THE ROLE OF MONUMENTS IN THE NEOLITHIC OF THE SOUTH OF SCOTLAND

in three volumes

JANE MURRAY

Volume I : Text
Volume II : Catalogue of Sites
Volume III : Regional Gazetteer

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I hereby declare that this thesis has been composed entirely by myself.

[Signature]

Jane Murray
ABSTRACT

The thesis considers the role of monuments in neolithic society in relation to Scotland south of the Forth-Clyde estuaries, excluding western Galloway. The numbers of known monuments here are low, although neolithic artefacts are widely found, and it is argued that site losses have been high, partly, perhaps, because of insubstantial monument forms, and failures of recognition. To address this problem the thesis presents not only a Catalogue of acceptable neolithic monuments (Volume II), but a Gazetteer (Volume III) discussing evidence for the Neolithic and possible alternative forms of funerary and ritual activity on a Regional basis. Overall physical characteristics of the study area and the history of neolithic research in Scotland are outlined in chapters of the thesis.

Thinness of evidence has imposed a need for a pragmatic approach, and, in order to explore the social and cognitive context of the monuments, comparative methods are employed both spatially, by means of the Regional format of the Gazetteer, and temporally, on the basis of a chronological framework for the Neolithic of Scotland set out in the thesis. Examination of the poorly dated evidence for the Latest Mesolithic in Scotland finds little indication of economic intensification or evolving social complexity. The
former seems to be a post-Elm Decline event, and agriculture may have remained a minor option until the later third millennium bc. From c 3200 bc, however, neolithic artefact types appear, primarily in contexts of ritual deposition, and from c 3000 bc substantial and very various monuments are constructed. Size becomes increasingly emphasised, particularly in terms of extremes of elongation, seen at cairns, barrows, megalithic chambers, pit alignments and cursus enclosures being built in the first half of the third millennium. In the final centuries of the millennium a phase of enclosure building produces a range of timber circles and enclosures, ditched and banked sites; stone circles remain difficult to date. Artefact types diversify from the mid-third millennium, and stylistic messaging becomes increasingly important; ritual deposition is practised throughout the period. Monument and artefact distributions are analysed and discussed in the thesis.

It is suggested that ceremonial served initially as a means of declaring neolithic status, but that monument styles and particular ceremonial forms were soon being used as expressions of community identity. 'Special places', whether natural or monument enhanced, acquired their own histories of use and symbolic significance. In the Latest Neolithic the choice of styles of monuments and artefacts became a means of making external rather than purely internal, social statements.
Large numbers of people have given assistance in compilation of this thesis and I must hope that the following acknowledgements do not omit too many of those who have responded to my requests for help and information.

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All original survey work has been drawn up by myself, despite obvious deficiencies in draughtsmanship, but I must thank David Murray for drawing some of the other figures (Figs. 5:2, 5:3, 8:1, II:1-5).

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Volume I

The Role of Monuments in the Neolithic of the South of Scotland

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THE ROLE OF MONUMENTS

IN THE NEOLITHIC

OF THE SOUTH OF SCOTLAND
1. THE PROBLEM STATED; THE APPROACH DEFINED

1.1 The Problem stated

The Neolithic in Britain has always largely been perceived through its monuments, pre-eminently in Scotland the stone-built heritage of chambered cairns. The slanted image that this angle of view imposes is not a preferred option, but derives from the limitations of the evidence. Prehistorians have always attempted to look beyond the circumscriptions of the data, pursuing typologies and classifications of chambered cairns, not as ends in themselves, but as a means of tracing the origins of peoples and of discovering the nature of the societies responsible for building the tombs. It was in default of the recurrent artefactual associations which could be held to constitute 'archaeological cultures' that Childe sought to characterise regional groupings of chambered tombs (1933; 1935; 1947). The entities thus defined could be related to points of origin and influx of peoples, but Childe was also much concerned to explore the implications of environmental setting as an indication of settlement choice. Tomb distributions could inform on economic priorities and on the character of social organisation (Childe 1934; 1946). Thus the variability encountered among Scottish chambered tombs
was ascribed to shifting agricultural practice related to inefficient farming methods, and was also held to illustrate the "fissparous tendency ... observable in primitive farming societies today", and to represent the effects of "the desire of adventurous young men to establish fresh households for themselves immune from the domination of the elders" (Childe 1934, 20).

Presumed identity between chambered tomb distributions and neolithic settlement has continued to shape socio-economic explanations of the Scottish Neolithic (e.g. Davies 1946; Piggott 1954; Daniel 1962; Scott 1969; Fraser 1983; Perry 1983; Hunt 1987). Henshall's detailed compendia of chambered tombs (1963; 1972; Davidson and Henshall 1989; 1991) have given wide access to the Scottish material, encouraging its use in model building designed to address general problems of neolithic explanation. In a discussion of the origins of chambered tombs, Renfrew (1976), having suggested that the megalithic idea developed as a response by 'segmentary societies' to limitations on settlement expansion imposed by the Atlantic seaboard, 'tested the hypothesis' against the distribution patterns of chambered tombs on Rousay and on Arran. Orkney again provided him with evidence for the transformation of those Early Neolithic segmentary societies into the hierarchical systems of the henge-building Late Neolithic (Renfrew 1981).
These areas with high monument densities have attracted much recent research work. Fraser's spatial analysis and study of the economic and environmental setting of the chambered cairns of Orkney (1983), and detailed analyses of individual tomb location and site catchment on Arran by Perry (1983) and Davidson and Green (1989), have explored the settlement implications of the island distributions. The survival of stone built domestic dwellings on Orkney has given an added dimension, facilitating the development of 'contextual' approaches to the monuments which seek to explain the symbolism of the tombs by reference to patterns in the organisation of domestic space (Hodder 1982(a); C. Richards 1992).

It is indisputable that advantages lie in exploitation of the richest seams of available evidence. On the other hand it is abundantly clear that surviving distributions of chambered cairns afford no equivalence to density of neolithic settlement. Rates of casual artefactual recovery are consistently higher in the agricultural counties of eastern Scotland than on the Atlantic fringe (see Atkinson 1962, 20, fig.3: Leaf arrowheads). There remains, nonetheless, some ambivalence over whether the superior representation of monuments in the north and west should be attributed to enhanced potential for survival in these areas, or whether monument building itself was a practice
fostered by economic and social pressures, and in particular by the peculiar constraints of island life (Cherry 1981; Chapman 1981).

Of relevance to this debate is the immense variability of scale and form to be found in the design of neolithic funerary cairns. It is not to be supposed that cairns over 100m in length, such as Bellshiel Law, Northumberland or Loanfoot, Ayrshire, should have functioned in society in ways identical to those of the pair of chambered cairns at Mid Gleniron, each under 20m long. Such disparities of scale demonstrate differences in social role, showing that surviving distribution patterns cannot be a relict of a former uniformity. But, on the other hand, if it is accepted that the role of monuments in society on Arran and on Rousay is representative of situations peculiar to those islands alone, doubts must arise over the relevance of local studies to theories of general neolithic process. It must seem probable that the wide variety observable in archaeological remains derives from equally various prehistoric social realities. As Kinnes has pointed out (1992(b), 62) the restriction of causewayed enclosures to the southern half of Britain is strongly suggestive of differing levels of social cohesiveness between north and south.

Within Scotland evidence is beginning to accumulate for similar disparities in monument form between
regions. Cropmark photography and excavation have revealed a wide range of impressive earthworks and timber constructions forming complementary distribution patterns to those of the chambered cairns. A massive Early Neolithic timber hall has been excavated at Balbridie on Deeside and possibly analogous cropmark sites have been discussed (Ralston 1982). A range of timber enclosures, perhaps mortuary enclosures, of the same period have been excavated at Douglasmuir (Kendrick 1980), Inchtuthil (Barclay and Maxwell 1991), and Balfarg Riding School (Barclay forthcoming), all in eastern Scotland. Cursus monuments are now known to exist in Lower Nithsdale, both ditched and of an idiosyncratic pit-defined form (Loveday 1989), also widely present in eastern Scotland (RCAHMS 1978(b), 22, no.158; 1983(b), 32, nos.256, 258; Tavener 1987). The suggestion has been made that the 2.2km long ditched earthwork in Perthshire, known as the Cleaven Dyke, could be a neolithic bank barrow or cursus-related monument (Maxwell 1989, 105-6). It has become necessary to confront the fact that chambered cairns, so far from being the primary index to neolithic settlement, may be a minor regional variation illustrative of a segment only of the wide choice of options available to neolithic monument builders. Long cairns themselves, chambered and unchambered, are by no means a unitary set; morphological variability is a constant, and the cairns appear to have functioned in
different ways for different communities, their role developing and changing over time. There is some evidence for the use of natural settings for ceremonial activity, providing one possible explanation for a local the absence of monuments.

Recognition of the wide range of monument forms utilised during the Neolithic can only re-inforce appreciation of the importance of the concept of monuments to neolithic peoples. The nature of that significance, however remains obscure. We face the paradox that, while monument building would appear to be a major characteristic of the Neolithic in Britain, the nature of those monuments and of associated ceremonial activity assumed a wide variety of forms. The purpose of the present enquiry is to explore this recurrent association between the Neolithic and the monumental in a Scottish setting, taking account of both diachronic and regional variability. These complexities do not represent insignificant local divergence from some standardised neolithic norm, but are all valid expressions of what Hodder (1990) has called the "principles" underlying neolithic cognition.

The methods employed in the study are outlined in the following section.
1:2 The approach to the problem

1:2:1 The comparative method

Variability has been discussed above in terms of the problems that it poses. An alternative perspective effects welcome to all evidence for variation as offering opportunities for comparative study. Material is provided to illuminate contrasting trajectories of social and cultural development and to trace networks of communication. The broader the basis of the comparison the greater the chance of extracting the fundamental values and outlooks of the neolithic world and of perceiving priorities and constants. The methodological advantages of the comparative approach are considered in Chapter 3; the present section outlines the methods used in the study.

Essentially the thesis is based on comparisons of material from within several Regions in the south of Scotland. The monuments in each Region are studied in relation to their environmental setting and in the context of local prehistoric background. Post-depositional factors affecting monument survival and recognition, including records of artefact collection and excavation in the locality, are considered. Each group of monuments is thus viewed within its particular setting, and comparisons across the Regions can be drawn giving full weight to factors of unequal opportunity.

