35	7	Heavily decayed nail, with broad rounded head and square shaft. Shaft bent through 90° and the point is bent over. ML 78 mm MW 7.5 mm MT 7.5 mm MD of head c24 mm
2031	763	7	Bent hook, wire of pin. ML 33 mm
2442	876	7	Square ended tweezers made from one piece of metal. Slightly curved and splayed at tweezer end. Opposite end is formed into a ring. (illus 130) ML 58 mm MW 9 mm MD of ring c12 mm
2624	883	7	Fragmentary nail. ML 33 mm
2640	883	7	Fragmentary strap or blank. ML 26 mm + 37 mm MW 6 mm
2709	1017	7	Open and elongated 'ring' - spur? MW across ring 59 mm MT 8 mm ML of ring 50 mm
2801	360	7	Unconserved lump. ML 51 mm MW 23 mm
3101	883	7	Unconserved lump.

SF	Context	Phase	Description
3392	1078	7	Blade in 2 pieces. ML 57 mm MW 10 mm
4164	805	7	Solid and heavy piece, with narrow upturned end c20 mm wide. No distinguishing marks. Part of agricultural implement. ML 226 mm MW 50 mm MT c17 mm
4437	1329	7	Thin bent bar. ML 28 + 14 mm MW 7 mm
4701	1326	7	Five unconserved lumps.
4735	1443	7	Unconserved lump. ML 35 mm MW 17 mm
4822	1513	7	Flat and square ended chisel or chaser on a tapering square shank. (illus 130) ML 113 mm MW of chisel end 24 mm
4892	1427	7	Unconserved lump. ML 45 mm MW 37 mm
4924	1458	7	Roughly rounded pin, point missing. Large iron lump at head end. May have been a decorative dress pin. ML 81 mm MW 4 mm
5005	1527	7	Unconserved lump. ML 38 mm
5134	1466	7	Unconserved lump on glassy slag.
5153	1603	7	Three unconserved lumps.
5165	1491	7	Tanged knife with slightly curved blade. Bone handle missing, but tang terminates in a spike with a bone end. ML 185.5 mm ML of blade c90 mm MW of blade 15 mm MT c3.5 mm (illus 130)
5313	1491	7	Square bar or blank. ML 59 mm MW 4 mm

SF	Context	Phase	Description
5319	1583	7	Razor. Fragment of iron blade in a polished and grooved bone holder. Iron blade survives - ML 35 mm MW 15 mm MT 2 mm, heavily corroded. Blade was probably curved to fit into the curved holder. Bone - ML 77 mm MT 9 mm MW 17 mm At wide end, an iron pin secures the blade. The bone is grooved to a depth of 12 mm, and shallows to the pointed end. Groove is 1-2 mm wide. Securing pin lies 7 mm from wide end and is MD 3 mm. (illus 130)
5333	1662	7	Unconserved nail head with square sectioned body. ML 47 mm
5367	1373	7	Incomplete bent bar or staple. ML 40 mm MW 7 mm
5368	1689	7	Square shanked pin top missing. ML 31.5 mm MW 3 mm
5390	1597	7	Square shanked nail fragment. Head missing. ML 32 mm MW 2-3 mm
5502	1265	7	Bent iron pin surmounted by a spherical paste head. Shank may have had a T bar at the top, around which the paste was applied, revealed as a tack in the paste. Paste cracked and discoloured. ML 44 mm MD of head 10 mm MT of shank 3 mm (illus 130)
5774	1474	7	Unconserved imp.
5903	1481	7	Unconserved lump. ML 40 mm MW 27 mm
5960	1469	7	Unconserved lump. ML 30 mm MW 19 mm
6106	861	7	Unconserved lump. ML 35 mm MW 23 mm
6138	981	7	Red shaped blank. ML 39 mm HW 11.5 mm MT 7 mm
6547	1491	7	Fragmentary and square shafted point. ML 35 mm

SF	Context	Phase	Description
6593	1067	7	Unconserved lump. ML 44 mm MW 33 mm MT 24 mm
7001	1558	7	Unconserved tool or chisel. ML 110 mm MW 32 mm
7117	1813	7	Three unconserved lumps.
7222	1952	7	Fragmentary square shafted nail. No head.
7343	2041	7	Spike or square sectioned nail, pointed at one end. ML 93 mm
7348	2041	7	Bar, rectangular in section. ML 89 mm
7502	1639	7	Unconserved lump.
7503	1362	7	Three unconserved lumps.
7504	1340	7	Twenty four unconserved lumps.
7505	883	7	Bar or nail in 2 pieces. ML 53 mm MW 13 mm
2142	770	7/8	Head of square shanked nail or fibula. Shank partly curved. ML 20 mm MW 14 mm
2352	769	7/8	Small nail in wood. ML 31 mm MW 12 mm
2573	894	7/8	Unconserved lump. ML 28 mm MW 20 mm
3282	894	7/8	Unconserved lump. ML 32 mm MW 22.5 mm
43	34	8	Four nails, 2 possible pieces of nail shank, one iron shank bonded to a thin iron plate, possibly a fish hook. ML 62 mm MW 10 mm MT 7 mm
48	8	8	Thin strip of metal looped over at one end. ML 59 mm MW 4 mm MT 1.5 mm
211	163	8	Fragmentary nail with bent end. ML 38 mm MW 3.5 mm MT 3 mm
212	257	8	Unconserved elongated oval chain-link. ML 72 mm MW 21 mm MT 9 mm

SF	Context	Phase	Description
284	291	8	Long, straight pin with drum head. Pin has a copper alloy or silver gilt band 2 mm wide encircling the shank 32 mm from the end. Either side of which is a 5 mm wide band of slanting incisions with copper inlay. The drum head has an applied and embossed disc on both its faces. They are decorated with 5 ring and dot designs. Around the circumference of the head are 2 opposing milled bands 2 mm wide and 5.5 mm long. ML 75 mm MD of shank 4 mm of head 10 mm MT of head c6 mm (illus 130)
380	405	8	Unconserved lump. ML 27 mm MW 18 mm MT 10 mm
382	405	8	Square headed nail or pin, with a rounded, pointed shank. ML 38 mm MW 5 mm
725	491	8	Small knife blade with part of tang, point missing. ML 66 mm MW 13 mm MT c6 mm (illus 130)
1289	378	8	Rivet or nail head. ML 11 mm MW 5 mm MT 2 mm
1503	615	8	Small triangular blade with a narrow point. ML 35 mm MW 9 mm
1803	493	8	Possible blade. ML 41 mm MW 17 mm
1995	734	8	Single pointed tooth of a wool comb. ML 82 mm MD 3 mm (illus 130)
1996	734	8	Bar or blank. ML 51 mm
2033	734	8	Fragmentary nail.
2065	786	8	Crescentic blade, possibly part of a razor. ML 65 mm MW 12 mm (illus 130)
2086	786	8	Round but flat headed nail, with rounded shank. ML 37 mm MT 3 mm MD of head 9 mm (illus 130)
2116	399	8	Nail or bar, rounded at one end, square at the other. ML 117 mm
2230	841	8	Unconserved lump. ML 27 mm MT 24 mm

SF	Context	Phase	Description
2287	715	8	Strap or bar. ML 57 mm MW 5 mm MT 4 mm
2320	715	8	Strap or bar. ML 30 mm MW 7 mm
2500	901	8	Length of wire with looped top folded over. ML 30 mm MW 40 mm
2538	924	8	Twisted nail (?) shank. ML 33 mm MW 3 mm MT 3 mm
2676	912	8	Iron ore. ML 73 mm MW 28 mm
2697	963	8	Hollow iron bubble. ML 35 mm MW 25 mm
2725	922	8	Fragmentary nail, needle or pin. ML 42 mm
3087	786	8	Unconserved nail (?) ML 42 mm HW 10 mm
3641	1134	8	Unconserved lump in 2 pieces. ML 51 mm MW 24 mm
4257	715	8	Tanged knife blade. Handle missing. Blade is angled and cutting edge is eroded. Tang may have been rectangular in section. ML 120 mm MW 16 mm MT 5 mm MT of blade 8 mm (illus 130)
4286	1181	8	Square shanked but tapering bar or nail shank. ML 100 mm
4459	1359	8	Square sectioned fragmentary nail. ML 39 mm
4842	1410	8	Rounded pin shank. ML 21 mm MW 2 mm
5564	1319	8	Unconserved lump.
5650	1353	8	Unconserved bar or hook. ML 55 mm
5843	1410	8	Three unconserved pieces.
6190	783	8	Unconserved lump.
7506	856	8	Unconserved lump. ML 61 mm MW 51 mm MT 15.5 mm

SF	Context	Phase	Description
39	29	8-9	Thin plate, one side slightly curved, and one end curved. Other side straight and toothed or hinged. One end of curved side is bent over and adjoining end is straight. ML 174 mm MW 62 mm MT 1-3 mm
41	29	8-9	Unconserved lump. ML 55 mm MW 22 mm
216	143	8-9	Heavily corroded ring. ML 37-38 mm MT 6 mm
111	1	9	Incomplete blank or nail shank. ML 16 mm MD 2.5 mm
148	1	9	Complete but bent and twisted ring. ML 40 mm MW 45 mm MT 8 mm
202	168	9	Incomplete metal bar or nail shank. ML 30 mm MW 6 mm MT 2 mm
450	110	9	Unconserved lump. ML 22 mm MW 10 mm
997	496	9	Three pieces of metal plate (not joining), fabric impressions on one side. One piece has a small hole c4 mm diameter. ML of largest piece 25 mm MW 13 mm MT 2 mm
1051	180	9	Incomplete and reconstructed fragment, possibly a knife blade, but broken at either end. One edge is sharpened. ML 42 mm MW 9 mm MT 1-3 mm
2135	1	9	Bar clasp? ML 47 mm MW 23 mm
<b>Copper Alloy</b>			
7002	1764	5/6	Ring, probably from pin or brooch. Lozenge-shaped in section. Waisted central hole. Flattened at one point of surface where a pin may have been attached. MD 19 mm MD of hole 7 mm MT 6 mm (illus 134)

SF	Context	Phase	Description
7101	1868	5/6	Projecting ring-headed pin made of a single piece of wire forming a tapering and pointed shank and a flattened ring. Wire terminates at base of head. The ring head is plain except for a central raised ridge which runs round the circle. ML 91 mm MD of shank 3.5 mm MD of ring 18 mm (illus 134)
2630	807	6-9	Fragment of ring made from circular wire. One end pointed the other broken. ML 18 mm MD 2.5 mm
2347	876	7	Zoomorphic brooch in shape of an insect, with elongated representative eyes. Has large curved and rounded wings which are tinned and spring from the ribbed body. The catch-plate is long and curved allowing the body of the brooch to be raised. The body and tail are incised and the tail of the insect curves downwards to form a hinge. The copper pin of the brooch is fixed to the hinge by a small tack or securing peg, and is probably a replacement. ML 32 mm MW of wings 48 mm MT of wings 1 mm (illus 135)
2358	883	7	Reconstructed metal plate, formed of 2 thickness of metal. ML 31 mm MW 26.5 mm MT 2 mm
2369	876	7	Projecting ring headed pin of square sectioned wire, which gives the ring a ridged and flattened appearance. Shank in 2 pieces. MD of head 12 mm MT of wire 2.5 mm
2688	985	7	Repousse disc pin, with tapering 'u' shaped pin shank. The pin is attached to the back of a dish which has a beaded rim. The dish contains a decorative sheet which is attached to the dish by a central pin or boss. Three swirls radiating from the centre of the sheet to form the decoration. ML 58 mm MD of pin 3 mm MD of head 23 mm (illus 133)

