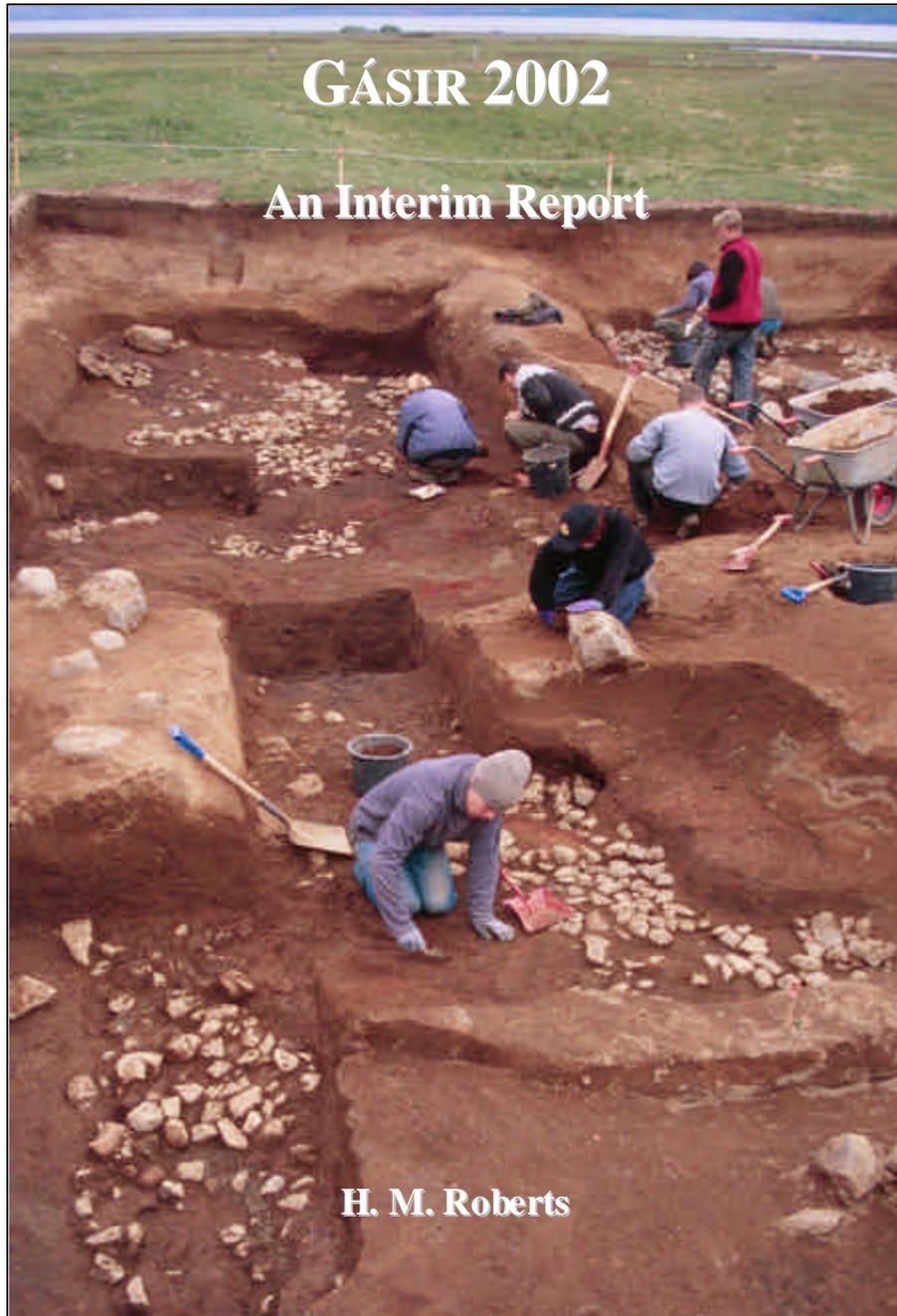




MINJASAFNIÐ Á AKUREYRI
AKUREYRI MUSEUM



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CONTENTS

INTRODUCTION	1
AIMS AND METHODS	3
EXCAVATION OUTLINE	5
RESEARCH QUESTIONS	5
RESULTS	7
Excavation	7
Evaluation Of Maritime Remains	19
Finds and Samples	20
Dating Evidence	22
DISCUSSION	29
Historical Background and Archaeological Context	29
The Nature of Export	27
CONCLUSIONS AND FURTHER WORK	31
ACKNOWLEDGEMENTS	32
BIBLIOGRAPHY	33
APPENDICES	35
Appendix 1 - Index of Finds	35
Appendix 2 - Preliminary Conservation Report by Jannie Amsgaard Ebsen, PJMS	44
Appendix 3 - Index of Environmental Samples	45

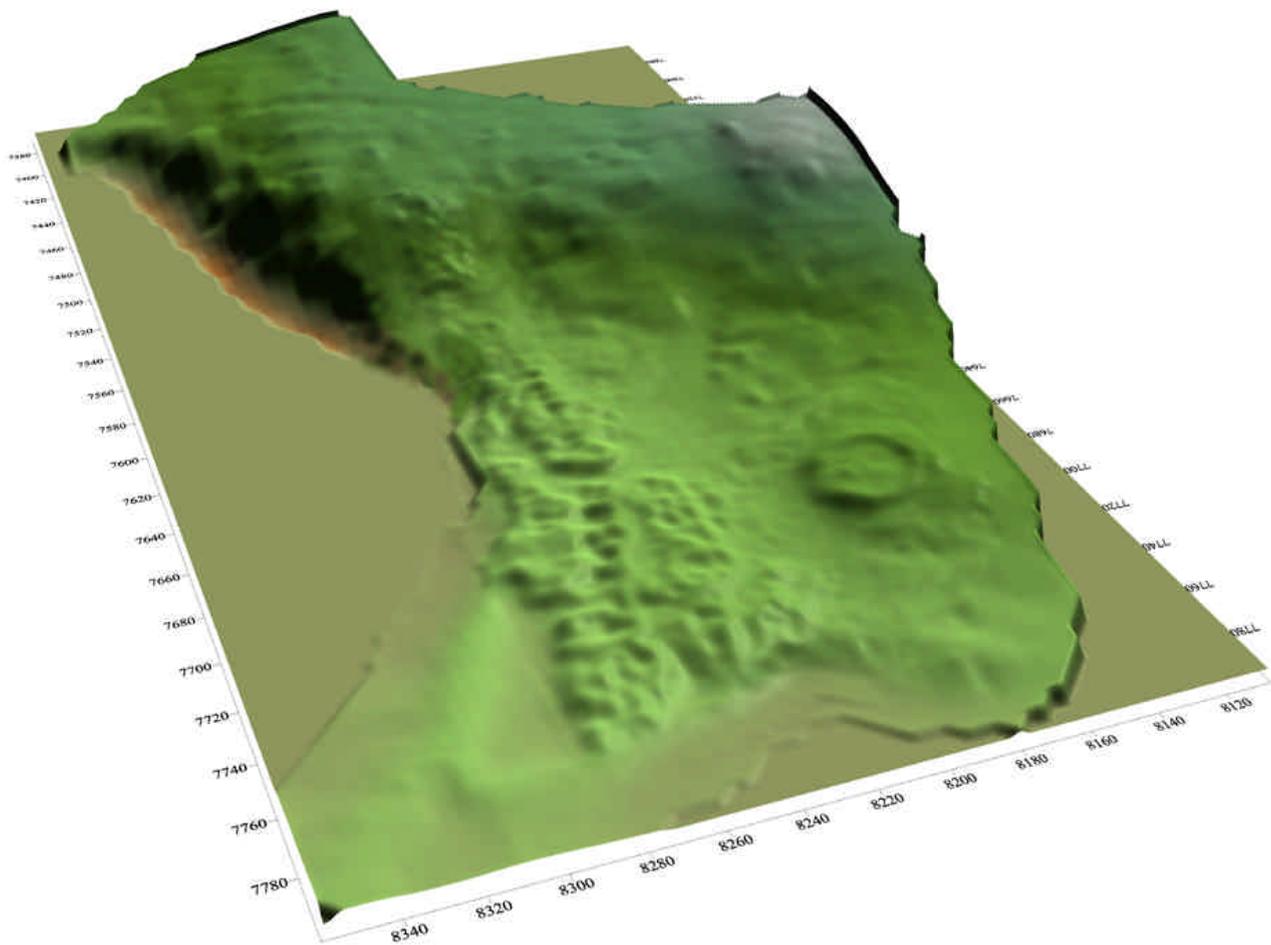


Figure 1 – 3d surface model derived from 2001 topographic survey¹.

INTRODUCTION²

Gásir is located on the western shore of Eyjafjörður, 11km north of Akureyri (centred on 538260E/ 587700N, ISN93).

A great number of broadly sub-rectangular earthworks up to 2m tall are clearly visible to the west of an area of salt marsh, itself protected from the sea by a large sandbar. The visible archaeological remains lie in a zone of grass and low shrub, between 1m and 7m above sea level, and cover an area of some 10,000m². The broader study area or site environs, including part of the marshes to the north and east of the upstanding archaeology, encompasses an area of some 85,000m².

¹ This image has been produced using “Surfer 8” software. It is a mosaic of both a 1m resolution survey of the visible ruins and a 5m resolution survey of the wider study area. The grids were produced at the 1m and 5m intervals using a kriging method. Once joined, the resulting surface has been processed with a low pass gaussian filter. The Z axis has been exaggerated by a factor of 3. The scene is lit from 220° horizontal / 50° vertical, and has been rotated to 200° and tilted to 30°. The brightness and contrast of the image have been enhanced. The grid values shown above represent the last four numerals of the ISN93 grid system.

² The following report is an expanded version of the Preliminary Excavation Report, Roberts 2002b

The archaeology of Gásir has been investigated on a number of previous occasions. Excavation was first undertaken in 1907 by Daniel Bruun and Finnur Jónsson. These investigations focused on the church at Gásir, and upon a group of structures at the eastern edge of the site. Four small trial trenches were excavated by Margrét Hermanns-Auðardóttir and Bjarni F. Einarsson during the summer of 1986.

At the initiative of Minjasafnið á Akureyri, further work was carried out at Gásir during July 2001. Fornleifastofnun Íslands completed a new topographical survey of the site and a re-assessment of previous work at Gásir, including the re-excavation of earlier trenches³. This work was expanded and continued between July 1st and August 10th 2002.

³ Roberts, 2002a

AIMS AND METHODS

The continuing archaeological investigations at Gásir by Fornleifastofnun Íslands form the core of a five year project aimed at typifying remains from the full functional and chronological variety of the site. The project also aims to enhance the presentation and potential development of the site as a focus of public interest and amenity.

Owing to the tremendous scale and complexity of the surviving remains, only selected portions of the archaeology have been targeted for intrusive investigation. This work commenced in 2001 with the re-excavation of areas examined in 1907 by Daniel Bruun and Finnur Jónsson⁴. The archaeological excavation conducted in 2002 was a direct continuation of this work.



View of the excavations in 1907, by Daniel Bruun.

It is hoped that this aspect of the work will see its completion with the excavation of a 20-25m wide transect from east to west, across the extent of visible archaeology (Area A). A number of other areas are also targeted for investigation, addressing other aspects of site use and site formation.

