

## Lecture Summaries

### The discovery of a Norse horizontal mill at Orphir, Orkney

Colleen Batey

The site known as the Earl's Bu at Orphir in Orkney, lies on the north side of Scapa Flow and includes the remains of the Round Church and adjacent Norse 'Hall', so often equated with the references in the *Orkneyinga Saga* for the year 1135 (Pálsson & Edwards 1978, ch 66, 113). The church itself is fragmentary, having been partially removed during the building of the later Parish Church immediately to its west, and itself subsequently re-sited. The other visible structural remains, uncovered in the 1930s, are an amalgam of several different structural phases, probably predominantly of the Late Norse period – but not necessarily the remains of the 'Hall' of Earls Paul and Harald.

In 1978, the farmer, Mr Stephenson, drew our attention to a feature he had uncovered some years previously during the digging of the foundations for a new barn. This barn was re-sited to the west and the remains of a drystone 'tunnel-like' feature remained undisturbed. Initial investigation revealed a series of slab lintel-stones and a clay capping to the passage. Small-scale investigation followed intermittently, as funding allowed, in subsequent years, and it was considered most likely that the feature was part of a souterrain, very similar in form to that discovered at Rennibister or Grain in Orkney (Ritchie & Ritchie 1988, 49–51). This was the preferred interpretation until 1988.

Dense banks of rich organic debris covered the stone lintels beyond the 1978 exposure. Dated by artefactual inclusions to the Late Norse period, this is likely to be the first stratified artefactual and ecofactual material to be recovered from the Earl's Bu lying only some 10 m to the south. This dumping became more pronounced as the length of the passage was revealed and, some 10 m west of our starting point, it led into a chamber which was itself filled with similar material – mammal and fish bone, whale, seal as well as cat and dog bones, burnt oats and barley seeds as well as artefactual pieces. Extensive sampling and on-site processing of this material has provided us with an unparalleled wealth of information on the economic and dietary base of this Late Norse complex. A preliminary discussion of this material is now available (Batey 1992).

The identification of a chamber and realization that the passage was continuing beyond the chamber to the west, began to cause concern. Perhaps the features revealed could be the underhouse and tailrace of a horizontal mill? The work undertaken by Matthew Edgeworth and Paul Johnson to persuade me that this different function could be suggested is most gratefully acknowledged. Succeeding seasons of work have confirmed this: possible fragments of the upperhouse, headrace and stone-lined chute, as well as a fragment of a quern stone have now been identified. Additionally, a possible sump, covered by a substantial stone slab, was identified adjacent to the inflow of the lade or headrace, as well as several small pivot stones which could have acted as bearing stones (discussed in Batey forthcoming). Beyond the limit of the excavation, geophysical work has supplemented the picture: traces of

a water channel have been found from a more recent mill dam which had fed two phases of vertical mill to the north of the Norse example.

This stone mill, which is infilled with Late Norse material, has now been shown to lie on top of material which is also Scandinavian in character. A relatively brief lifespan would seem to be indicated within the Norse period, and clearly this was part of the complex of the Earl's Bu. To date, a single fragmentary timber example is all that can be cited as a Norse parallel (from Omgard in Denmark, dated dendrochronologically to the 10th century), although several other earlier examples of wood have been noted from Ireland. The type of mill continued long into this century, and the many to be seen in the Shetland landscape can testify to this. In Orkney, the more gentle landscape may have militated against the type being so common, but the Click Mill at Dounby in Orkney provides an excellent modern parallel and helps us interpret the surviving elements. It is planned that this mill will be laid out for public display as part of the Earl's Bu complex.