SF	Context	Phase	Description
2929	973	7	Long thin pin with point. Broken off at head end. ML 57 mm MD 3 mm
4120	1051	7	Incomplete curved rectangular metal plate with rounded corners. Has 3 holes down one end, four along one side and one in each other corner and one off centre hole. Five holes were punched from one side and 3 from the other. May be a wrist guard. ML 77 mm MW 42.5 mm MT 0.25 mm
4396	1306	7	Circular pin head with central depression filled with yellow paste as if to hold a decorative piece. The rounded rim tapers to a conical base and broken pin shaft, which may have curved away from the pin head. (illus 134) MD 16 mm ML 13 mm MT of shaft 2 mm
4414	1334	7	Long bodkin with eye and point. Eye 6 mm long and 1 mm wide (illus 136) ML 62 mm MW 3.5 mm MT 1.5 mm
4547	1218	7	Two pieces of bent wire, bent at right angles and tapering. Perhaps 2 halves of a staple. ML 16 mm MW 4.5 mm MT 2 mm
4598	1403	7	Square sectioned pin, slightly splayed at the bent end. Tip missing. Formed of metal sheeting and not cast. Probably hollow. ML 40.5 mm MW 2 mm MT 1.5 mm
4704	1251	7	Half a plain cast ring, circular in section. Rldged slightly on internal surface. ML 19Wmm MT 2.5-3 mm
4775	1475	7	Long and thin bent pin which tapers gently to a fine point. The other end is notched to take a decorative terminal (missing). ML 248 mm MD 3.5 mm (illus 134)
4931	1545	7	Waste metal. ML 21 mm MW 21 mm

SF	Context	Phase	Description
4932	1456	7	Unusual pin. The pin shank is bent at its pointed end and is slightly square in section. The circular head is irregularly moulded, below which is an elbow stud. Both stud and head are decorated with cross-hatching. ML 60 mm MW of shank 2 mm MD of head 11x9 mm (illus 133)
5018	1216	7	Three small unconserved fragments of wire.
5034	1527	7	Thin metal plate, irregularly broken off at one end, other end tapers and is folded over. ML 25 mm MW 25 mm MT 1 mm
5064	1545	7	Two chain links and possibly a chain terminal. Links of interlocking bent wire. Terminal is a wider ring. ML 25 mm MD of chain wire 1.5 mm MW of terminal 4 mm (illus 132)
5099	1585	7	Fragment of ring semi-circular in shape. ML 23 mm MW 9 mm
5187	1595	7	Fragmentary plate ML 27 mm MW 28 mm MT 0.5-1 mm
5271	1470	7	Small fragmentary disc with punched hole. MD 10 mm MT 0.5 mm MD of hole 2 mm
5446	1271	7	Incomplete projecting ring headed pin with two thirds of head missing. Seems to have been made of bent wire. Shank tapers to a point. ML 72 mm MD of shank 3.5 mm (illus 134)
6110	861	7	Small penannular ring, not conserved. MD 13 mm MD of wire 2 mm
6868	1281	7	Three small unconserved fragments.
7023	1838	7	Two unconserved fragments.
7097	1332	7	Projecting ring-headed pin with bent tapering shank. Cast and decorated on one side of head. Ring surface divided by incisions into raised buns. ML 50 mm MD of shank 2 mm MD of head 17 mm (illus 133)
7245	1962	7	Three pieces of unconserved pin.
7636	1952	7	Two small unconserved fragments.

SF	Context	Phase	Description
2014	729	7-8	Projecting ring-headed pin made from one piece of wire. Tapering and pointed circular shank, bent at right-angles to form a small flattened circular head. ML 79 mm MW of shank 3 mm MD of head 10.5 mm (illus 134)
168	192	8	Small, flat-ended tweezers composed of 2 arms encircling a fragmentary suspension ring at the enclosed end. One piece of metal is bent around to form the tweezers. (illus 136) ML 30Wmm MW of end 4.5 mm MT 1 mm
603	424	8	Object with long handle or shank, which tapers in towards the middle. One end is rounded and contains a circular hole 0.5 mm from end. Other end of shank widens to 5 mm and continues in a right-angle to contain a square hole 4 x 3 mm. Made of folded metal sheeting, and holes punched after manufacture. ML 51 mm MW 5 mm MT 1.5 mm ML of square end 6 mm MD of round hole 2 mm. (illus 136) A key from a spring lock or padlock.
1111	623	8	Well preserved complete penannular brooch. Pin has a bent end to lie over brooch, and the pin head is in a barrel form. Brooch has zoomorphic terminals in the form of a snouted beast with raised eyes. Ears barely moulded. MD 32.5 mm ML of pin 39 mm MT of brooch 2.5 mm MT of pin 2.5 mm (illus 133)
1422	284	8	Two pieces of chain link, unconserved.
1458	298	8	Unconserved fragments.
1502	615	8	Fragments of a circular and slightly raised stud.
1729	493	8	Decorated projected ring-headed pin with slightly tapering pointed shank. Has a large bead at the base of the head and 2 smaller ones either side of it. Upper part of the bead is corrugated. (illus 133) ML 50 mm MD of shank 2.5 mm ML of head 9 mm, MW of head 7.5 mm MT of head 1.5 mm
1773	609	8	Small fragment of chain link.

SF	Context	Phase	Description
2028	734	8	Tapering pin from a hinged brooch. ML 50.5 mm MD 1.5-4 mm
2045	785	8	Penannular brooch, a slightly flattened circle with decorated terminals. Pin tip is lost, but head is well moulded in the barrel form. Terminals of brooch are zoomorphic in the form of a snouted beast, with moulded ears and eyes. Reverse side of terminals (splayed), contains parallel and transverse parallel incised lines in a triangular design with centre incised dots. MD 35 mm ML of pin 34 mm MT of pin 2.5 mm MW of terminal 4.5 mm ML of terminal 12 mm MD of brooch wire 2.5 mm (illus 133)
2209	841	8	Fragment of a plain ring. Wire semi-circular in section. ML 9 mm MW 8.5 mm MD of wire 1.5 mm
2393	896	8	One fragment of chain link.
2423	896	8	Three tiny fragments.
2833	1041	8	Decorated hipped pin with broken point. Top of shank decorated with incised lines with central dots. Pin head lies above this decoration. It is circular in plan and hexagonal in section with the top of head flattened. Around centre of head is a line of incised linear dots. ML 50.5 mm MD of head 8 mm MD of shank 4 mm MDepth of head 5.5 mm (illus 134)
4531	1535	8	Reconstructed pin from brooch, tapers from a wedge-shape to a rounded point. ML 33.5 mm MW 4 mm MT 2.5 mm

SF	Context	Phase	Description
4559	1170	8	<p>La Tene I fibula. A flattened brooch with 3 springs either side of the bow. The axis bar is iron and the linking spring chord is missing. The pin is round (MD 3 mm) and may have been applied separately to the head of the brooch at the springs. It is bent slightly at its tip to fit into the catch plate. The bow is c10 mm wide and narrows at both ends. A single incised line runs up either edge of the bow. The bow is bent to form a moulded catch-plate and a 'cobra-head' foot. The external surface of the catch-plate is decorated with 7 oblique but parallel incised lines. The foot is decorated with incised feathering, below the disc or 'cobra-head' (13.5 x 15 mm) the foot terminates in a 7 x 5 mm block, decorated with 5 horizontal incised lines.</p> <p>ML 83 mm MW of spring 26 mm (illus 135)</p>
4610	1352	8	Piece of folded plate or sheeting.
4665	1402	8	<p>Unconserved roundel, may have been a pin head. Part of the Shank is visible.</p> <p>MD 11 mm MT c5 mm</p>
6067	786	8	A small unconserved fragment.
6845	1353	8	Unconserved fragment.
1	1	9	<p>Two thirds of a semi-oval decorated brooch. Semi-circular in section. Fragment of one decorated arm or terminal present. Enclosed zig-zag design in a raised oval on a longer length of piece, surrounded by an incised band at either side. Enclosed dotted design on partial arm.</p> <p>ML 23 mm MW 17 mm MT 1 mm (illus 136)</p>
108	1	9	<p>A Bawbee of Charles II 1677-1679. No distinguishing marks on coin, although it may have had a thistle on one face when found.</p> <p>MD 25 mm MT 1 mm</p>

SF	Context	Phase	Description
205	104	9	Spiral finger ring. One and a half coils of wire, irregular in shape. Ends of ring cut. Seems to be manufactured from folded sheeting made into the round and then twisted into a coil. MD 15 mm MD of thread 1.5 mm (illus 132)
319	1	9	Small coil, overlapping and extending c/ beyond overlap. Both ends damaged. MD 10 mm MD of thread 1.5 mm (illus 132)
682	1	9	Fine needle or pin. Slightly bent, point flattened and damaged. Flattened head incomplete. ML 71 mm MT 1.75 mm (illus 136)
2132	1	9	
2927	816	9	Long tapering pin. Ribbed top is slightly thinner than main shank. Top ends in a plain irregular blob as if to house a further decorative piece. ML 82.5 mm MD 3 mm ML of ribbing 11.5 mm MD of top 2.5 mm (illus 134)
4199	1186	9	Four tiny fragments.
4312	1268	9	Square shanked pin tapering slightly to a point. Shank has an irregular anti-clockwise twist which stops 70 mm from the top. Squared top has a zoomorphic face on one side of a snouted beast with moulded eyes and ears. ML 183 mm MD 2 mm MT of head 4 mm MW of head 3.5 mm ML of beast 13.5 mm (illus 133)

Table 60mf SF 2197 - bulk and phase analysis (weight %)

	B1	B2	B3	B4	B5	FEOX1*	FEOX2	FEOX3
Na <sub>2</sub> O	0.2	N.D	0.8	0.1	0.5	N.D	0.1	0.3
MgO	0.8	0.4	0.7	0.6	0.9	0.5	0.2	0.7
Al <sub>2</sub> O <sub>3</sub>	1.2	1.2	1.4	1.3	1.2	0.1	N.D	0.2
SiO <sub>2</sub>	10.4	10.5	8.8	10.0	10.2	0.5	0.8	0.5
P <sub>2</sub> O <sub>5</sub>	0.5	0.8	0.2	0.8	1.0	N.D	N.D	N.D
S	0.3	0.2	0.1	0.3	0.3	N.D	N.D	N.D
K <sub>2</sub> O	0.7	0.7	0.3	0.6	0.6	N.D	0.1	N.D
CaO	5.1	5.1	2.4	4.9	4.8	0.1	N.D	N.D
TiO <sub>2</sub>	0.1	0.1	0.1	N.D	N.D	0.1	0.1	
V <sub>2</sub> O <sub>5</sub>	N.D	N.D	N.D	N.D	N.D	0.1	N.D	0.1
Cr <sub>2</sub> O <sub>6</sub>	N.D	N.D	N.D	N.D	N.D	N.D	0.1	0.1
MnO	1.7	1.6	1.6	1.6	1.6	1.7	1.5	1.6
FeO	81.6	81.6	79.4	81.1	80.2	97.1	96.7	96.2
CoO	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
NiO	N.D	N.D	0.1	0.1	N.D	N.D	0.1	0.1
CuO	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
Total	102.6	102.2	95.9	101.4	101.3	100.1	99.7	99.9

\* FEOX = FREE IRON OXIDE

Table 61mf SF 5100 - bulk and phase analysis (weighting %)

	B1	B2	B3	B4	GLASS	FE0X
Na <sub>2</sub> O	N.D	0.1	0.6	N.D	0.4	0.6
MgO	0.4	0.3	0.4	0.5	0.8	0.4
Al <sub>2</sub> O <sub>3</sub>	1.3	1.2	2.4	1.2	6.2	0.1
SiO <sub>2</sub>	6.5	6.9	13.1	5.5	36.9	3.0
P <sub>2</sub> O <sub>5</sub>	0.4	0.3	0.7	0.4	2.4	0.7
S	0.2	0.2	0.2	0.3	0.5	0.1
K <sub>2</sub> O	0.4	0.4	0.7	0.4	3.6	N.D
CaO	2.1	2.5	3.1	1.9	15.2	1.0
TiO <sub>2</sub>	0.1	0.1	0.2	0.2	0.4	N.D
V <sub>2</sub> O <sub>5</sub>	N.D	N.D	N.D	N.D	N.D	N.D
Cr <sub>2</sub> O <sub>6</sub>	N.D	0.2	N.D	N.D	N.D	N.D
MnO	1.8	2.0	1.8	1.6	2.5	1.0
FeO	83.7	86.6	74.5	87.0	31.0	69.0
CoO	0.4	0.3	0.3	0.1	0.3	0.3
NiO	0.8	0.2	0.2	0.3	0.3	0.1
CuO	0.2	N.D	0.1	0.1	N.D	N.D
Total	98.3	101.3	98.3	99.5	100.6	76.2

A second sample (H5100/1) was analysed. It had a more 'flowed' morphology, and the mineral texture was fine iron oxide dendrites (mean=15%) with massive silicate (mean=80%) in a glassy matrix (mean=5%). The bulk analyses (Table 5) were typical of silicate slag and were characterised by high MnO contents, but they showed some variation. Bulk Analyses 1-3 were richer in iron oxide and MnO and lower in alkali oxides. This indicates that the sample derived from the smelting rather than the smithing process.

