

# Neolithic mortuary practice in Orkney

David Lawrence\*

## ABSTRACT

*The human skeletal remains from the Neolithic chambered cairn of Isbister, Orkney have recently been re-examined to test the accuracy of observations reported in the published analysis. During this examination, pathological lesions, signs of weathering and other taphonomic markers were recorded. Two marked disparities between the current study and the published report have been discovered: the Isbister population has been found to display a high prevalence rate of pathological symptoms not previously described; and the bones were found not to display any great degree of the weathering, bleaching and other erosion remarked upon in the published literature. Doubt is also cast on the published calculation of minimum number of individuals interred. The most likely explanation for the apparent differences in results is the systematic misinterpretation of pathological symptoms as evidence of taphonomic processes. It is suggested that there is no supporting evidence for the view that external exposure or preliminary disarticulation occurred prior to interment in Isbister chambered cairn.*

## INTRODUCTION

. . . hazards arise from . . . over-reliance on one outstandingly productive and intensively audited site, Isbister (ORK 25) (Davidson & Henshall 1989, 52).

Modern studies have indicated that a variety of mortuary practices existed in Neolithic Britain (Saville 1990; Wysocki & Whittle 2000; Baxter 2001; Smith 2005). One recent paper (Henshall 2004) summarized the evidence for Neolithic mortuary practice in Orkney in particular, explaining that interment of flexed cadavers in chambered cairns was the norm, with later rearrangement of disarticulated remains a common feature. Two exceptions to this were noted: the cairns at Isbister and Quanterness, where preliminary exposure had been identified as occurring prior to deposition in the chambers (Henshall 2004 after Hedges 1983, 269). This interpretation was based on a high degree of

both weathering and bleaching in the human skeletal material (Chesterman 1983, 124–7).

The chambered cairns of the highland zone appear to be regional variations of a more widespread phenomenon. English barrows, in particular, have received attention. Excavation reports from Neolithic chambered cairns and long barrows throughout Britain have typically noted the occurrence of a large quantity of human bone in apparent disorder within the structure. Not infrequently, these have been said to be accompanied by complete skeletons in anatomically correct arrangement. This led early archaeologists to suggest that the mortuary use of these monuments involved the inhumation of the body in the chamber(s) and later movement of unarticulated elements to ‘tidy’ the space. At Stoney Littleton, for example, Colt Hoare (1829) suggested that crouched interment was the early practice and extended interment late, with a potential phase of cremation. The possible

\* Bayview, Birsay, Orkney KW17 2LR

practice of external exposure or of relocation of remains in the Neolithic was suggested as early as 1869 in a wide-ranging discussion of known mortuary practices by Thurnam, using ethnographic parallels (Thurnam 1869). By the early 20th century, Grinsell, following Hoare & Thurnam, confidently explained that in the Neolithic, 'people were often buried in the contracted position' but that 'Frequently the custom was to expose deceased in an ossuary or in the open air for several weeks or months before burial, and then to place a selection of his bones in the long barrow' (Grinsell 1936, 34).

Excavations by Ashbee at Fussell's Lodge, Wiltshire, in 1958 retrieved probably the best-recorded human skeletal assemblage to that date. It was found that the bones were limited to the expected burial location but had suffered from varying degrees of weathering and frequent breakage. The assemblage appeared unarticulated but 'bundled' and Ashbee considered that the population had been interred as inhumations at some other place and then transferred in containers whilst in a state of advanced decay (Ashbee 1966, 37), some elements possibly being removed at a later date (*ibid*, 39). Ashbee later considered that the typical inhumation was crouched (Ashbee 1984, 62) but that there had been differences in the degree of exposure in different areas within the tomb (*ibid*, 60) and that later rearrangement of the bones had occurred (*ibid*, 63) that produced the observed features.

Judson T Chesterman's first published paper on Neolithic human remains (Chesterman 1977) followed his analysis of the human bone assemblage from Ascott-under-Wychwood, Gloucestershire, which had been excavated some ten years earlier. That paper lays out the pattern for his later, highly influential, opinions. Chesterman suggested that the bones were bleached, weathered and entirely disassociated from any anatomical relationship, with skeletal elements missing. He concluded that this must have been the result of exposure of cadavers to the elements followed by interment of the

dry bones after defleshing was complete. He further claimed that the bones, because of their fragmentary nature, must have been intentionally broken across stones. It is only with a recent study that substantial information on this site has been published (Benson & Whittle 2006), but a failure to comprehend archaeological remains was criticized by the site excavators at the time, pointing out the lack of evidence for 'ill-conceived suppositions concerning bleaching and bone fractures' (Benson & Clegg 1978).

#### EVIDENCE FROM ORCADIAN CHAMBERED CAIRNS

Few of the antiquarian excavations of Orcadian chambered cairns in the 19th century involved any substantial recording of deposits. Together with destruction of bone in the local wet acid soils, this has left little available evidence of any human remains that might have been present, their nature or their distribution. The 1930s saw the publication of reports on several chambered cairns excavated by Grant & Callander on the Orcadian island of Rousay, with more detailed descriptions than was previously common. Perhaps most notable of these was Midhowe, a stalled cairn containing the remains of 25 individuals, many discovered lying flexed on their sides on shelves with their backs to the walls with a quantity of unarticulated and individually heaped human bone (Callander & Grant 1934). This pattern is directly comparable with the evidence from English long barrows.