Three parameters to the study need first to be
defined, spatial, temporal and qualitative. The three following subsections set out these limits and details of the format of the thesis are presented in section 1:3.

1:2:2 Spatial definition of the study area

It was originally intended to study the whole of Scotland to the south of the Forth - Clyde estuaries, both on grounds of personal familiarity with the country, and for the opportunities that the area provided for cross-regional contrasts. The south of Scotland, stretching for 225km from Portpatrick in the south west to St. Abb's Head on the Berwickshire coast, covers c 19,000km², and contains about fifty very various long and chambered cairns, besides a range of henges and other neolithic enclosures and stone circles. Field work was carried out across this area, and all the cairns were planned by plane table survey or taped offset, and the henges and other enclosure sites were visited. In compiling the Catalogue, however, it became clear that if justice was to be done to the detail of the material, the thesis would be weighted down by an unwieldy amount of data. Rather than shortening the chronological perspective, the decision was taken to omit the south western part of the area in which over half the cairns were sited. Much of this material has already been published by Henshall (1972), and it includes the very idiosyncratic set of circular passage graves, the Bargrennan Group,
probably differing from the other chambered cairns of the area in both chronology and function. Work on the Bargrennan Group has been published separately in abbreviated form (Murray 1992). The other long and chambered cairns of the south west, principally in the Cree and Luce valleys, represent, to some extent, a norm against which material in the remainder of the study area can be tested. The regular spacing of the Luce valley distribution, in particular, resembles those of the island sets already discussed. Reference is made throughout the thesis to this material, particularly to the published excavations at Cairnholy (Piggott and Powell 1949) and at Mid Gleniron (Corcoran 1969(a)), but the sites are not included in the Catalogue (Volume II), nor is the Region treated in the Gazetteer (Volume III).

The remainder of Scotland south of the Forth and Clyde has been divided into six Regions on the basis both of geography and of neolithic coherence. The physical basis of the pattern is discussed in Chapter 5. Each Region is treated in a separate section of the Gazetteer, which includes descriptions of geography, and discussion of artefactual and settlement evidence for the Neolithic, and an account of monuments. The six Regions, shown on Fig. 1:1, are:— I The Firth of Clyde; II The Lothians; III The Biggar Gap; IV The Tweed Basin; V The Borders; VI The Nithsdale Region (including
Fig. 1: The Regions of the Study Area

I The Firth of Clyde;   II The Lothians;
III The Biggar Gap;   IV The Tweed Basin
V The Borders;   VI The Nithsdale Region
upper Annandale, the eastern Stewartry and the Glenkens). The variation present in these six Regions provides ample material for cross-Regional comparisons.

1:2:3 Chronological limits

Construction of long and chambered cairns began early in the Neolithic, and there are late fourth millennium dates from such monuments in eastern and southern England, Wales and Ireland, besides possibly doubtful dates from Monamore chambered cairn on Arran (MacKie 1964) and Lochhill, Kirkcudbright (Masters 1973). Evidence for the establishment of farming by this period is thin, and it would be possible to argue, as Burenhult (1984) has attempted to do in relation to Carrowmore in western Ireland, that the monuments were the product of a native Mesolithic, perhaps built in response to external neolithic pressures (cf. Zvelebil and Rowley-Conwy 1986, 72-3, re Brittany). In explanation of the emergence of monuments, it is therefore necessary to assess the nature of the Late Mesolithic in the study area, pushing chronological limits back to the earlier fourth millennium.

Henges and enclosures, on the other hand, regularly furnish dates well into the second millennium, as, for example, with the shafts at Maumbury Rings, dated to c 1700 bc (Harding and Lee 1987, 134), or the West
Kennet enclosure 1, with dates from the outer ditch ranging up to 1670 ± 50 bc - BM 2602 (Whittle 1993). Some of the later dates may be due to recutting of pits and ditches, and there are problems over readings taken from posthole weathering cones, as with the latest date of 1791 ± 70 bc - SRR 648 from the Meldon Bridge enclosure (Burgess 1976). Stone circles were, however, certainly being erected after 2000 bc (Haggarty 1991). It is not the intention here to explore the generally funerary ritual practices of the second millennium, and it would seem appropriate to draw a line at the point where impressed and grooved ware disappears and Northern beakers of steps 4 - 6 and food vessels begin to be produced, probably shortly before 1800 bc (Morton 1990).

A case could be made out for suggesting that a Neolithic running from the later fourth millennium until the early second millennium lacks real unity. There is an 'earlier' Neolithic characterised by the construction of long and chambered cairns and barrows, and a 'later' Neolithic which saw the building of henges and other forms of enclosure. The two are separated by a period of standstill, or recession, with widespread evidence for forest regeneration (e.g. Whittle 1978; 1980; Bradley 1978). There are reasons why it was not regarded as appropriate for the present study to accept such a division, and to be confined to one of these periods only.
In the first place, there is still a need to come to terms with the chronological implications of multi-period or multi-phase cairn accretion. The successive forecourts at Trefignath, Anglesey (Smith and Lynch 1987) and at Lochhill, Kirkcudbright (Masters 1973) demonstrate phased extension without establishing time depth. There are instances of the external appearance of cairns being modified long after original construction, as at Pierowall Quarry (Sharples 1984) and at Slewcairn (Masters 1981(b)). Continuing activity of this nature must be central to the present theme of understanding neolithic cognition of monuments, and should not be marginalised as a footnote to the central story.

Secondly, an issue of particular fascination is the extent to which individual sites were used and re-used over long periods of prehistory. Such sequences are not confined to the Neolithic; but involve the recurrent recovery of mesolithic evidence from below neolithic mounds (e.g. Hazleton North: Saville 1990), and the frequent founding of Bronze Age round barrows on earlier long mounds, or insertion of cists into such mounds (e.g. Dalladies: Piggott 1972). It must, however, be particularly relevant to enquire into the extent of continuity in the Late Neolithic use of chambers for deposition, or the insertion of individual inhumations of the later Neolithic into earlier mounds (e.g. Whitegrounds: Brewster 1984). Evidence for direct
links between funerary monuments and enclosures also occurs, for example, at the Giant's Ring, Belfast (Archaeol. Survey Co. Down 1966, 89-91), at Callanish (DES 1981, 49) and probably at King Arthur's Round Table (Bersu 1940). Such instances of re-use, adaptation and supersession offer means of charting the changing patterns of the Neolithic.

Thirdly the weakness of chronological control over sequences of monument building in Scotland must frustrate any attempt to impose tightly defined chronological limits to study. The radiocarbon dates available in relation to the Scottish Neolithic are few, and often unreliable. Whole classes of monuments, such as Clava cairns (Barclay 1992) and Shetland tombs (Müller 1988), remain undated. Alternative dating methods, based on typological sequence or distant comparanda, can be inherently unreliable. For example, the cursus-like double pit alignments of eastern Scotland could be related in type to the 54m long timber mortuary enclosure at Inchtuthil, with radiocarbon dates of the late fourth millennium bc (Barclay and Maxwell 1991), to the post-defined enclosures at Balfarg Riding School, probably of the early third millennium bc (Barclay, forthcoming), to the cursus enclosures of southern Britain with early mid-third millennium dates (Gibson and Loveday 1989), the double pit alignment at Meldon Bridge articulating with a timber enclosure dated to the late third millennium.
(Burgess 1976), or to double pit alignments in the Milfield Basin which produced grooved ware and early second millennium dates (Miket 1981; Radiocarbon 24 1982, 267). The range of possibilities is wide, and the group of monuments cannot be securely assigned to one particular phase.

The time span adopted for the present study therefore covers the whole of the Neolithic from the late fourth to the early second millennium. It has been taken as an important priority to construct a chronological framework for the period, however tentative its structure, in order to explore diachronic perspectives and the dynamic sequence of the Neolithic (see Chapters 8, 9).

1:2:4 Evidential basis

It is the fashion to found research on a computerised database which enables large amounts of material to be handled, ostensibly increasing the statistical reliability of the conclusions. As David Clarke has warned, however, in relation to computerisation of the Catalogue of the National Museums of Scotland (1991, 222):-

"The structuring of what is still essentially dirty data in an homogenised format has imparted a spurious sense of reality to it."

What is true in relation to artefacts is of even
more importance in consideration of the ambiguities of field remains, some of which depend on interpretation of badly damaged amorphous mounds or the selective indications of cropmark evidence as recorded by aerial photographs taken under a particular set of conditions. It is argued here that in order to retain a due sense of the uncertainties of the evidence, rigid classifications should be avoided and flexibility of approach maintained.

This proviso is the more necessary in that the extent of reliable excavation evidence from the study area is extremely limited. With full publication of the long mounds at Lochhill, Slewcairn and Biggar Common still awaited, the only post war excavation account of a long or chambered mound within the study area concerns examination of an already ransacked chamber at Haylie, Largs (Aitken and Marshall 1957). The henge at Cairnpapple had its interior completely excavated by Professor Piggott (1948), without resolving a series of questions regarding sequences of construction in the pre-cairn phases. Only the first two of three seasons of work at Meldon Bridge enclosure have been published (Burgess 1976), covering a small portion of the site. Exploratory trenches dug across the boundaries of the two Blackshouse Burn enclosures (DES 1985, 38-9) and the possible cursus at Monktonhall (Hanson, n.d.) await publication, as do some small scale recent rescue excavations.
Study of the monuments has thus been very dependent on field survey. All of the unexcavated long and chambered cairns, including some doubtful sites, have been planned, generally by plane table survey, with occasional taped offsets. Profiles have been drawn of four of the Pentlands cairns, and, in a few cases, the immediate surroundings of sites have been planned. The henges and large enclosures have been visited, and cropmark sites have been transcribed from aerial photographs. Stone circles, which have mostly been surveyed by Thom and Thom (in Thom, Thom and Burl 1980), have not been so fully studied, and the only plan that has been made of a stone circle is that of the Crow Stones, on the Lammermuirs, of which no previous plan had been published. Information on cup-and-ring marks is mostly derived from work by R.W.B. Morris (1979; 1981). Much use has been made of the maps and records in the National Monuments Record of Scotland, where some unpublished plans have been consulted. Acknowledgements are made in the Catalogue entries as appropriate.