⁴ Bruun, 1928, pgs 114-125

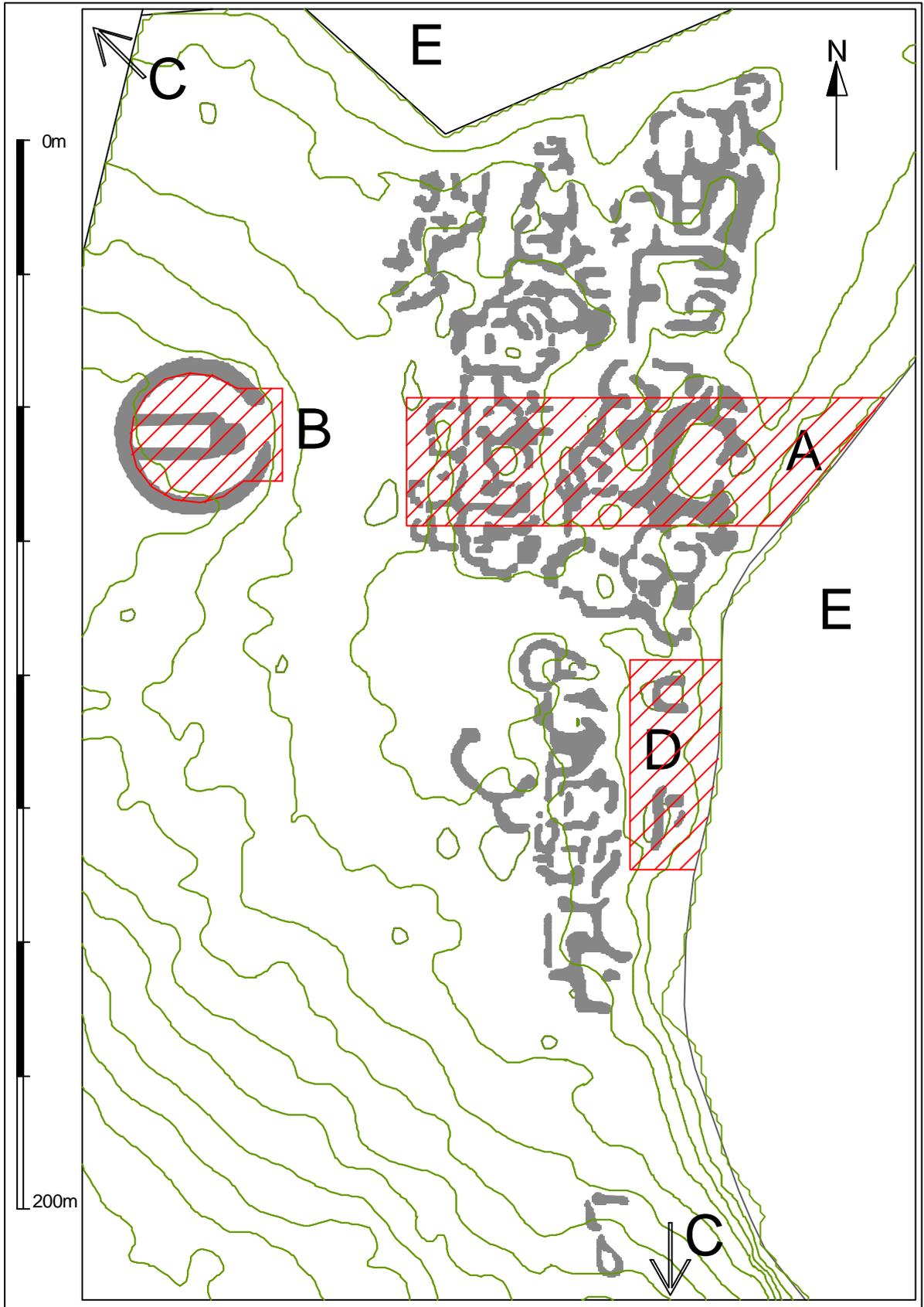


Figure 3 – Study Areas

EXCAVATION OUTLINE

- A Primary excavation area across the area of earthworks. Scheduled for excavation from 2001 until 2006.
- B The church and churchyard. Scheduled for investigation in 2004 and 2005.
- C Limited investigation of isolated structures elsewhere within the farm of Gásir. Scheduled for 2003.
- D Examination of structures affected by coastal erosion. Scheduled for 2006.
- E Evaluation of potential maritime aspects of the site. Undertaken in 2002.

Inevitably, each new discovery will influence the precise targeting of these investigations, and modifications to this outline will be made as circumstances dictate.

RESEARCH QUESTIONS

Issues under investigation include;

When was the site in use?

When did trading commence at Gásir ?

When did this activity cease, and why?

Were all parts of the site utilised simultaneously?

If not, how did the locus of occupation change over time?

Is there earlier and/or later activity for other purposes?

What is the nature of the structures at Gásir?

Are they primarily built of turf and stone, or are they sunken buildings?

Do construction methods change over time?

Are these structures temporary or permanent?

What is the nature of trade at Gásir?

What items are being imported, and from where?

What items are being exported, and to where?

Does the nature of trade change over time?

Is this activity seasonal or permanent?

What other activities may be discerned?

What, if any, items are being manufactured and/or processed at Gásir?

If so, are these activities localised to only parts of the site?

What role does the church at Gásir have?

Does it serve only the traders, does it have a wider congregation?

Does the churchyard contain inhumations?

What relationship does Gásir have to the community?

Does Gásir serve only the local region, or is it a focus for more widespread commerce?

Is there any formal control or maintenance of the site or its trade, and if so, exercised by what authority?

What effect does trade at Gásir have for its immediate neighbours?

As the project progresses, supplementary questions will no doubt arise.

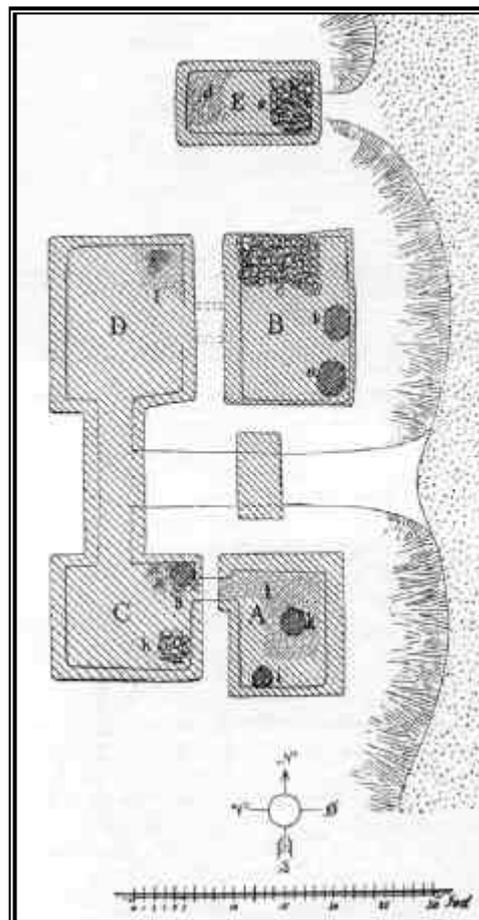
The primary method of investigation is one of archeological excavation. This commenced in 2001, following on from non-intrusive field survey (both topographic and geophysical). Broader aspects of environmental change, and landscape morphology will be addressed in collaboration with the University of Edinburgh, and the University of Stirling, Scotland. Targeted industrial and functional features of the site will be analysed in collaboration with the University of Stirling. Historical and regional issues will be integrated as the project progresses. Extensive field surveys of the archaeology of Eyjafjörður have already been undertaken by Fornleifastofnun Íslands, on behalf of Minjasafnið á Akureyri, thus providing a valuable resource for this process of regional integration.

The excavation methodology employs a modified version of single-context recording developed by Fornleifastofnun Íslands, along with a strategic sampling programme for environmental remains (Garðar Guðmundsson FSÍ, Professor Paul Buckland and Dr Eva Panagiotakopulu, University of Sheffield). Artefactual analyses will be coordinated by Dr Colleen Batey, University of Glasgow, and Natascha Mehler, Römisch-Germanische Kommission des Deutschen Archäologischen Instituts.

RESULTS

EXCAVATION

Whereas the results of the 1907 excavation⁵ provided some indications of what might be found, the interpretation of that work and its impact upon the surviving remains are in a number of ways problematic. Bruun and Jónsson identified 5 cells or rooms, and for at least one of these (“Rum B”) it is recognised that the results imply several (apparently 4) levels of activity. The published plan of these structures is however at best schematic, and does not correlate entirely happily with the remains discovered in 2001-2002. As an example, whereas Bruun does note the stone surface at the north of “Rum B”, he fails to indicate the very similar surfaces apparent in “Rum C” or “Rum D”. His interpretation may approximate to one of the later phases of activity in this area (see below), but conflates evidence



from a number of levels. Also, the approach taken to excavation in 1907 has unfortunately obscured a number of relationships between these and other structures. Furthermore, no less than 8 testpits were excavated through the basal layers of these structures, as deep as the current water table, and these seemingly went unrecorded. The level of truncation discovered must add significantly to the complexity of excavation and interpretation in the areas affected. Conversely, this intrusion does offer a window into the lower levels of the archaeology, and confirms our suspicions about the depth and complexity of surviving remains. This factor has, for instance, highlighted the likelihood of encountering water-logged remains, and allows for timely consideration of the logistical issues that will ensue.

⁵ Bruun 1928

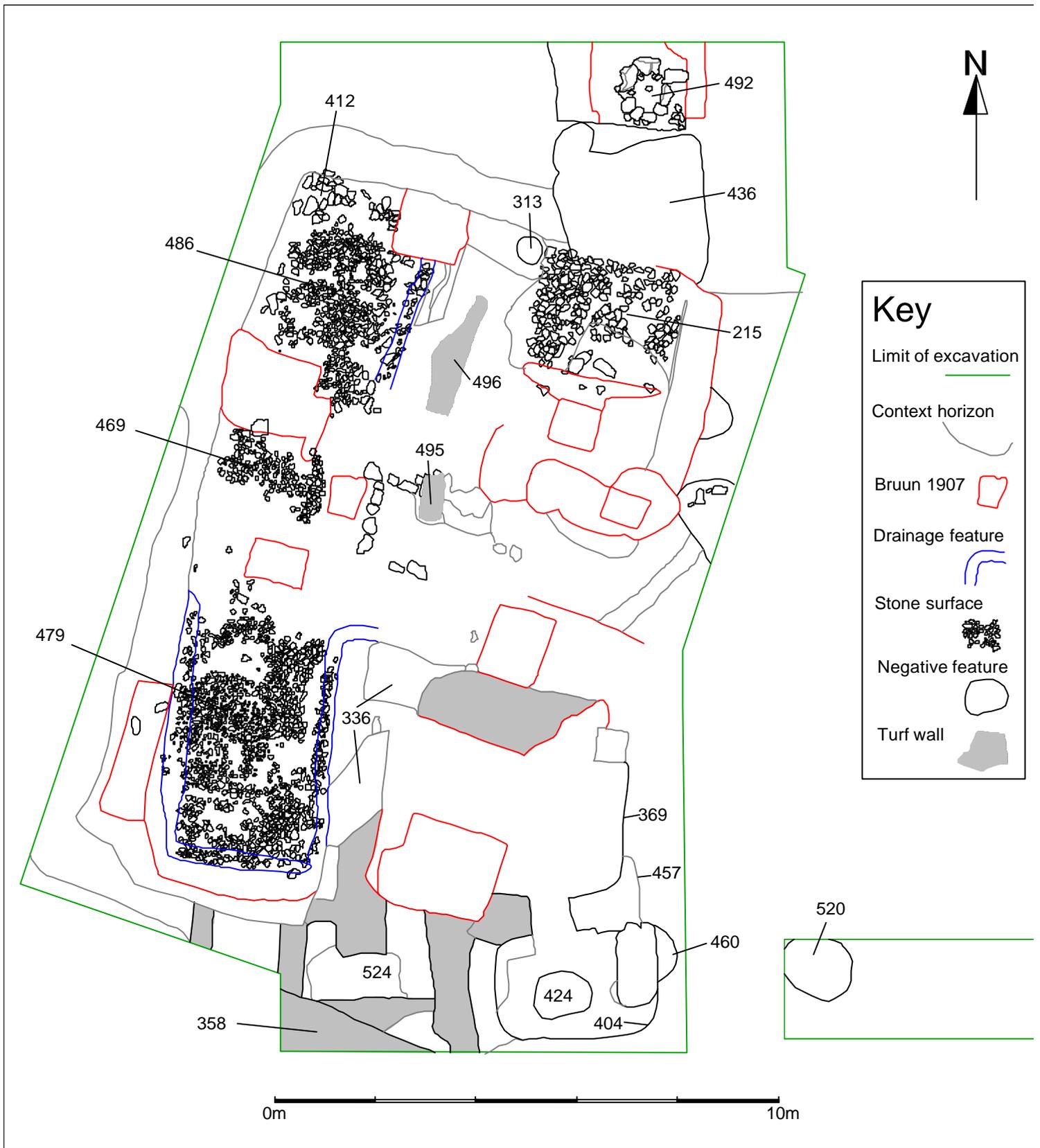


Figure 4 – Excavation Area A, 2002

Excavation in 2002 has revealed a very complex sequence of remains, representing possibly 10 separate rooms or cells, belonging to at least four phases of construction, and in addition, a number of external features. Each of these phases includes many individual episodes of deposition, activity, repair and modification. Additionally, some features cannot as yet be securely phased, and remains from further earlier phases await continued excavation. The truncation of numerous horizons by excavation in 1907 necessitates a considerable degree of caution in