In 1974, Quanterness chambered cairn was excavated (Renfrew 1979), and the subsequent publication included skeletal analysis by Chesterman (1979). It was natural that Chesterman should then also perform the human bone analysis for the later report on Isbister chambered cairn. Both these Orkney reports furnished supporting evidence for Chesterman's previously published views on Neolithic mortuary practice. Weathering, bleaching, disarticulation and post-mortem fracture were described as highly prevalent and were used

to propose an extra-mural exposure practice (Chesterman 1979, 106–7; 1983, 124–7).

A recent study (Beckett & Robb 2006) found that Isbister remains the largest Neolithic inhumation assemblage (341 individuals) yet recovered in Britain, with that from Quanterness being the second largest (165 individuals), and that only 26 sites produced ten or more individuals. Chesterman alone performed the skeletal analyses on over 71% of the published sample of human inhumation remains from the British Neolithic. An additional important aspect of the large assemblage sizes at Isbister and Quanterness is that it is possible that a complete population was interred and remained in situ in each case – a very rare case in the British Neolithic. The accurate description of these assemblages is therefore fundamental to understanding prehistoric health status in Britain.

#### ISBISTER CHAMBERED CAIRN

At Isbister, excarnation took place outside the burial chambers (Stoddart et al 1999, 104).

The Isbister Neolithic chambered cairn, the so-called ‘Tomb of the Eagles’ (Parish of South Ronaldsay, map reference ND 4704 8449, NMRS no ND48SE1) was controversially excavated by the landowner, Mr Ron Simison, on several occasions between 1958 (Ritchie 1959) and 1982, with minor professional work in 1987 (Smith 1989). These excavations recovered the largest and best-preserved single assemblage of Neolithic human bone in the British Isles. Radiocarbon dating demonstrates use of the monument over about 1000 years from 3300 BC to 2300 BC (Renfrew et al 1983). It is clear that at no time during the major excavations were adequate records made contemporaneously, although Hedges did take some photographs of elements of the site soon after they had been exposed (Hedges 1983, 1). In the case of the trenches excavated in 1978, there was a hiatus of two years before recording (Hedges

1983, xvii) and in 1982 further trenching was undertaken (ibid, 301). The two major publications on Isbister written by Hedges laud the quality of Simison’s excavations, and yet, although recording was by trained professional archaeologists used to Orcadian conditions, the entire site as reported in the formal monograph is described with just 16 contexts of limited stratigraphic value (ibid, table 1). Four contexts describe modern or unstratified deposits for example, two are from backfilling in antiquity and five are given to structural elements of the cairn.

Chesterman’s (1983) skeletal analysis provides detailed non-metric observations and metrical analysis of the bones, the probable high accuracy of which has been demonstrated (Bernal 2003). It contains, however, little description of any pathological lesions other than ‘osteoarthritis’ and ‘osteophytosis’. The few other described abnormalities occur almost entirely within the crania and, except dental disease, none relates to infection. The limb bones have a single case of osteochondritis dissecans and two (plus one inferred) fractures that form the entire catalogue of non-arthritis pathology. In his published report on the Quanterness remains, Chesterman explicitly states that there was no indication of infectious disease except dental (Chesterman 1979, 109), but no such observation was made for Isbister. This absence of evidence seems unlikely to reflect true prevalence in such a large population probably living in a settled community, reliant on intensive physical labour required both for agriculture and on the dangerous shoreline, and likely to be exposed to pathogens (Dockrill et al 1994; Roberts & Cox 2003, 55–74).

There are three potential explanations for the apparent lack of evidence of lesions:

- 1 There were no pathological lesions
- 2 Chesterman did not record evidence that actually exists
- 3 Evidence existed but was destroyed taphonomically.

In order to test the validity of the published pathological data from Isbister, a study of the assemblage was undertaken by the author in the summer of 2006. This is the first major direct study of the assemblage since Chesterman's original work almost 30 years ago. Other recent work has relied on the existing reports, but a new independent study has led to some unexpected observations.

## METHODS

The huge amount of human bones recovered from Isbister was studied in great detail by Chesterman (Davidson & Henshall 1989, 53).

All substantial skeletal elements from the collection of human bone from Isbister were

assigned unique reference numbers and examined macroscopically for evidence of pathology. In order to assess the condition of the assemblage and estimate potential loss of evidence, taphonomic indicators were also recorded: in particular, fragmentation; evidence of weathering, using the scoring system of Behrensmeyer (1978), adapted after Buikstra & Ubelaker (1994); and surface coatings and concretions, scored according to degree of surface cover (table 1; illus 1). Surface colour was recorded using a Munsell soil colour chart. Fragments were examined for erosion, abrasion, nature of fractures and gnaw marks.