Table 62mf SF5100-1 - bulk and phase analysis

	B1	B2	B3	B4	B5	GLASS	FE0X
Na <sub>2</sub> O	0.3	N.D	N.D	0.3	0.9	0.4	N.D
MgO	0.7	0.4	0.6	1.6	1.6	1.2	0.3
Al <sub>2</sub> O <sub>3</sub>	2.6	3.1	2.8	4.2	4.3	6.4	0.2
SiO <sub>2</sub>	18.5	21.2	18.7	28.2	27.8	34.2	0.5
P <sub>2</sub> O <sub>5</sub>	0.8	0.8	0.9	1.7	1.6	2.0	N.D
S	0.5	0.5	0.6	0.4	0.5	0.5	0.1
K <sub>2</sub> O	1.4	1.6	1.4	2.6	2.3	3.6	0.1
CaO	5.6	6.6	6.1	14.0	14.1	16.5	0.1
TiO <sub>2</sub>	0.6	0.5	0.6	0.2	0.3	0.1	0.1
V <sub>2</sub> O <sub>5</sub>	N.D	N.D	N.D	N.D	N.D	N.D	N.D
Cr <sub>2</sub> O <sub>6</sub>	N.D	N.D	N.D	N.D	0.1	N.D	N.D
MnO	3.9	4.3	4.2	1.3	1.4	1.3	3.3
FeO	59.3	61.9	61.9	45.9	45.5	32.7	92.7
CoO	0.2	0.4	N.D	0.2	0.4	0.1	0.2
NiO	0.3	0.2	0.3	N.D	0.5	0.5	0.8
CuO	0.3	N.D	0.1	N.D	N.D	0.5	0.8
Total	95.0	101.0	98.2	100.6	101.3	99.5	98.4

Table 63mf

SI# 5309 - bulk and phase analysis

	B1	B2	B3	B4	B5	SIL	GLASS	FEOX
Na <sub>2</sub> O	0.5	0.2	0.4	0.2	0.1	N.D	0.8	0.1
MgO	0.6	0.1	0.5	0.2	0.5	1.5	0.4	0.8
Al <sub>2</sub> O <sub>3</sub>	3.2	1.7	1.8	1.3	1.7	0.4	7.0	0.4
SiO <sub>2</sub>	16.2	9.9	7.9	7.0	6.8	29.8	42.6	0.6
P <sub>2</sub> O <sub>5</sub>	0.4	0.2	0.2	0.1	N.D	0.9	1.1	N.D
S	0.5	0.3	0.2	0.3	0.1	0.2	0.7	N.D
K <sub>2</sub> O	0.8	0.4	0.4	0.3	0.4	0.3	1.4	N.D
CaO	4.8	3.6	3.0	3.0	2.4	9.2	6.5	N.D
TiO <sub>2</sub>	N.D	N.D	0.1	0.1	N.D	N.D	N.D	N.D
V <sub>2</sub> O <sub>5</sub>	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
Cr <sub>2</sub> O <sub>6</sub>	0.1	N.D	N.D	0.1	0.1	N.D	0.2	N.D
MnO	0.7	0.5	0.5	0.8	0.5	1.7	0.4	0.6
FeO	73.4	82.5	82.3	84.5	85.4	56.3	32.5	94.9
CoO	0.2	0.4	0.3	0.4	0.7	0.2	N.D	0.4
NiO	0.2	0.3	0.3	0.2	0.3	N.D	0.1	0.2
CuO	N.D	N.D	N.D	N.D	N.D	N.D	N.D	N.D
<b>Total</b>	<b>101.6</b>	<b>100.1</b>	<b>97.9</b>	<b>98.5</b>	<b>99.0</b>	<b>100.5</b>	<b>93.7</b>	<b>98.0</b>

Table 64mf

## SF 5982 - bulk and phase analysis

	B1	B2	B3		SIL	GLASS	FEOX
Na <sub>2</sub> O	0.5	0.5	0.6	N.D	N.D	1.9	0.2
MgO	0.9	1.1	1.4		1.9	N.D	N.D
Al <sub>2</sub> O <sub>3</sub>	6.5	4.3	5.6		0.5	15.2	0.4
SiO <sub>2</sub>	22.9	19.9	30.8		30.0	40.9	1.1
P <sub>2</sub> O <sub>5</sub>	1.1	0.2	0.4		0.1	1.9	N.D
S	0.4	0.2	N.D		N.D	0.4	N.D
K <sub>2</sub> O	1.8	1.1	2.7		0.1	7.9	N.D
CaO	7.1	4.0	8.7		10.1	8.6	0.2
TiO <sub>2</sub>	0.5	0.3	0.1		0.1	0.6	0.3
V <sub>2</sub> O <sub>5</sub>	N.D	N.D	N.D		N.D	N.D	N.D
Cr <sub>2</sub> O <sub>6</sub>	N.D	N.D	N.D		N.D	N.D	0.1
MnO	3.2	2.4	3.3		5.9	0.7	1.2
FeO	55.6	66.4	44.6		52.8	12.9	93.5
CoO	0.2	0.4	N.D		N.D	N.D	0.1
NiO	0.2	0.2	N.D		0.2	0.2	0.2
CuO	N.D	N.D	N.D		N.D	N.D	N.D
Total	100.9	101.0	98.2		101.7	91.2	97.3

Table 65mf

## SF 5245 - bulk and phase analysis

	B1	B2	B3	B4	B5	FEOX1	FEOX2	FEOX2
Na <sub>2</sub> O	0.1	0.5	N.D	0.1	0.2	0.2	0.2	0.1
MgO	0.3	0.6	0.6	0.6	0.4	0.4	0.3	0.5
Al <sub>2</sub> O <sub>3</sub>	1.1	1.7	3.3	2.8	2.7	0.2	0.4	0.4
SiO <sub>2</sub>	1.9	2.7	11.3	8.7	6.4	0.4	0.2	0.3
P <sub>2</sub> O <sub>5</sub>	N.D	0.1	0.7	0.4	0.7	N.D	N.D	N.D
S	N.D	0.2	0.1	0.2	0.2	N.D	N.D	N.D
K <sub>2</sub> O	N.D	N.D	N.D	0.5	0.1	N.D	N.D	N.D
CaO	0.4	0.5	2.5	4.4	2.6	N.D	0.1	0.1
TiO <sub>2</sub>	0.2	N.D	0.5	0.1	0.2	N.D	N.D	N.D
V <sub>2</sub> O <sub>5</sub>	N.D	N.D	N.D	N.D	0.1	N.D	0.2	N.D
Cr <sub>2</sub> O <sub>6</sub>	0.1	0.1	N.D	N.D	0.1	N.D	0.1	N.D
MnO	1.2	0.4	1.3	1.8	0.6	1.5	0.8	1.0
FeO91.4	91.4	79.4	60.2	79.8	80.8	95.4	96.3	95.9
CoO	0.2	N.D	0.1	0.1	0.3	0.4	0.2	0.2
NiO	0.4	0.3	N.D	0.4	0.1	0.6	0.2	0.6
CuO	N.D	N.D	N.D	N.D	0.1	N.D	0.2	N.D
Total	97.3	86.5	80.7	99.9	95.5	99.1	99.0	99.1

Table 66mf SF 4106 - bulk and phase analysis

	B1	B2	B3	B4	B5	SIL	FE0X
Na <sub>2</sub> O	0.1	0.3	0.3	0.1	N.D	N.D	0.5
MgO	0.6	0.7	0.3	0.8	0.4	0.4	0.3
Al <sub>2</sub> O <sub>3</sub>	2.3	2.3	1.8	2.0	1.4	0.4	0.6
SiO <sub>2</sub>	15.8	13.2	9.4	10.1	7.8	29.0	0.6
P <sub>2</sub> O <sub>5</sub>	N.D	0.2	0.2	0.1	N.D	N.D	N.D
S	0.1	0.2	N.D	N.D	N.D	0.1	N.D
K <sub>2</sub> O	0.1	0.2	0.1	0.1	0.1	N.D	N.D
CaO	0.7	0.9	0.9	0.8	0.8	1.0	N.D
TiO <sub>2</sub>	N.D	N.D	N.D	0.1	N.D	N.D	N.D
V <sub>2</sub> O <sub>5</sub>	N.D	0.1	N.D	N.D	N.D	N.D	N.D
Cr <sub>2</sub> O <sub>6</sub>	N.D	N.D	N.D	0.2	0.1	0.1	N.D
MnO	1.6	1.9	1.4	1.6	1.5	2.5	1.0
FeO	73.6	78.6	82.6	80.8	85.7	63.7	96.1
CoO	0.8	0.7	1.0	0.8	0.9	0.5	1.2
NiO	0.2	0.4	0.2	N.D	0.3	0.3	0.4
CuO	N.D	N.D	N.D	0.1	N.D	0.1	0.2
Total	95.9	99.7	98.2	97.6	99.0	98.2	100.9

Table 67mf Summary of analyses of slag samples

Sample	Type	Volumetric:	Mean Bulk Analysis		
		%FE0X	%SiO <sub>2</sub>	%MnO	%Feo
H2197	Smith	70-80	10.0	1.6	80.8
H5100	Smith	70-80	8.0	1.7	83.0
H5100/1	?	20	19.5	4.1	61.0
H5309	Smith	85	9.6	0.6	81.6
H5928	Smelt	30	24.5	3.0	55.5
H5245	Smelt	80	6.2	1.1	78.3
H4106	Smelt	65	11.3	1.6	80.3

Table 68mf Detailed distribution of slag by phase  
In Grammes

		Smith	Smelt	Ore	H/FL	FA/C
Phase 4						600
Phase 4/5						1
Phase 5/6	ramparts and levelling	20	55	30		
	burnt feature 1781 and 1954		100			630
	ditch fills				10	290
Phase 6					20	
Phase 7	broch tower floors features		5	150		150
	walls			100	25	30
	Workshop 1		5			80
	Workshop 2			160		10
Phase 7	NE B floors, rubble and furnace	535	545			80
	walls		95	20		
	SE B					
	NW B					10
Phase 7	S building walls		240			
	SW building hearth floor and ash				130	46
	rubble					65
	E building and yard stone features and rubble		35	2901		
	clay and floor		40	185		240
	central entrance way rubble					50
	ditches		30			20

Table 68 contd

In Grammes

		Smith	Smelt	Ore	H/FL	FA/C
	X Trench					225
Phase 7 later	S buildings rubble		115	2180	50	209
	earth floor/clay floor		10	15		1
	hearth		120			16
	981 dump		150	1015	240	87
	SE buildings earth floor		15			1
	E buildings					
	SE yard 1403 clay		1630	50		30
	E yard walls	1160	110	165	100	210
	rubble and path	2746	4290	375	2825	190
	floor	100	230			
	NE building rubbles	32,170	8255	840	13,430	2600
	furnace and dump		3025		13,500	10,600
	hearths		8665			
	ash and floor		5220	405	320	
Phase 7/8	SE		10			
	W earth floor		80			
	Tower floor 3		80			
	floor 4			140		625
	tower	50				

Table 68 contd  
In Grammes

		Smith	Smelt	Ore	H/FL	FA/C
Phase 8 early						
NE D and yard	hearth	25				
	dump					5
	rubble and walls	2100	955	1085		845
	surface flags - floor	4635	2310	120	435	260
	rubble	70				
SE E Workshop	earth floor		30			
S Workshop	rubble walls surface		665	360		715
	hearth		225			1
	earth floor/ash		2275			131
	dump		1580			
Broch Abandonment			50	12,550	126	
Phase 8 later						
Stage 5	walls		15			10
	ash and floors		50	30		1
Stage 6	flag ash and earth floor	245	165			44
	wall/rubble	1890	140			1016
	hearth		12			
Stage 7	earth floor and ash	150				4
	891-896 setting dump	24,795	6365		420	25
	rubble	65				
Stage 8	earth floor			25		3
	walls and rubble		142	10		8

Table 68 contd  
In Grammes

		Smith	Smelt	Ore	H/FL	FA/C
Stage 9	earth floor					1
	rubble surface			30		10
Stage 10	earth floor		5		10	10
	rubble					
Stage 11						
Stage 12	earth floor/ paving	100	260			
	rubble		275			
Pict Abandonment		180	140		125	245

## GLASS CATALOGUE

Illustrated in Glass section (8.8) in text.