## REFERENCES

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## Britain and the Mediterranean in Late Antiquity

Michael Fulford

This lecture was particularly concerned with the changing character of long-distance trade contacts between Britain and the Mediterranean, with special reference to the late Antique/early Medieval period. Imported goods from the Mediterranean – ranging from luxury silverware, glass, and miscellaneous metalwork, through wine, olive oil and other foodstuffs (and the containers which carried them) to ordinary domestic pottery – are not uncommon in the late Iron Age and early Roman period in Britain. In the mid and later Roman period such goods appear less frequently, although there is the possibility of increased contact in the fourth century. Although these imports may in some measure have arrived on boats navigating through the Straits of Gibraltar and up the Atlantic coast of Gaul, it is more likely that most of the trade travelled overland by a variety of routes: some ultimately via the Garonne and Bordeaux, some by the Loire, and the rest via the Channel ports or the Rhine delta. Apart from the direct trade, the economic context for the traffic which delivered these goods probably lay between Britain and Gaul. There is little evidence for British goods and commodities percolating in exchange through Gaul to the Mediterranean.

This puts into perspective one of the most distinctive elements of the material culture of western Britain and Ireland in the late fifth and sixth century – imported amphorae and tableware from the east Mediterranean. In contrast, Anglo-Saxon England has produced evidence only of more luxurious goods – silverware, cowrie shells, amethysts, etc. Recent

study of the western material suggests that the ships concerned set out from east Mediterranean ports with the deliberate intention of reaching the British Isles. The pottery evidence suggests that this direct trade continued for at least half a century from the end of the fifth century, but other evidence reviewed in the lecture suggests that it may have lasted for a while longer. The significance of this traffic and what was sought from Britain has aroused considerable discussion in the past. The purpose of this lecture was to re-examine its context, from both British and Mediterranean perspectives. While the origins of the traffic may lie in the relationship between late Roman Britain and the prefecture of the western empire, the eventual demise may be related to the disintegration of the Byzantine empire in the Mediterranean and of British society in the face of the advancing Anglo-Saxons. Environmental factors may also have played a part.

## Scottish prehistoric ‘jet’ jewellery: some new work

Mary Davis & Alison Sheridan

The use of jet and similar-looking materials has a long history, stretching back to the early fourth millennium BC in Britain. Best known for its use as a symbol of mourning in Victorian times, jet has been accorded a special status at many periods in the past, for various reasons. Its rarity and aesthetic appeal have led to its use as a prestige commodity, and its unusual characteristics (which include its electrostatic property and the ability to burn) have engendered a widespread and persistent belief in its magical and medicinal powers. Pliny the Elder, for instance, claimed that jet was able to cure ‘suffocation of the uterus’, toothache and scrofulous tumours and, when burned, to drive away snakes.

The use of substitute materials has an equally long history, and the similarity in appearance between the various substances has led to a great deal of confusion and misidentification in the past. The role and importance of Whitby – the only significant source of jet in Britain – during the prehistoric period has been a matter of debate, with some arguing that it was an important centre of specialist artefact manufacture, exporting far and wide, and others claiming that most of the so-called ‘jet’ artefacts found away from Whitby are of local substitute materials.

In order to resolve this conflict of opinion, the authors have established a research project with Paul Wilthew of the NMS, featuring the use of non-destructive techniques to identify and (as far as possible) source the raw materials used for Scotland’s pre-Iron Age ‘jet’ artefacts. So far, 23 Neolithic, 62 Early Bronze Age, two Middle Bronze Age and three Late Bronze Age artefacts have been analysed, together with 26 post-Bronze Age items (for comparative purposes) and a selection of raw material samples.

The artefacts are items of personal adornment. Initial use, during the Neolithic, was small-scale and restricted almost exclusively to the production of large beads (and/or necklaces thereof) c 3800–3300 BC, and belt sliders c 3400–3100 BC. The popularity of jet and jet-like jewellery increased markedly during the Early Bronze Age (c 2400–1700 BC), with the manufacture of three types of necklace (namely the disc bead, disc-and-fusiform bead, and spacer-plate – the latter sometimes accompanied by matching bracelets) and the adoption of some European-inspired accessories (V-perforated buttons, ‘pulley belt rings’). One disc-and-fusiform bead belt is also known. Thereafter, interest in ‘jet’ declined, and only a handful of Middle and Late Bronze Age finds (comprising various types of bead, and armllets) are known.