The skeletal assemblage was recovered from a commingled deposit and so methods more commonly used in zooarchaeology – the calculation of 'minimum number of individuals'

TABLE 1  
Scoring of surface stains, varnishes and concretions

<i>Score</i>	<i>Description</i>	<i>Surface coating definition</i>	<i>Weathering definition</i>
0	None	No staining or concretion	Surface shows no signs of cracking or flaking
1	Slight	Pale staining or slight concretion might be present but is unlikely to obscure any feature	Longitudinal cracking of longbone shaft; mosaic cracking of articular surfaces
2	Moderate	Staining or concretion obscures limited parts of the surface but minor features will be clearly visible	Some flaking of outermost cortex, may be associated with cracks
3	Heavy	Staining or concretion obscures up to half the surface, obscuring minor features, but major features are likely to be visible in those areas	Surface has fibrous texture with patches of roughened bone where outer cortex has been lost (to a depth of 1.0–1.5mm); cracks have rounded edges
4	Very heavy	Staining or concretion obscures over half the surface, even major features may be missed	Roughened, coarsely fibrous surface with deep cracking and splintering of bone; typically friable
5	Severe	Staining or concretion covers nearly all the surface or all but extremely large features will be obscured	Bone coarsely splintering and clearly disintegrating, with cancellous bone exposed; fragile

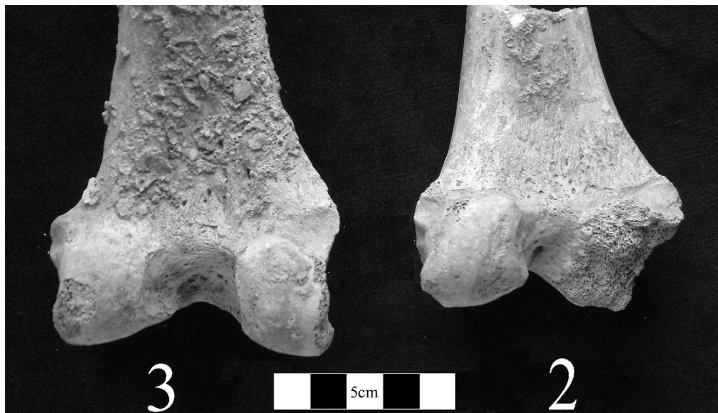
(MNI) – were necessarily employed by Chesterman as summarizing tools (Chesterman 1983). The present study recorded each bone fragment individually, using the zonation method of Knüsel & Outram (2004) to permit the calculation of prevalence rates. All observed lesions and measures of taphonomic expression were recorded in a computer database and on individual pro forma record sheets.

Chesterman's manuscript notes were examined to ensure that the complete assemblage was being used in the present study by comparing the numbers of fragments of each bone present. The two data sets were found to be in close agreement, although Chesterman had necessarily attempted to marry broken fragments together to estimate MNI, thus reducing his fragment numbers for some elements, an approach not attempted here.

## RESULTS

The quality of a report, of course, depends on the quality of the material and information supplied (Chesterman 1983, 75).

The condition of the fragments was remarkably consistent. The bones were very pale brown in colour (Munsell colour 10YR8/4) and had moderate marginal mechanical bone loss, although the surface was usually sound.



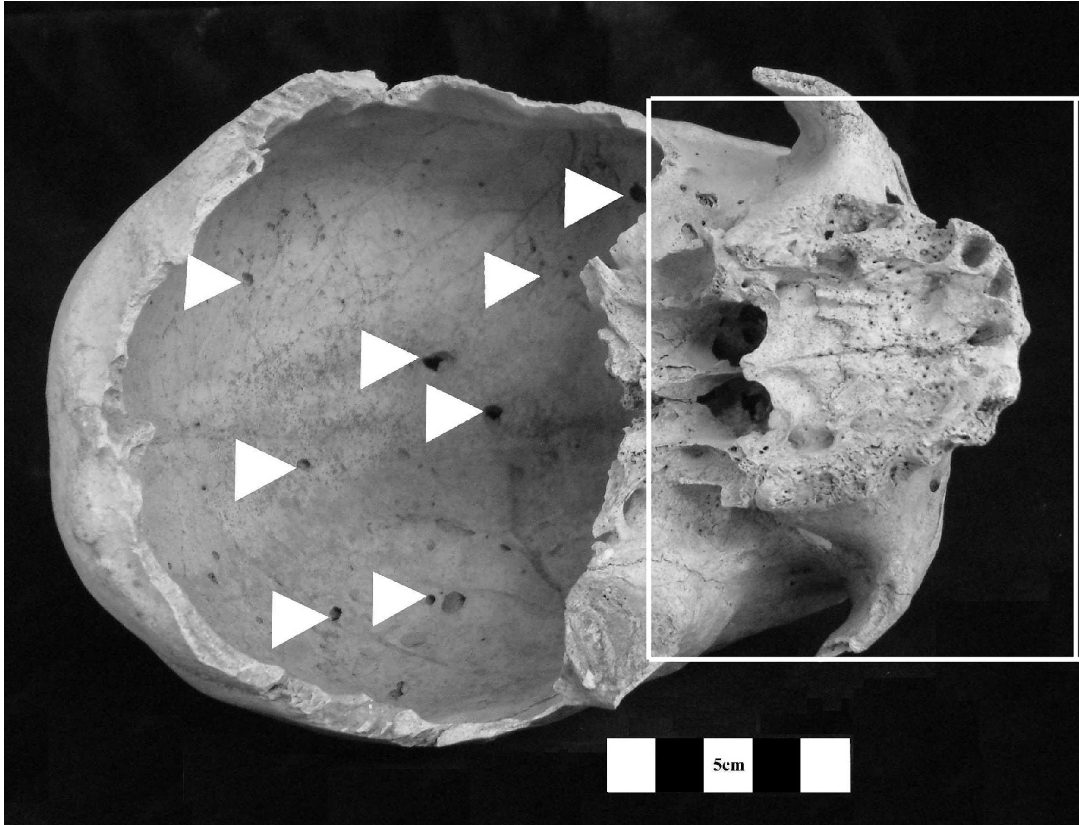
ILLUS 1 Examples of surface coating scores

Almost all elements examined displayed post-depositional fractures indicated by the roughness of the fracture surface; the breaks appear, from the lighter colour of the fracture surface, to be recent. Chesterman notes this in his study, and so it may be assumed that most of these fractures existed before his examination in 1978. At the original excavation it was reported that bone condition was good but that sightseers had broken some elements (Ritchie 1959).