SF No	Context	Phase	Description
36	8	8	Fragment of transparent green bubbled glass vessel. Applied strip of pinched decoration in very similar glass metal to vessel wall. Possibly part of a bowl, possibly derived from the same vessel as SF 37. ML 37mm      MW 25mm      MT 0.5mm
37	8	8	Fragment of a transparent green bubbled glass vessel. Probably a rim fragment of a bowl. The edge is rouletted. ML 29mm      MW 8mm      MT 4mm
464	131	9	Transparent turquoise (copper-blue), slightly asymmetrical dumb-bell bead with streaks of opaque yellow glass passing across both ends. Around the area of the bead's waist are two separate streaks of opaque white glass. In the position of the waist is a short protrusion of glass which probably originates from pulling the glass around the bead at a mid-way point to produce the waist. ML 19.5mm      MD of bead 9mm
2043	765	8	Opaque yellow annular bead with flat facets around both ends of the hole. ML 6mm      MT 2mm      MD of hole 2.5mm
2878	1098	8	Opaque yellow annular bead. Probably formed by winding opaque yellow filaments around a former. Superficial weathering makes it possible to discern a change in direction of one of the surface filaments. MD 9.5mm      MT 3.5mm      MD of hole 4mm
5077	1589	7	c30% of a translucent purple globular bead with an applied circumferential cable consisting of a helix of transparent purple and opaque white glass and an applied circumferential cable of opaque yellow and opaque white glass. Est MD 25mm      MT 11.5mm      MD of hole 6mm
5142	1545	7	half of a flattened annular nearly colourless bubbled transparent glass bead with several dark inclusions. Circumferential streaks of opaque white glass pass across both flat faces. Opaque yellow glass is applied in one area. Opaque red accretion lines the remnant of the hole. MD 24mm      MT 5mm      MD of hole 7mm

Table 69mf QUANTITATIVE ELECTRON PROBE ANALYSES OF GLASS  
(weight percent)

COLOUR	BEAD										
	36	37	5077	5077	5077	5142	5142	2043	2978	464	
	tpg	tpg	tlp	opw	opy	tpc	opy	opy	opy	tlt	
Na <sub>2</sub> O	20.1	19.9	17.1	14.8	11.49	15.77	15.08	12.9	10.86	16.89	
MgO	0.9	0.8	0.65	0.36	0.4	0.86	0.87	0.48	0.38	0.59	
Al <sub>2</sub> O <sub>3</sub>	2.45	3.1	2.36	2.48	1.9	2.6	2.55	2.7	3.49	2.4	
SiO <sub>2</sub>	67.1	67.2	64.57	65.67	51.65	68.3	68.26	61.55	58.9	66.3	
P <sub>2</sub> O <sub>5</sub>	0.07	0.07	0.07	0.1	0.06	0.15	0.2		0.05	0.1	
S	0.24	0.2	0.3	0.6	0.3	0.24	0.2	0.5	0.78	0.36	
K <sub>2</sub> O	0.59	0.6	0.77	0.75	0.66	0.93	0.87	0.66	0.66	0.7	
CaO	6.2	5.69	9.2	7.3	5.96	8.94	8.93	4.5	4.07	8.85	
Sb <sub>2</sub> O <sub>3</sub> /Sb <sub>2</sub> O <sub>5</sub>				6.2	0.59			1.0	1.3		
SrO <sub>2</sub>				ndl	0.17			0.1	0.1	0.4	
TiO <sub>2</sub>	0.1	0.1				0.07		0.07	ndl		
B <sub>2</sub> O <sub>3</sub>	1.20	1.08	1.59	0.8	0.1	0.95	0.9	0.08	0.2	1.1	
Fe <sub>2</sub> O <sub>3</sub>	0.79	0.8	0.26	0.3	1.16	0.97	0.87	0.55	1.37	0.39	
NiO <sub>2</sub>								0.07			
CuO										2.4	
PbO				0.14	24.77	0.16	1.03	14.2	17.72	0.3	

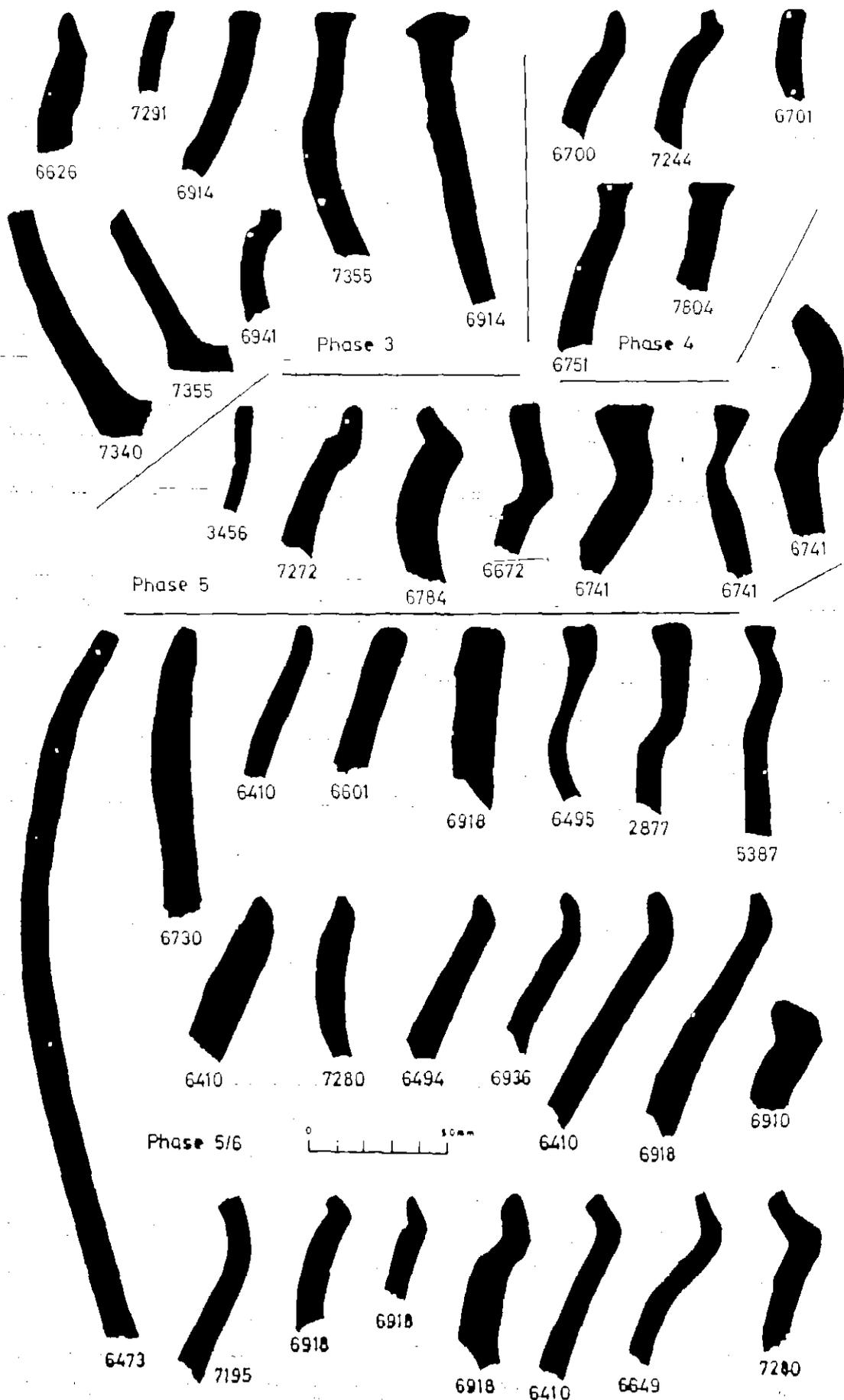
Abbreviations

tpg - transparent green  
tlp - translucent purple  
opw - opaque white

opy - opaque yellow  
tpc - transparent colourless

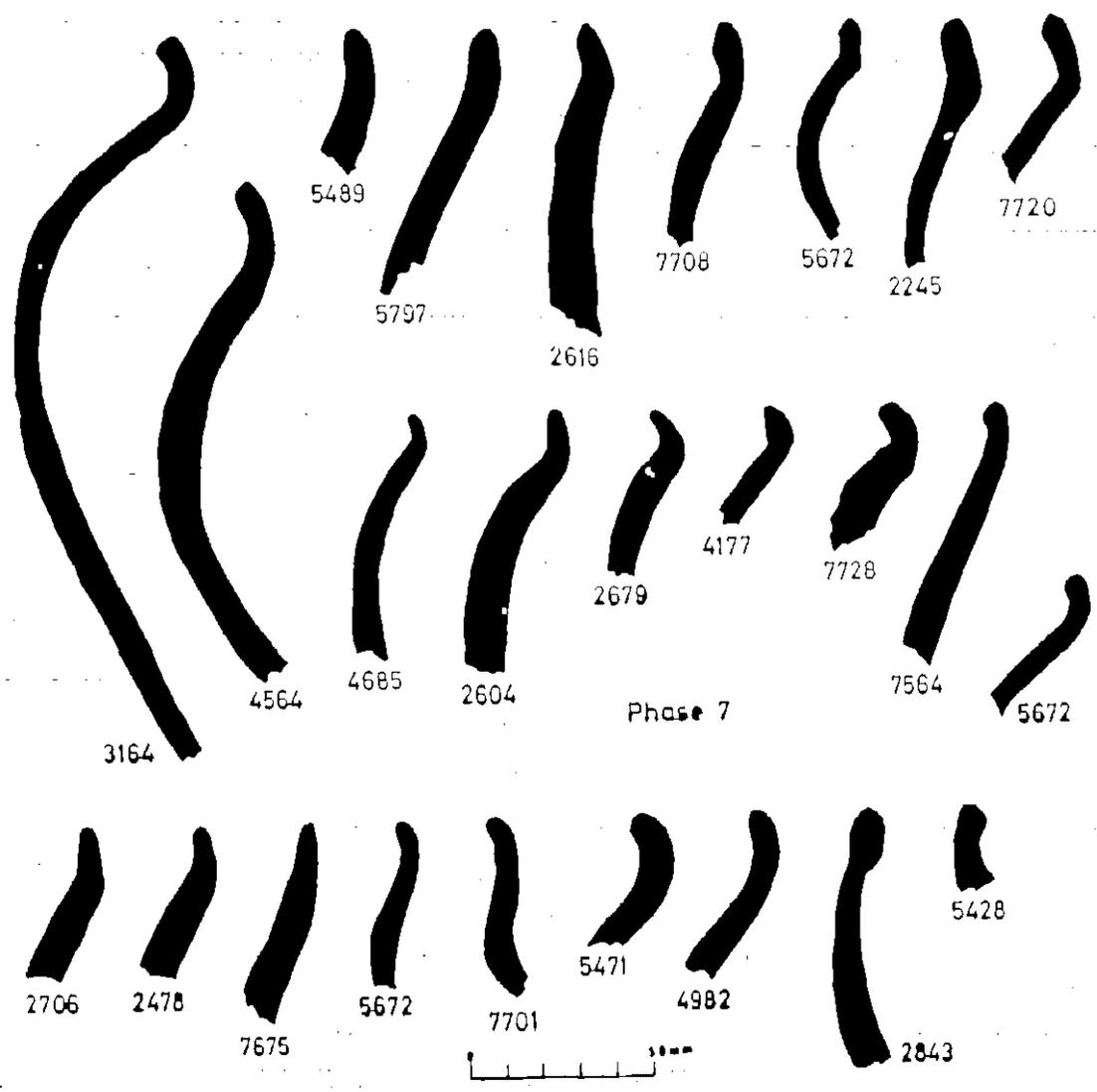
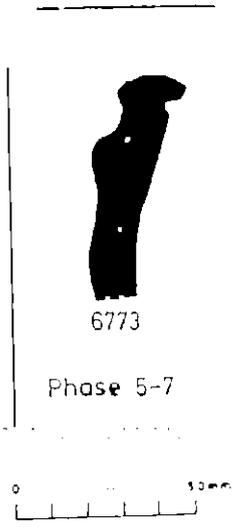
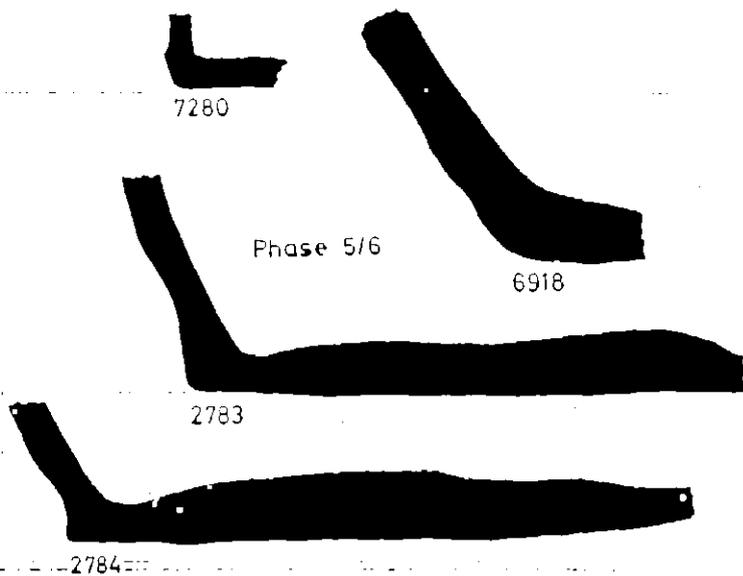
tlt - translucent turquoise  
ndl - minimum detectable level