The research project began with an assessment of the range of materials which could have been used. Fieldwork established that the four sources of true jet in Scotland are most unlikely to have been used (a conclusion supported by the subsequent analytical work), and examination of raw material samples and geological accounts enable other candidates (eg cloustone) to be ruled out. Cannel coal, lignite and shale emerged as the most likely candidates, alongside Whitby jet. Cannel coal and shale are widely available in Scotland, with the former occurring in all the major coal-bearing deposits; sources of lignite are more restricted, the principal outcrops being in Skye, Rum, Canna, Mull and the Morvern and Ardnamurchan peninsulas.

These materials are all derived – to varying degrees and by different processes – from organic matter. Jet is the compressed and semi-fossilized remains of the monkey puzzle tree, whilst lignite consists of less compressed plant matter, and cannel coal was formed from a mixture of plant remains (including pollen and spores), algae, and inorganic mud. Shales have a lower – and more variable – organic content than the other materials.

*Differentiating between these materials can be problematic: reliable yet destructive methods (such as petrological thin-sectioning) cannot be used on archaeological specimens, whilst some non-destructive techniques (such as observation of colour and surface texture) are less than foolproof, although useful if employed in conjunction with other techniques. X-ray fluorescence analysis of chemical composition proved to be the most valuable technique, and is being used in conjunction with macro- and microscopic examination, X-raying and some scanning electron microscopy.*

*The results reveal that a reasonable degree of discrimination between the various materials can be achieved, although there is some compositional and textural overlap between jet and lignite, and between some cannel coals and shales. Whitby jet, although heterogeneous in composition, is distinguishable from the Scottish jets. Cannel coal is also heterogeneous, and, given its abundance, the chances of pinpointing a source for a particular artefact seem fairly low. The same may be assumed for shales.*

The artefactual results show that Whitby jet was indeed being exported to Scotland from as early as the Neolithic period (as shown by the necklace from Greenbrae, Aberdeenshire), and that local substitute materials were also being used at the same period. A similar, but more complex, picture is emerging for the Early Bronze Age. A flourishing specialist Whitby jet industry evidently did exist, exporting all types of artefact to Scotland. Local non-jet materials (namely cannel coal, canneloid shale and lignite) were also being used, not only to provide replacement parts for broken spacer-plate necklace components, but also to make entirely new necklaces and other items. Indeed, most of the disc bead necklaces so far examined are of cannel coal; only one – from Cloburn, Lanarkshire – is of Whitby jet. Shale is represented amongst the analysed artefacts in the disc bead necklace from Taversoe Tuick, Orkney; another shale disc bead necklace (albeit unfinished) is known from Dunrobin Castle Park, Sutherland. Only five Middle and Late Bronze Age artefacts have so far been analysed; and although it is suspected that Whitby jet continued to be exported, the results so far (on armlets) reveal the continuing use of local materials.

The project continues apace, and is providing a wealth of new information – particularly about spacer-plate necklaces. It is planned to publish the results in the form of a *corpus*, fully illustrated by Helen Jackson.

## Medieval embroiderers

Kay Staniland

The British Museum Press conceived their recent series on medieval craftsmen as one which would centre upon the highly skilled but usually anonymous band of workers responsible for creating some of the most impressive artefacts of medieval Europe.

While none of the authors would claim that their particular group of craftsmen was well documented, it is a fact that the producers of surviving embroideries are, with only a handful of exceptions, wholly anonymous. Some are clearly the work of skilled amateurs and others the product of convents. A large proportion, however, are the much-admired ecclesiastical embroideries generally known as *opus anglicanum* in which fine silk split stitch and gold thread underside couching are much-used distinctive techniques.

These embroideries have attracted the attention of art historians, intrigued by their close affinity with English manuscript illumination; however, tantalisingly little can now be discerned about links between these two groups of craftsmen. In Italy the writings of the painter Cennino Cennini, coupled with surviving contracts between artists and their patrons, offer more substantial proof of the involvement in embroidery design of artists of the highest calibre. Entries in the English and French Royal Wardrobe accounts reveal the way in which local artists, usually working in the armourers' workshops, drew up designs for their fellow embroiderers.