There was frequent surface coating of a clear brown 'varnish' that might possibly be a decay product, and of frequent adherent mineral deposits and soil. The 'varnish' coating was evident on a number of the fracture surfaces. This suggests that either decay products fell onto broken bones in the tomb or that the coating became applied after excavation. Some groups of bones did not display significant adhering concretions and, on some of these, typical natural decay products and the frequently encountered pink staining of probable fungal origin (Dye et al 1995) were clearly evident. One fragment (an ulna) was found to display rodent gnaw marks, but these are of unknown date. Evidence of geochemical erosion was negligible.

Surface cracking and exfoliation of bone were rarely observed, as indicated in Table 2. Study of Chesterman's manuscript notes revealed that 23.6% of his identifications include a diagnosis of 'weathering' with one of the highest prevalences in the calcanei (43.6% of 156 bones). It is immediately apparent that this new study does not identify the same high degree of weathering as the published report. The severity of weathering recorded here is generally minor and appears in some instances to have occurred after the fragment had suffered varnish/concretion/staining. This limited existing weathering damage





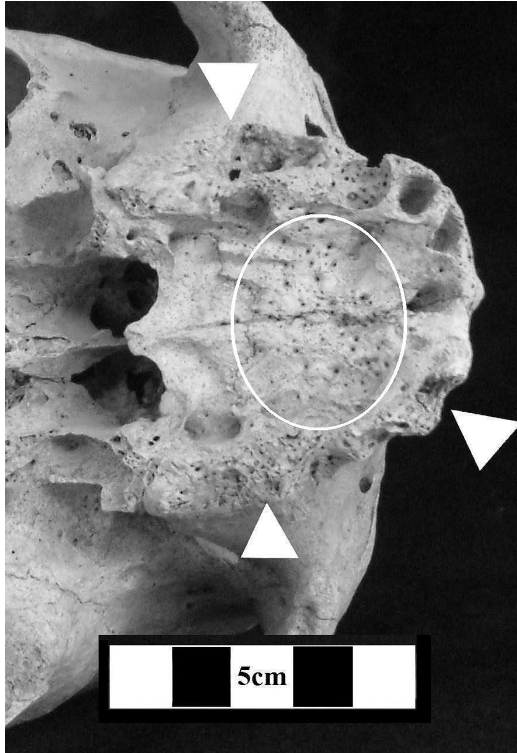
ILLUS 2 Cranium 1958, Showing lytic lesions from multiple myeloma. (boxed area indicates view in illus 3)

is therefore partly ascribed to post-excavation processes associated with poor early curation practices (Lorimer 2000), although some may be a true archaeological taphonomic artefact.

There was little apparent light bleaching, but this could possibly be explained by taphonomic coating obscuring the signs. It is also possible that the bleaching previously recorded was

TABLE 2  
Prevalence of taphonomic indicators

<i>Severity</i>		<i>Surface coatings (%)</i>	<i>Weathering (%)</i>
5	Severe	0.1	<0.1
4	Very heavy	3.3	<0.1
3	Heavy	12.7	0.6
2	Moderate	28.8	0.8
1	Slight	7.1	0.8
0	None	48	97.8



ILLUS 3 Maxillae and palatals from Cranium 1958, Showing palatal pitting and symptoms of periodontal disease associated with ante-mortem tooth loss

itself predominantly an artefact of the staining/ varnish coating, with the 'bleached' surfaces simply those unaffected. Both bleaching and weathering, where they did occur, were usually limited to a single end or surface of the bone.

It was found that several pathological conditions were frequently identifiable in the Isbister population, including neoplastic disease, trauma and genetic, inflammatory and nutritional disorders, all previously unrecorded (Lawrence 2006). Those conditions defined by deposition of woven bone or by bone porosity, in particular, had not been identified as such by Chesterman.

Some bones could be specifically identified with entries in Chesterman's manuscript notes, and three examples are presented here to illustrate a pattern of reinterpretation. One clear example is an adult cranium (no 1973), with

four healed depressed fractures to the calvarium (originally interpreted as post-depositional stone impressions), in which the palatals and maxillae displayed palatal pitting, periodontal disease and ante-mortem tooth loss. An initial description of sepsis present in the tooth sockets, new bone growth and abscesses (the joint opinion of Sheffield University's Professors L Henry and P Bramley regarding oral pathology) was entered in the manuscript but crossed through and was additionally marked:

*NOT* accepted as sepsis *later weathering*  
(Chesterman 1978, vol 2, 42–7, his emphasis).