The recency and intensity of archaeological survey carried out by the Ordnance Survey or RCAHMS varies across the country. Fig 1:2 gives the dates of the most recently published RCAHMS survey (full titles are in the Bibliography). It will be seen that while post-war Inventories have covered most of the Borders' counties and Lanarkshire, some parts of the Stewartry have not
Fig. 1:2  RCAHMS survey: most recent work by year of publication (see Bibliography: RCAHMS)
been surveyed since 1914. Recently, *Sites and Monuments Lists*, representing intensive field work, have been published for certain areas. There has, however, never been a professional survey of Renfrewshire, or of north Ayrshire. Clearly, the amount of information available varies widely.

Artefactual evidence can provide a vital source of information, of particular value in assessing settlement distribution when traces of occupation have so rarely been recovered. There are few artefact studies relating to the study area, but information has been compiled from the Catalogues of a number of museums. It has not been possible to examine museum material itself to any extent, and the information kept by museums naturally varies greatly, not least because of the proclivities of the original collectors. The problems posed by this material are discussed below under constraints on the use of Artefactual Evidence (2:5). Essentially the variability of the record regarding lithics is such that little in the way of cross-Regional comparison has proved possible. Axeheads, on the other hand, have been more widely recorded, creating distribution evidence of more general validity. Account has been kept of the number of finds in the study area, including references to axes now lost. This information has been of use in discussion both of settlement evidence (8.6), and of the evidence for deposition of artefacts as a form of ritual (10:10:4).
Pottery is a relatively rare find, and thus of little value in mapping settlement distributions, although a useful guide to chronology.

In consideration of both field remains and artefacts the aim has been, not to reduce the evidence to a standardised uniformity, but to attempt to explore variability. Such evidence as is available has been exploited, taking account of deficiencies in the record, and seeking to avoid the 'spurious sense of reality' that David Clarke has warned against. The empiricism of this approach is regarded as necessary in the face of the constraints set by the nature of the evidence, discussed in Chapter 2. The theoretical basis of the 'case for empiricism' is further discussed in section 3:3:1.

1:3 Presentation format

The three volumes that comprise this thesis constitute three separate sections. Volume I contains the discussion paper of the thesis proper; Volume II is a Catalogue of Sites; Volume III, a Regional Gazetteer, presents an account of the evidence for the Neolithic in each of six Regions that make up the study area. Constant cross-reference is made in the thesis to material in Volumes II and III, and the system employed must be explained.

As set out above (1:2:2) the study area, consisting of Scotland to the south of the Forth and Clyde estuaries,
excluding the south west, has been divided into six Regions, numbered I to VI. References to sites in the Catalogue and to items in the Gazetteer depend on this Regional division.

Volume II, the Catalogue of Sites, itself consists of two parts, concerned respectively with 'Funerary Monuments' (long and chambered cairns and barrows) and 'Enclosures'. Sites included are grouped by Region, the funerary monuments headed by numbers, enclosures by letters. Thus III:1 Burngrange indicates a chambered cairn in Region III, the Biggar Gap; IV:b Overhowden is a henge in Region IV, the Tweed Basin. The internal sequence for funerary monuments in each Region follows the county numbering system adopted by Henshall where numbers have already been allocated, and unnumbered sites follow within their counties. Thus III:1 Burngrange, LNK 1 precedes III:2 Greens Moor, LNK 2, which is followed by the unnumbered Lanarkshire sites, III:3 Easton, III:4 Biggar Common and III:5 Brownsbank, before reaching the Peeblesshire long cairn III:6 Harlawmuir PBL 1. Enclosures appear within their Regions in the following type order: interrupted ditch enclosures; cursus monuments; Late Neolithic enclosures; henges; stone circles. There is an Index of Sites at the beginning of Volume II.

Every Catalogue entry has been assigned a category
grade of acceptability, A, B, C or D, explained in the
Introduction to Volume II. Full Catalogue entries are
only given to Category A or B sites and to a few Category C
sites where reasons for uncertainty of status merit
fuller discussion. Effectively the A and B sites are
acceptable or probably acceptable neolithic monuments,
Category C sites are doubtful, and Category D, rejected.
Lists of Category C and D funerary monuments appear at the
end of the first section of the Catalogue.

The main Catalogue entries for all types of site
consist of three parts, descriptive, locational and
contextual. The first section includes the history of
the site and an account of any excavation evidence,
besides current description. The locational section
covers environmental factors such as distance from sea
and from water, situation, slope, geology, soils and land
use, and also looks at the prominence of each site, the
views obtained from it and local landmarks. The section
on context lists the nearest neighbouring neolithic
monuments, discusses relationships with these sites and
with other comparative material, and looks at the
distribution of neolithic artefacts locally, the
immediate landscape of other prehistoric sites, and,
where appropriate, any records of folklore and previous
archaeological comment.

Volume III, the Regional Gazetteer, consists of six
separate parts, each devoted to one Region of the
study. Each of these sections includes a description of the physical environment of the Region, a discussion of the Mesolithic, and the evidence for neolithic settlement and agriculture, together with accounts of artefact distributions, and monuments. These sub-sections are annotated by means of lower case Roman numerals after the upper case Regional number, as I:i, I:ii, etc. At the end of each Regional discussion there are Tables giving details of certain classes of material, such as pottery, lithic finds and stone circles, as appropriate. A set of maps then illustrates the distributions. It is intended that each of these Regional sections of the Gazetteer could stand alone, with the relevant Catalogue entries, as a summary account of the Neolithic in that area.

Throughout the discussion paper in Volume I reference is made to material in the other two Volumes by means of the numbering system described. Thus I:1 and I:a refer to Catalogue entries in Volume II, a cairn and an enclosure respectively, in Region I, the Firth of Clyde; I:i refers to a Gazetteer section in Volume III. A reference to Table I:1 or Map I:1 again concerns Gazetteer entries. A table, map or figure in Volume I is referred to by its Chapter number, viz: Table 10:1, Fig.1:ii etc.; those tables and figures are listed in an index at the beginning of Volume I. A reference
prefaced by C or D concerns the Lists of Category C and D sites in the middle of Volume II, the Catalogue of Sites.

Radiocarbon dates have not been calibrated, and are given as dates bc. There are only seventeen readings on cultural material attributable to the Neolithic in the study area, eight of these derived from Meldon Bridge. Adherence to the uncalibrated readings perhaps gives a better impression of the fragility of the radiocarbon record than any claim to be offering a range of "real" calendar dates. The chronology of the local Neolithic is discussed fully in Chapters 9 and 10. A useful working division, however, must be that between an 'earlier' and a 'later' Neolithic the change-over occurring at c 2600 bc.

Background aspects of the study are discussed in Chapters 3 to 5, on theoretical frameworks, the history of research and the physical setting. Chapters 6 to 8 look at issues of neolithisation, the impact of man on the environment and the character and chronological sequence of neolithic economy and settlement. Chapters 9 to 11 constitute the core of the thesis, examining the chronology of monument building, spatial and physical aspects of monument location, and the role of monuments within neolithic cognition and social life. Before embarking on these chapters, however, consideration is given to constraints of a practical nature.
2: PRACTICAL CONSTRAINTS

2:1 Archaeological limitations

The stated aims of the present study invoke those questions of ritual and religious belief that Christopher Hawkes (1954) considered to be the most difficult of attainment within the limits of archaeological inference. These constraints are considered in Chapter 3, in a discussion of theoretical frameworks, where it is argued that it is precisely these difficult, cognitive areas that must be explored if progress is to be made in understanding neolithic society.

Inherited limitations, deriving from long term failures to recognise or to research the archaeology of the Neolithic in the south of Scotland, are considered in Chapter 4, tracing the history of research. Comment has already been made (1:2:4) on the small amount of excavation and the unevenness of the record of survey in the study area, which set severe archaeological constraints on possibilities of reconstructing patterns.

The purpose of the present chapter, however, is to examine constraints imposed by the nature of the evidence, both as regards monuments and in relation to other aspects of neolithic settlement and society.
Interpretation of that evidence is hampered by the unpredictability and insubstantiality of original material remains, by erosion, with consequent distortions, resulting from post-depositional processes, and by modern failures to understand the nature of neolithic society and its outlooks. Interaction between these factors multiplies effects, fragile monuments being particularly susceptible to decay, and thus failing to register in archaeological perceptions. The three issues, depositional, and post-depositional effects, and the limitations of perceptions, are considered separately and in turn in the following sections, before an examination of the constraints inherent in interpretation of artefactual evidence, and a comment on the ineffectiveness of chronological control.

2:2 Constraints set by deposition practice

Variability of practice creates differentials in survival, and there is no easy equation between original significance and durability. Monumental stone piles may be a by-product of field clearance, yet survive, while traces of important ritual centres, built of perishable materials, are ploughed away. The particular problems set by constructional preference in neolithic Scotland are considered here.

First, the northern choice of stone cairn rather
than ditched barrow has facilitated total obliteration of sites. Heaps of loose stone offer an easy quarry to the dyke builder or road mender, and, once removed and grassed over, leave no permanent trace. Total disappearance of large and conspicuous cairns at Haylie, Largs (I:1) and at Caverton Hillhead (IV:3) illustrates the problem, also revealed by the removal of the tail of the cairn at Cairn Avel (VI:1) and the cratering of the head at Broughton Knowe (III:7). The long cairn at Easton (III:3), only c 7.5m broad along most of its length, was apparently only 0.3m in height when overlain by a round cairn built onto its tail. The long cairn at Street House, Cleveland, seems never to have consisted of more than a low platform of stone (Vyner 1984).

Secondly, rare examples of long barrows in the north, as at Dalladies (Piggott 1972) and Biggar Common (III:4), appear to have been composed of turf and scraped up soil; the Dalladies "ditches" were no more than shallow marker trenches, unlikely to survive as cropmarks after ploughing.

Absence of a tradition of ditch digging may also have affected the format of enclosure. Meldon Bridge (III:b) and Blackshouse Burn (III:c), comparable in area to the large, earthwork enclosures of southern Britain, are respectively stockaded and stone banked, with a later timber element added to the latter bank.
The ditched henges in the south of Scotland, all of modest dimensions, follow a Britain-wide format, not rooted in local practice. It seems probable that other types of enclosure, of banked, stone-ramparted or palisaded form, remain unattributed to their neolithic origins.