Admiration for this English embroidery was widespread in Europe and examples found their way into many ecclesiastical treasuries. Already in 1295 the Vatican owned 113 examples of *opus anglicanum*, accumulated as the result of direct patronage or as diplomatic gifts. The 13th-century chronicler Matthew Paris noted the lustful admiration of Pope Innocent IV (1243–54) 'allured by the desire of the eye . . . for these embroideries which he preferred above all others', despite the production of skilled and sophisticated embroideries in Italy. The marketing of these powerful symbols of status was already in the hands of merchants who, Paris continued, 'sold them at their own price'. It is likely that these merchants commissioned the embroideries, bearing the expense of materials and labour until buyers appeared.

The techniques used for ecclesiastical embroideries indicate that they were probably created in small (domestic) workshops over an extended period of time by a small group of embroiderers. The opposite was true of workshops for royal embroidery where speed of execution was essential and dictated the use of less time-consuming techniques; equally impressive results, however, were still required. Here mixed teams of artists, embroiderers, goldworkers, tailors and sempstresses were brought together to create magnificently ornate garments, horse equipment, and bed and room hangings for the king, his family and friends. These were mainly for martial and ceremonial use and could still occupy a sizeable team for several months.

Court embroideries made much use of repeating motifs which could be worked separately and then assembled on a common ground. Coloured grounds and contrasting motifs formed instant heraldic bearings which could be embellished with gold embroidery, with stamped gold motifs, or with semi-precious stones such as pearls.

## Field survey and excavation at Dunbeath, Caithness

Alex Morrison

The village and strath of Dunbeath are situated in the parish of Latheron in south-east Caithness, bordering with the parish of Kildonan in Sutherland. The first systematic record of prehistoric and historical sites in the area was the work of Alexander Curle in 1910, which appeared as the Royal Commission's Caithness *Inventory* in 1911. He listed 36 sites in the area of the present Dunbeath Estate and this figure was greatly increased over the succeeding years by the archaeological field workers of the Ordnance Survey. Other than these surveys, the only archaeological activity was the excavation of Dun Beath broch by the landowner in 1866, but he left no plans or details.

The Dunbeath Estate has been owned by Mr R Stanton Avery, of Pasadena, California, since 1977. Mr Avery set up the Dunbeath Preservation Trust, which initiated the field survey of the Estate. This has involved students and staff of the Archaeology Department of the University of Glasgow in the discovery and recording of archaeological and historical remains in the region. Known sites have been checked and planned and many new sites have been discovered, particularly in areas which have not been regarded as suitable for agriculture or settlement in recent times. It has also been important to note the deterioration in the condition of some of the remains in the relatively short time since they were first systematically recorded and described by the Royal Commission in 1910/11. Some of this deterioration is undoubtedly due to natural processes of weathering and subsidence, but grazing animals and the hand of man seeking materials for making roads, dykes and other structures are responsible to an even greater extent.

Remains on the ground represent practically every period since the earliest farming groups. The earliest structures that survive best in the landscape, from the very nature of their massive construction, are the chambered cairns. The Dunbeath cairns form one of four main groups in the Caithness region. There are eight reasonably certain surviving chambers or chambered cairns and a few possible sites, but most of the surviving cairns are greatly reduced or wrecked. Other cairns were listed in the area covered by the survey, and some may cover burials, but there is no indication from surface remains that they are chambered. Others may yet lie undiscovered under the deepest peat cover, particularly farther to the west towards the possible buried landscapes of the 'flow country'.

A much wider range of field monuments, both physically and chronologically, is represented by the turf-covered hut-circle foundations scattered singly and in concentrations along the valleys of the Houstry Burn and Dunbeath Water, in some cases with associated traces of possible turf-covered field walls. These round house remains have been classified according to structure, form and size. Recent classifications have produced many shapes, reduced by one writer to two basic types: the single-walled hut and the double-walled hut, with the former type being most common. The Dunbeath examples follow this trend, with some 'tangential' and 'integral' forms.