(for conditions of analysis see Henderson 1987)



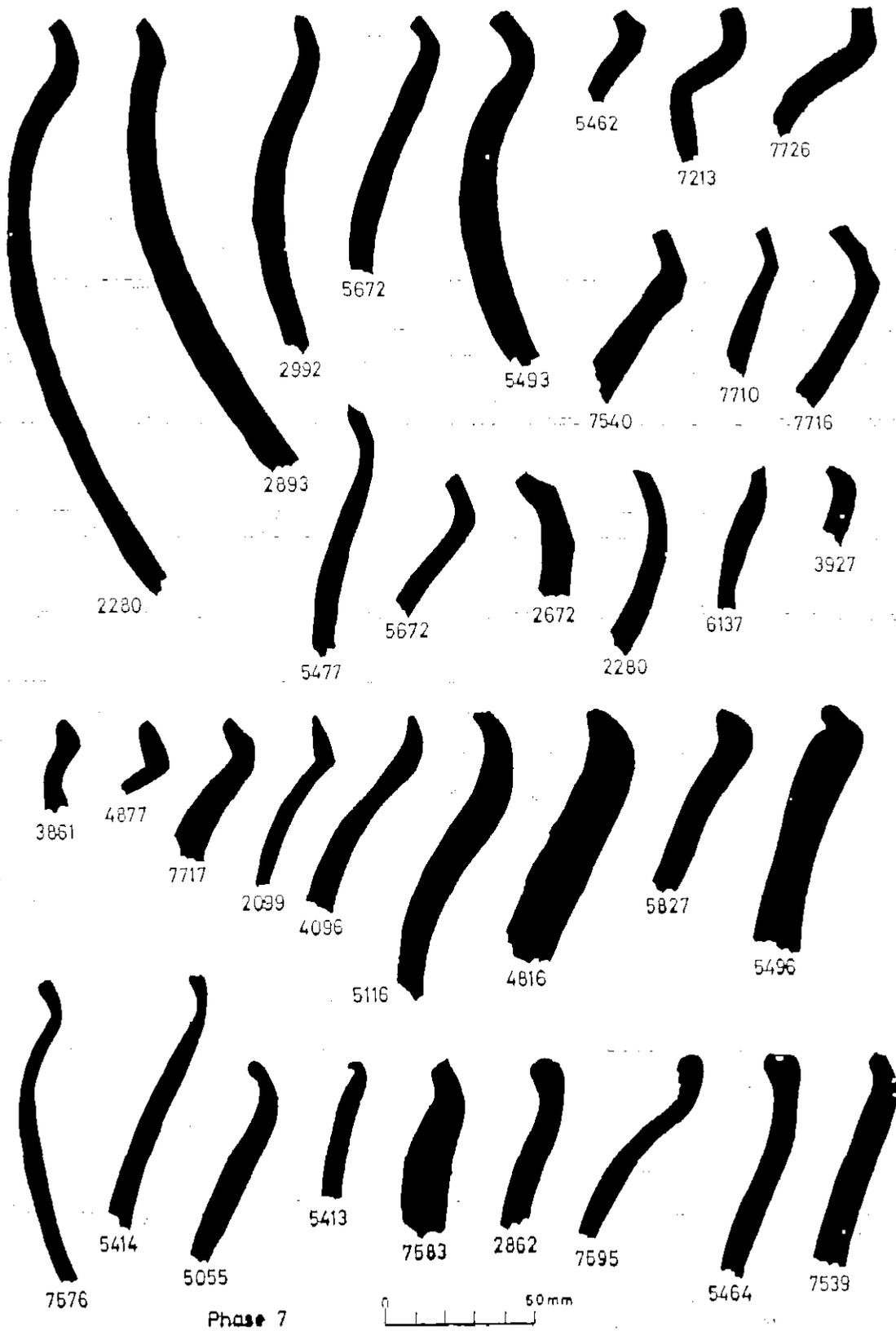
illus 140a

3:F8



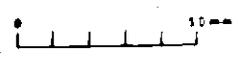
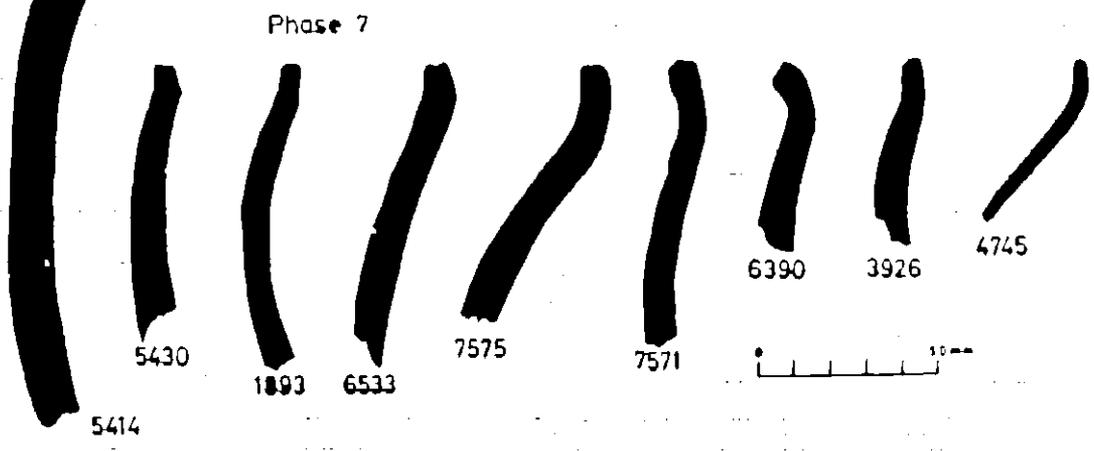
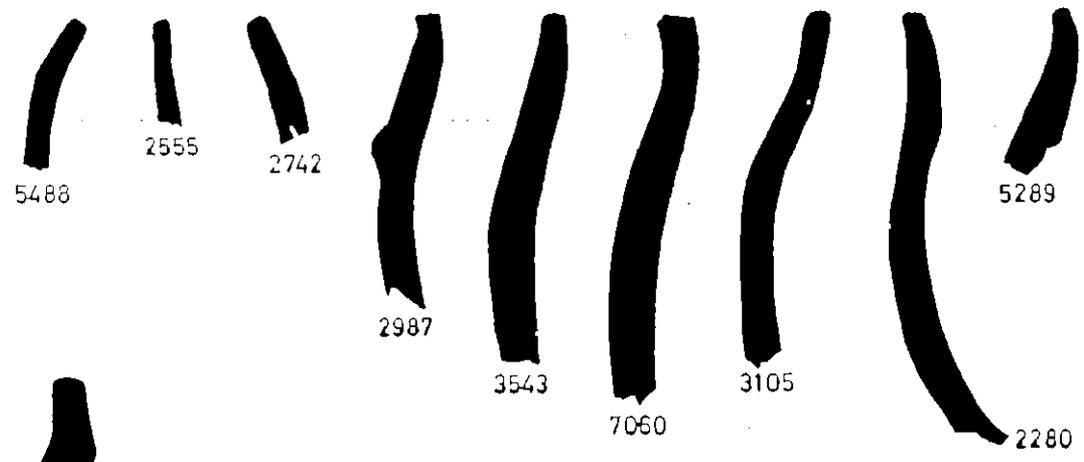
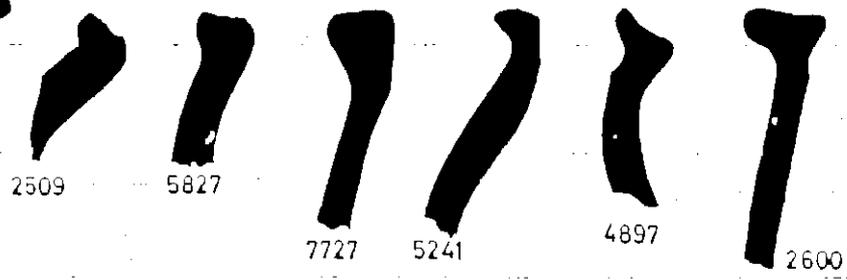
illus 140b