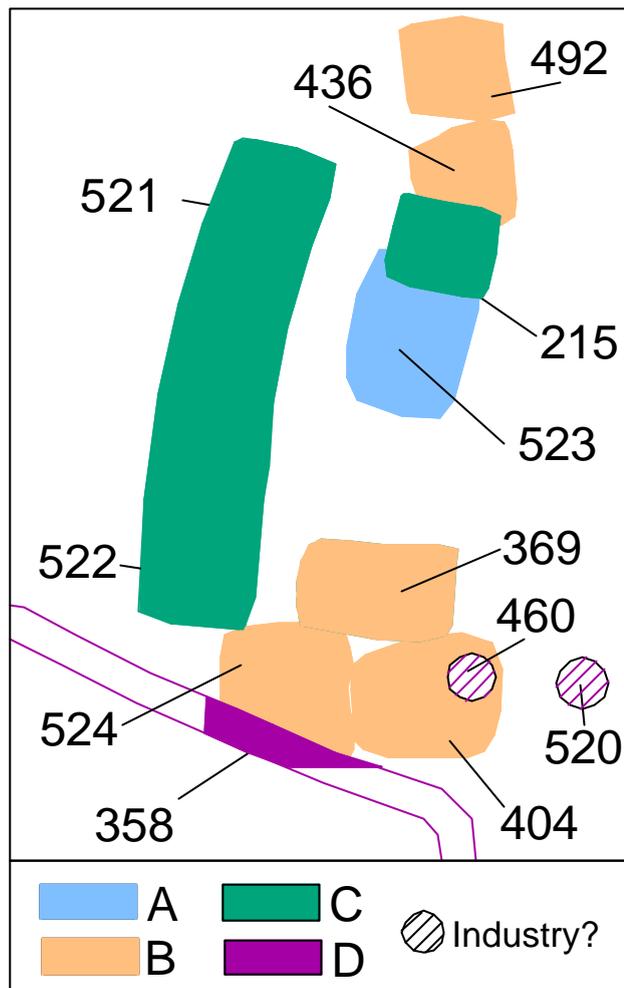


Figure 5 – Proposed Phasing

the phasing of surviving remains. This has meant, unfortunately, that not all relationships can be demonstrated with complete certainty. The following proposed phasing utilizes those stratigraphic relationships that can be proven, but also physical relationships and constructional similarities. Some margin of doubt attends on these, and this proposed phasing must be regarded as subject to revision as further evidence comes to light.

A – Possibly the earliest levels thus far recorded. As yet represented only by the outline of a large sunken feature, likely to be a room or cell (523) – this feature awaits excavation. Prior to further study this feature appears to measure circa 4.5m in length and 2.3 m in width, being sub-square in shape. Deposits exposed thus far are typified by a dark, compact surface apparently edged or bordered by frequent small stones. Unexcavated deposits beneath Group 521 might also belong to this phase of activity.

B - At the northern limit of the excavation are located the remains of two sunken features that may relate to this phase of activity, Group 492 and Cut 481. Group 492 is the remaining parts of “Rum E” as excavated in 1907. Although this group requires more investigation, the removal of the backfill from this area revealed the well

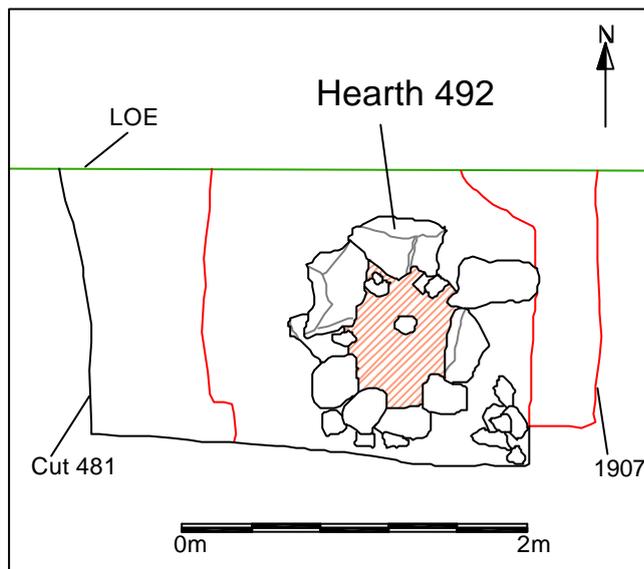


Figure 6 – Group 492

preserved remains of a stone built hearth, not noted as such in the 1907 report.

This hearth measures 1.2-1.4m in diameter and was constructed from a ring of large angular stones, that showed signs of burning. These stones measured up to 0.6m in length. The interior peat ash fill of this feature awaits excavation once the full extent of the structure within which this feature is

located becomes apparent. The hearth group 492 sits within the base of an apparently large, steep sided and square cornered pit (Cut 481), some 1.3m deep. This feature has been truncated by Bruun, and further parts of the feature to the north of the current LOE require excavation. After excavation in 1907, this area had been backfilled by a very large quantity of fire cracked rock. Unfortunately, it is no longer clear what, if any, relationship these rocks had with either the hearth or any other feature. The morphology of feature 492 requires some comment – the form of the hearth, the large quantities of possibly associated stone, and the location of this feature at the base of Cut 481 all seem to imply that this is not a domestic hearth, but rather some type of industrial feature.

Group 436 is a large sunken feature or pit, measuring 3m x 3m, and circa 0.9m at its maximum depth to the west. The purpose of this construction is unclear, but the feature contained extensive deposits of mixed peat ash including some charcoal (Contexts 368, 381, 394, 420, 414). These deposits seem to have been primarily tipped from the west, and maybe represent the waste from some as yet undiscovered

industrial activity. They included some finds of bone, slag, sulphur <F 02-142>, and a fragment of pottery <F 02-111>.

Group 524 remains only partially excavated – this space is defined by clear turf walls to the east and west, and occupational deposits now coming to light are suggestive of smithying, being primarily composed of pink ash and including significant quantities of slag or other industrial residues. The area bounded by this group measures 2.4m E/W by 1.8m N/S. These horizons were sealed by numerous deposits of mixed turf collapse, infilling the space between the turf walls (Contexts 406, 416, 423, 428, 439, 475, 478). The latter contexts included only small quantities of bone and possible slag.



Detail of turf forming the eastern limit of Group 524.

Group 483 is a hybrid structure located to the east of Group 524, and likely to be broadly contemporary in use. It comprises two rooms, defined by cuts 369 and 404 (see Figure 4). It is partially dug down, but also reinforced with turf blocks (Contexts 435, 438, 465) around its southern rim. In total, the southern room measures 3.2m E/W x 2.1m N/S x 0.7m deep. As surviving, Cut 404 represents a scouring or cleaning event, redefining the extent of the structure. This action also maintained the form of a large ovoid pit at the eastern limit of the room, partially voided and partially filled with wet organic material including fish bone (Context 385). Context 385 measured 1.45m in length, 0.7m in width, and 0.35m in depth.

The central part of the room was occupied by a shallow temporary hearth, Cut 424. This feature measured up to 1.15m E/W, 0.9m N/S and 0.17m in depth, and was filled by a deposit of charcoal rich peat ash (Context 411). Context 411 was seen to contain animal bone, including fishbone. Together these features occupied the majority of the available space – therefore it seems that this room may have served for

processing (possibly of fish or other foodstuffs), rather than storage or dwelling. In addition to these negative features this room was found to contain traces of trampled surfaces (Contexts 393, 396, and 425). Context 396 produced two fragments of iron nail <F 02 -047>.

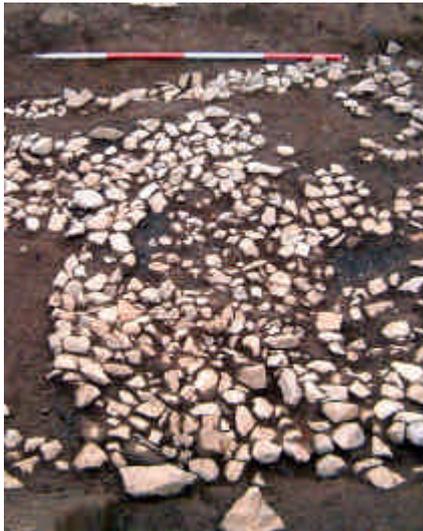
The scouring event 404 had truncated the blocking (by contexts 364, 367 and 388) of a passage leading to the north. At the north this blocking had been truncated by a construction event, Cut 369 – possibly equivalent to the scouring event 404. The full extent of this northern room is unclear due to truncation to the west, but it appears to be rectangular or sub-square, measuring a minimum of 2.6m E/W, 2.8m N/S and surviving to a depth of up to 0.5m. An unexcavated turf wall at the northern limit of this area is thought to belong to this phase of activity. No occupational deposits survived within this structure. Cut 369 had subsequently been filled with mixed dumps of debris and collapse (Contexts 352, 350 and 346), seemingly tipped in from the north. The latter deposits produced a fragment of stoneware <F 02-102>, a fragment of copper <F 02-171>, sulphur <F 02-139> and schist <F 02-162>, along with a small quantity of animal bone. In the absence of occupational layers or diagnostic finds, the function of this structure remains unknown. A direct relationship between Group 524 and Cut 369 does not survive, but they may be contemporary in use.

Group 483, Cuts 404 and 369 are all seen to overlies the remains of earlier construction phases, including the remains of earlier turf-built buildings that await further study. Also discovered were the fragmentary remains of a hearth between and beneath the two rooms (Group 458, Cut 457), truncated by both the construction events (404 and 369). Cut 457 was filled by multiple layers of peat ash and charcoal (Contexts 448, 450 and 455), containing small quantities of bone and slag.

C – This phase of activity most closely corresponds to the results published by Daniel Bruun.

Groups 521 and 522 appear to represent one episode of construction, but two separate rooms or cells. Taken together, the latter groups form a sunken building measuring in total some 14.5m in length, up to 3.5m in width, and up to 2m in depth. As such they are an exceptionally large sunken featured building. The very large cut within which

these features are located had previously been excavated, down to the level of the floors. Hence, the level from which this feature was originally dug is now a matter of estimate, and the precise depth and shape of this event are lost. What survives is only what Daniel Bruun and Finnur Jónsson *believed* to be the extent of these rooms. Nonetheless, the preservation in situ of the floor surfaces and drains allows us some good level of confidence as to their original dimensions.



The floors of both these structures were formed by rough surfaces of small angular stones, typically 10-15 cms in size. The perimeters of these surfaces were marked by shallow stone filled drains, up to 20 cms deep. As surviving these surfaces seem to form a very uneven and uncomfortable floor. It is believed that a further temporary surface of some kind would have lain over this foundation, although traces of such were absent.

Group 521 is formed primarily by two fragments of stone floor (Contexts 469 and 486), along with an irregular stone built fireplace (Contexts 410 and 412). A drainage feature has been identified at the eastern edge of context 486, but this requires further study. These encompass an area of 6.8m N/S x 3.1m E/W. Stone surface 486 was overlain by a thin spread of compacted hearth debris (Context 452), containing small fragments of iron and a small

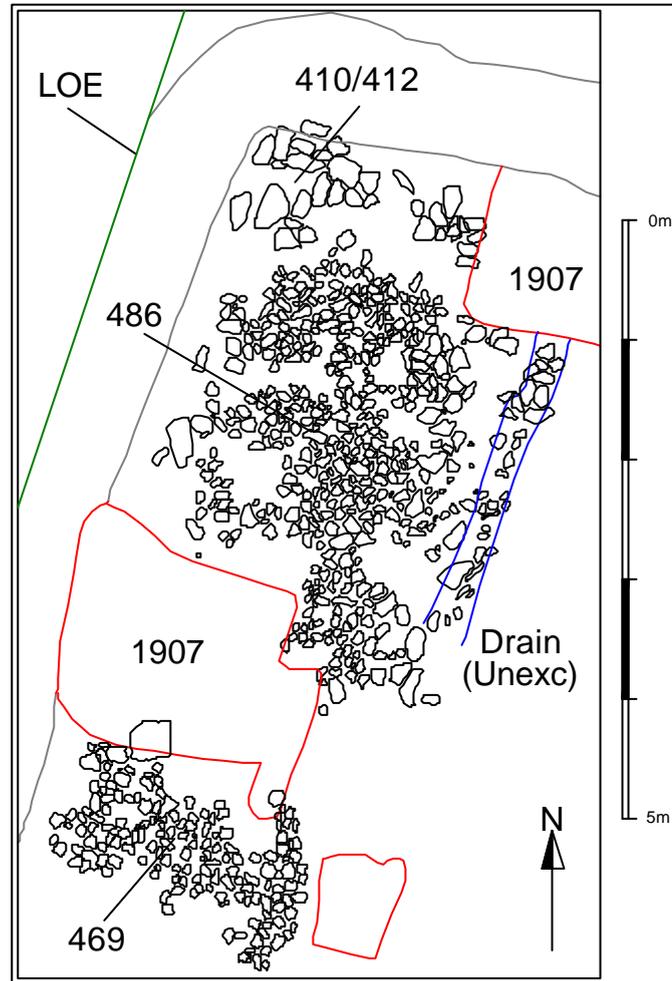


Figure 7 - Group 521

piece of a possible ceramic crucible <F 02-110>. Stone surface 469, along with elements of the southern room (group 522), was overlain by traces of a possible occupation layer (context 451). Although this had been somewhat truncated, its distribution clearly suggests the contemporaneity of the two rooms. The fireplace 410/412 was located in the northwestern corner of Group 521. This feature measured approximately 1m square, and stood some 0.25m above the level of the stone floor. Context 410 was a deposit of multicoloured pinkish peatash including charcoal, and was found to contain burnt bone, fragments of iron and a discreet concentration of burnt shell <02-182>.