There are nine broch and possible broch sites in the Dunbeath area. Many Caithness brochs have been recorded simply as 'broch mounds' and only excavation will reveal the true nature of the buried structures. Some of the Dunbeath 'brochs' have this form and must therefore remain doubtful until excavation is possible. At Tiantulloch ('the house by the mound'), for example, much of the building material for the more recent juxtaposed deserted

settlement has been derived from the broch mound. As mentioned earlier, the only site which has been excavated in the area is the Dun Beath broch, the best surviving example in the district.

Galleried structures, some locally termed 'wags', are numerous in the Dunbeath region, the 'classic' form having roofing slabs supported on stone pillars. This type of structure, whether or not it can be regarded as a unified class, appears to have its greatest concentration in the parish of Latheron. Only two such galleried structures have so far been excavated, at Langwell to the south of Dunbeath and at Forse to the north, both by Alexander Curle. Not all the remains recorded in the Dunbeath area have obvious traces of the upright supporting pillars and these 'wag' sites may represent a variety of structures and functions. At the moment they appear to defy generalization and there can be no simple interpretation based on the evidence from only two partial excavations. Until their natures and relationships with other forms of settlement and with the brochs (and perhaps the functions and varieties of the brochs and 'broch mounds' themselves) are better known by further research and excavation, it would be wrong to draw too detailed conclusions from the evidence of unexcavated field monuments.

There is little unequivocal field evidence for the first millennium AD, and much of the medieval period is better known from documentary evidence. Some Dunbeath place-names are recorded on the maps of Timothy Pont, and charters and other documents from the late 16th century onwards record the names of Dunbeath lands in increasing numbers. Some of these may have been the actual townships (they are sometimes listed as *villas et terras*) but it cannot be assumed that they were all settlement names. It would be difficult to say with certainty that any of the field remains recorded belong to these earlier periods, but many of the traces of field systems and almost-buried field walls must be older than the nearby drystone ruins and therefore represent possible survivals from pre-18th-century occupation.

By far the largest class of remains recorded during the survey were the ruins of the former farm townships, their fields and boundaries, some traces perhaps dating from the mid 18th century. The Military Survey (Roy's Map) is the first map to show these settlement clusters and names with some degree of accuracy, although there are obvious omissions. Some of the settlements of the Dunbeath region were mapped and there are surviving remains at many of the sites. At one location ('Halmie' on Roy's Map) there are remains of a settlement cluster with its various buildings and enclosures. It was listed as 'Almens' in 1789 and as 'Almins' in the first decade of the 19th century; by the later 19th century it was shown as a ruin on the first Ordnance Survey maps and the name had gone out of use. The settlement's origins are as early as the first half of the 18th century and probably earlier. Within and around the edges of this settlement are scattered a number of structures, including what might be hut-circle foundations, mounds and cairns. These are indications of an even earlier occupation of the site and of the possible use of the same arable area.

In an attempt to discover just how far back these structures would date, and with a hopeful thought for the past few hundred years, a site was selected for investigation. It had been described in our original survey as a heather-covered circular bank, approximately 12 m in diameter, enclosing an apparently U-shaped arc of large sandstone orthostats which appeared to delineate the inner edge of a hut or chamber. As excavation proceeded it became obvious that the U-shaped setting of massive stones was more circular in form and was surrounded and partly covered by the remains of a large stone cairn at least 16 m in diameter. A section through the edge of the cairn showed a complex of supporting kerbs or revetments, one quite massive. In the spaces between these lines of stones were quantities of redeposited

earth with silts and clays and some traces of charcoal, apparently used as packing material between the stones. Underlying this again was a clay layer with many traces of charcoal and burning, resembling an occupation deposit.