31F9



illus 140c

3:F10



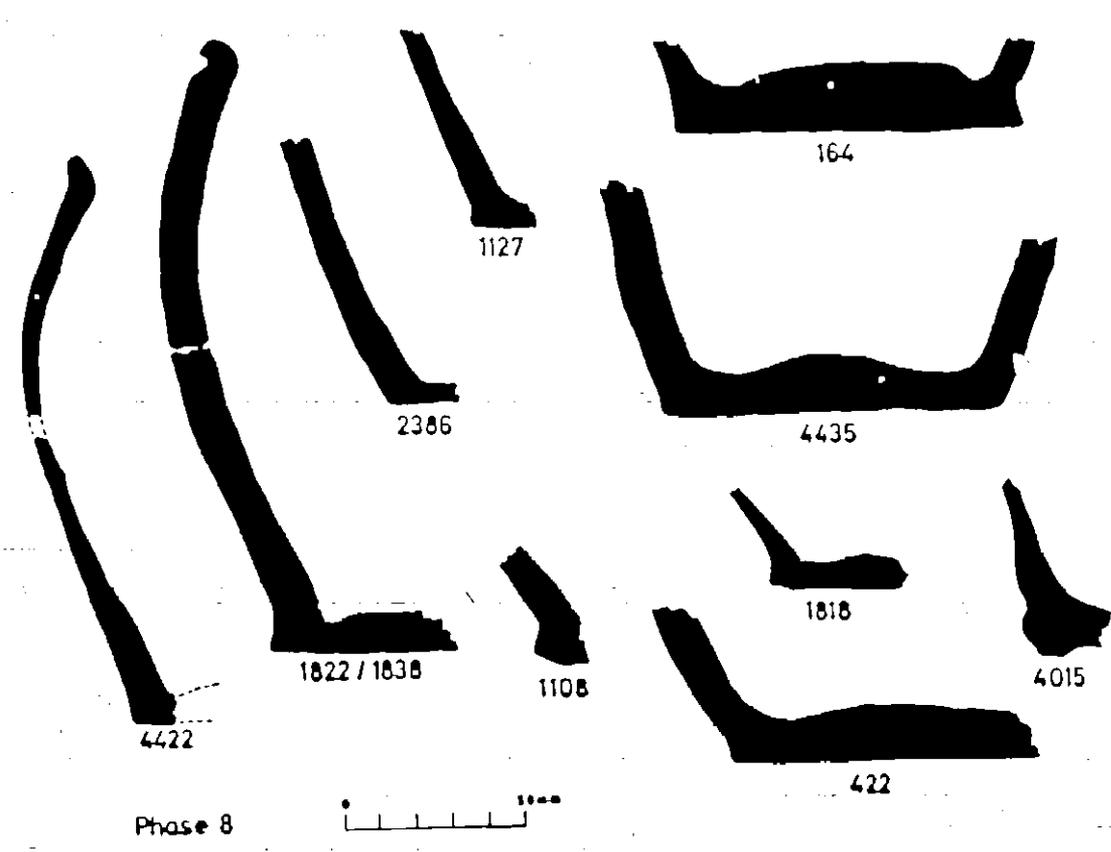
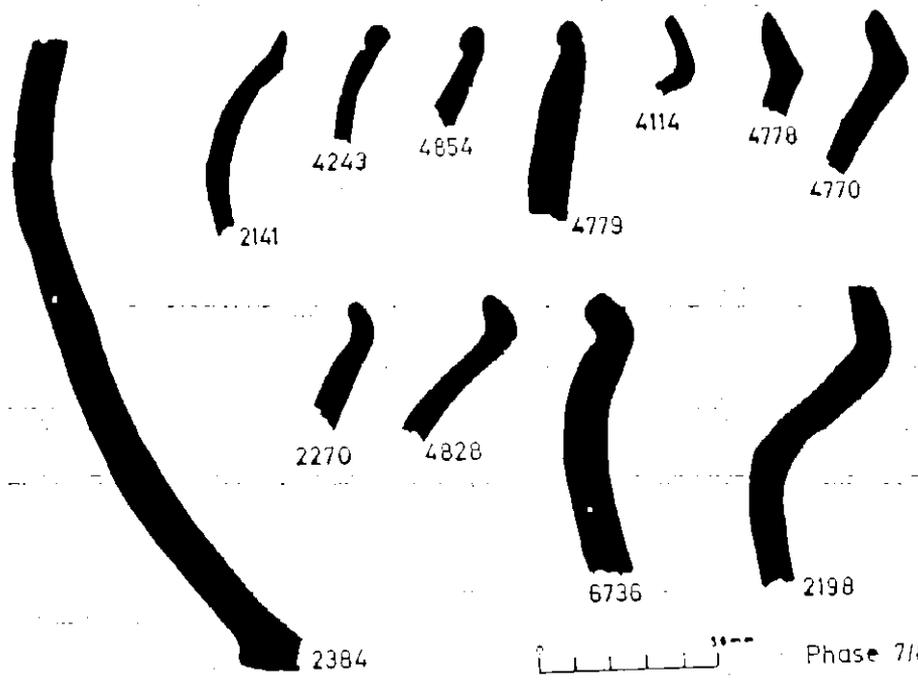
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3:F11

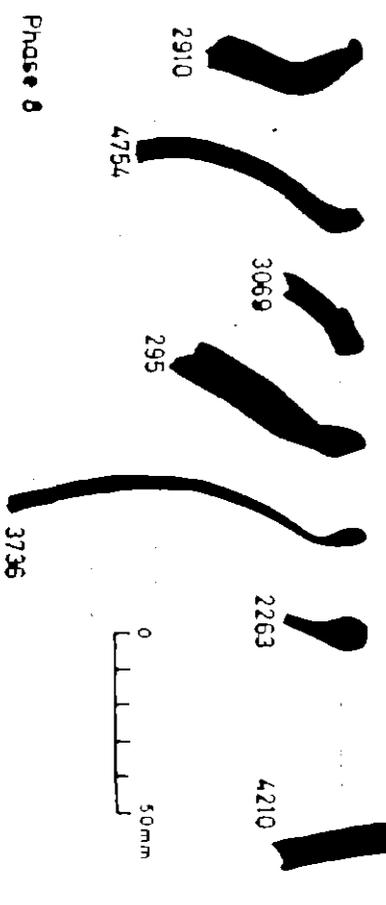
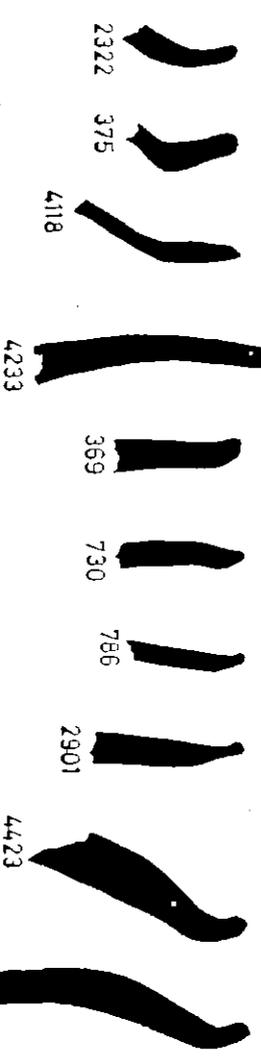
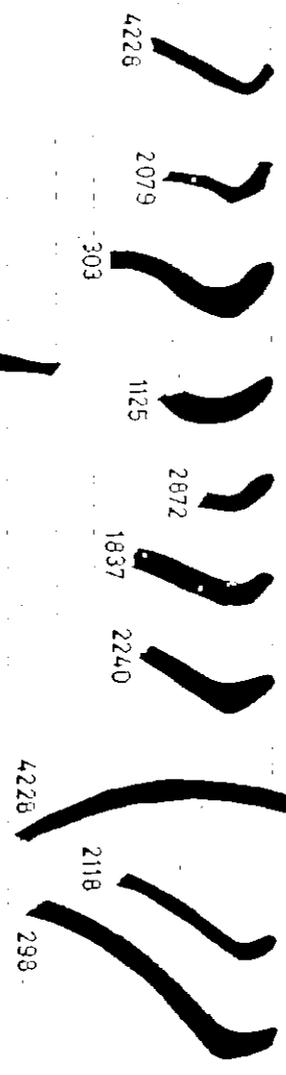
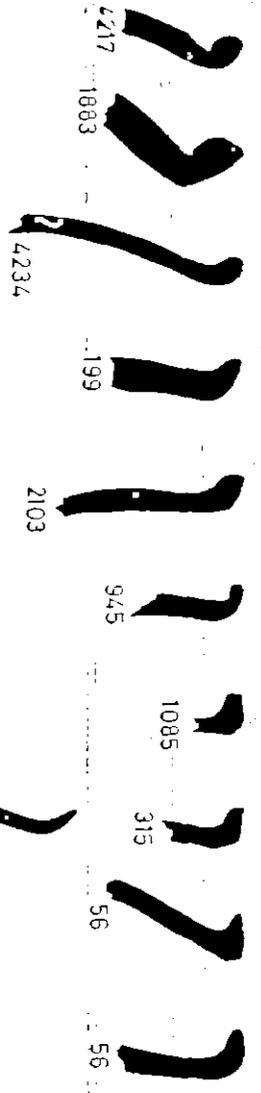
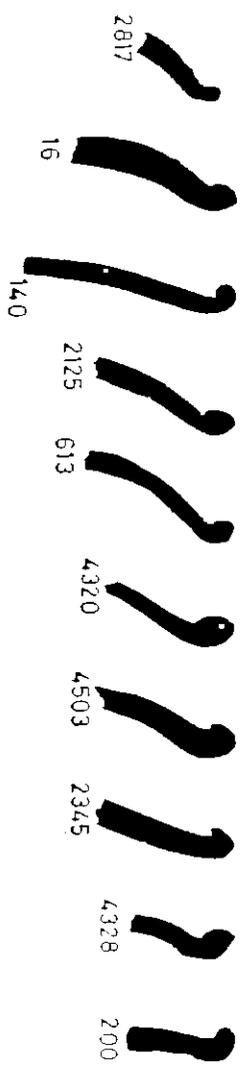


Illus 140c

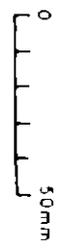
3:F12



illus 140f  
 3:F13



Phase 8



illus 140a

3:F14

Table 7imf SIZE RANGE OF MINERAL FILLER  
 (as a percentage of total sherds and by phase)

PHASE	SIZE < than 1mm	S 1-3mm	M 4-7mm	L 8-10mm	S-M 1-7mm	S-L 1-10mm	M-L* 7-10mm	Total No Sherds
1/2		0.01						2
2		0.01			0.03		0.01	9
2/3		0.03				0.11		24
3		0.15	0.16	0.17	0.15	0.5	0.57	300
3/4		0.07						13
4		0.33	0.33	0.22	0.08	0.22		207
5		0.10	0.16	0.02		0.02	0.16	81
5/6		3.15	2.18		1.99	1.22	0.19	1527
5/7		0.04			0.20			43
6			0.32				0.12	27
6/9					0.38			67
7		11.0	3.0	0.11	37.34	18.09	2.56	12612
7/8		0.95	1.38			0.06		419
8	0.59	8.24	0.63		1.20	0.01		1867
8/9					0.05			10
9								265

TOTAL

17473

\*

S - small  
 M - medium  
 L - large

Table 72a: Rim Shapes (As a percentage of each phase and of the total shards).

Phase	Rim Shape inverted		straight		inverted		flipped		beaded		flattened		X*	Total	% Total of all rims
	A	B	A	B	A	B	A	B	A	B					
2, 2/3	<1.0 [25.0]		<1.0 [25.0]	1.0 [25.0]										4	<1.0
3	1.2 [40.9]	1.5 [22.7]	>1.0 [4.5]	6.5 [26.3]				1.6 [4.5]				>1.0 [1.0]		22	1.29
3/4, 4	<1.0 [23.0]		1.1 [15.4]	6.5 [46.1]			1.9 [7.7]					<1.0 [7.7]		13	<1.0
5	<1.0 [53.8]	<1.0 [15.4]		3.2 [23.0]			3.3 [7.7]							13	<1.0
5/6	7.9 [45.4]	6.3 [21.5]	10.1 [13.8]	6.5 [4.6]	7.5 [3.0]	16.7 [3.8]	3.2 [1.5]	3.0 [1.5]				4.6 [4.6]		130	7.6
6	<1.0 [50.0]		<1.0 [50.0]											2	<1.0
7	33.0 [41.7]	81.4 [24.4]	76.4 [12.0]	65.6 [5.4]	40.3 [2.6]	66.7 [1.7]	61.9 [3.4]	24.6 [1.4]	90 [1.4]			49.2 [5.5]		1128	66.0
7/8	5.2 [54.2]	1.5 [6.9]	2.8 [6.9]	4.3 [5.5]	9.4 [6.9]	3.3 [1.4]	7.9 [6.9]	7.7 [6.3]				2.4 [4.2]		72	4.2
8	18.3 [48.4]	6.8 [8.1]	6.2 [3.9]	6.5 [2.9]	20.7 [3.9]	10.0 [1.1]	22.2 [4.9]	64.6 [14.3]				28.6 [12.7]		283	16.6
6/9,9	2.7 [47.6]		1.7 [7.1]				3.2 [4.8]					13.5 [40.5]		42	2.4
% total of all rim types	[43.7]	[19.8]	[10.4]	[5.4]	[3.1]	[1.76]	[3.7]	[3.8]	[0.9]	[7.41]	1709	100.0			

\* A - rounded  
 B - flattened  
 X - unclassified or broken

Howe Excavation 1978-1982

Other Fired Clay, Unfired Clay and Mortar

SF	Context	Phase	Description
130	126	9	Fragment of clay pipe bowl, undecorated. ML 18 mm MW 14 mm MT 3.5 mm
294	342	9	Irregular biconical bed with central perforation. Slightly flattened at apexes. Pottery slipped and well polished. Hole punched through after firing. ML 22 mm MH 14 mm MD of hole 2.5 mm (illus 107)
2155	826	7/8	Pottery sherd with slag adhesions. ML 36 mm MW 34 mm MT 13.5 mm
2244	811	8	Burnt or fired clay, a rough and irregular piece. Stones within matrix but no noticeable organic content. Munsell Colour 2.5 yr 6/8 light red.
2429	892	8	Burnt or fired clay. Rough and irregular piece. Stones within matrix. Munsell colour 2.5 yr 6/8 light red.
2988	981	7	White compound, possibly mortar. A mixture of broken shell, some larger fragments, a small quantity of cominuted charcoal and some yellow clay. Not analysed.
3523	1103	7	Burnt clay floor or luting. Small natural stones included. Munsell colour 10 yr 6/4 light yellowish brown.
4395	1259	8	Thumb-pressed little pot of yellow baked clay. Fire cracks around body. Roughly circular with a deep central depression which is smooth at the bottom. Base of artefact is rounded and shows signs of heat. Possibly a small crucible. MD 30 mm MH 17 mm MD of hole 24 mm MD of hole c15-18 mm.