A similar example is the case of Cranium 1958, which also displays lesions of periodontal disease and ante-mortem tooth loss, possibly associated with scurvy (illus 3), as well as numerous lytic lesions of multiple myeloma (illus 2). Chesterman noted the presence of the lytic lesions with the comment, 'These are erosion due to soil content *NOT* pathology' (his emphasis). Below that entry, the palatal pitting and periodontal disease are noted with an initial diagnosis of 'Palate roughened due to sepsis' but this has been crossed through and replaced with the word 'weathering' (Chesterman 1978, vol 1, 17).

An example of a different type of lesion, widespread in the population, is shown in illus 4. This is a clear example of both cribra orbitalia and superficial woven bone, probably indicating co-morbidity of the nutritional disorders iron-deficiency anaemia and scurvy. These were described by Chesterman as 'pitting orbital plate frontal due to weathering not pathological' (Chesterman 1978, vol 5, 61).

## DISCUSSION

It is quite clear that the bodies were excarnated (de-fleshed) before interment in the tomb (Chesterman 1983, 124).

Although there is damage to the Isbister bones, the assemblage has had several distinct non-

TABLE 3

Prevalence rate or cases recorded of selected pathological conditions (prevalences in some cases are difficult to calculate accurately, due to fragmentation)

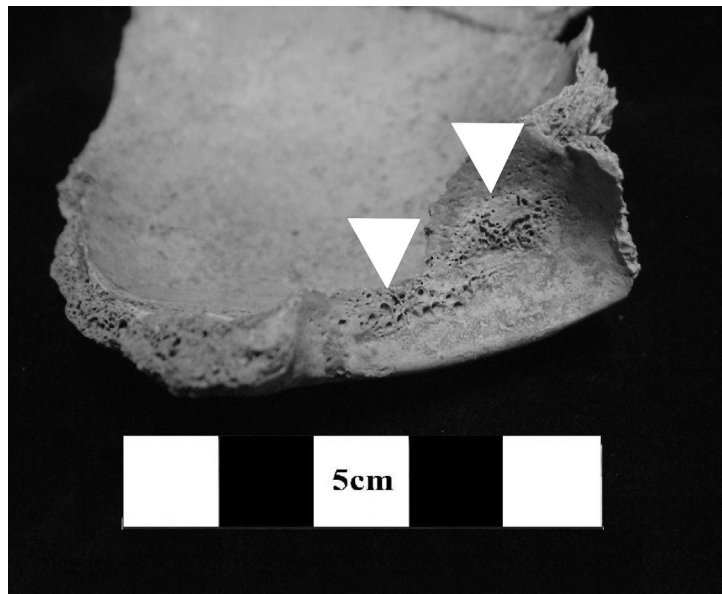
<i>Pathological condition</i>	<i>Estimated prevalence rate</i>
Cribrra orbitalia	48 cases (overall)
Cranial periostitis	5–22 cases, depending on bone
Antemortem maxillary tooth loss	21 adult cases
Palatal pitting	20 cases
Periodontal disease	33 cases in adult maxillae
Periostitis or pitting of calcaneus	34.1%
Long bone periostitis	16–31% according to bone

archaeological episodes that may have affected condition and composition. Excavation is likely to have resulted in preferential recovery of large fragments and loss of smaller bones. The initial storage in fish boxes and then later transport to Edinburgh, subsequently to Sheffield and then back to Orkney, may have led to exposure to chemical spillages and rodent activity as well as incidental mechanical damage.

Chesterman referred to bleaching of the Isbister bones (Chesterman 1983, 74), which he considered to be significant evidence of exposure practices (Chesterman 1979, 102). The usage of the term was undefined, only that such bones are not greasy, due to a physico-chemical process (Chesterman 1979, 102; 1983, 130). Loss of organic material is a normal decay process under most depositional conditions. Unusually pale colouration, possibly from sunlight-bleaching, was observed only very rarely in the assemblage in the re-examination. In virtually every case, the

colour loss was localized at one end or on a single surface of the bone. This suggests that the light was directional, without the bone being greatly disturbed from its location. Where the colour was paler, no greater signs of weathering or erosion were observed.

Chesterman particularly noted ‘weathering’ of bones (Chesterman 1983, 74), implying a



ILLUS 4 A frontal bone, showing both cribrra orbitalia (left) and superficial woven bone (right) present in the same orbit



specific aetiology. The new analysis found that a small number of bones were observed to have localized cracking or, even more rarely, exfoliation. In those cases where this was observed, the effects were limited to a small area or a single surface, showing that exposure to the causative factor occurred to just a part of the bone and with the bone in a stable position. Even this was infrequent, but features that do occur with similar prevalences to Chesterman's 'weathering' are the lytic and blastic pathological lesions apparent on the bones.

There was no discussion of surface erosion from plant-roots in the Isbister report. Linear erosion patterns would be expected to appear on bone surfaces if defleshed skeletons had been left on or near the ground surface and were sought in the present study but none were found on any of the Isbister bones. There was therefore no significant exposure to growing vegetation. More generalized geochemical erosion was also absent.