Stone circles, their distribution suggesting them to be a highland alternative to the henge, can, like stone cairns, easily be removed without trace. Broad based stones are erected in minimal stone holes (Rutherford and Ritchie 1974, 186), and the boulders defining some stone circles have not even been set upright in the ground (e.g. Holm of Daltallochan: Table VI:2:2).

Thirdly, round, or oval mounds may have been a regularly used alternative to long in the Neolithic, thus being indistinguishable from bronze age sites. After excavation of the 24m by 20m sub-circular mound at Pitnacree, Coles and Simpson (1965) drew attention to the numbers of large round mounds in the Tay valley as possible parallels, but excavation of a large, kerbed bronze age cairn at Sketewan, across the river from Pitnacree, demonstrated the uncertainties of prediction in such cases (DES 1988, 28). Neolithic round or oval mounds have been identified in northern Britain, as at Boghead of Fochabers (Burl 1984), and Ford, Northumberland (Burgess 1984), probably also as small
ring ditches at North Mains, Strathallan (Barclay 1983), and as primary cairns under the Mid Gleniron long cairns, whether or not these mounds ever existed as free-standing structures (Corcoran 1969(a)); there is, besides, the passage grave class of round cairns of Hebridean, Clava or Bargrennan type. Leaving aside those last, the 4.4% of excavated round mounds that Kinnes (1979) estimates to have been shown on excavation to be neolithic, have not yet been revealed in the study area, but may await identification.

Fourthly, the ritual structures of the earlier Neolithic were not, in themselves, substantial, and generally owe their preservation and recognition to the long cairns that covered them. The common format of two or three large posts in a banked linear area would leave a cropmark consisting of postholes only. Some of the small, slab-built chambers of the earlier phase, such as those at Lochhill (VI:3) and at Mid Gleniron, were scarcely more solid. The point is re-inforced by the frequency with which bronze age cairns are found to overlie traces of earlier use, perhaps consisting of one or more pits, presumably the focus for neolithic ritual activity. A knoll at Kirkburn, Lockerbie continued in use for pit deposition throughout neolithic, beaker and bronze age phases, the earlier material perhaps protected by a small rectangular structure (Cormack 1963(a)).
It is possible, further, that in some instances natural features formed a focus for ritual activity, leaving no archaeological traces. The recurrent location of monuments in dramatic situations, and the deposition of artefacts in rivers and beside springs, are suggestive of such practices.

Finally, there is the problem of the near invisibility of settlement evidence from the Neolithic in mainland Scotland. Evidence for timber long houses is scarce, and the neolithic stone buildings of the Northern Isles have not materialised further south. Excavations on Loch Olabhat, North Uist may have contributed an explanation in demonstrating the insubstantiality and repeated rebuilding of domestic structures of the Neolithic (Armit 1992). The excavator has argued that the small, temporary dwellings of the Western Isles may be an aspect of a logistic economy in which permanent settlement did not have a part to play (Armit and Finlayson 1992).

2.3 Post depositional constraints

2.3.1 The forces of nature

The six thousand years that have passed since the first neolithic structures were erected in Scotland represent a passage of time which would limit the survival of the most massive constructions, let alone the work of a low-technology farming community.
Timber structures naturally decay rapidly, leaving only negative post-hole features, save in the rare circumstances of wetland preservation. Ditches silt up, and earthworks erode, retaining little of their original bulk. Stone built cairns are inherently unstable, and collapse carries with it retaining walls, revetments and facades. This natural decay is frequently accompanied by colonisation by herbaceous, shrubby or arboreal vegetation, masking features under soil accumulation and damaging structures by invasive roots and the cratering caused by falling trees.

2:3:2 Geomorphological transformations

Although geomorphological events in Scotland may be regarded as having been unlikely to have been cataclysmic, the effects of ecological change have nonetheless been such as to set major constraints on the recovery of representative samples of neolithic evidence. The different processes at work may be outlined, but the numbers of sites affected cannot be estimated.

Eustatically falling sea levels after c 4000 BC should have ensured survival of coastal sites in the west, but in the east, isostatic sinking of the land over-compensated for this effect (see 5:2:4). East Lothian sand dune sites may represent upper survival levels of eroded coastal occupation (II:iii). Cliff
erosion may also be a factor, affecting a situation which evidently represented one neolithic choice of monument location (Davidson and Henshall 1989, ORK 25, 41).

The water's edge is a common focus for prehistoric settlement, whether coastal, riverside or lochside (e.g. the Hirsel, Coldstream (IV:iii); Loch Doon, Ayrshire (VI:ii)). Such locations are vulnerable to flooding and other forms of hydrological change. Sites likely to have been affected include enclosures (see III:a West Lindsaylands; III:b Meldon Bridge; IV:a Sprouston), and possibly henges (see Table III:4:10 Hillend).

Pedological processes of erosion and alluviation must have affected a wide range of situations and sites. Erosion has been severe on some hills, as is seen on Biggar Common (III:4) and on Cairnpapple Hill (II:b), where a 15cm depth of soil was preserved below the henge bank. Ploughing aggravates such erosion, as can be witnessed around Overhowden henge (IV:b). The resultant soil wash plays its part in concealing monuments. The small, long cairns at Lochhill (III:3) and at Glenvoidean, Bute (Marshall and Taylor 1977) were long unrecognised due to the build up of colluvium along their uphill sides. Similarly, deep overburden may accumulate at the base of slopes, while river alluviation leaves deep deposits in valley bottoms,
diminishing opportunities for site survival, artefact collection or cropmark recording. Selective processes of this nature distort perceptions of locational patterns, suggesting avoidance of the valley floors.

Sand-blow has played a part in burying prehistoric settlement, and may also have concealed or destroyed monuments. Coastal topography has been subject to major change since the Neolithic (Evans 1977).

Peat growth must also have been important in concealing remains. Former estuaries, such as Lochar Moss and the Moss of Cree on the Solway, and Linwood Moss on the Clyde, have been transformed from attractive waterside locations to deep basins of peat (Jardine and Morrison 1976; Boyd 1986). Inland lochs and level areas with impeded drainage have developed into raised bogs. The spread of blanket bog, particularly in the wetter climates of the west, may have been fostered by the very neolithic activity, clearance and agriculture, which it was in turn to destroy. The effectiveness of blanket bog in concealing structures has been commented on by Ray and Chamberlain (1985) in relation to Arran. Some of the long cairns in the study area, such as the Mutiny Stones (IV:1) and Lang Knowe (V:2), are visibly being invaded by peat, and several of the prostrate stones at the Wildshaw Burn circle (III:j) were under a depth of 30cm. Further west, in Wigtownshire, some round cairns survive only as stony hollows, the better drainage of
the cairn continuing to repel the encompassing peat (Murray 1986, 38-9). This destruction of landscape offers one of the most dramatic examples of geophysical transformation of the archaeological record.

2:3:3 Cultural modifications of the archaeological landscape

While ecological effects may be to some extent predictable, the arbitrary nature of human destruction sets different problems of assessment.

Deliberate modification of neolithic monuments began almost as soon as the initial phase was completed. Indeed, the cairns and barrows that constitute the "Funerary Monuments" of the Catalogue, could be regarded as devices intended to conceal original structures. The long sequence of adaptation seen at Cairnpapple (II:b) involved the deliberate destruction of some structures, such as the 'Cove', and expansion of the round cairn to accommodate cinerary urns involved infill of the ditch, no longer required as a form of definition. This last stage is paralleled at long cairns, such as Easton (III:3) and High Hendryton (I:4), overlain by round, the stone for the latter mound being, perhaps, robbed from the former. Perceived obsolescence may have resulted in the removal of monuments, their sites now lost beyond recall.

A similar process appears to have taken place in
relation to decorated stones, broken across their designs for accommodation to new purposes. Bradley (1989) and Burgess (1990) have both argued that these cup-and-ring marked stones must originally have been neolithic, perhaps standing upright, as a slab was wedged upright within the inner chamber at Cairnholy 1 (Piggott and Powell 1949), or with designs carved onto the living rock (cf. Greenland Quarry, Dunbartonshire; MacKie and Davis 1989). Carvings occur on outcrop in southern Scotland, but in restricted areas, and none display the passage grave style seen on the cist covers. It seems possible that some neolithic ritual involving carved slabs has had all traces entirely removed by the attentions of later peoples.

Chapter 4 traces the history of attitudes to the past in Scotland, arguing for a decline in earlier respect under the onslaught of an iconoclastic Presbyterianism and philosophical rationalism specifically associated with an 'improving' land-owning or land-managing class (see 4:3). It was this improvement, involving drainage, enclosure and more intensive livestock management, that transformed the landscape of rural Scotland, sweeping away, in its progress, many of the irksome obstacles surviving from antiquity. Pre-improvement arable cultivation was based on the rig-and-furrow method, which piled soil up into high curving ridges, commonly 8m to 10m across.
Improved drainage, at first using open drains, involved replacement of the old ridges with straighter, narrower ones. In the nineteenth and twentieth centuries, these were in turn replaced by deep laid tile drains, and the fields were ploughed to a level surface. Over the years huge depths of soil were thus moved and removed, the effects still observable in the frequent difference in ground level, of a metre or more, between adjacent fields.

Destruction by ploughing is an ongoing process. The 1970s and 1980s saw an increase in areas of grass and moorland brought under the plough (see III:5), while greater depths of ploughing now reach surfaces formerly protected by overlying soil. Even Scheduled Monuments are increasingly being eroded, as observed by l-Smith (199?) in relation to Sprouston cropmarks (IV:a).

There are instances where a niche for site survival has been created by the use of a linear mound to define a field boundary as seen, for example, at Loanfoot (I:3) and High Hendryton (I:4). The result may be to reshape the feature, as has happened at both of the above cairns. Similar distortions frequently result from close ploughing of monuments, creating, for example, the oddly angular outline of the henge bank at Weston (III:f) and, perhaps, reducing some long mounds to ovals as low tails are ploughed away (see Greenlaw VI:5).