SF	Context	Phase	Description
6546	1582	7	A mixture of dried clay and mud. Has been stabbed with cockleshell and/or a comb to produce random indentations, like a child's attempt at modelling. Two rounded pieces. Munsell colour 10 yr 5/2 greyish brown.
6713	1964	5/6	Two pieces of burnt clay and 2 pieces of badly eroded vessel, possibly fragments of a crucible. Surface of sherds is missing, but mica and quartz are present. Munsell colour 2.5 yr 6/8 light red to 7.5 yr 8/6 reddish yellow. One piece is a curved rim fragment, ML 30 mm MW 30.5 mm MT 6 mm. The other piece is probably part of the body of the vessel. There are no metal deposits on the pieces.
6949	415	9	Stem fragment of a clay pipe. End is unglazed. The stem is elliptical in section. MD 9 mm ML 43.5 mm
7208	1865	7	Semi-circular clay object. The slightly concave interior has a smooth shallow near depression running the length of the object, blackened at one end. Outer surface is smoothed around the raised lip and rough beyond, and fired grey. Munsell colour 7.5 yr N6 grey, 5 yr 7/8 reddish yellow. 7.5 yr 7/4 pink - 6/4 light brown. (illus 154) ML 46.6 mm MW 41.5 mm
7875	1689	7	Well fired fragment of crucible, probably pear-shaped, shallow and wide. Impregnated with slaggy deposits. A grey clay with no visible temper, fired white/blue and cracked, especially on the interior. Two pieces. (illus 154) ML 44 mm MW 43 mm
7876	1865	7	Wedge shaped piece of burnt clay. Has small stone in matrix and parallel grass impressions on the triangular flat surface. Munsell colour 2.5 yr 5/8 red - 5 yr 6/6 reddish yellow.

Howe, Cairston, Stromness 1888 - 1889

Acc No	Description
GA 294	Grey-yellow micaceous sandstone whorl. Both faces flattened and sides smoothed and curved. Central hole, elliptical on one surface. MD 28.5 mm MT 14 mm MD of hole 8-10 mm
GA 295	Yellow micaceous and banded sandstone whorl. Surface only roughly smoothed. Central hole worn irregularly on one surface and slightly splayed on other. MD 35.5 mm MT 17.5 mm MD of hole 11-12 mm
GA 296	Yellow micaceous sandstone, Irregular roundel. Sides cut and smoothed in Irregular sections. Sides not vertical. Roughly flat top and bottom surfaces. MD 28 mm MH 15.5 mm
GA 297	Conical and hollow fragment. Sandy fabric with mica inclusion (no grits seen). Part of a tubular handle of earthenware porri. Two raised bands at narrow end, with a third band forming the narrow end, with an irregular splayed hollow. Orange slip with remnants of red-purple glaze. ML 55 mm MT of pottery 8 mm MD 28 mm
GA 298	Rounded and everted rim fragment. Gritty and slipped. MT 7.5 mm
GA 299	Curved length of antler. One end sawn off and smoothed. Other end slightly faceted. Surface generally smooth, some cut marks present. Pierced centrally through width. Underside of artifact the hole is round, and the topside of the implement has a square hole. Antler handle. ML 100 mm MT 17 mm MW 31 mm Square hole 7 x 8 mm Circular hole 6 mm in diameter.
GA 300	Elongated pebble of grey sandstone, oval in section. Smooth all over. May have some slight pecking at narrow end. Classified as unworked. ML 92 mm MD 18-20 mm
GA 301	Boar's tusk, broken at base. Upper end broken and sharpened. ML 84 mm

Acc No	Description
GA302	<p>Antler tine, end sharpened to a point. Well polished. Other end has cut marks and is slightly hollowed; one face has a rounded notch cut into it. This end may have been slotted into something else, the inside is slightly smoothed.</p> <p>ML 110Wmm MW 19 mm MW of hole 10 mm ML of slot 9 mm MW of slot 5-8 mm</p>
GA 303	<p>Piece of coral, presumably would have been circular. Has a banded and vesicular structure. Lower surface concave. Sides roughly smoothed. Upper surface convex. Hollows filled with white and red deposits and rootlets. Probably found close to the topsoil. Originally described as a portion of a vessel of steatite.</p> <p>ML 77 mm MW 55 mm MT 27 mm</p>
<b>Stromness Museum</b>	
4119	<p>Blown bottle-green glass, but has a very dark appearance. The linen smoother is bun-shaped with rounded sides and a rounded top that has been slightly flattened with wear. The lower surface is well chipped and slightly hollow where the glass has been finished off. Partly chipped around edges. No other wear or pattern marks.</p> <p>MD 73 mm MT 31 mm</p>

## 9.1 ANALYSIS OF HUMAN BONE

### PHASE 3

The only human bone found in this phase of the site was a 1st cervical vertebra or atlas with the right transverse process (projecting part) missing. It was distinguished by marked waisting of the superior articular facets, that on the right side being almost divided in two.

### PHASE 5

SF 5451 : The condition of the bones from this phase, was poor. They were very thin with poor muscle markings and appeared to belong to two adult skeletons of different ages and possibly of different sex, although they were found and excavated as one skeleton.

The smallness of all available articular surfaces (including the acetabula) of the pelvic girdle, indicated the female sex, but there was sufficient of the left os innominatum to show a deep sacro-sciatic notch of male shape with no pre-auricular sulcus (or groove). The tuberosities of the ischia were ununited (which occurs between the ages of 17 and 25), and the head of the femur had only just united with the diaphysis or shaft. The line of union was still very apparent. The age of the skeleton at death must therefore have been less than 19 and could have been as young as 16 (Stewart 1979). It is possible, that these bones belonged to a young adult-male in his teens.

The left femoral head was very abraded, but union of the epiphysis and the diaphysis was complete, and the tuberosities were united with the shaft as were the epiphyses at the lower end of the humerus. The small size of these articular surfaces indicated female bones of c20+ years of age.

There was considerable flattening of the shafts of both femora. Acetabular creases were present on both sides and a small bony exostosis was noted on the middle of the posterior surface of the neck of the left femur. Both femora showed a roughness on the front of the neck, although that on the right side was very worn (Poirier's facet). Poirier (1892) and others originally thought this to be due to the extension of the cartilaginous surface of the head, as the result of exceptional use. Later authorities (Pearson and Hill 1919) considered it far too common a trait to have any significance, but Angel (1971) suggested that it and platymerial may be an adaptation to walking and running in rough country.

### PHASE 5/6

These bones are few but could come from a minimum number of two adults, since they include one mandible (in two parts), which is complete save for the coracoid process, and two fragments and a lower first molar from a second lower jaw.

SF 5557 : This sample consisted of a tubercle and part shaft of a 2nd right rib, and a 3rd metacarpal from the right hand.

SF 5737 : This consisted of fragments of sk 11, which comprised a portion of occiput with the internal occipital protuberance and left lambdoid suture, and a portion with the right lambdoid suture and the left posterior portion of the parietal bone with lambda and one small fragment of tabular bone. There was an ossicle in the left lambda, but there was no sign of closure in the sutures.

Suture closure is an unreliable indicator of age but these bones might possibly come from a young adult. A navicular from the left wrist was associated with the skull fragments.

SF 5908 : Mandible 2 consisted of two fragments, which are associated with a lower 1st left molar, the odontoid peg and the superior articular surfaces of the 2nd cervical vertebra (axis) and the lower end of the diaphysis (shaft) of the left radius. Tooth-wear analysis indicated the age at death to be c17 - 25, but the fact that the epiphysis was ununited at the end of the radius indicates an age of between 17 and 20.

SF 6463 : This was the upper 1/3rd of the shaft of a right femur which from its heavy gluteus maximus muscle markings, may possibly be considered male. There was also some flattening of the femur.

SF 6472 & 7104 : Mandible 1 was robust with a well developed angle of the jaw and a broad ascending ramus. It was probably male. Using Brothwell's (1981) assessment of age from tooth-wear, the age of death would appear to have been between 25 - 35 years. The lower left 3rd molar is however, unerupted and an age nearer 25 would appear more likely. The in situ teeth appear healthy and there is no marked alveolar resorption. Most of the teeth have been lost post mortem (which may occur more readily where alveolar infection has been present). The loose lower canine shows pulp exposure.

#### PHASE 6

SF 5926 : One external cuneiform from the right foot.

#### Phase 6-9

SF 3339 : This consisted of heads and a small part of the shafts of metacarpals 1, 3 and 4 from the left hand. They probably belonged to a young adult of about 18 - 20 years of age at the time of death, as the heads were united to the shafts, but the lines of fusion were still apparent.

#### Early Phase 7

SF 3355 : Two fragments of a shaft of left fibula.

SF 3362 : Two portions of a left humerus and fragments of a second right rib.

SF 3377 : These bones consisted of fragments of long bones and the talus of the left ankle. The bones were gracile, especially the ulna and could well be those of a female (Dwight 1894). The head and tuberosities of the humerus were united to the shaft (which occurs between 18 and 30 years of age) (Brothwell 1981), and so they belonged to an adult.

SF 3390 : These bones included a 1st phalange and a small 7th cervical vertebra with the spinous process fused, which belonged to an adult of more than 25 years of age.

SF 3683 : These bones consisted of the shaft of a right ulna, the upper end and shaft of the 3rd right metacarpal and the calcaneus from the right heel with only the anterior surface present.

SF 3773 : The head, neck and upper shaft of a juvenile left femur (diaphysis only).

SF 4546 - adult skeleton (illus 156) : The bones of this skeleton were in a very fragmented condition, but on analysis, appeared to be fairly complete in number with the exception of the whole right lower limb, the left foot and both hands, even though some phalanges (finger or toe bones) were found. The skeleton was found lying on its left side with the arms and legs extended forward. Reconstruction of the shattered skull, showed that considerable distortion had taken place so that any cranial measurements must be considered suspect. Similarly, it was also found impossible to reconstruct the long bones sufficiently for measurements of length to be undertaken, so that stature could not be estimated.

#### Sex

The skeleton possessed both male and female characteristics but the reconstruction of the pelvis was not sufficient to enable the sciatic notch index to be calculated. However, its shape seemed indicative of a male, and the crest of the pubis was relatively massive. In the skull, the supra-orbital ridges were rounded and pronounced, the brow sloped back and the root of the left zygomatic process extended beyond the external auditory meatus or opening (the right side was broken). The mastoid process and nuchal crest were moderate. Discriminant function analysis of the jaw, placed it with an 85% probability, in the male category (Giles 1964).

The proportions of the manubrium to the gladiolus of the sternum were definitely male and are the chief factor in shaping the thorax, making it deeper and larger (Dwight 1894). The sternum is not a particularly significant indicator of sex, but in this instance, was worthy of note in view of the small size of the shoulder girdle. The left clavicle was only 126mm in length (138mm is female, according to Genoves 1969), and the length of the left glenoid fossa of the scapula was only 38mm. Dwight considered the average male socket of the modern scapula to be 39.2mm and that of the average female 33.6mm. The acromion process was rather narrow, the left coracoid process had no noticeable knob on the end, and the process for the attachment of the teres major muscle at the lower angle was narrow. All of these are female characteristics.

Since the two principal sex indicators, the pelvis and the skull show male characteristics, the skeleton was probably that of a man with underdeveloped shoulders.

#### Age

Brothwell's (1981) classification of age from tooth-wear analysis, places the skeleton between 35 and 45 years. This is reinforced by the presence of a completely united hyoid bone from the base of the tongue, which is a sign of advanced age (probably between 45 and 50). The symphyseal surface of the left os pubis was slightly eroded but indicated an age in excess of 30.