Chesterman considered that fracturing was a frequent intentional mortuary practice (Chesterman 1977; 1979, 102 and 107). Although the Isbister bones were almost all fractured, the fractures were the rough-surfaced transverse fractures typical of simple mechanical damage to dry bone that has lost much of its collagen. The pale colour of the fractured surfaces indicates relatively recent breakage. No signs of cut-marks were found on any bone that could be indicative of the intentional disarticulation of a cadaver.

There is some discussion of the absence of gnaw marks on the bones in the published report (Chesterman 1983, 74) but no consideration was made of what animals may have been present that might have produced such gnawing. The rat did not come to Orkney until the 13th century (Lever 1979, 83); the Orkney vole was probably introduced at some point during the Neolithic (Thaw et al 2004) but there is no evidence for its early presence on South Ronaldsay; dogs and pigs may have been present as part of the domestic assemblage – bones from both were

found in the cairn – but would as easily be kept from human remains in a cairn as on a raised platform or in a temporary grave, with less opportunity for mishaps.

Disparate numbers of skeletal elements are often used naïvely by excavators to infer skeletal manipulation. The apparent inconsistency of numbers recovered between skeletal elements is a feature common even today in excavated cemetery sites (eg Cox & Bell 1999). This cannot be used as evidence for losses during exhumations of the Isbister remains in the past. The cited differences in numbers between elements expected from complete skeletons and those recovered at Isbister (especially the low number of carpals and phalanges; Chesterman 1983, 124–8) almost certainly for most cases reflects differences of size, robusticity and ease of identification leading to different recovery rates. Where it may be more likely that elements have been removed from the assemblage in the past, as in the case of crania (accepting the existing published figures), there is no evidence for when this occurred: whether during initial use, at the time of backfilling or during the undated disturbance that was recognized. Crania enjoy an iconic status and may simply have been removed casually at some point or have been taken for an unknown function. This does not imply that different numbers were originally interred.

The published calculations of MNI, which were used to assess expected bone numbers, may in fact need revision. The highest count from any uniquely identifiable bone zone in this project was actually for cranial zone 6 (the left temporal: 85 identified). This would seem to contradict the reported underrepresentation of crania. Many zone counts were around 80: the number of left side calcanei recorded in this study was 75, for example, and this is a fairly large, readily identifiable and robust bone, expected to have a high recovery rate; the number of left tali is comparable, at 77. It seems that the existing MNI calculations (Chesterman 1983, 77–96) are based on the sum of the MNI from each area of the chamber, despite Chesterman's own

recognition that elements from any individual could be scattered throughout (Chesterman 1983, 128). The overall MNI published for the site is therefore greatly inflated and, pending further analysis, previously published data should be used with great caution. There is no compelling evidence for the intentional systematic removal of any particular elements.

No mention was made anywhere in the published report of the glossy organic coating that appears on many of the Isbister bones, although mention is made of staining in Chesterman's original notes. It was initially thought by the author that this might have resulted from an accidental spillage of varnish during the period when the bones were stored in open fish boxes, because it did not appear to occur on the bones recovered by RCAHMS in 1958 but does occur on even the broken ends of some bones. Further examination shows that the coating is exceptionally common to be the result of such an accident and is evenly distributed over many surfaces. Mrs Freda Norquay of the Tomb of the Eagles visitor centre was unaware, when asked, of any occasion on which the bones from Isbister might have become varnished. It must be considered unlikely, though perhaps not impossible, that such a coating will have accumulated naturally. If this coating is a natural decay product, then its appearance on broken ends of long-dry bones must indicate that the decay process occurred with fresh bone present above defleshed bone. This is most likely to occur if bodies were inhumed in the cairn long after earlier inhumations had decayed and bones broken; and in the absence of cut-marks, those bodies must probably have been intact.

Although there was limited 'weathering' and colour loss evident in the assemblage, there was far too little to indicate any general or substantial exposure to the elements such as that envisaged in the published report. A clue to one possible factor is found by careful reading of the report and examination of such illustrations that are presented. Mr Simison was not the first person to dig into the cairn. At some point, probably in

the Late Neolithic/Early Bronze Age, the cairn was opened from above, its entrance blocked and the chambers backfilled. At an unknown time between this and 1958, there was an excavation into the chamber that was again backfilled: this was recognized early on in the modern excavations (Hedges 1983, 18) but the limits of disturbance were not recorded. Apart from such light and water as reached the inside of the cairn while it was in use, there were thus at least two distinct periods of unknown duration when exposure might have occurred as well as during excavation and subsequent storage. Any exposure during these periods is likely to have occurred with the bones in a stable location and exposure over a limited area in a manner consonant with the observations.

An existing photograph (Ritchie 1995, 55, fig 39) clearly shows a cranium, vertebral column and possibly ossa coxae of a single individual all in anatomically correct and articulated position. At least one individual therefore was probably interred as a complete body but Hedges (1983, 1), who presumably took the photograph, does not appear to have recognized this.

## CONCLUSIONS

Observations on the condition of the bones at Isbister and Quanterness rest on the judgement and subtle arguments of one anatomist (Davidson & Henshall 1989, 54).

It is often repeated, following the published descriptions of the site, that there were no articulated human bones at Isbister (eg Davidson & Henshall 1989, 53; Baxter 2001, 122) but this is inaccurate, as existing photographs show (eg Ritchie 1995, fig 39). There is therefore reason to suggest that other observations made during excavation and without supporting evidence may be spurious. Similarity with observations on skeletal deposition from other sites throughout Britain therefore appears probable.