It has already been commented (2:2) that stone built
monuments are vulnerable as sources of stone. There has been considerable quarrying of cairns by farmers, who remove the central spine of loose stone in cartloads, leaving the grass grown edges. The uneven banks of stone remaining at, for example, Greens Moor (III:2) and Easton (III:3) escaped recognition as long cairns until work was carried out for the Lanarkshire Inventory (RCAHMS 1978).

The stone of the cairns has also rendered them attractive sites for the construction of later buildings and livestock pens. Almost every cairn in the study area has some overlying or adjacent structure, whether the rectangular building at Laggan Park (VI:9), the large circular stells dug in below ground level within the body of cairns at Windy Edge (V:1) and the Currick (V:3), or the small shelters or lambing pens hollowed out among the stones of Capenoch (VI:5) and Cairn Avel (VI:1). Stiddrigs cairn (VI:8) has been partially rebuilt, to produce vertical wall faces, and similar work at The Mutiny Stones (IV:1) makes it difficult to distinguish prehistoric from modern features. The regularity with which sheep rees have been built into and over the upland round cairns of the Bargrennan Group (Murray 1992) suggests that other sites will have completely vanished under shepherds' cottages and steading buildings.

Another major cause of site destruction must be
afforestation, beginning, as suggested above, with the natural regeneration of woodland in the Neolithic. The rocky knolls regularly selected as situations for cairns are also subject to landscape planting, as at Cuff Hill (I:2) (and see also C:1 Mound Wood, Kennox Moss). The destructive effects of amenity plantations can be seen on Dod Hill, where the long cairn is barely recognisable under tree stumps and moss, cut through by drainage channels (I:5). Early Forestry Commission planting impinged onto the edges of the long cairns at the Currick (V:3) and Lang Knowe (V:2), while ostensibly "respecting" the site, and although larger clearings are now left around recognised sites, such as Slewcairn (VI:2) and Stiddrigs (VI:8), and trees have been felled around Windy Edge (V:1) and Lang Knowe to increase space, adjacent prehistoric sites of lesser scale are still destroyed, landscape effects around the cairns are lost, and seedling trees soon re-establish themselves in the rampant, ungrazed vegetation.

The last thirty years have seen a massive increase in the extent of forested land, often in areas that had undergone little in the way of archaeological survey. Field walking in newly ploughed terrain appears to have been little practised, except by Lanark and District Archaeological Society. Results of their work include recovery of lithic material from Corse Law on the Pentlands (A. Clarke 1989), and the discovery of a
prehistoric landscape, including neolithic long mound and domestic material on Biggar Common (III:4). The sites here had already been plough damaged when discovered, and it is likely that unrecognised sites will be reduced beyond recall by the growth and later harvesting of trees (see D22 Gubhill Rig).

Urban and industrial development must also potentially have been responsible for extensive site destruction, largely without record. The Central Belt, from Greenock to Edinburgh inclusive, has been most at risk, and, despite the centrality of this area to Scottish cultural life, there has been little in the way of comment on material destroyed. Some sites have been removed at an era too early for archaeological interests to have developed (see C:4 Rutherglen churchyard), and it is clear that appreciation of the nature of neolithic remains has been slow to develop (see II:1 Port Seton; II:2 and 3 Inveresk). Ludovic Mann did achieve important rescue work in the 1930s, particularly at Knappers, Dunbartonshire (Ritchie and Adamson 1981; and see Welfare 1975). As recent work around Edinburgh, on the Inveresk bypass (II:a), at Elginhaugh, and at South Gyle has shown (II:iii), the potential for recovery of evidence in the Central Belt is still present.

Other urban centres are smaller, but can still coincide with prime locations, attractive in
This is particularly the case in relation to coastal situations (see Haylie I:1), where settlement opportunity can be confined. The town of Dumfries coincides with the centre of a major monument complex, and the record of site destruction, involving only two stone circles (Table VI:2:8, 14) probably understates the actuality.

In summary, post-depositional events, geomorphological and anthropogenic, were clearly able to inflict enormous damage on neolithic monuments, and were quite capable of removing all trace of their existence.

Following Stevenson (1976), certain types of environment and locational choice may be identifiable as being especially vulnerable, although it will not be possible to quantify the losses incurred. Approaches to the evidence must be modified accordingly to take continual account of survival probabilities. The distribution of other types of prehistoric remains may be informative, as, for example, in the good record of later prehistoric settlement sites, and even of agricultural traces, on the Cheviot grasslands, where no neolithic cairns are known. Assessment of contemporary settlement evidence, usually on the basis of artefact distributions, may give a measure of the probability of a neolithic, monument-building presence, encouraging the search for missing evidence to
complement that of the artefacts. Statistical and spatial analytical techniques are, in such circumstances, unlikely to be useful. There can be no opportunity to recognise significant 'black holes' in the distribution pattern, as suggested by Groube (1981) in relation to iron age hillforts, when all that can be glimpsed in the clouded night sky is a scatter of pinpoints of light. A major constraint must remain in that whatever consideration is given to processes of site destruction, it may be impossible to assess whether the recovery of an unusual site type, for example, the timber hall at Balbridie, represents isolated survival of a characteristic neolithic form, or chance encounter with an exceptional single venture. The constraint becomes one of perception as much as one of simple survival of the evidence.

2:4 Limitations of perception

Much of the site destruction, discussed above, occurred quite recently, without any recognition of the nature of the material being removed. Distorted perceptions of the Neolithic derive from identification of the period with chambered tombs, themselves represented in imagination by the most impressive examples. Prediction, necessarily, depends on what is already known, and the unfamiliar is neither sought nor recognised when encountered, as is seen in the long
failure to observe the presence of unchambered long cairns in eastern Scotland (Masters 1984). The glaciated landscape of the area, characterised by drumlinoïd mounds and eskers closely resembling long barrows, as at Wanlockhead (D:13), deflected identification of monuments. A "long cairn" can easily be created by heaping clearance stone onto a ridge of rock outcrop, as at Glen Moss, Renfrewshire (D:6). The existence of such confusing features can only have discouraged antiquarian enthusiasm, particularly in a climate of opinion which fostered a disregard of the Scottish past, as the product of a barbarian nation living on the fringes of the civilised world (Chapter 4). Such attitudes, compounded by the paucity of excavation and survey already referred to (1:2;4; Fig.1: 2), and commented on by Kinnies (1985, 16-17, illus.1), have helped to perpetuate perceptions of the Scottish Neolithic as an intrusive culture, dependent on a necessarily diluted version of continental agrarian and economic practice, which developed its corpus of divergent chambered tombs in response to the exigencies of climatic constraint and finite resources of cultivable land.

The uncertain basis of such perceptions is now being revealed by two, apparently contradictory sources of new, or newly evaluated evidence. On the one hand there is the discovery of a wide range of ambitious
monument types, predominantly in east central Scotland, where agricultural constraints are at their least severe. The constructional skills that produced the timber hall at Balbridie, the extent of organised land use suggested by the linear monuments of cursus- and bank barrow-related form, and the social complexity represented by the monument centre at Balfarg Riding School, combine to present a model of a very much more sophisticated and integrated society than had been suggested by the segmentary pattern of chambered tomb distributions along the western and northern seaboard. On the other hand, palynology and settlement evidence, or lack of evidence, are being combined to undermine accepted concepts of the Neolithic as a time of sedentary agriculture. New models have been presented of a Neolithic consisting of transhumant pastoralists (Pryor 1988) or of garden horticulturalists (Thomas 1991, 20), and Armit and Finlayson (1992) have argued for considerable continuity from the Mesolithic in the logistic basis of economic strategies practised in western Scotland. There is a need to recognise the uncertain basis of earlier perceptions and to re-assess the fundamentals of neolithic economies.

The dichotomy is further illustrated by consideration of perceptions of social change in the Late Neolithic. The period, loosely defined, can be taken to include both the individual burials of
Yorkshire accompanied by prestige artefacts, attributable to the mid third millennium BC, and the large earthwork and palisaded enclosures being constructed in the centuries around 2000 BC. Conflation of these phenomena has produced an image of a Late Neolithic of increasing social differentiation, where a hierarchical class could organise human resources in the construction of major monuments, and was involved in networks of elite exchange of high quality artefacts. There is a need to recognise the relatively small scale of most of the Scottish henges, and their almost total absence of exotic goods. There is a sharing of knowledge seen in the recurrent format of bank and internal ditch; styles of grooved ware stretch from Orkney to southern England. Yet excavation of a large palisaded promontory enclosure at Meldon Bridge (III:b) found only a local form of impressed pottery, almost no lithics, and one axe. The society responsible for construction of Late Neolithic enclosures can seldom be seen to match the models of prehistorians, and re-evaluation of perceptions seems to be required.

2.5 Constraints on the use of artefact evidence

2.5.1 Artefacts as a guide to settlement

While chambered cairns may be argued to provide a poor guide to settlement distributions, neither can artefact recovery offer a simple equivalence of
pattern. Depositional and post-depositional factors again distort records, and not least in importance are the vagaries of individual artefact collectors.

In terms of deposition practice, it is questionable whether artefacts can be expected to coincide with settlement. It is a matter of record that artefact recovery from neolithic domestic structures tends to be sparse, whether in Shetland (Whittle et al 1986, 135-7) or the Thames Basin (Holgate 1988(a), 31-3). It may be that axes are associated primarily with forests, arrowheads with hunting, and lithic debitage with sources of raw material. Neolithic pottery is most often found in pits, which may constitute ritual rather than directly domestic disposal (Thomas 1991, 59-61).

Recovery bias is directly related to recent agricultural practice, qualified by soil conditions. Centuries of agricultural use, including manuring, were found to have deeply buried prehistoric features on the Monktonhall gravels, the site of a probable cursus (II:a), and it is possible that the deep loams of the Lothian plain are consistently less likely to reveal prehistoric artefacts than the hillslopes of the Tweed Basin.

The extent of movement of artefacts within soils also varies. Holgate's observation (1988(b), 105) that artefacts tend to "oscillate" in plough soil near the place of deposition, applies to the Thames basin. In the
boulder clays of County Waterford, on the other hand, Zvelebil noted total disassociation between artefacts and features, the result of downwash of material, even on a gentle slope (*Summary Accounts of Archaeological Excavations in Ireland*: Dublin 1988, 26-7). The latter experience matches that of Mulholland (1970) in relation to mesolithic artefacts in the Tweed Basin, washed downslope to the river terraces from original areas of deposition on the hillsides. Artefact recovery again fails to provide a guide to preferred original locations for activity.