#### Non-metrical variations

The absence of the 3rd left molar, a possible lambdoid ossicle (bone-like plate), the presence of a 3rd trochanter for muscle attachment, plus hypotrochanteric fossae (geometric depressions) on both femora, partially divided superior facets on the first cervical vertebra (atlas) and a shallow vastus notch on the left patella were all noted. A platymeric index of 73.6 indicated considerable flattening of the femur.

The left clavicle was markedly flattened antero-posteriorly at the sternal end of the shaft with an oval depression with a raised edge (49.4mm long x 15.5mm deep), where the attachments of the pectoralis major and the

sterno-cleidomastoid muscles occurred. It is possible that this might have been the result of specialized activity.

#### Pathological conditions

Osteophytes (bony outgrowths) were present on the 5th and 6th cervical vertebrae, the 9th and 11th thoracic vertebrae and on all the lumbar vertebrae (although confined to the transverse process on the 4th).

The maxillae were in a poor state of preservation, especially the alveolar margins, with only the 1st upper right molar in situ. Abscesses appeared at the roots of

7 6 2 1 | 4 5 7, and the associated loose teeth which were lost post mortem, all had pulp exposure. It is thought that earlier populations had a tendency to abscesses due to the exposure of the pulp (Brabant 1967). The upper 2nd molar on the right side was rotated and all the upper teeth appeared to be worn down to the gum line. There did not appear to be any formation of secondary dentine.

In the mandible, there was macroscopic porosity and loss of alveolar bone with a little subgingival calculus in the region of {4 5 6 7 8 and a little in 5 6}. No hypoplasia or lines or arrested enamel growth was noted, but mesial caries was found in 8 1 | 1. Brothwell (1962) gives a mean of 1:3 cases of caries in each individual in prehistoric times.

It should be noted that while congenital absence of {8 was confirmed by X-ray, the area of 8} was missing. Since neither {7 nor 7} exhibited wear on the distal portions, it seems likely that there was a congenital absence of 8} also. The 3rd molar is the commonest missing tooth (Salzmann 1957) and its absence became fairly common from Neolithic times onwards. Heredity is the most important determinant of hypodontia (Brothwell, Carbonell & Goose 1963), and is primarily determined by genetic factors with a fairly marked degree of penetrance (Grahnen 1956).

SF 4546/3773 - foetal skeleton : These bones lay close to the previous skeleton, and were those of a foetus, possibly female and about full term. The squamous and tympanic portions of the temporal bone, which normally unite shortly before birth, were still separate, and although there is damage to the upper part of the tympanic ring, close examination of the squamous portion failed to reveal indications that fusion had actually taken place. Using the formulae and tables devised by Fazekas and Kosa (1978) the foetus had a body length of 47.32cm and weight of 2500grammes. This according to their calculations makes the foetus c9 and a half lunar months.

#### Sex

Washburn (1948) states that the basic adaptation of the sciatic notch to bipedal locomotion, together with that of the lower ilium, had for obstetric reasons, to be accomplished differently in the two sexes. Sex differentiation is the direct result of prenatal testosterone concentrations in foetal males (Weaver 1980), so that sexual characteristics which in the rest of the skeleton develop after puberty, are present in the pelvis before birth. Boucher (1955) found significant sexual differences in some populations but not in others. Fazekas and Kosa however, found significant sex differences between the length and depth indices of male and female sciatic notches and, in a modern mid-European population, considered it possible to establish the sex in c44.2 - 59% of cases. Applying their calculations to this foetal skeleton, a sciatic incisure index of 25.5 was obtained, giving the probability that the foetus

might be female. Weaver considered the auricular surface elevation a satisfactory non-metrical indicator, as it almost certainly contributes to the increased pelvic width of infant females noted by Reynolds (1945). In this case the auricular surface was elevated along both the anterior and posterior edges and could be considered female.

SF 4736 & 4738 - infant skeleton (illus 157) : These finds were of infant bones found within the same yard as the previous two skeletons. They had been disturbed, probably by rodents as the left femur showed signs of having been gnawed. The bones appeared to belong to one infant skeleton, probably about full term, and have been treated as such. The width of the basilar portion of the occiput exceeds the length so that the foetus was more than 7 months and almost certainly viable (Fazekas and Kosa 1978). The two parts of the body of the sphenoid had united, which occurs during the 8th month of foetal life. The tympanic ring had also united with the petrus portion of the temporal bone, which occurs shortly before birth. A mean body length was obtained of 48cm, indicating a body weight of 2834.3grammes or 6.25pounds indicating an age of c10 lunar months. These results should however be treated with caution.

#### Sex

Using the sciatic notch index of 30.9, there is a probability that the skeleton is male. It should also be noted that only a small section of the posterior edge of the auricular surface was elevated (Weaver 1980) thus supporting the male attribution.

#### Non-metrical variations

Incipient waisting of the left superior articular facet of the atlas was noted.

SF 5677/5958/3951/6462/5445 - Child's skeleton : These bones were all found in the NE yard and can be considered to belong to the same skeleton. SF 3773 and 3135 may belong to the same skeleton as far as their dimensions are concerned but could not be confirmed with existing bones.

#### Age

Only fragments of the heads of the humerus, femur and the epiphysis of the lower end of the femur were available from the long bones, so an indication of age was obtained from the 2nd cervical vertebra (axis) where the apex of the odontoid process was entirely united. This is thought to occur about the 12th year. It was noted that the area between the base of the process and the body of the vertebra was still not ossified but this condition may continue to an advanced age. Examination of the skull revealed that the turbinated process of the sphenoid had not united with the bone, which normally occurs between the 9th and 12th years.

The alveolar portions of the mandible and fragments of the maxillae were available together with a number of teeth lost post mortem. The deciduous molars and upper canines were present, the canines and the 2nd premolars were unerupted, also the 2nd molars and the 1st premolars had erupted and the roots of the 1st molar were complete on the right side and almost so on the left. This gives a dental age of c10 years. Taking both assessments into consideration (Miles 1963) and the fact that dental age is slightly more reliable as an indicator in the young, this juvenile was probably between 10 and 11 years old at the time of death.

#### Sex

Sexing of immature bones is notoriously difficult. The sexual dimorphism exhibited by the ossification of the bones of the wrist (Hunt & Gleiser

1955) can not be used in this case, owing to the absence of the epiphyses of the radii, ulnae and the carpal bones. It was noted however, that a pre-auricular sulcus (groove) was present and a sciatic notch index of 51.16 was obtained. The skeleton is tentatively considered female.

#### Pathology

The 1st right upper deciduous molar had distal caries and the deciduous molars showed very great wear.

#### Non-metrical variations

A supra-orbital foramen was present on the left side.

SF 5690 : 1st phalange of the 4th digit on the right hand.

SF 5726 : An upper right third molar 8 with some calculus present formed this sample. The wear indicated and age of 35 - 45.

SF 6492 : This sample consisted of fragments of the body of a lumbar vertebra, 3 rib fragments and fragments of a left fibula and tarsal bones.

SF 6615 : This was an upper left third molar [8]. The mediostinal crown diameter was only 9mm, but broken. Using Brothwell's (1981) formula for wear, a very tentative age of 25 - 35 is proposed.

#### Later Phase 7

SF 3121 : This was the lower end with the articular surface of a left tibia. The external surface is however missing. A squatting facet was present, and since the lower epiphysis was joined to the shaft the bone must have belonged to an adult over 18 years of age.

SF 3135 : This find consisted of 12 fragments of the right and left parietal bones of the skull, which when united appeared to have the dimensions of a juvenile skeleton. The sutures were entirely open which may indicate an early age although this is an unreliable indicator.

SF 3359 : This was a right clavicle. The maximum length of 151.6mm indicated a male (Genoves 1969), as did the perimeter at the middle of the diaphysis (340mm), and the weight of 24.1grammes. The maximum width of 20.8mm is however, slender for a male. The inner end of the clavicle was fused, so the age at death was over 25.

The region of the pectoralis major muscle attachment was markedly flattened and there was an indication of an oval area with raised borders in place of the usual roughened areas separated by smooth shaft. A rhomboid pit was present where the clavicle pressed on the 1st rib; Parsons (1916) noted this feature in 10% of his specimens.

SF 3446 : Two fragments of the mid-shaft of the right femur with a well marked linea spera were found.

SF 3454 : This sample consisted of the shaft of a left clavicle and the 2nd metacarpal of the right hand. The clavicle also showed signs of flattening and an oval depression with raised edges replaced the normal roughened area of muscle attachment. The diameter of the approximate centre of the diaphysis was 37mm, indicating that the bone might have belonged to a male skeleton.

SF 3694 : These bones consisted of a 4th thoracic vertebra, a fragment of the 1st sacral segment, - the acetabulum (part of the right side with

portions of the ilium and ischium) and fragments of the crest and the articular surface of the ilium. They appear to be adult.

SF 3711 : The shaft only of a left femur was found. The muscle attachments for the gluteous maximus were so raised that the possibility of a third trochanter is postulated. The platymeric index of 80.6 indicated a marked degree of flattening of the femur. The probability is that the sex of the bone is male.

SF 3887 : One fragment of parietal bone.

Phase 7/8

SF 3031 : A shaft of an adult right radius.

Phase 8

SF 1257 : A single phalanx.

SF 1920 : This sample consisted of a mid-thoracic vertebra and a fragment of left ilium.

Phase 8/9

SF 51 : Only two bones, the lower end of a right ulna and the 1st phalanx of the 2nd digit were found in rubble.

Phase 9

Most of the bones from this phase were intermixed by a gale after excavation and they had also been disturbed by recent burials of animal bones and picnic debris. However, the majority appear to belong to one skeleton. Many of the bones showed signs of having been gnawed by rodents and some had cut marks, possibly made during disturbance, or through plough damage.

SF 68/126/3644 : The bones were very fragmented due to their soft condition in the soil and their recent disturbance. They were probably a burial (possibly of Viking date, see above), and using the diameter of the head of the femur of 49.3mm, it is tentatively suggested that the skeleton was male (Pearson & Bell 1917). Using Brothwell's (1981) assessment of tooth wear on the three molars, an age of between 25 - 35 years at death is suggested. A non-metrical variation was noted in the 1st cervical vertebra (atlas) where the superior articular facets were divided in two.

SF 448 : From ploughed rubble came part of the upper half of a right tibia. The bone appeared gracile and the muscle attachments light. The platymeric index of 70.4 is within normal limits and the bone is probably female.

SF 650 : Two fragments of a right radius.

SF 1749 : A single phalanx.

#### PATHOLOGY

Other than osteophytes (an abnormal bony outgrowth) on the vertebrae of SF 4546, and a bony exostosis on the neck of the left femur of SF 5451, no bone disease was found. The teeth and jaws however, exhibited considerable dental pathology.

#### Non-Metrical variations

Lambdoid ossicles (Wormian bones) were noted in three skulls SF 3887, 4546

and 5737. Skeleton SF 4546 also had a hypotrochanteric fossa on the femur, a congenital absence of the right upper third molar and a shallow vastus notch on the patella. The juvenile skeleton SF 5677, while having a supra-orbital notch on the right side, had a closed notch or supra-orbital foramen on the left. Acetabular creases were noted on both sides of the pelvis in SF 5451.

Three of the 1st cervical or atlas vertebrae from SF 6624, 4546 and 68, all showed either division or marked waisting of the superior articular facets. Incipient waisting was also noted in the atlas of the new-born infant SF 4736/4738, but it was not present in the juvenile skeleton.

The lower end of the tibia SF 3121, exhibited a squatting facet, and clavicles SF 4546, 3359 and 3454 were markedly flattened antero-posteriorly at the sternal end of the shaft. Here an oval depression with a raised edge replaced the normal roughened attachments for the pectoralis major and sterno-cleidomastoid muscles. These areas are usually separated by a smooth convex shaft. This moulding of the bone might possibly be due to the carrying of some form of back-pack from an early age (Dr Olaf Cuthbert pers comm).

Flattening of the femora was a very noticeable trait in the skeletons from the site, and only one adult femur did not show evidence of platymeria (the bone's response to muscular stress).

The main source of reference is Gray's Anatomy, seventeenth edition.