Lack of caution in calculating MNI has led to an inflated population estimate and will have

affected Hedges' groundbreaking demographic studies (Hedges 1982; 1983, 273–83; 1984). This aspect of the assemblage will require further analysis, including age and sex attribution.

It is apparent from notes found with the remains and from Chesterman's notebooks that Chesterman had seen many of the lesions identified as pathological in the present study. He noted the presence of the lytic lesions in Cranium 1958 and the orbital porosity of Cranium 2638 but considered both to be taphonomic results from 'soil erosion' and definitely not pathological. Chesterman was clearly more prepared to ascribe a taphonomic than pathological origin to lesions he did not expect to encounter but failed to properly comprehend taphonomic destruction. His overtly conservative attitude is displayed in a marginal note explaining the diagnosis (of Bone 1973) in his manuscript 'common things are common, rare things are rare!' (Chesterman 1978, vol 2, 41). Almost a quarter of recorded bones were described as 'weathered', an interpretation that now appears to be a systematic misinterpretation of pathological symptoms including bone surface porosity, woven bone deposition and ante-mortem tooth loss. This has previously been noted for Chesterman's records of Ascott-under-Wychwood (Baxter 2001, 187) and so a reassessment of the Quanterness assemblage must be considered imperative.

The lack of colour-fading, low scores for weathering (Table 1) and absence of root erosion support an argument against there being any substantive evidence for excarnation outside the tomb before inhumation. Barber's (1997, 68–9) interpretation of burial practice at Point of Cott is a more convincing model based on the evidence examined so far and matches closely the evidence from other British sites.

Study of Neolithic mortuary practice has suffered through the widespread acceptance of some terms as having meanings beyond their proper definition. 'Rite' is one example: with use of the term 'burial rite' almost every

activity associated with a chambered cairn, and especially with human remains, becomes endowed with a significance that it may not actually have possessed. Similarly, Chesterman's and Hedges' use of 'excarnation' has come to imply an act occurring prior to deposition of bones in a chambered cairn, although it simply describes removal or loss of flesh. Such loss may, and apparently in Neolithic Orkney usually did, occur within a tomb and it may be that Graham Ritchie's comment on Hedges' 'Tomb of the Eagles' is more appropriate to the skeletal inferences than he realized: '*haute vulgarisation* at its best, coupled with archaeological sci-fi' (Ritchie 1985).

## ACKNOWLEDGEMENTS

The author would like to thank Anne Brundle (Orkney Museum), Theya Molleson (Natural History Museum) and the late Daphne Home Lorimer for suggesting and encouraging his analysis of the Isbister assemblage; the Trustees of Orkney Museum, for access to the assemblage; the staff of the Biological Anthropology Research Centre, Department of Archaeology, University of Bradford for their support during this project, especially Christopher Knüsel, whose advice was particularly valued; Freda Norquay and Kathleen MacLeod, of the Tomb of the Eagles Visitor Centre, for their friendly reception and discussions on my visit; and Caz Mamwell, of Orkney Archaeology Tours, for her support. Comments from anonymous referees were gratefully received and subsequent changes have been incorporated in this paper. All errors remain, of course, the author's.

## REFERENCES

- Ashbee, P 1966 'The Fussell's Lodge long barrow excavations 1957', *Archaeologia* 100, 1–80.
- Ashbee, P 1984 *The Earthen Long Barrow in Britain*, 2nd edn. Cambridge, Cambridge University Press.
- Baxter, M I 2001 *Human Remains from the British Neolithic: A Taphonomic Perspective*. Unpublished PhD thesis, University of Cambridge.