Unequal levels of artefact recovery are re-inforced by the work of collectors, who naturally gravitate to areas of known potential. The disparities of the collecting record across the study area frustrate attempts to compare Regional statistics. On a local level, too, records are inadequate. Historically, lithic collection has been concerned with accumulation of finds rather than with the identification of working sites or methods. There is little information available on specific locations of finds, density of recovery, or association between items. The most diagnostic neolithic artefact, the leaf arrowhead, carries little chronological refinement, and, as a hunting weapon, is likely to occur as a casual loss. Transverse arrowheads imply Late Neolithic context, but disparities in distribution suggest cultural factors to influence their use.
Pottery can be more informative on chronology, although much uncertainty still remains over certain styles. Rapid decay of ceramics weights recovery to excavated sites or to sand dunes. The regularity with which neolithic pottery is found on iron age, Roman and medieval excavations, suggests original use levels to have been much higher than recovery would suggest. Distribution patterns may be wholly misleading.

The most widely found neolithic artefact, with the greatest potential for informing on overall settlement patterns, must be the stone axe, a recognisable and relatively indestructible survivor from the period. Constraints attached to the use of axe distributions as a guide to settlement are considered separately.

2:5:2 Axehead Distributions

Prehistorians recurrently look to distributions of neolithic axes as being "quite the best guide to farming settlement" (Burgess 1984, 135). Yet in Galloway, separation between the upland distribution of chambered cairns and coastal recovery of axes led Ritchie (1987) to suppose that a distinction was being maintained between areas of settlement and those of burial. In the Milfield Basin, with its record of Early Neolithic settlement and its concentration of Late Neolithic monuments, only seven or eight axes have been recovered as against two hundred in Northumberland as a whole.
(Miket 1976, 119). Soil conditions in the Basin may be
inimical to recovery of artefacts, just as in the
Galloway moorlands few axes will be recovered from the
peat. There are also, however, questions of deposition
practice involved.

The majority of axes from the study area have been
casual finds, often encountered during ploughing or
draining of farmlands. Apart from occasional finds made
in peat cutting or draining bogs, few axes come from
'unimproved' land, although excavated specimens from
hilltop forts, on Traprain Law, Burnswark Hill, the
Dunion and Hownam Rings, suggest that an upland element
of original distributions may be under-represented.

As with lithics, questions must arise over the
immediacy of the link between axes and settlement. In
functional terms, axes tend to be associated with
clearance, not a domestic role, but one which would not
be expected to arise any great distance from settlement,
to which, indeed, it might be a necessary preliminary.
Axes vary greatly, however, in size, shape, and,
presumably, also in function (Darvill 1989), and areas
of use are likely to have been as varied. Distribution
studies (e.g. Chappell 1987) have focussed on two
particular factors which may have distorted equivalence
between axe densities and population: dispersal
mechanisms and modes of deliberate deposition.

Chappell discusses the patterns of dispersal in
Britain which show decreasing numbers and size of specimens correlating with distance from source. This linear regression suggests a 'down the line' exchange system, within which account must be taken of factors such as coastal transport and cultural links over land. In matching this model to Scottish distribution, problems arise over identification of sources. In the case of axehammers it seems that local rocks, including erratic cobbles, were much used (Fenton 1989), but there is little information on similar practices in the case of axeheads. Of c 800 axes attributed to the study area, 100 have been thin sectioned for petrographic analysis (Ritchie and Scott 1989), nearly half of these coming from the two southern Regions, the Borders and Nithsdale. As the programme was designed to identify products of known axe 'factories' (ibid p.87), it is not surprising that a heavy reliance on Group VI axes is suggested. Macroscopic examination of the Solway material by Williams (1970) does, however, support this conclusion, and it seems that the coastal area here has acted, in the terms of Renfrew, Dixon and Cann (1968, 327-30), as a 'supply zone' in direct contact with Cumbria. Certainly Luce Sands, with quantities of axe flakes and debitage, appears to have been a workshop site (Williams, op. cit.) Such patterns help to explain the disparity between axe finds and chambered cairns commented on by Ritchie (1987).
McVicar (1982) has attempted to use results of the Scottish sectioning programme to conduct a trend surface analysis of Group VI and Group IX products, looking at axe sizes rather than simple numbers of axes or axe lengths. The contoured patterns of decreasing size which he produces are so heavily weighted by the small numbers of axes involved in the exercise, that it must be unsurprising that he finds the pattern for Group VI axes "rather confusing" (p. 36). His suggested centre for Group VI distribution based on the Ayrshire coast, fanning outwards both to inland Ayrshire and southwards to Wigtownshire, makes no sense in terms of geography, of the small numbers of such axes known in Ayrshire, or his own weighting of the data.

McVicar does not attempt to extend his analysis to the Tweed Basin, where only three Group VI axes have been petrologically identified. There can be no doubt that there are many more such axes in this Region, which has the highest numbers of axes in the study area, some of which, as Manby (1965, 14) suggested, were probably brought into Teviotdale over the Cheviots, creating a weighting of axe finds to the south of the Region.

Another factor contributing to distortions in distribution patterns of axes must have been practices of special deposition. Axes carried great symbolic importance in the Neolithic (Bradley 1990), although they were not implicated in funerary practice in the
study area except in the case of Later Neolithic single grave burials with Yorkshire type flint axes and adzes. Deposition practice concerning axes is discussed in section 10:10, but it may be observed here that in the Regions with the densest distributions, the Biggar Gap (III) and the Tweed Basin (IV), large specimens and jadeite axes gravitate towards upland and peripheral locations. Deposition of special artefacts may thus distort correlations between axe distributions and settlement.

Finally it must be added that there is little chronological information on axes, except for Late Neolithic flint types, and, perhaps, the axes from Killin, Perthshire, which also seem to have been exploited at a late period (Edmonds et al 1992). Other types were probably in use throughout the Neolithic, making their distribution a crude measure of population density at any particular period, and setting constraints on any correlation with monument construction.

2:6 Chronological constraints

The last point with regard to the paucity of chronological information on axe dispersal echoes a theme which is encountered throughout consideration of the material culture evidence for the Scottish Neolithic. Evolving social perspectives cannot be
explored unless some measure of the length of time involved can be made, yet the tools for such achievement remain blunt. The long time scales of prehistory can be supposed to give the subject an inherent advantage over, for example, the one dimensional view of ethnography. What the archaeologist observes, however, is not continuous process but a succession of moments in time. It is the inability to observe mechanisms of change that account for the frequent appearance in prehistory of the 'hiatus' (van der Waals 1984). This is illustrated in the present case in relation to the Mesolithic - Neolithic transition, and again in the transformations occurring between 'Early' and 'Late' Neolithics. If the dynamics of change are to be examined, the static evidence must, at the very least, be set in diachronic sequence. "Absolute" dates from the study area are few, often unreliable in themselves, covering a wide probability range and seldom simple in application. Measurement of chronology must still depend to a large extent on the traditional means of stratigraphy and typology. Chapter 3 presents the theoretical case for the requirement of chronology (3:2), and Chapters 8 and 9 constitute an attempt to construct a framework. The present chapter has set out some of the constraints which limit possibilities in this endeavour.
3. THEORETICAL FRAMEWORKS

3.1 Terminology

3:1:1 The need for definition

Working definitions of terminology form a necessary preliminary to theoretical discussion, although the concepts involved receive fuller analysis in the course of the thesis. As an overture to the present chapter, usage of the three key words of title, "role", "monument" and "Neolithic", merits some clarification.

3:1:2 "The Neolithic"

Period classifications are, a priori, artificial constructs, intended to impose selective concepts on chronologically defined segments of the past. The periods concerned must always be more complex than the terminology would suggest. In the present case, it is necessary to distinguish the 'Neolithic' of southern Scotland, from concepts of the Neolithic as the product of a Near Eastern Neolithic Revolution, and to look for a geographically specific definition. Economic aspects of the Scottish Neolithic, outlined in Chapter 8, are not necessarily the most fundamental characteristics of the period.

Discussion of the inception of the Neolithic in Britain has traditionally been concerned with
questions of the evidence for clearance, crop production, animal domestication and sedentism. Each of these aspects probably contributed to the developed Neolithic of the study area, but each may have appeared as an individual strand within an earlier, technologically mesolithic society, while widespread adoption of such practices may have been delayed for several centuries after the onset of neolithisation. The scope for differing sequences of development is discussed by Zvelebil and Rowley-Conwy (1986). An archaeologically recognisable Neolithic, on the other hand, does appear to make a quite sudden appearance in Britain, north and south, shortly before the end of the fourth millennium bc. The first neolithic sites in the north seldom produce substantial evidence for agriculture or for domestication, although a little grain is often present; the absence of faunal remains is usually attributable to acidic soil conditions. Microliths have disappeared and pressure flaked tools, particularly leaf arrowheads, are sometimes present, but early lithic assemblages are often undiagnostic. Polished stone axeheads, too, are rare in dated early contexts, although the Langdale Pikes were probably being exploited before the end of the fourth millennium bc (Bradley and Edmonds 1988); flint axes are of little relevance in the north. The most common 'signal' allowing for recognition of an early neolithic site in Scotland is the recovery of Grimston-
Lyles Hill type pottery, hardly, of itself, sufficient indication of the occurrence of an economic or social revolution. The more important message of fundamental change derives from the site types themselves. Late fourth millennium dates across Britain are regularly associated with major timber structures of a wide variety of types: the framework of Sweet Track, Somerset; post-built facades at Giants Hill 2 and Willerby Wold in Lincolnshire and at Street House, Cleveland; mortuary structures at Ascott-under-Wychwood, Oxfordshire and Lochhill, Kirkcudbright; a mortuary enclosure at Inchtuthil, Perthshire; plank built houses at Lismore Fields, Derbyshire and Balbridie, Fardershire. They also derive from pits, hearths or occupation layers below or beside funerary mounds: Beckhampton Road, Wiltshire; Gwernvale, Breconshire; Trefignath, Anglesey; Seamer Moor, Yorkshire; Biggar Common, Lanarkshire; Port Charlotte, Islay; Boghead of Fochabers, Morayshire; and Raigmore, near Inverness. Other early dates, from Fussell's Lodge in Wiltshire, Garton Slack, and Whitegrounds in Yorkshire, and, more doubtfully, Monamore on Arran and Tulloch of Assery A, Caithness, are associated with the use of these funerary sites. It is, of course, true that monuments attract excavation, producing, in turn, the largest pool of radiocarbon determinations. A few late fourth millennium dates do come from sites without major structural evidence,
such as Ehenside Tarn, Cumberland, Thirlings in the Milfield Basin, and Linlithgow Priory, West Lothian. Shell middens, too, the one substantial site type of the Mesolithic, produce early neolithic dates on Oronsay and the Firth of Forth. The weight of evidence, nonetheless, overwhelmingly demonstrates that the onset of the Neolithic is associated with structures, of timber, earth and stone, and it may be added that the nature of these structures was frequently funerary or ritual. Essentially the period is marked by the appearance of monuments. This same phenomenon has been discussed by Thomas, who concludes (1991, 29-30) that monuments cannot be regarded, in Humphrey Case's terms, as an 'optional extra', demonstrating the achievement of 'stable adjustment' by settled neolithic communities. He would argue, rather, "that it is more consistent with the evidence to view monuments as something fundamental to the Neolithic way of life".