The circular form of the layout of large stones in the centre and the remains of the covering cairn suggested for a time the possibility that this was some type of small passage grave or burial cairn but, as the level of the broken, slabby stones filling the 'chamber' was lowered, it was realised that the bases of the orthostats were actually lying slightly higher than the floor of the chamber and did not continue down into the underlying ground surface. No trace of human remains has so far been recovered. Quartz and flint working debris and many very small sherds of undecorated pottery have been recovered, scattered all over and among a spread of small stones on the south western edge of the cairn. Generalizing, the sherds resemble the undistinguished pot forms of the later second and early first millennium BC. A segment of jet or lignite armband has been recovered, sealed under the broken slabs that filled the 'chamber' area. Towards the end of the 1992 season a curving line of large stone slabs, some partly overlapping, was uncovered under cairn material around the NW/N/NE edge of the cairn. Thoughts of a souterrain were dispelled when it was discovered that the space under the slabs amounted to only 0.2–0.5 m – more like a covered drain than anything else, but with a very massive covering. The results of analysis of samples and possible radiocarbon dates are awaited.

The field survey of the Dunbeath area, and those undertaken by Roger Mercer in the same county, represent catalogues, gazetteers or inventories of the visible remains of human activity, and will serve as frameworks for future detailed research and excavation. More important than single monuments are the areas where there is obvious surface evidence for more than one period of occupation, in particular where deserted settlements apparently of later 18th to early 19th century date are surrounded by, and sometimes overlies, the remains of circular stone-based huts, ancient field boundaries, and stone heaps and cairns. It is these locations which offer the potential to answer some outstanding questions in Scottish archaeology, not least the possibility of finding some traces of medieval settlement and field systems.

## The post-medieval burial vault 1450–1715

Julian Litten

Apart from Howard Colvin's majestic *Architecture and the After Life* (1991), and James Stevens Curl's *A Celebration of Death* (1980), little has been written on the mortuary chapels of post-medieval England and Scotland. Yet both publications omit to mention the complicated engineering required to construct the burial chambers beneath. Julian Litten's *The English Way of Death* (1991), went some way to redress the balance and included a chapter on intramural burial and on vaults in particular. This lecture examined the circumstances giving rise to the burial vaults and mortuary chapels of England and Scotland from 1450 to 1715. Whilst the earlier intramural burials were contained in brick-lined graves, either beneath or adjacent to the tomb, the post-Reformation period saw the erection of private family chapels, connected to the parish church, with spacious burial vaults beneath. In England, intramural burial was tolerated, in Scotland it was frowned upon; thus the English vaults were encouraged, the Scottish vaults tolerated.



Few private chapels expressed association with contemporary architectural style, preferring a stylized late 16th-century idiom. However, this did not extend itself to the monuments themselves and neither, on examination, to the coffins beneath.

Until c 1700, vaults were little more than subterranean chambers, but in the 18th century shelves and loculi were introduced, together with charnel cisterns into which were placed the more decayed coffins, in an attempt to provide order and maximum usage of space. Greater attention was being given to the means of ventilation, and some ingenious systems were devised to ensure ease of access for the bearers.

Examples illustrated from Essex, Gloucestershire, Somerset and Yorkshire showed that there were no regional differences in vault construction. In Scotland, the burial aisle frequently doubled up as a family pew and, whilst this was not always the case in England, there are some examples – notably at Kedington in Suffolk and Debden in Essex – where this is in evidence.

## Post-glacial hunter/gatherers in Europe and their adaptation to change

W Finlayson

Summary of a paper presented to the Pithecanthropus Centennial International Conference, Leiden, Netherlands, June 1993, for which the author received a Young Fellow's Bursary from the Society.

The evidence for the Scottish Mesolithic comprises microlithic flint scatter sites and a series of sites, traditionally called 'Obanian', comprising shell-midden deposits. Comparison is made difficult because research on the chipped-stone scatters has concentrated on artefact typology and technology, while work on the shell middens has concentrated on economic data.

There is some evidence (from the presence of a high proportion of skeletal parts more suitable for tool making than for meat, and from the tool kit itself) that the Obanian sites, despite their rich economic data, are not just the waste heaps from fishing, but represent the results of non-subsistence activities. It is possible that highly predictable marine sources were exploited to allow time for industrial purposes. If the identification of bevel-ended tools (limpet hammers and scoops) as hide-softening tools is correct – and it is supported by initial results from experimental work – there is an implication that social pressures existed to encourage the labour-intensive manufacture of such fine clothing. Such clothing has been interpreted on the American north-west coast as indicating social stratification.