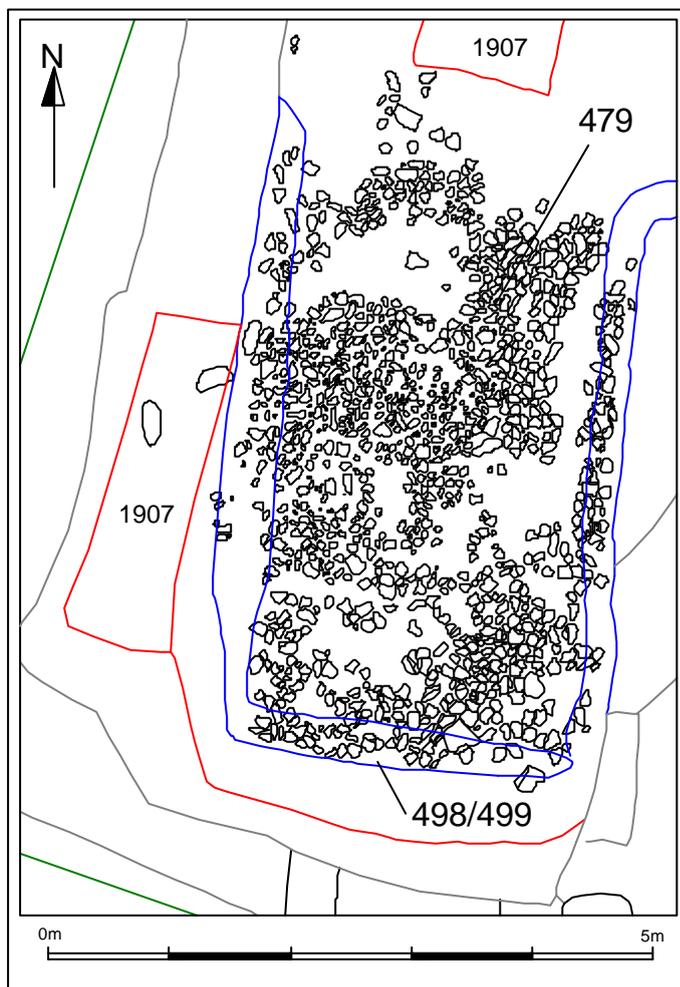


Figure 8 – Group 522

Group 522 is formed by the floor surface 479, and its associated drainage system (contexts 498 and 499). Context 479 measures 4.8m N/S x 2.5m E/W, and was overlain by parts of possible occupation surface 451 (see above), and by some localised traces of burning/charcoal (context 474). Context 474 was located in the southern corner of group 522, and may relate to a structure identified in 1907 by Bruun. However, no well defined structure survives, and this is rather thought to represent the last remains of a temporary

hearth. No artefacts were recovered from this layer. Bordering the stone surface 479 was an irregular stone filled channel (cut 498, fill 499). This is believed to be a drain. Beneath surface 479, the underlying surface had been levelled and stabilised by a dump of stone rubble (Context 500) – this is thought to belong to this phase of

construction, and to represent a foundation deposit, and a further response to possible problems of dampness.

At the eastern limit of Group 522, the surviving floor layers were overlain by a very complex sequence of aeolian layers, turf collapse, and lenses of sand (Group 336 – see Figure 4). All of these deposits are believed to relate to a period after the abandonment of this structure, but some differentiation may be discerned. At the lowest level, contexts 289, 331, 290, 295, 339, 321, 334, 402, 305, 380, 421, and 441 are dominated by the inclusion of turf collapse, and may represent the immediate decay of a probable eastern turf wall. One of the lowest of these, context 441, a widespread red/orange turf collapse horizon, might possibly be interpreted as roof collapse. Above the latter sequence contexts 415, 267, 259, 291, 422, 275, 294, 426, 430, 298, and 323 are dominated by aeolian inputs of silt and sand, but also including some lesser turf collapse content. In turn, these layers are overlain by a sequence of layers exhibiting further anthropogenic input in the form of significant peat ash inclusions (Contexts 246, 260, 248, 285, 286, and 252). The source of this material is unclear, but may be taken to represent continued activity somewhere in this area of the site after the abandonment of these structures. It maybe that these layers relate to industrial activity in Phase D (see below).

At the eastern limit of Group 521 were the remains of another possible turf wall and associated collapse layers (Group 264). This group is also very complex, but again, some subdivisions may be possible. At its base, there appears to be the truncated remains of deliberate construction (context 496 and 495 – see Figure 4), although these are not formed of any typical building turf. Rather, these contexts comprise irregular blocks of sediment containing a high content of sand and peat ash. As such, they can only have served as a very temporary structure. At their eastern face these layers were overlain by a sequence of contexts possibly representing collapse, repair and some activity (indicated by peat ash inclusions), (Contexts 282, 263, 468, 269, 488, 484, 272, 485, 316, 493, 494). This sequence is then overlain by aeolian deposits 221, 235, 240, 243, and 253. These aeolian deposits were found to contain traces of decayed timber, and are thought to represent a final episode of roof collapse and abandonment.

Group 264 is believed to relate to Group 521, and also a stone surface to the east (215, see below), but excavation in 1907 has removed any direct relationship between these groups.

Surface 215 was largely exposed both by Daniel Bruun, and by excavation in 2001 (A more detailed description of these remains may be found in that report⁶) Further work in this area suggests that the stone surface therein belongs to a phase of activity most likely to correspond to Groups 521 and 522. As surviving, surface 215 measures 2.4m N/S x 2.8m E/W.

D – Structurally, this phase of activity is thus far only represented by a late turf wall (Context 358), running east-west, along the southern edge of the excavated area. This structure clearly sits over the phase “B” remains, and appears to be stratigraphically later than phase “C”. This wall is interpreted as the northern limit of a group of rooms or structures located to the south of Area A. A study of the apparent surface topography suggests a large sub-rectangular structure, perhaps 10-12m in length. This wall survived to a height of some 60cms, and was built from large rhomboidal turf blocks, possibly “*kvía-hnaus*”. To investigate this structure more fully will require a redesign of the current excavation plan, although this may be merited if one considers the apparent lateness of these remains. Also assigned to this phase are a number of possible industrial features (Groups 460 and 520, see below).

Industry – In addition to the structural evidence recovered from this years’ work at Gásir, a number of hearth features came to light that had no clear relationship to any upstanding structures. It is noted that these features are concentrated on the eastern, seaward side of the structural remains. These features belong to a phase of activity concurrent with the construction and occupation of structural phases C or D.

Of particular interest is a hearth feature (Group 520, Cut 349, Fills 344, 337, 332, and 330) identified in a small trench to the south east of the main area. This trench was excavated to define the limit of structural activity, and indeed no building elements were discovered. Upon excavation, this putative hearth showed a number of unusual features. The fills of this feature contained lenses of sand with a pale to bright yellow

⁶ Roberts 2002 – pages 7-13, see structure A-1

colour. Additionally, a yellow or whiteish staining could be seen to extend beyond the cut edges of the pit, along with the reddening effects associated with heat. The yellowish deposits encountered bore a strong resemblance to sulphur (numerous lumps of which had been discovered elsewhere) – one hypothesis is that this pit was used for the processing or purification of raw mineral sulphur to produce a higher value commodity for export.



In order to test this hypothesis, help was sought from Dr. Ian Simpson of Stirling University, who visited the site along with Amanda Thomson and Paul Adderley. This feature was recorded in close detail and samples have been taken for ongoing chemical and physical analyses. The team are undertaking thin section micromorphology analyses and associated micro-chemical analyses of the sulphur material in its cultural sedimentary context to assess level of purity and evidence of refining. Control material has also been collected from Mývatn for micromorphology and micro-chemistry analyses. Samples are currently being prepared.

Group 460 was located vertically above the remains of Group 483 and 3m west of Group 520 (“Sulphur pit”), at a comparable physical and stratigraphic depth from the modern surface. The group comprises Cut 314 (c1.5m diam x c0.5m depth) and fills 311, 307, and 302. Fill 311 was an up to 0.4m thick deposit of black, burnt organic material, including some wood, but also frequent possible animal dung pieces up to 0.1m (compacted, matted organics). Fill 307 was a 25cm-45cm thick deposit of fairly

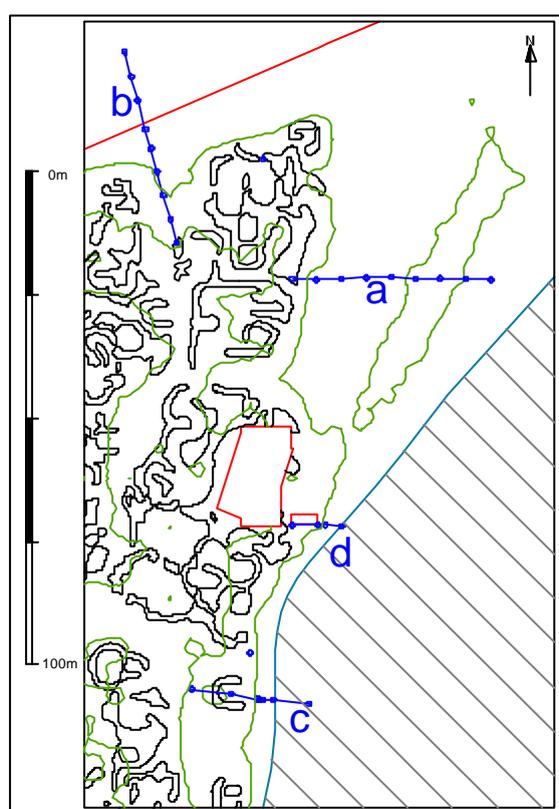
clean and homogenous peat ash, with moderate vitrified material, occasional calcined bone fragments, and occasional small heat cracked stone. Fill 302 was 0.12m thick, 0.8m diameter deposit mixed peat ash and blackened organic material.

One hypothesis is that this feature was for generating smoke. It is a deep, seemingly fuel filled pit, but with no real hearth-like construction details, and lacking any apparent flue/air inlet etc. It seems that this feature would be oxygen poor, and slowly smoulder/smoke rather than burning with any efficiency. Samples of vitrified material from this feature, along with the putative burnt dung, await further study.

Unphased – Beneath the remains of Group 264 (see above), a pit was discovered (Group 313). This feature does not appear to relate to the occupation of Group 521 or surface 215, but rather an earlier phase of activity. Prior to further excavation it is not phased. Group 313 comprises cut 301, and contexts 300, 324, 299, and 315. This feature was circular in form, measuring up to 0.55m in diameter, and up to 0.40m deep. The fill of this feature was partially voided, and partially formed from wet, organic rich sediments (300, 324). At its surface, the remains of a wooden beam (299) had been carefully lain across the pit, set amongst small stones (context 315). Environmental samples were recovered from this feature for further analysis. Context 300 was found to contain a large whalebone stake <F 02-079> in excellent preservation. This artefact is amongst those currently undergoing conservation.

EVALUATION OF MARITIME REMAINS

It is in the nature of a coastal trading site that the possibility exists for the survival of a maritime element to the archaeology. Such a possibility was noted in 2001, and steps were taken to begin to address this question. Flemming Rieck and Jørgen Dencker of the Danish National Museum's Institute of Maritime Archaeology (Nationalmuseets Marinarkæologiske Undersøgelser), kindly agreed to undertake a preliminary study of this question. Flemming and Jørgen joined the team at Gásir for a period of two weeks, and undertook a programme of systematic coring and sampling.



Four main transects were laid out in order to test the spread of sub-surface anthropological materials from the visible archaeological monument out towards the wetland areas to both the north and the east. This process demonstrated quite clearly that the anthropogenic content of deposits drops away very rapidly. Coring produced a series of soil profiles that will be of considerable use in mapping the formation processes of the site, but little of promise was discovered that might merit maritime excavation. It is possible that the trade at Gásir required no

formal quays or piers, and that boats could be beached or unloaded into smaller vessels. Alternatively, the cyclical action of riverine and oceanic currents may have removed any such remains. The possibility still exists that maritime artefacts await discovery elsewhere in this zone, but a detailed investigation of the most likely areas has not produced any definable targets for further study. A detailed report⁷ on this aspect of the project follows separately.