To define the Neolithic as a monument building period must simplify the present enquiry into the role of neolithic monuments by focussing on this specific aspect of the period. The mesolithic-neolithic transition is problematic and may well have been protracted, and it will need to be examined as being the prelude to the theme. After the well-marked late fourth millennium horizon detailed above, monuments form a recurrent focus of interest throughout the Neolithic, emphasis falling
increasingly on the definition of ceremonial space for community enactments. The fundamental shift of the second millennium is towards a reduction in scale of ritual activity, with a greater interest in individual funerary rites. The Neolithic may be said to have ended when the communal functions of Cairnpapple henge are subsumed in the construction of burial sites and cairns.

3:1:3 "Monuments"

In the last section the ad hoc assumption has been followed that structures of a funerary or ritual nature classify as monuments. This idiomatic archaeological usage must now be succeeded by a rather more analytical examination of the term.

Distinction must first be drawn between two common ways of using the concept of monuments in archaeology. Derived from the latin monere, to remind, a monument is a reminder of the past, but may perform that function either passively, simply by its survival, or actively, being designed to serve as a memorial. In the first usage, monuments are simply immobile artefacts (Mercer 1985(b), 10), man-made features, surviving from the past, which may be preserved under Ancient Monuments Acts as a reminder of their original function, and listed in Inventories of Ancient Monuments. It is the second, active definition which is of greater concern in the
present instance. The intention to construct a memorial implies that a monument is concerned with making statements, setting patterns for the future, and creating images of the past. In order to achieve such ends monuments are often monumental. Richard Bradley has defined monuments on the assumption that monumentalism is integral to their nature as "undertakings whose scale is out of proportion to their function" (Bradley 1985, 2), thus setting the prehistorian the relatively simple task of relating the effort involved in construction to resources available. Such monumentalism would seem to be extraneous to the idea of a monument as a memorial, a function which can be achieved in the case of a personal memorial by a simple headstone marking a grave. Whether it is an essential quality in the case of communal monuments must also be doubted. A monument may create a setting for ritual and ceremonial without attempting to express grandeur disproportionate to function.

This more modest interpretation of a monument seems of particular relevance to the Neolithic, where a recurrent concern appears to have been community involvement in construction, rather than permanence. Timber structures, once used, are burnt down and mounded over; ditches are refilled, only to be re-cut on a later occasion. Within the study area two stone circles in the Lammermuirs, Borrowston Rig (IV:d) and the Crow Stones (IV:a), each about 40m in diameter, consist of small
boulders, easily collected in the vicinity, and set out to define respectively an egg-shaped and an elliptical ring. While the secrets of geometry may have conferred a magic status on these settings, the effort expended in their construction was slight. Presumably they served as designated locations for periodic gatherings or ceremonies, when a peopling with participants brought them impressively to life.

While intention may be taken as being integral to the role of monuments, discussion of that intentionality may be better left to a fuller discussion of the meaning of neolithic monuments in Chapter 11. For present purposes it can be accepted that monuments are man-made structures intended to communicate meaning to the future; that future, however, may have been the immediate 'tomorrow' of planned ceremonial, perhaps incorporating a cyclical view of a time of recurrent tomorrows in which ceremonials are re-enacted, rather than a distant, linear perspective of succeeding generations.

3:1:4 "Role"

The third key word of the title can be defined simply as constituting both the practical function and the cognitive perception of monuments within their originating society. Behind the word, however, lies an assumption that the role of monuments in prehistoric societies is a legitimate and attainable object of
enquiry. It is the philosophy that justifies such an assumption that needs next to be explained.

3:2 Theoretical approaches

In recent years archaeology has become one of the most theory-driven of disciplines, a consequence, in part, of the data distortions and deficiencies which impose a requirement for abstract models to structure interpretation. A useful product of the theoretical debate has been a general acknowledgement of the dictum that the past is the creation of the present, and a recognition of the fact that prehistory is not an immutable reality, waiting to be read, but needs to be re-interpreted and re-created by succeeding generations according to their own vision. This realisation creates a need to go beyond simple record, and to examine the most fundamental aspects of social structure, exploring those questions of belief and cognition once thought to lie beyond the compass of archaeological recovery.

The normative view of the legitimate scope of archaeological method was set out by Christopher Hawkes (1954) in terms of a 'ladder of inference'. The techniques that produced archaeological phenomena could be relatively easily reproduced, and subsistence economies fairly easily, but social and political institutions were hard to divine, while religious institutions and spiritual life, superficially easily
apparent, lay, in fact, in the hardest and least testable area of all. Post-war, empiricist, normative archaeology worked within this framework, insisting that the 'unattainable' attributes of the past should be eschewed as objects of enquiry (Piggott 1959). Social narratives were produced on the basis of direct inference: for example, rich grave goods were treated as evidence for chieftain-led hierarchy, and innovation and change were ascribed to invasion. Problems of internal social development were thus largely evaded, and the chief area of advance lay in the study of relationships between man and the natural environment (Coles 1963, 93).

Scientific techniques of various kinds were expanding archaeological potential, not least in the application of radiometric dating methods, which soon began to be undermine the Invasion Hypothesis. The 'New Archaeology' of the 1970s embraced these scientific approaches whole heartedly, laying especial emphasis on the need to quantify and to apply mathematical models, as well as to test hypotheses (Binford 1972; Clarke 1972). Systems theory provided a favourite framework, the various facets of social and economic life being seen as subsystems within the overall, interlocking socio-economic system, itself set within the constraints of the environmental system (Clarke, DL 1968). Despite the explicit balance of the model, fundamentally, systems
theory was an ecological approach, using concepts of adaptive response to environmental pressures.

For Renfrew, however, the radiocarbon revolution in chronology created a challenge to re-examine social process. He used systemic approaches which focussed on the boundaries between cultures (or systems) analysing trade and culture contact (Renfrew, Dixon and Cann 1968), types of social organisation as evidenced by the scale of co-operative effort in the construction of Wessex monuments (Renfrew 1973) and aspects of territoriality (Renfrew 1976). Such studies borrowed techniques from spatial geography to 'read' social organisation from settlement distributions, thus edging up the rungs of Hawkes' ladder (see also Hodder 1978). Even as these methods were being adopted, however, spatial geographers were coming to recognise the inadequacies of formal mathematical models in the reconstruction of human phenomena (Green and Haselgrove 1978). Archaeological evidence is even less adapted to such techniques (see Ch.2). The records of chambered cairns on Arran and Rousay had been selected by Renfrew for their apparently good levels of preservation, but later studies have shown how incomplete such distributions can be (Fraser 1983), and what a complex chronological sequence they may represent (Sharples 1985).

More importantly, functionalist explanations of chambered tombs as territorial markers are now seen to
be ignoring fundamental problems of social motivation. The decision to build a chambered tomb of a particular type is more than an adaptive response to pressure, but is rather the product of a whole web of social, cultural and cognitive attitudes, which will themselves be affected by the construction of the tomb. As social explanations come to supplement and replace rational, systemic models, theoretical approaches have been brought to bear on the particular problems of revolutionary or evolutionary change (e.g. Bender 1975). Marxist explanation invokes a 'conflictual model', emphasising the tensions at the root of social order (e.g. Tilley 1981). The alternative 'consensual models' (Burke 1992, 28), build on a Durkheimian view of the cohesiveness of society, where shared social attitudes are rooted in a common understanding of the sacred, and the collective rhythms of life themselves constitute the social order (Bourdieu 1977, 71). Explanation of social change thus invokes a need to understand the whole complex of society and its institutions.

Conflictual and consensual models are not opposites, but place varying emphasis on aspects of the complex whole. Society can only exist through cohesion, and by a share of acceptance of some basic norms and attitudes, but, equally, society is pluralistic, encompassing a range of elements and interests which must sometimes conflict. It was the achievement of the Romantic
movement to understand that each social situation had validity on its own terms, and that historical studies should proceed on a basis of cultural relativism (4:4). It has been the role of the anthropologist to unpick and explore the cultural patterns that permeate different societies examined. More recently, 'contextual archaeology' has been developing the same theme (e.g. Hodder 1982(a); Barrett and Kinnes 1988). The various aspects of the past – technology, subsistence, domestic living space, settlement patterns, decorative devices, cultural habits and ritual practices, all form parts of a single web of social context, which cannot be studied as separate sub-systems. Each aspect of life is not simply a component part, but rather a facet of the greater whole, shaped by the social order and, in turn, creating that order. On this premise Hawkes' ladder must be approached from the opposite end, treating the decoding of the rituals, beliefs and attitudes of society as the essential preliminary to an understanding of more mundane aspects of life.