It appears likely that the Obanian overlaps in date with the microlithic sites, but continues after microliths ceased to be made. It is possible that the Obanian sites represent an increasing intensification of settlement and a developing social complexity preceding and during the transformation from Mesolithic to Neolithic, and in fact spans the two periods, as part of an unbroken continuum. Settlement in the west of Scotland appears to have continued to be small-scale and transitory during the Neolithic, with reoccupation of some sites over long periods. This suggests that an economy similar to the Mesolithic continued. There is often little to distinguish the sites, as at Kinloch, Rum, where only the appearance of small quantities of pottery and the disappearance of microliths provide evidence of a transition.

Change is always considered to be directly caused by economic necessity, regardless of whether that economic necessity is originally caused by an external factor such as the environment, or by population stress. There is little room for human decision making. Economic strategies are not necessarily clear cut, mutually exclusive alternatives. While the physical environment presents restrictions, the economy is culturally mediated. Within each environmental constraint, there are options that can be selected. This has been borne out by much recent research on adaptations to modern farming practices.

Anthropological evidence suggests that neither the hunter-gatherer nor early farming social organisations would have been stable, but may indeed have swung from one economy to the other and back again. Some groups may practice agriculture only intermittently once it is available to them. Evidence from the Obanian suggests that in western Scotland a complex stratified society may have been developing before contact with the Neolithic. The arrival of the Neolithic will have provided further potential means of status differentiation. Ritual monuments and pottery could be adopted by hunter-gatherer groups. Even aspects of the agricultural economy, such as domesticated animals, could be adopted. Groups that adopted pottery, agricultural elements or ritual monuments might appear as Neolithic from their material remains.

Environmental pressures cannot be translated into social and economic change without an appropriate social mechanism. This is a lesson that studies in modern development have recognised. The value of agricultural 'improvements' may appear clear to an outside observer, but their value has to be appreciated by the local culture for adoption to occur. The importance of individual decision makers is high, not only when economic change is apparently urgently required for survival, but when it is massively supported by an external agency. To be adopted, new technology has to fit the current mould. Congruency with the existing situation is important. No economic decision can be made without reference to its cultural context.

Evolutionary and Marxist models incorporated stadial interpretations that required the Mesolithic to be interpreted as part of a logical, developmental progression; the European Mesolithic did not appear to fulfil this role, for farming clearly originated in the east as part of a revolutionary total socio-economic package that was imported to the west by colonists. Pre-farming, post-glacial European societies were therefore not perceived, according to these models, to be on the main trajectory of human development. More recent research on the European Mesolithic has shown it to be part of a phenomenon encompassing Europe and the Middle East, illustrated by an increasing use of microliths from the late Upper Palaeolithic onwards. It was far from being a blind alley, but was a period when society was changing rapidly and was apparently producing a host of specific local adaptations. In the Middle East some of these adaptations led directly to farming. In Europe, adaptations to the post-glacial environment led to an equally intensive non-farming exploitation of the environment.

In western Scotland there appears to be strong evidence for continuity between the so-called Mesolithic and Neolithic periods. An innovative hunter-gatherer society appears to have been intensifying its economy, and developing increasing social complexity. There is no apparent-break in this process as elements of the Neolithic, most obviously pottery and ritual monuments, are adopted.

It is now beginning to appear that the Mesolithic in Europe comprised a range of economic and social adaptations, none of them necessarily stable. Neither the Mesolithic nor the Neolithic represent monolithic entities, they varied internally and contained varying patterns of behaviour, with substantial overlaps between them. As with the labels 'hunter/gatherer' and 'farmer', the archaeological names for these periods are exaggerations.

## Brochs: domestic architecture and changing social configurations in prehistoric and Early Historic Scotland

Sally Foster

Summary of a paper presented to the 92nd meeting of the American Anthropological Association, Washington DC, USA, November 1993, for which the author received a Young Fellow's Bursary from the Society.