⁷ Dencker and Rieck 2002

FINDS AND SAMPLES

Excavation at Gásir in 2002 produced an assemblage of artefacts, both unusual in its nature and meriting considerable further study.

Amongst the most interesting of these are the pottery fragments, several pieces of mineral sulphur, and fragments of unworked schist. These groups are taken to be indicative of both import and export from Gásir.

Material	Quantity (Count)	Comments
Iron	114	Includes 2 knives, 1 buckle and 42 nails or bolts
Cu alloy	27	Includes vessel fragments
Pottery	18	8 pieces of stoneware, 5 pieces green glaze, 3 crucible fragments, 1 redware, 1 unknown
Leather	8	Awaits further study
Textile/hair	7	Cloth, felt, threads
Worked bone	4	1 stake, 1 pin head, 1 wedge, 1 unknown
Sulphur	24	Largest piece weighs 129g
Worked stone	22	Inc. 9 fragments of baking plate, 6 whetstones
Glass	1	Re-melted green glass object
Wood	6	Inc. pin head

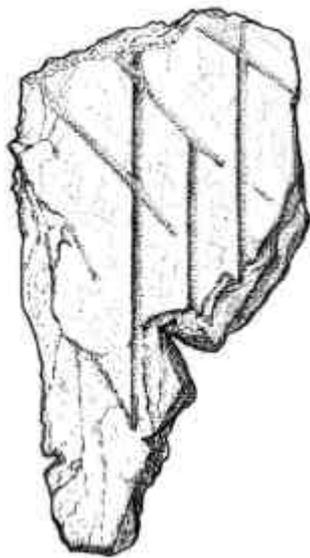
All of the artefacts will require considerable further study as the project progresses, but a few preliminary observations may be made.

Pottery – although these are mostly very small pieces, they are surprisingly unabraded. The assemblage includes one large piece of jug, possibly of Siegburg stoneware, (F <02-096>, see right) plus a joining sherd. The other fragments of stoneware are of a similar fabric, and prior to further analysis may be described as germanic stonewares. The fragments of green glazed pottery are reminiscent of Grimston ware.



Iron – although many of these objects are indeterminate, some of the nails/bolts maybe upon further study prove to be associated with ship building/repair.

Organics – the preservation of this class of artefacts in as yet non-waterlogged contexts is very encouraging for future recovery.



Find <02-120>, a fragment of baking plate.

Worked stone – along with the whetstones and baking plates, 4 small pieces of quartz(?) were recovered that have polished surfaces. As an interim hypothesis these are believed to be of use for the finishing of metal goods.

Sulphur – the presence of large quantities of sulphur is of particular interest. This is thought to indicate that Gásir served as a trade centre for areas (eg. Mývatnssveit) where sulphur may be mined, and not only Eyjafjörður.

Active and passive conservation of the artefacts is being undertaken by Jannie Ebsen of Þjóðminjasafn Íslands (see Appendix 2). A complete list of all artefacts recovered follows (Appendix 1).

In addition to the recovery of artefacts, environmental samples were recovered from all deposits displaying potential. Significant quantities of unworked animal bone, ferric slag, other vitrified material, and stone were also recovered for identification and further analyses. A total of 28 soil samples were taken for environmental analysis. A complete list of the samples taken follows (Appendix 3).

DATING EVIDENCE

Several different lines of research contribute to the dating of the archaeological remains thus far excavated. In the framework of known historical evidence (suggestive of occupation in the 12th-14th centuries, see above) further information can be obtained from a detailed study of the artefacts, from the study of isochronic tephra layers, from radiocarbon dating, and detailed stratigraphic analysis.

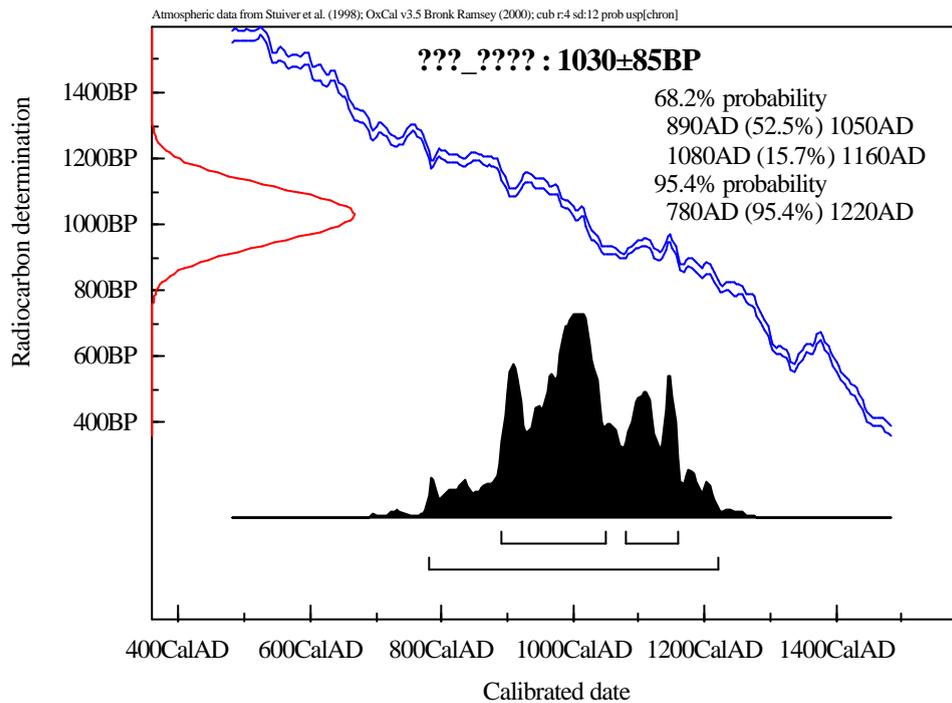
The stoneware pottery recovered this year awaits detailed study, but is suggestive of manufacturing dates in the later 14th or 15th centuries. If the green-glazed pottery is confirmed as Grimston Ware, this would suggest a date range from the late 12th to the 14th century. Few if any of the other artefacts are typologically dateable within any useful ranges.

Radiometric dating will be undertaken as the project progresses, and samples have been taken for this purpose. It is intended that this study should focus upon samples of the bone of terrestrial mammals, and only upon those recovered from well defined occupational layers.

A single radiocarbon sample of charcoal was taken during excavation in 1986, from a charcoal rich feature located beneath structural remains at the northern limit of the site⁸, and submitted to the Trondheim laboratory. This has since been reported⁹ as being of “local wood”, and giving a value of 1030±85BP, although *no laboratory reference is quoted for this date* . The figure overleaf indicates calibrated ranges for such a radiocarbon value.

⁸ Margrét Hermanns-Auðardóttir, 1987, page 15

⁹ Margrét Hermanns-Auðardóttir, 1999, page 24



The 2 sigma (or 95.4% probability) range (780AD-1220AD) is by no means sufficient evidence to securely demonstrate activity at Gásir in the Viking period. Further consideration should also be given to the many difficulties concerning the archaeological use of radiocarbon dates obtained from unspecified wood recovered from a coastal environment.

Tephrochronology studies by Magnús Á. Sigurgeirsson are ongoing¹⁰. So far, one particular tephra horizon is of clear value. The remains excavated at Gásir thus far can all be shown to be later than a clear dark blue grey tephra, dated to 1300AD. At least four structural phases, forming in places up to 2m of complex deposition, must all date to the 14th century *or later*. Another tephra horizon one might expect at Gásir (the “A” later, or V-1477) is not yet apparent within the excavation. The absence of this layer may in itself be suggestive of continued activity into the later 15th century.

At this time we are unable to provide a concrete proof for occupation at Gásir forward into the 15th century, or backwards into the Viking period. We are, nonetheless, inclined to the view that mounting evidence will in due course extend the demonstrable chronology of the site.

¹⁰ Appendix 1, in Roberts 2002b

DISCUSSION

Excavation at Gásir in 2002 has begun to address some of the issues raised by the research agenda (see above). Much new information has come to light regarding the nature of buildings at Gásir, and this evidence may begin to be placed within a theoretical framework for the development of trade. Some of the artefacts recovered also offer new and intriguing evidence for the nature of the trade. These include items that clearly evidence international connections, and may in due course allow us to focus upon a well evidenced net of trade vectors that are independent of historical documentation. At this stage, these indicators should still be viewed within a broader framework, and some historical sources may illuminate new and developing hypotheses.

Historical Background and Archaeological Context

Gásir (or Gásar, Gæsir, Gáseyrr, Gás(a)-eyri etc.) is mentioned in connection with trade and transport in various sagas and annals dating to the 12th to 14th centuries. The earliest known documentary source for such activity is dated to 1163, and is from *Prestssaga Guðmundar góða*;

“En um vǫrit eftir fýstist Ari út hegat ok gaf jarl honum knörr með rá ok reiði. Hann varð vel reiðfari ok kom skipi sínu at Gásum...”¹¹

The role of Gásir as a focus of commerce is clearly evident for this period. One example of many may be found in *Guðmundar saga dýra*, and dated to 1191;

“Þann vetr vǫru skip at Gásum. Ok um sumarit var kaupstefna mikil.”¹²

The role of Gásir as a conduit of communication is also noted, in *Íslendinga saga*, during the year 1232;

“Leið svá fram til þess, er Magnús biskup kom út at Gásum með bréfum Sigurðar erkibiskups, þeim er Guðmundi biskupi buðu af embætti sínu.”¹³

The latest reference is to be found in *Gottskálks annal*, dating apparently to 1391;

“... [a ship].... kom norðr a Gaseyri og hafði þat legit j Hialltlandi”¹⁴

Whilst these documents are undoubtedly a valuable resource for shedding further light on archaeological research at Gásir, they have several limitations. The information

¹¹ Jón Jóhannesson, Magnús Finnbogason and Kristján Eldjárn, 1946, page 119.

¹² Op cit., page 177

¹³ Op cit., page 337.

¹⁴ Gustav Storm, 1888, page 367

about Gásir in these historical documents is largely incidental – the site, its scope and its function, are but details in stories focused upon other narratives and individuals. They are of limited value in determining the full chronology of the site, or the true nature and variety of activities taking place there. It is this information that we hope to discover from ongoing archaeological study.

Gásir disappears from the historical record at the end of the 14th century, but this may only reflect the paucity of the historical record from the following period. The later development of Akureyri must eventually eclipse Gásir as the major regional trading centre.

Similarly, activity may of course have commenced at Gásir somewhat prior to its first documentation. The earliest references to Gásir (above) could be taken to imply that the site is already familiar in this role at the time of writing – certainly nothing here suggests that trade or transit from Gásir is novel, or surprising. Although as yet unconfirmed, the utilisation of Gásir for trade (or other purposes) might well reach back into the settlement period. Eyjafjörður has seemingly been quite densely settled from an early date, as is attested by the large number of pagan burials known from this region¹⁵ (although considering possible recovery bias, this should not necessarily be taken to indicate lesser settlement elsewhere). At what point this community was sufficiently established to attract maritime and other trade on a scale that required a specific and developed focus remains unclear. Other sites might also be considered as possible proto-markets, not least Kaupangur – on place name evidence, and also Dalvík, where a heathen grave field might suggest an early economic focus¹⁶. However, archaeological evidence for the date and function of any remains at or near Kaupangur is lacking – its connection with a putative assembly site and nearby coastal structures are at best conjectural. The grave finds at Dalvík, whilst of the highest importance in their own right, are not in themselves sufficient evidence for the conduct of trade at that place.

Models for the development of “Emporia” may be considered. Hodges¹⁷ proposes that coastal, seasonal meetings may represent the earliest stage in this process, and for

¹⁵ Kristján Eldjarn, 2000, Ed. Adolf Friðriksson, page 149

¹⁶ Margrét Hermanns –Auðardóttir, 1992

¹⁷ Hodges 1989, p. 50 ff

this type of market discerns a possible “functional similarity in the Icelandic medieval fairs”. Furthermore, the archaeological evidence offered to typify this stage of development (at Löddeköpinge, Sweden), may be seen to be in good accordance with the evidence recovered thus far at Gásir, being a “very impermanent first phase with numerous sunken-huts of a rural character filled with alternate layers of wind-blown sand and occupational debris”. If this is the type of evidence surviving for Gásir in the later middle ages, then the traces of settlement period activity might indeed be tenuous. Modes of trade that might precede a seasonal fair could include those of personal travel and acquisition, and ritualised gift exchange, as discussed by Helgi Þorláksson¹⁸. Such processes may be very difficult to discern in the physical evidence, and are unlikely to be located at any special place of trade. The results of this personal mode of trade might rather be found in either a domestic or funerary setting. Eight weights of lead recovered from a burial in Dalvík¹⁹ may be held to be indicative of some level of exchange and commerce within that individuals’ community. The evidence from goods found in the broader group of heathen graves in Eyjafjörður also demonstrates access to imported materials (in the form of coins, amber, weaponry, bronze items etc.²⁰) but this in itself tells us little of the mechanism or location of that exchange. A grave field at nearby Ytra-Garðshorn also includes an individual buried with a collection of eight weights²¹, and in total twenty Icelandic heathen burials contain such evidence, along with twelve other weights known from other contexts²². Weights are not an exceptional find in archaeological contexts in Iceland, and cannot be taken to be indicative alone of an economic centre. Imported goods are very frequent in the context of heathen burials.