- Barber, J 1997 *The Excavation of a Stalled Cairn at the Point of Cott, Westray, Orkney*. Edinburgh, Scottish Trust for Archaeological Research.
- Beckett, J & Robb, J 2006 'Neolithic burial taphonomy, ritual and interpretation in Britain and Ireland: a review', in Gowland, R & Knüsel, C J (eds) *The Social Archaeology of Funerary Remains*, 57–80. Oxford, Oxbow.
- Behrensmeyer, A K 1978 'Taphonomic and ecologic information from bone weathering', *Palaeobiology* 4, 150–62.
- Benson, D G & Clegg, I N I 1978 'Cotswold burial rites', *Man* 13, 134–7.
- Benson, D & Whittle, A (eds) 2006 *Building Memories: The Neolithic Cotswold Long Barrow at Ascott-under-Wychwood*, Oxfordshire. Oxford, Oxbow.
- Bernal, J 2003. *Measuring Variation in the Neolithic Human Bones from the Orkney Islands*. Unpublished MA dissertation, University of Southampton.
- Buikstra, J E & Ubelaker, D H (eds) 1994 *Standards for Data Collection from Human Skeletal Remains*. Fayetteville, Arkansas Archaeological Survey Research Series No 44.
- Callander, J G & Grant, W G 1934 'A long stalled chambered cairn or mausoleum (Rousay Type) near Midhowe, Rousay, Orkney', *Proc Soc Antiq Scot* 68, 320–50.
- Chesterman, J T 1977 'Burial rites in a Cotswold long barrow', *Man* 12, 22–32.
- Chesterman, J T 1978 'Manuscript notes on human skeletal remains from excavations at Isbister 1958 and 1976', 6 volumes. Orkney Museum Collections.
- Chesterman, J T 1979 'Investigation of the human bones from Quanterness', in Renfrew, C (ed) *Investigations in Orkney*, 97–111. London, Society of Antiquaries.
- Chesterman, J T 1983 'The human remains', in Hedges, J W *Isbister: a Chambered Tomb in Orkney*, 73–132. Oxford (=Br Archaeol Rep, Br Ser 115).
- Cox, M & Bell, L 1999 'Recovery of human skeletal elements from a recent UK murder inquiry: preservational signatures', *J Forensic Sci* 44, 945–50.
- Davidson, J L & Henshall, A S 1989 *The Chambered Cairns of Orkney*. Edinburgh, Edinburgh University Press.
- Dockrill, S J, Bond, J M, Milles, A, Simpson, I & Ambers, J 1994 'Tofts Ness, Sanday, Orkney: an integrated study of a buried Orcadian landscape', in Luff, R & Rowley-Conwy, P (eds) *Whither Environmental Archaeology*, 115–32. Oxford (=Oxbow monogr 38).
- Dye, T J, Lucy, D & Pollard, A M 1995 'The occurrence and implications of post-mortem "Pink Teeth" in forensic and archaeological cases', *Intl J Osteoarchaeol* 5, 339–48.
- Grinsell, L V 1936 *The Ancient Burial Mounds of England*. London, Methuen.
- Hedges, J W 1983 *Isbister: a Chambered Tomb in Orkney*. Oxford (=Br Archaeol Rep, Br Ser 115).
- Hedges, J W 1984 *Tomb of the Eagles: a Window on Stone Age Tribal Britain*. London, J Murray.
- Henshall, A S 2004 'Scottish passage-graves: some confusions and conclusions', in Gibson, A & Sheridan, A (eds) *From Sickles to Circles: Britain and Ireland at the Time of Stonehenge*, 78–91. Stroud, Tempus.
- Hoare, R C 1829 'An account of a stone barrow, in the Parish of Wellow, at Stoney Littleton in the County of Somerset, which was opened and investigated in the month of May 1816', *Archaeologia* 19, 43–8.
- Knüsel, C & Outram, A 2004 'Fragmentation: the zonation method applied to fragmented human remains from archaeological and forensic contexts', *Environmental Archaeol* 9, 85–97.
- Lawrence, D 2006 *A Healthy Outdoor Life? Evidence for Disease, Trauma, Habit and Stress in the Orcadian Neolithic*. Unpublished MSc Dissertation, University of Bradford.
- Lever, C 1979 *The Naturalised Animals of the British Isles*. St Albans, Granada.
- Lorimer, D H 2000 'The tale of the tea chests – an Isbister saga', *BABAO Annual Review* 1, 7–8.
- Renfrew, C (ed) 1979 *Investigations in Orkney*. London, Society of Antiquaries.
- Renfrew, C, Stenhouse, M J & Switsur, R 1983 'The radiocarbon determinations', in Hedges, J W 1983, 61–71.
- Ritchie, A 1995 *Prehistoric Orkney*. London, Batsford.
- Ritchie, G 1985 'John W Hedges: Tomb of the Eagles: a window on stone age tribal Britain', *Antiquity* 59, 140–1.
- Ritchie, P R 1959 'A chambered cairn at Isbister, South Ronaldshay, Orkney', *Proc Soc Antiq Scot* 92, 25–32.

- Roberts, C & Cox, M 2003 *Health and Disease in Britain: From Prehistory to the Present Day*. Stroud, Sutton.
- Saville, A (ed) 1990 *Hazleton North, Gloucestershire, 1979–82: The Excavation of a Neolithic Long Cairn of the Cotswold-Severn Group*. London, Historic Buildings and Monuments Commission for England, English Heritage Archaeological Report 13.
- Smith, B 1989 'Isbister, an Orkney Islands Council Guardianship Monument', *Proc Soc Antiq Scot* 119, 55–8.
- Smith, M 2005 *Picking up the Pieces: an Investigation of Cotswold–Severn Funerary Practices via Re-analysis of Human Skeletal Material from Selected Monuments*. Unpublished PhD thesis, University of Birmingham.
- Stoddart, S, Wysocki, M & Burgess, G 1999 'The articulation of disarticulation: preliminary thoughts on the Brochtorff Circle at Xaghra (Gozo)', in Downes, J & Pollard, T (eds) *The Loved Body's Corruption*, 94–105. Glasgow, Cruithne Press.
- Thaw, S, Jaarola, M, Searle, J B & Dobney, K 2004 'The origin of the Orkney vole *Microtus arvalis orcadensis*: a proxy for reconstructing human movements', in Housley, R A & Coles, G (eds) *Atlantic Connections and Adaptations: Economies, Environments and Subsistence in Lands Bordering the North Atlantic*, 114–19. Symposia of the Association for Environmental Archaeology No. 21. Oxford, Oxbow.
- Thurnam, J 1869 'On ancient British barrows, especially those of Wiltshire and the adjoining counties', *Archaeologia* 42, 161–244.
- Wysocki, M & Whittle, A 2000 'Diversity, lifestyle and rites: new biological and archaeological evidence from British Earlier Neolithic mortuary assemblages', *Antiquity* 74, 591–601.