The paper presented a case study from the Orkney Isles between the period of about 600 BC to AD 800, outlining methodological advances which may be of wider chronological and geographical significance. It describes an archaeological application of access analysis, a form of spatial analysis, in order to demonstrate the potential of this technique for investigating the relationship between the arrangement of the built environment and the organisation of society. The technique appears to be a useful tool in articulating an understanding of the part space plays in structuring social relations and the part social relations play in structuring space. All analysis of material culture should be undertaken with reference to space because all social interaction is situated within space and time.

Access analysis looks at the patterns of relations between inhabitants, and between inhabitants and strangers, as they are reflected in the use of interior space, in terms of the patterns created by boundaries and entrances, and the form and function of the constituent spaces. The technique allows us to consider how frequently and under what architectural circumstances physical encounter might occur and can thus illuminate the way that a particular architecture may structure social discourse. Orkney, famous for the survival of its prehistoric architecture – whether Neolithic tombs and settlements or Iron Age brochs – provides a unique and exciting resource upon which to apply this technique.

The paper fell into four parts: a description of the technique; its application to the Orcadian settlement sequence; a social interpretation of the results; and a brief description of the way in which others have now developed this technique.

The technique is based on the gamma analysis of Hillier and Hanson, who believe that spatial organisation is a function of the form of social structure. Without adopting this extreme view, and by making modifications to it, this formal and vigorous technique can be demonstrated to be of some value to those who believe that spatial order does carry some social information (Foster 1989a).

Such analysis may impart social information at two general scales:

1 The variations in spatial arrangements impart social information about the realities of living in, or visiting, that particular building. This is analysed by examining the means of access to a space and its degree of segregation or integration. Interior spaces constitute some of the most common places for activity and social interaction, but the information on access maps is inevitably static. It is, however, of value in considering how space was occupied over time during the course of social interaction.

2 Study of the morphology of the access diagrams may reveal topological patterns which relate to social factors. The challenge is to consider what type of social relations these patterns might represent.

Turning now to Orkney, what can this technique tell us about the development of later prehistoric and Early Historic settlement (Foster 1989b)? From the point of view of social interpretation, placing these observations within a broader historical framework, it seems that the Orcadian brochs were local power centres; at the centre lived a pre-eminent family surrounded by those who probably paid tribute and who received protection and patronage in return. Broch society appears to have been closely defined and structured at the individual settlement level, but was part of a wider society with similar values. The transition in the post-broch period to more egalitarian, less spatially prescribed on-site relations, can be set against various literary and archaeological indications to demonstrate that there was a general trend towards the centralisation of power; certain individuals were able to extend their authority amongst a more widely distributed population, and ultimate power no longer resided in the hands of someone who lived at the centre of the immediate settlement, one of many similar power bases dotted throughout the Orcadian countryside. The changes observed in the spatial order of settlements therefore relate to a shift from a ranked society (where there was the ability to organize tightly and to command a high level of commitment or mobilisation from participants at the local level) to the emergent state in which there was the ability to organize large numbers of people over far-flung territories, although the relationship of co-operation between the ultimate authorities and the population may have been less stable. The archaeological and historical evidence suggests that the ultimate authorities were now based in south-east Scotland, with a local agent (probably based at the Brough of Birsay) representing their interests in Orkney (Barrett & Foster 1992).

Since the first publication of this work, progress has been made by others in the use of access analysis. There are problems with the technique, particularly in its application to prehistoric remains, since considerable options for error exist, but there have been attempts to address many of these problems, albeit using more recent data. Graham Fairclough (1992) has examined high-status medieval buildings, such as Edlingham Castle in Northumberland, and has recognized that it is also important to look at direction of access, its purpose, and the use and function of a space. His development of the technique places more balance on the use and function of spaces, with emphasis on the part this played in structuring the life and activity of its inhabitants, whilst marrying this with the ability of access diagrams to provide an insight into how the access to space was controlled. It also makes more complex access diagrams easier to use. The full potential of this technique for Scottish material has yet to be realized.

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