The study of evidence from other Northern European trade sites will undoubtedly shed light on the nature of trade at Gásir - but this may still be premature. A larger body of artefactual and structural evidence will be required to securely make these comparisons. Such a study awaits further progress at Gásir.

¹⁸ Helgi Þorláksson, 1999

¹⁹ Kristján Eldjarn, 2000, Ed. Adolf Friðriksson, page 165

²⁰ Op cit, pages 148-190

²¹ Op cit, page 159

²² Op cit, page 414

The Nature of Export.

The discovery of sulphur nodules, and features possibly associated with their processing, is held to be of great interest. This alone may be taken to demonstrate that Gásir is a place of export, and that the catchment of Gásir had at least some special resources that were sought in trade. Natural sulphur is not a widely available commodity, and was certainly one of increasing importance during the medieval period due to its use in the manufacture of gunpowder. Although the 14th century is somewhat earlier than the widespread use of firearms in Europe, the value and importance of sulphur as a commodity in Iceland can be shown even from this period. This is illustrated by a number of historical sources. One of the earliest of these comes from *Árna saga biskups*, discussing events in 1279;

“Þetta svmar kom oc til a[rna] bref jons erkibis kups j hverio er hann bavð þat a[rna] biskupi at lata eigi konungs menn draga þat frelsi vndan kirkionni sem hon hafði aðr land kom vnder konongdominn. Þat var at kavpa frialsliga brennvstein oc falka.”²³

"That summer Árni also received a letter from Archbishop Jón where he exhorted Árni not to let the king's men take away those liberties the Church used to have before Iceland became subjected to the king, namely the free acquisition of sulphur and falcons."

(Translated by Orri Vésteinsson)

It is of course unclear to what extent this action is motivated by financial imperatives, and to what extent the right to acquire sulphur (and falcons) is rather a token in a much larger and more complex political adjustment in the aftermath of Iceland's submission to the Norwegian crown. For whatever reasons, it is plain that the Archbishop and the church do indeed attach some weight to these items. It is not however clear in what way sulphur was exploited and utilised within Iceland at this date, nor that it is a trade item of any significance, although this appears more likely than not.

For the later medieval, and post-medieval periods it may be shown that Icelandic sulphur was indeed traded abroad. By the late 15th century (1485-86), Icelandic sulphur was arriving in England;

²³ *Árna saga biskups*, in: *Íslenzk fornrit XVII. Biskupasögur III*, ed. Guðrún Ása Grímsdóttir, Reykjavík 1998, p. 76

“Computus Johannis Walsh et Johannis Shipward’ collectorum custume et subsidii domini regis nostri Henrici VII. in portu ville Bristol a festo Sancti Michaelis anno primo vsque festum Sancti Michaelis extunc proximo sequentem

Navis vocata le Trynete de London unde Thomas Sutton est magister venit de Islonde eodem die et habet in eadem

Thomas Grafton ind.

xvi lastis giltfishe	val. lxxx li.	subs. iiii li.
x lastis cropelynge	val. xxx li.	subs. xxx s.
viii lastis tyttelinge	val. xx li.	subs. xx s.
xxv pipes salmon	val. xxxvii li. x s.	subs. xxxvii s. vi d.
pipe brymston	val. xiii s. iii d.	subs. viii d.
x peccis wodmoll	val. xl s.	subs. ii s.
cc panis linei hibernie	val. xx s.	subs. xii d.
ix dacris di. corriorumsalsorum	val. vi li. vi s. viii d.	subs. vi s. iiii d...” ²⁴

“The calculations (ledger) of John Walsh and John Shipward covering customs and taxes for our Lord and King Henry VII. in the port of the city of Bristol from the holiday of the Saint Michael in the first year to the holiday of the Saint Michael in the following year. (29. Sept. – 29. Sept)

The ship called “le Trynete de London”, where Thomas Sutton is captain, came from Iceland on the same day, and was carrying -

16 lasts ²⁵ of dried fish (skreið).	Value 80 li.	Tax 4 li.
10 lasts of small dried fish (skreið).	Value 30 li.	Tax 30 s.
8 lasts of small fish (cod).	Value 20 li.	Tax 20 s.
25 barrels of salmon.	Value 37 li.10s	Tax 37 s. 6 d.
Barrel of brimstone.	Value 13 s. 3 d.	Tax 8 d.
10 strands of wool.	Value 40 s.	Tax 2 d.
200 strands of Irish linen.	Value 20 s.	Tax 12 d.
9 dacris of salted [corrio ²⁶]	Value 6 li. 6 s. 6d.	Tax 6 s 4 d

(Translation by Ragnar Edvardsson)

Although sulphur is present in this cargo, one should also note that fish products are by far the largest item by value in this inventory. Unfortunately these may prove less simple to discern in the archaeological record - secure evidence that fish have been

²⁴ Diplomatarium Islandicum, Vol. XVI, pages 60-61 Rvík 1952-1972

²⁵ Last(läst/læst/lest) – Largest standard measure of cargo, a freight “ton”, may equate to 1200 pieces of skreið – See KLNLM, Vol. XI, page 132.

²⁶ Possibly herring?

processed for trade and export might come from the detailed analysis of a large and well preserved faunal assemblage, but such is not as yet available. One must also note the Irish linen, implying more than one port of trade for this voyage. That fish might play a large part in trade from Gásir would be by no means surprising – Björn Þorsteinsson observes, regarding English merchantmen of the 15th -16th centuries;

“Hér norður frá keyptu þeir skreið og aftur skreið. Allir heimildir benda til þess, að þeir hafi einkum sótt eftir sjávarafurðum, en einnig finnst vaðmál, fálkar og brennisteinn í skipum, sem koma frá Íslandi.”²⁷

Björn further notes that whilst fish products may naturally be sought elsewhere, sulphur is one item that may be indicative of trade with Iceland. Icelandic sulphur was, at a somewhat later date (1536), seemingly regarded as a significant asset...

“...the said duke [*of Holst*] declared his great charges sustained in these wars with the practice of the emperor for Denmark, wherein he used the Lubeckers, who lately have admitted 3 or 4 papists into rule and authority within their city, to the intent they may both extinguish the word of God and further the emperor's purpose, declaring plainly his necessity, and for a pawns, mentioned before by the said Richarde [*Caundishe*], said that his grace might have two great countreys naming Iseland and Feraye, whereof **th'one that is Iseland he found had great plentie of brymestone**. To this it was answered, that he and his colleague durst not upon this light matter move his grace, unless they might get some better ground and foundation, considering how many inconveniences might ensue...”²⁸

...although clearly not a sufficient enticement for this difficult negotiation.

A recent maritime discovery on the Baltic coast of Germany may also prove to illuminate the medieval trade in Icelandic sulphur. Currently under investigation as part of the EU funded “M.o.S.S” project, the “Darsser cog” has been found to contain, inter alia;

“...a wooden barrel ... A dendrochronological analysis indicates that the oak of the barrel came from the Polish coastline and that the oak was felled in 1335. The barrel was filled with sulphur that is likely [*to be*] of Icelandic origin”²⁹

²⁷ Björn Þorsteinsson, 1969, page 33

²⁸ Diplomatarium Islandicum, Vol. IX, page 757ff

Rvík 1909-1913

²⁹ <http://www.nba.fi/INTERNAT/MoSS/darssercogeng.htm>

Other items found aboard this vessel include whetstones from Norway, roofing tiles and pieces of antler. Pieces of imported whetstones and also unworked schist (believed to be of Norwegian origin) have also come to light at Gásir. Such whetstones are more or less ubiquitous in assemblages from Icelandic sites, and some evidence points to their source as being the Eidsborg quarry in Telemark – although this provenance is not always proven. The provenancing of the sulphur to an Icelandic source seems fairly secure, although other natural sources do exist – its discovery in the Baltic within a barrel of Polish oak serves well to demonstrate the extent and complexity of trade networks at this time.

Some further evidence in this context may be considered in a find from excavations at Stóraborg, on the south coast of Iceland. Dendrochronological study of a barrel/vessel base of oak indicates a date in the early 15th century³⁰, and furthermore dendro-provenience suggests a source for this wood in the southeastern Baltic. The circumstances under which this wood arrived in Iceland are of course opaque, but reinforces the same long distance connections. Iceland's position as a known source of sulphur for the Baltic region can be documented in the later, post-medieval period. By the 17th century (apparently 1664), this knowledge has travelled as far as Latvia;

“13. Augusti kom hafskip á Sauðárkrók. Þar á voru kúrlenzkir menn meinlausir, áttu að sækja brennistein..... Þeir fengu ekki brennisteininn og sigldu burt 8. Sept[embris].”

(Annáll Gunnlaugs prests Þorsteinssonar í Vallholti (Vallholtsannáll) 1626-1666)³¹

The Latvians lack of success in this endeavour might be taken to indicate mere misfortune, the effectiveness of a monopoly imposed by the Danish crown, or their arrival at a port too distant from the key sources of Sulphur.

³⁰ Pers. comm Mjöll Snæsdóttir

³¹ Hannes Þorsteinsson (ed), 1922-27, page 364. I am grateful to my colleague Mjöll Snæsdóttir for this point.

CONCLUSIONS AND FURTHER WORK

Excavation at Gásir in 2002 has successfully demonstrated the potential for further study. The complexity of the site, its scale, the richness and variety of the artefactual assemblage and the quality of preservation all promise to shed new light on the history and economy of not only Eyjafjörður, but also of Iceland as a whole, and of its role in the North Atlantic community throughout the medieval period.

The scale and complexity of this work will demand a considerable investment of time and resources to fully capitalise upon that potential. The site is of considerable interest to both the local and wider community, as was eloquently demonstrated by the great number of visitors to the excavation.

Work in 2002 has brought to light a number of features and artefacts that are indicative of industrial and technological activity at Gásir. This new evidence changes our view of the site, and opens new lines of research. We must now also consider the possible importance of Gásir as a centre for specialised craft work, industry, and the nature of its role as an economic centre in the medieval period. That Gásir did not subsequently develop into a significant urban settlement begs many questions that only further investigation can begin to answer.

In order to expand upon what has already been achieved, it is proposed that excavation work at Gásir in coming years is conducted at a larger scale. The excavation area opened this year encompassed an area of 250m², and was dug to a depth of between 1m and 2.4m. Significant remains within this area still await attention. Additionally, it is proposed that work commences on undisturbed deposits to the west of this area, encompassing an additional 400m² of complex structural archaeology.

In order to achieve this goal it is proposed that the excavation work is undertaken by a team of 12-15 individuals for a period of 10-12 weeks in the years 2003-2006.

ACKNOWLEDGEMENTS

Excavation at Gásir in 2002 was made possible by generous grants from Ríkissjóður and the Kristnihátíðarsjóður. We are most grateful for this support and for the support and co-operation of a large number of individuals and institutions. The site was excavated by Mary Alexander, Guðlaugur Árnason, Ally Becket, Bruno Bersson, Craig Cessford, Marta Dulnicz, Louise Felding, Oddgeir Hansson, Jón Óskar Jónsson and H. M. Roberts (director). The excavation was directed by the author, and the project was managed for Fornleifastofnun Íslands by Orri Vésteinsson, on behalf of Minjasafnið á Akureyri. Public relations were managed by Kristín Sóley Björnsdóttir of Ferðamálastetur Íslands, assisted by Barabara Guðnadóttir of FSÍ. The project was administered for Fornleifastofnun Íslands by Ólöf Þorsteinsdóttir. The artefacts were processed by Sigríður Þorgeirsdóttir, and recorded by the author. Alix Sperr illustrated a selection of the finds. Finds conservation has been undertaken by Jannie Amsgaard Ebsen of Þjóðminjasafn Íslands.

An evaluation of possible maritime remains³² was conducted by Flemming Rieck and Jørgen Dencker of the Danish National Museum's Institute of Maritime Archaeology (Nationalmuseets Marinarkæologiske Undersøgelser). Magnús Á. Sigurgeirsson continued his study of the tephra profile for the site and its environs. Ian Simpson, Amanda Thomson, and Paul Adderley (University of Stirling) sampled a potential industrial feature for further study.

Guided tours of the site were provided by Ingibjörg Magnúsdóttir for Minjasafnið á Akureyri and Ferðamálastetur Íslands. In total, 859 local and international guests took advantage of this opportunity.

Our thanks are due to Guðrún Kristinsdóttir, Sigurður Bergsteinsson, and staff of Minjasafnið á Akureyri for their encouragement and co-operation. We would also like to thank Vegagerðin á Akureyri for the loan of surveying equipment.

We would especially like to thank Friðrik Gylfi Traustason and Guðrún Björk Pétursdóttir, the farmers at Gásir, for their kind co-operation.

³² Dencker and Rieck 2002

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Appendix 1

Index of Finds

Finds no	Context	General Name	Material Type	Weight (g)	Quantity (Count)	Comments
1	001	Buckle	Fe	85	1	
2	001	Nail	Fe	77.5	1	
3	001	Object	Fe	51.5	3	
4	001	Nail	Fe	12	2	
5	001	Nail	Fe	24	1	
6	001	Nail	Fe	10	1	
7	001	Object	Fe	35	1	
8	001	Nail	Fe	18	1	
9	001	Rove	Fe	11	1	
10	001	Object	Fe	47.5	3	
11	001	Object	Fe	3	1	
12	001	Object	Fe	52	2	
13	101	Object	Fe	12	1	
14	221	Thread	Fe	<0.5	1	
15	221	Staple	Fe	5.5	2	
16	221	Object	Fe	29	4	
17	221	Object	Fe	64	4	
18	221	Nail	Fe	17.5	2	
19	223	Object	Fe	13	1	
20	223	Nail	Fe	15	1	
21	231	Object	Fe	16	1	
22	239	Object	Fe	29.5	1	
23	243	Nail	Fe	25.5	3	
24	244	Nail	Fe	5	1	
25	246	Object	Fe	9	2	
26	253	Nail	Fe	29.5	2	
27	266	Object	Fe	48	1	
28	280	Nail	Fe	9	1	
29	280	Object	Fe	8	2	
30	281	Object	Fe	9.5	2	
31	282	Nail	Fe	14.5	2	
32	283	Nail/bolt	Fe	20	1	
33	283	Object	Fe	133	1	
34	293	Nail	Fe	18.5	1	
35	297	Object	Fe	16	3	
36	306	Nail	Fe	19	3	
37	308	Object	Fe	10	1	
38	318	Object	Fe	5	1	
39	343	Nail	Fe	15.5	2	
40	356	Object	Fe	3	1	
41	357	Nail/bolt	Fe	29.5	1	

Finds no	Context	General Name	Material Type	Weight (g)	Quantity (Count)	Comments
42	373	Object	Fe	6.5	1	
43	381	Object	Fe	25.5	2	
44	381	Nail	Fe	7	1	
45	392	Nail	Fe	14	1	
46	392	Nail	Fe	15	1	
47	396	Nail	Fe	14.5	2	
48	399	Object	Fe	<0.5	1	
49	410	Nail	Fe	51	8	
50	441	Nail/bolt	Fe	13.5	2	
51	449	Object	Fe	4	1	
52	451	Object	Fe	29	1	
53	452	Object	Fe	130	10	
54	452	Object	Fe	8.5	1	
55	471	Object	Fe	12	3	
56	479	Object	Fe	30.5	1	
57	480	Object	Fe	12.5	1	SF7
58	482	Object	Fe	5.5	2	SF6
59	499	Nail	Fe	18.5	1	
60	N/A	Object	Fe	4	1	SF4
61	226	Knife	Fe	23	4	
62	001	Object	Cu	17	9	
63	001	Object	Cu	5.5	3	
64	221	Sheet, 2 rivets	Cu	3	1	
65	231	Sheet	Cu	8.5	3	
66	266	Vessel fragment	Cu	18.5	1	Cast?
67	275	Sheet, 1 rivet	Cu	2	1	
68	283	Object	Cu	2	2	Hair, wood adhering
69	284	Object	Cu	<0.5	1	
70	284	Object	Cu	4.5	1	
71	350	Object	Cu	2	1	
72	374	Sheet, pierced	Cu	2.5	1	
73	374	Sheet, 2 rivets	Cu	7	1	
74	420	Object	Cu	<0.5	1	
75	N/A	Object	Pb/Cu	6	1	SF9
76	223	Object	Fe	5	1	
77	328	Knife?	Fe	6	1	
78	001	Object	Bone (whale)	32	1	
79	300	Stake	Bone (whale)	251	1	
80	399	Fragment	Wood	6	1	
81	345	Object	Wood	6	1	
82	306	Fragment	Wood	<0.5	2	Charred
83	354	Pin	Wood	3	1	
84	372	Fragment	Wood	10	1	

Finds no	Context	General Name	Material Type	Weight (g)	Quantity (Count)	Comments
85	227	Threads	Textile	10	1	
86	283	Fragments	Textile	45	4	
87	221	Piece	Hair	5.5	1	
88	418	Piece	Hair	114	1	
89	001	Fragment	Leather	<0.5	1	
90	001	Shoe fragments	Leather	10	4	
91	256	Fragment	Leather	3	1	
92	244	Fragment	Leather	3	1	
93	001	Fragment	Leather	2.5	1	
94	001	Fragment	Leather	3.5	1	
95	368	Object	Bone (whale)	39.5	6	Dry, Fragile
96	310	Pottery fragment	Ceramic	242	1	Rim, neck and handle - stoneware - Siegburg?
97	405	Pottery fragment	Ceramic	44	1	Body - stoneware - joins
98	001	Pottery fragment	Ceramic	11	1	Body - stoneware
99	001	Pottery fragment	Ceramic	3.5	1	Body - stoneware
100	244	Pottery fragment	Ceramic	<0.5	1	Body - stoneware
101	250	Pottery fragment	Ceramic	3	1	Body - stoneware
102	352	Pottery fragment	Ceramic	5.5	1	Rim/base - stoneware
103	441	Pottery fragment	Ceramic	2	1	Body - stoneware
104	001	Pottery fragment	Ceramic	6	2	Body - Grimston? - 2 joining sherds
105	243	Pottery fragment	Ceramic	5	1	Rim - Grimston?
106	283	Pottery fragment	Ceramic	15	1	Rim/spout - Grimston?
107	357	Pottery fragment	Ceramic	3.5	1	Body - Grimston?
108	221	Crucible fragment	Ceramic	3	1	Base
109	221	Crucible fragment	Ceramic	5	1	Rim - notched
110	452	Crucible fragment	Ceramic	2	1	Body - vitrified inner face. SF3
111	381	Pottery fragment	Ceramic	14	1	Unknown

Finds no	Context	General Name	Material Type	Weight (g)	Quantity (Count)	Comments
112	405	Pottery fragment	Ceramic	6	1	Salt-glazed redware
113	001	Baking plate, fragment	Stone	34.5	1	
114	001	Baking plate, fragment	Stone	19	1	
115	235	Baking plate, fragment	Stone	33	1	
116	243	Baking plate, fragment	Stone	29	1	
117	266	Baking plate, fragment	Stone	35.5	1	
118	317	Baking plate, fragment	Stone	<0.5	1	
119	357	Baking plate, fragment	Stone	14.5	1	
120	374	Baking plate, fragment	Stone	14.5	1	
121	399	Baking plate, fragment	Stone	6	1	
122	001	Whetstone	Stone	37.5	1	Plus small fragment
123	243	Whetstone	Stone	17.5	1	
124	244	Whetstone	Stone	17	2	Unmatched
125	256	Whetstone	Stone	8.5	1	
126	346	Whetstone	Stone	34	1	
127	N/A	Object	Stone	47.5	1	SF2 - Flat kidney shaped object, with 2 drilled holes
128	223	Object	Stone	22	1	Quartz? - with polished surface
129	256	Object	Stone	19	1	Banded quartz? - worked surface
130	278	Object	Stone	13	1	Quartz? - with polished surface
131	283	Object	Stone	3	1	Quartz? - with polished surface
132	312	Object	Stone	303	1	Flat, 2 smoothed surfaces
133	001	Quern fragment	Stone	202	1	Porous lava
134	001	Sulphur	Mineral	19	7	
135	223	Sulphur	Mineral	3.5	1	
136	256	Sulphur	Mineral	10	2	
137	271	Sulphur	Mineral	129	1	
138	283	Sulphur	Mineral	15	4	
139	350	Sulphur	Mineral	2.5	1	
140	353	Sulphur	Mineral	12	4	
141	374	Sulphur	Mineral	6.5	2	

Finds no	Context	General Name	Material Type	Weight (g)	Quantity (Count)	Comments
142	394	Sulphur	Mineral	<0.5	2	
143	398	Pin	Bone (whale)	3	1	Head fragment
144	357	Object	Glass	7	1	Green glass, re-melted
145	001	Flake	Stone	<0.5	1	Flint
146	001	Fragment	Stone	4.5	1	Greenish, malachite?
147	001	Pebble	Stone	5.5	1	Quartzite, rounded
148	001	Fragment	Stone	73.5	3	Fire cracked ?
149	001	Fragment	Stone	809	1	Fine dark grey schist. Raw material for whetstones?
150	223	Fragment	Stone	235	1	Fine mid grey, micaceous schist. Raw material?
151	223	Fragment	Stone	92.5	1	Fine pale grey schist. Whetstone fragment?
152	229	Fragment	Stone	28	2	Coarse, dark grey schist. Burnt? Quern fragment?
153	236	Flake	Stone	5.5	1	Worked?
154	238	Pebble	Stone	2	1	Yellow brown, quartzite, rounded. Poss. Opal?
155	244	Fragment	Stone	2.5	1	Fine pale grey schist. Whetstone fragment?
156	260	Fragment	Stone	14.5	1	Fine, mid pinkish grey, slightly micaceous schist. Worn?
157	268	Pebble	Stone	2	1	White, quartzite, rounded
158	268	Fragment	Stone	15	1	Fine pale grey schist. Whetstone fragment?
159	270	Fragment	Stone	22	4	Black/white crystalline. Gabbro?
160	282	Fragment	Stone	20	1	White, granular. Quartzite?
161	283	Fragment	Stone	235	3	Sub angular, laminar, dark grey sandstone?
162	350	Fragment	Stone	44	2	Orange pink, micaceous schist.
163	356	Fragment	Stone	53	3	Black/white crystalline. Gabbro?
164	356	Fragment	Stone	354	2	Pale grey - dark grey, laminar.
165	356	Fragment	Stone	540	2	Coarse, dark grey schist. Quern fragment?
166	357	Pebble	Stone	<0.5	1	Clear, pale yellow, rounded, quartzite?
167	359	Flake	Stone	4.5	1	Flint
168	366	Fragment	Stone	702	1	Pale grey - dark grey, laminar. Micaceous.
169	372	Pebble	Stone	2	1	Opaque, yellow, rounded

Finds no	Context	General Name	Material Type	Weight (g)	Quantity (Count)	Comments
170	377	Fragment	Stone	3	1	Fine , pale grey schist. Whetstone fragment.
171	407	Pebble	Stone	2	1	Clear, white, rounded, quartzite?
172	410	Pebble	Stone	8	2	Opaque, white, rounded
173	452	Pebble	Stone	12,5	5	Semi-opaque, white, rounded. Quartz?
174	486	Fragment	Stone	1430	1	SF-26. Coarse, dark grey, laminar. Schist?
175	493	Fragment	Stone	2	1	SF-8. Fine pale grey schist. Whetstone fragment?
176	497	Fragment	Stone	8	1	Zeolite?
177	001	Fragment	Shell	50.5	1 bag	
178	221	Fragment	Shell	3	2	
179	224	Fragment	Shell	3.5	1	
180	284	Fragment	Shell	4.5	1	
181	377	Fragment	Shell	4.5	1	Encrusted
182	410	Fragment	Shell	17	1 bag	Burnt
183	439	Fragment	Shell	7.5	1	
184	266	Fragment	Shell	5	2	
185	001	Slag	Slag	47	1	Heavy, porous
186	283	Slag/Fe	Slag	37.5	1 bag	
187	400	Slag	Slag	7.5	3	Lightweight
188	001	Slag	Slag	67.5	4	Lightweight
189	381	Slag	Slag	145	22	Lightweight
190	307	Slag	Slag	340	44	Lightweight
191	443	Slag	Slag	7	1	Lightweight
192	226	Slag	Slag	162	3	Lightweight
193	288	Slag	Slag	45.5	1	Heavy, purplish
194	429	Slag/Fe	Slag	48.5	7	Lightweight
195	429	Slag/Fe	Slag	6	2	Lightweight
196	370	Slag/Fe	Slag	6	1	Lightweight
197	231	Slag	Slag	8.5	2	Glassy
198	221	Slag	Slag	32.5	2	Dense, some Cu content, pale inclusions.
199	390	Slag	Slag	14	5	Lightweight
200	431	Slag	Slag	3	1	Lightweight
201	429	Slag	Slag	197	6	Lightweight
202	450	Slag	Slag	173	7	Lightweight
203	368	Slag	Slag	42	8	Lightweight
204	370	Slag	Slag	29	5	Lightweight
205	365	Slag	Slag	5	2	Variable
206	368	Slag	Slag	3	1	
207	243	Slag	Slag	14	2	
208	221	Slag	Slag	0.5	1	
209	238	Slag	Slag	5.5	1	

Finds no	Context	General Name	Material Type	Weight (g)	Quantity (Count)	Comments
210	439	Slag	Slag	535	4	1 large, heavy piece, +3 fragments
211	377	Slag	Slag	107	3	
212	429	Slag	Slag	203	18	
213	394	Slag	Slag	181	20	Lightweight
214	259	Slag	Slag	18	1	Dense
215	001	Slag	Slag	21	2	Dense
216	357	Slag	Slag	37.5	5	Lightweight
217	001	Slag	Slag	29.5	7	Lightweight
218	284	Slag	Slag	215	81	Variable
219	443	Slag	Slag	49	8	
220	311	Slag	Slag	186	8	Black, inc charcoal?
221	355	Slag	Slag	16	1	
222	317	Slag	Slag	15.5	5	
223	317	Slag	Slag	33	3	
224	297	Slag	Slag	42.5	11	
225	224	Slag	Slag	3	1	
226	480	Nail?	Fe	4	1	SF5
227	001	Bone	Bone	852.0	61	
228	001	Bone	Bone	1089.0	110	
229	001	Bone	Bone	982.0	69	
230	001	Bone	Bone	852.0	53	
231	001	Bone	Bone	801.0	70	
232	001	Fish bone	Bone	3.0	10	
233	001	Bone	Bone	228.0	2	
234	220	Bone	Bone	528.0	12	Horse skull frags
235	284	Bone	Bone	353.0	24	
236	293	Bone	Bone	341.0		
237	223	Bone	Bone	519.0		
238	243	Bone	Bone	412.0	29	
239	237	Bone	Bone	287.0		
240	226	Bone	Bone	245.0	17	
241	221	Bone	Bone	281.0	14	
242	282	Bone	Bone	241.0	14	
243	284	Bone	Bone	201.0	20	
244	284	Bone	Bone	274.0		
245	293	Bone	Bone	272.0	28	
246	297	Bone	Bone	152.0	29	
247	230	Bone	Bone	176.0	20	
248	288	Bone	Bone	181.0	23	
249	231	Bone	Bone	134.0	18	
250	224	Bone	Bone	193.0		
251	222	Bone	Bone	91.0	13	
252	245	Bone	Bone	112.0	11	
253	260	Bone	Bone	90.0		
254	256	Bone	Bone	47.0	5	

Finds no	Context	General Name	Material Type	Weight (g)	Quantity (Count)	Comments
255	265	Bone	Bone	42.0	6	
256	223	Bone	Bone	106.0	8	
257	283	Bone	Bone	132.0	8	
258	266	Bone	Bone	35.0	6	
259	221	Bone	Bone	79.0	2	
260	246	Fish bone	Bone	3.0	11	
261	226	Bone	Bone	100.0	5	
262	238	Bone	Bone	63.0	12	
263	229	Bone	Bone	67.0	8	
264	272	Bone	Bone	63.0	17	Inc. blackened bone
265	272	Bone	Bone	50.0	10	
266	241	Bone	Bone	40.0	5	
267	235	Bone	Bone	38.0	4	
268	254	Bone	Bone	46.0	1	
269	221	Bone	Bone	18.0	6	
270	235	Horn core	Bone	38.0	1	
271	247	Bone	Bone	14.0	1	
272	276	Bone	Bone	12.0	1	Burnt
273	224	Bone	Bone	15.0	7	
274	246	Bone	Bone	10.0	2	
275	287	Bone	Bone	12.0		
276	239	Bone	Bone	5.0	1	
277	236	Bone	Bone	5.0	3	
278	248	Bone	Bone	3.0	1	
279	224	Fish bone	Bone	2.0	2	
280	256	Tooth	Bone	2.0	1	
281	221	Bone	Bone	5.0	5	Burnt
282	297	Bone	Bone	2.0	1	
342	187	Bone	Bone	14.0	2	
283	328	Bone	Bone	956.0		Concentrated group of tarsals + calcan – young, cow?
284	345	Bone	Bone	179.0		
285	348	Bone	Bone	159.0		
286	394	Bone	Bone	170.0	52	Some burnt. calcined.
287	381	Bone	Bone	105.0	13	
288	343	Bone	Bone	75.0	10	
289	357	Bone	Bone	141.0	11	
290	366	Tooth	Bone	11.0		
291	367	Bone	Bone	106.0	8	
292	318	Bone	Bone	60.0	2	
293	397	Bone	Bone	51.0	13	
294	378	Bone	Bone	30.0	2	
295	306	Bone	Bone	42.0	12	
296	346	Bone	Bone	29.0	19	Burnt. calcined
297	317	Bone	Bone	29.0	14	

Finds no	Context	General Name	Material Type	Weight (g)	Quantity (Count)	Comments
298	365	Bone	Bone	28.0	2	
299	377	Bone	Bone	28.0	1	
300	327	Bone	Bone	31.0		
301	333	Bone	Bone	14.0	1	
302	346	Bone	Bone	28.0		Some calcined
303	398	Bone	Bone	14.0	4	
304	368	Bone	Bone	14.0		
305	325	Bone	Bone	24.0	3	
306	373	Bone	Bone	28.0	3	
307	377	Bone	Bone	15.0		
308	350	Bone	Bone	17.0	5	
309	311	Bone	Bone	12.0	3	Burnt
310	370	Bone	Bone	14.0	21	
311	392	Bone	Bone	15.0	5	Some burnt
312	365	Bone	Bone	13.0	22	Burnt
313	385	Fish bone	Bone	26.0		
314	357	Bone	Bone	67.0	5	Inc tooth
315	385	Bone	Bone	11.0	2	Inc fish
316	308	Bone	Bone	5.0	9	Inc burnt
317	390	Bone	Bone	4.0	2	
318	370	Bone	Bone	6.0	2	
319	370	Bone	Bone	3.0	2	Calcined
320	368	Bone	Bone	2.0	1	
321	429	Bone	Bone	760.0	138	Inc. burnt. calcined
322	419	Bone	Bone	135.0	42	Inc. burnt. calcined
323	470	Bone	Bone	92.0	1	Butchery marks?
324	496	Bone	Bone	58.0	16	
325	414	Bone	Bone	97.0	2	
326	405	Bone	Bone	62.0	1	
327	418	Bone	Bone	51.0	7	
328	448	Bone	Bone	49.0	1	
329	428	Bone	Bone	45.0	1	
330	482	Bone	Bone	13.0	5	
331	400	Bone	Bone	14.0	1	
332	431	Bone	Bone	20.0	5	
333	461	Bone	Bone	12.0	2	
334	405	Bone	Bone	4.0	1	Burnt
335	486	Tooth	Bone	10.0	33	Small fragments
336	421	Bone	Bone	4.0	6	
337	456	Bone	Bone	2.0	2	
338	410	Bone	Bone	3.0	4	
339	471	Bone	Bone	2.0	3	
340	473	Bone	Bone	5.0	6	
341	504	Bone	Bone	401.0	29	

Appendix 2

Preliminary Conservation Report

9.12.2002.

Jannie Amsgaard Ebsen,

Objects conservator, Department of Collections, National Museum of Iceland,
Vesturvör 16-20, 200 Kópavogi.

Excavation at Gásir in 2002 recovered 95 find groups which have been selected for active and preventative conservation. The finds are largely a variety of inorganic objects, as well as a smaller quantity of organics. The inorganics are various fragments and objects made of copper alloy and iron. The organics consist of textile, hair, leather, bone and wood. The conservation is now taking place at Þjóðminjasafn Íslands (National Museum of Iceland). The conservation includes (amongst other processes) mechanical cleaning, inhibition, consolidation, impregnation and freeze drying, as well as preventive conservation including repacking with inert supporting materials and the creation of desiccating environments for certain materials. The conservation will be finished in the Spring of 2003.

Inorganics

Copper alloys etc. (Bronze and lead).

Mostly of the copper alloys seem to suffer from active corrosion ("Bronze-disease") with the formation of light greenish copper chloride products. Furthermore the copper alloys are quite mineralised and fragile and in need of stabilizing treatment. The objects have been cleaned mechanically under a microscope to remove unwanted corrosion products and to find the "original surface" of the objects. This was followed by vacuum impregnation with the inhibitor benzotriazole and the consolidant/laquer Paraloid B 44.

Iron

11 out of a total of 61 iron objects will be treated actively. The objects have been X-rayed and will be cleaned of unwanted corrosion with air-abrasive equipment. Unwanted salts will be removed in a desalination process and finally the objects will be vacuum consolidated with microcrystalline wax or Paraloid B 72. Before conservation they are being stored in a desiccating environment with silica gel. The remaining iron finds will be permanently stored in a dry environment to prevent corrosion.

Organics

Textile, hair, wood, leather and bone

The damp textile, wood and leather have been cleaned with water and are being consolidated in polyethylenglycol (PEG) of varying concentrations and molecule sizes. The objects will then be freeze dried to prevent collapse and deformation. The bone objects have been dried slowly, consolidated with Paraloid B72 and packaged with appropriate support.

Appendix 3

Index of Environmental Samples

Sample no	Context	Grid Sq /Location	Volume in litres	Number of buckets/bags	Description/Comm/Info	Date	Sampler ID
1	188	8270/7700	30	3 buckets	Fill of hearth	9.7.2002	CC
2	269		10	1 bucket	Hearth material	18.7.2002	GJA
3	285	8265/7695	20	2 buckets	Peat ash	19.7.2002	BB
4	286	8265/7695	10	1 bucket	Charcoal	19.7.2002	BB
5	292	8275/7690	20	2 buckets	Includes decayed twigs	19.7.2002	LF/JOJ
6	311	8270/7690	30	4 buckets	Hearth material - Sub-samples in extra bucket	23.7.2002	CC
7	300	8265/7705	30	3 buckets	Wet, grey pit fill - Insects/fish bone?	23.7.2002	AB
8	324	8265/7705	10	1 bucket	Wet, orange/grey pit fill - Insects/fish bone?	23.7.2002	AB
9	328	8270/7690	20	2 buckets	Lens of fish bone	24.7.2002	CC
10	355	8270/7690	10	1 bucket	Peat ash	24.7.2002	OH
11	375	8260/7690	10	1 bucket	Charcoal	29.7.2002	BB
12	385	8270/7690	10	1 bucket	Waterlogged fill - Insects/fish bone?	30.7.2002	CC
13	393	8270/7690	10	1 bucket	Trampled surface - macrorefuse?	30.7.2002	CC
14	394	8270/7705	30	3 buckets	Charcoal rich peat-ash	30.7.2002	MA
15	396	8270/7690	30	3 buckets	Floor including organics	30.7.2002	CC
16	411	8270/7690	30	3 buckets	Hearth fill - peat ash	31.7.2002	CC
17	411	8270/7690	10	1 bucket	Hearth fill - lower portion	31.7.2002	CC
18	410	8265/7705	30	3 buckets	Peat ash with charcoal	31.7.2002	MD
19	425	8270/7690	30	3 buckets	Floor including organics	31.7.2002	CC
20	427	8275/7690	10	1 bucket	Layer with bone fragments , peat ash charcoal	1.8.2002	LF/JOJ
21	450	8270/7690	30	3 buckets	Peat ash with charcoal	2.8.2002	CC
22	455	8270/7690	20	2 buckets	Burnt black pit fill	2.8.2002	CC
23	475	8265/7690	10	1 bucket	Ash and charcoal	6.8.2002	HMR
24	473	8275/7690	0.05	1 small bag	White lens - organic?	6.8.2002	LF/JOJ
25	474	8260/7690	5	1 bucket	Burnt layer (black)	6.8.2002	OH
26	486	8265/7705			Stone sample from floor	7.8.2002	GJA
27	214		10	1 bucket	Waterlogged deposit - Insects?	8.8.2002	CC
28	517		10	1 bucket	Waterlogged deposit - Insects?	8.8.2002	CC