It remains to be asked, however, whether the flawed remains of material culture survival can carry the information on social structure, cultural symbols and belief necessary if the patterns of past societies are to be reconstructed. Questions of archaeological method need next to be addressed.
3:3 Methods of approach

3:3:1 The case for empiricism

In the search for understanding of cognitive belief and attitudes, anthropologists have an apparent advantage over archaeologists in their access to a store of myth, lore and legend. Oral tradition may, however, prove an unreliable aid, consisting of symbolic rather than literal meanings, and of garbled, ad hoc explanations of familiar, but ill-understood, patterns of life. It can become necessary to take a deconstructionist view, accepting the limitations of the language game of ritual explanation, and searching, instead, for the meaning of ritual actions through the observation of daily patterns. The symbols used by societies may be better understood through a study of contexts of use than through direct inference. Symbols do not follow any universal Jungian system, but may have been chosen quite arbitrarily (Firth 1973, 68), as the tribal totems of the Aborigines appear to have been selected for ease of pictorial representation (Evans Pritchard 1965, 58-9). The chief barrier to interpretation of Palaeolithic parietal art lies, not so much in the art itself, as in lack of knowledge of the context of production (Hodder 1986, 44-55).

Hodder recognises that there is a general problem with contextual approaches in the diminishing availability of evidence for early periods of
prehistory, as the Palaeolithic example demonstrates. Archaeology must, of its nature, depend on material culture evidence, and, where this is in limited supply, it may be necessary to tailor approaches to utilise such information as is available. Acceptance of the role of data in structuring research strategy may resemble a return to the normative archaeologies which the processualists of the 1960s and 70s hoped to have outgrown (Hill and Evans 1972). Equally the post-processualists Shanks and Tilley (1987, 9-12) decry such empiricism as being an abnegation of the archaeologist's responsibility to look for patterning as predicted by social theory. They argue that it is "rabid empiricism" that fuels the idiosyncrasies of intuitive approaches to archaeology, being responsible, ultimately, for the retreat to the fantasy worlds of the ley-liners. Extreme cases make for poor argument, and it is countered here, with Hodder, that a mature archaeology must recognise the parameters set by the nature of the evidence. As discussed in Chapter 2, the filters of time have set severe constraints on perceptions of the Neolithic in the south of Scotland. Adaptation to opportunity as offered must constitute one positive way forward.

Interpretation of the Scottish Mesolithic, known primarily through its lithic distributions and technologies, has, of necessity, been directed to reconstruction of economic patterns on the basis of
supposed optimising strategies. The resultant models have been decried by Julian Thomas (1988(a)) as creating 'a cybernetic wasteland'. The nature of the evidence for the succeeding period alters dramatically, opening up opportunities for social interpretations through readings of the text of material culture remains. New fields of evidence are not confined to the monuments, already commented on as characterising the Neolithic (3:1:1). Practices of structured deposition of artefacts, in pits and ditches (Healey 1987; Thomas 1991), present a contrast to the lithic scatters of the Mesolithic, and forms of recovery of material culture evidence thus themselves illuminate value systems at work and add a contextual dimension to the evidence of the monuments, compensating in certain respects, for some of the thinness of domestic survival.

3:3:2 Comparative methods

Changing perspectives have transformed the domestic rubbish pit of the normative school of archaeological thought into an artefact of structured deposition. Such reconstructions illustrate the point that material evidence is not neutral but is always viewed through the particular conceptual view of the archaeologist (D.L. Clarke 1972). To be conscious of such preconceptions, however, is an aid to flexibility of outlook, and, as a means of achieving self-awareness and of broadening
frames of reference, the comparative method may have particular value. It is by examination of similarities to and differences from comparable evidence that a contextual view can be achieved (Hodder 1986, 125-134).

The hallmark of the ethnographer has long been the use of the comparative method, and huge data banks of cross-cultural ethnographic material have been accumulated with the specific intention, not always successfully achieved, of identifying predictable regularities in patterns of association of cultural traits (MacNett 1979). Basic to the use of such material, however, must be the principle of comparing like with like and seeking cross-cultural analogy only in cultures which manipulate similar environments in similar ways (Ascher 1961). This restriction probably excludes the possibility of useful comparison of detail being made between the British Neolithic and primitive societies surviving today. The Neolithic may have been 'primitive' in the sense of being a non-literate, small scale society with simple material culture (Evans Pritchard 1965, 18), and it probably shared the cosmological outlook of traditional religions. The Neolithic, however, was an expanding, successful society, reaching out to acquire new technologies and to occupy prime areas of ecological opportunity in the Temperate Zone, in stark contrast to the marginality of present day primitive societies,
surviving precariously in the most inhospitable environments. Behaviour patterns are likely to have been very different and social relationships and habits of thought to have developed along entirely other lines.

Analogy, then, may more usefully be sought among societies nearer in time to the Neolithic. Already, in definition of the period (3:1:1), the value of such an approach has been demonstrated, the characteristics of the time being isolated through comparisons with the Mesolithic and the Bronze Age. The last section (3:3:1) extended the comparison to draw attention to characteristically neolithic habits of deposition. Such interperiod comparisons direct attention to similarities and differences, which, in the above instances, were directly illuminating on alternative concepts of ritual. The fruitfulness of the comparative method is well-proven, and has been adopted in this thesis as a means of making the most of the evidence available.

Several different scales and perspectives are employed in the pursuit of comparison. In the first place there is the diachronic approach, used above on an interperiod basis to illustrate the method. Changes during the Neolithic are also of considerable importance, and it is in comparisons between phases that it may be possible to reveal the dynamism and direction of change. Limitations on knowledge of neolithic chronology have been commented on above (2:6), but the importance of
this element of comparability is such that an attempt is made in Chapters 8 and 9 to construct a chronological framework for the Neolithic of the South of Scotland, and the changing patterns are used to chart sequence in the role of monuments throughout the period.

Secondly, the Regional structure of the Gazetteer is designed to facilitate spatially defined analogy, comparing forms of expression and development between Regions. Such methods fulfil particularly closely the requirement of comparing like with like, noted above. The Regions concerned are ecologically varied, but all lie in the same climatic and vegetation zone, and the resource potential of each varies only in certain respects. All were facing the challenge of changing opportunities from a similar technological basis, and observation of differences of response should help in identification of the factors influencing choices. From such variation it may also be possible to extract general principles on the underlying nature of the Neolithic in the study area.

Patterns within the south of Scotland, both general and local, must continually be viewed within a wider north west European context. Similarities and differences again serve both to isolate the irreducibles of the Neolithic and to pose appropriate questions regarding the variations. Such comparisons may also help in identifying areas of dialogue and information
networks across neolithic communities. Examination of the broader field may help in elucidating the 'principles' underlying neolithic actions and attitudes (Hodder 1990).

It must finally be appropriate also to be aware of social theory derived from ethnographic and historical situations. Such material is of value, not for the direct analogies that it may furnish, but in the maintenance of broader perspectives and deeper understanding of the potential for social and cognitive variation.

3:4 Readings for the present

Affirmation of the difference between past and present need not diminish the significance of the former for the latter. The present creates its own past, but does so by selection, responding to such aspects as appear meaningful within modern cognitive schemes. At times it may be that it is the unlikeness of the past to the present that proves its attraction.

An important point of contact between the Neolithic as discussed in this thesis and the present day is one of shared location. Neolithic society could only survive in southern Scotland by making a success of its physical relationship with the same countryside that, much altered, is still inhabited today. Indeed the Neolithic appears to have chosen to celebrate its relationship with the landscape directly, constructing monuments
interwoven with locality, exploiting the potential of local materials, and focussing on some of the most remarkable topographic features of the area (see, 10:5).

In the 20th century relationships with the same landscape have intensified in a variety of different ways, in addition to the continued practical utilisation of land resources for farming and forestry. Romantic attachment to the countryside, part product of urbanisation, has been heightened by an environmentalist concern with the threat to the natural heritage from over-exploitation and pollution. There is also political reaction to the centralising and homogenising forces of modern bureaucracies in London and Europe, giving rise to divergent local separatist movements deeply rooted in a sense of place.

Celebration of locality can be a valuable means of confirming individual identity in an increasingly depersonalised society. The added dimension of prehistory offers a past, not immediately progenitive of the present, and thus without the divisive nationalisms of recent history. The Neolithic was a time when the countryside was explored, utilised, brought under control and celebrated, but within a broader European and indeed human, canvas of achievement. Understanding of the period can only enrich appreciation of the local landscape, while opening a sense of participation in a wider past.
Chapter 2, discussing constraints imposed by the failure of monuments to survive or to be recognised in their surviving forms, laid emphasis on faults of perception rooted in deficiencies in antiquarian and archaeological research, besides the paucity of modern excavation that has been commented on also by Kinnes (1985)(2:4). The shortage of work in this field is the more surprising in that the south of Scotland is not some remote, rural enclave, but contains a capital city which, particularly during the eighteenth century, has been at the forefront of intellectual life, which contains a University that, through the Abercromby Chair of Archaeology, has made a central contribution to neolithic studies on a European, and, indeed, on a worldwide basis, and which houses all the major institutions involved in the promotion of Scottish archaeology (Historic Scotland; the National Museums; the Royal Commission on Ancient and Historical Monuments; the National Monuments Record; the Society of Antiquaries; the Ordnance Survey). There are also many local museums and societies throughout the area, while in Glasgow there are two major archaeological museums and another University, teaching archaeology. On the one hand there are present a wide range of
resources and active intellectual interest, while, on the other, the Neolithic of the area has barely begun to take shape or, indeed, to attract serious attention. Reasons for this position are rooted in the history of ideas, traced in the present chapter.

4:2 Early times

There is possible evidence for continuing iron age respect in the use of Cairnpapple henge for long cist burials (II:(b)) and of the Lochmabenstane as a place of assembly (Table V:1:1). Cemetery sites in the Lothians (II:vii) and Lauderdale (IV:viii) demonstrate long continuity of use. Westside (III:g) appears to be a henge rebuilt as a defensive earthwork, and outer ditches at Weston (III:f) and Swallowdean henges (IV:c) suggest re-use, perhaps as dependent on the prestige of the ancient sites as on the utility of their surviving banks (cf. Yeavering: Bradley 1985).

Churches may also have made purposeful use of surviving monuments. There are mounds, of uncertain character, in the churchyards of Inveresk (II:2) and Largs (Table I:3:1), and a mound and a 'dolmen' are said to have stood in Rutherglen churchyard (C:4) (and see also Linton church, C:8). The significance of such choice of sites is, however, uncertain.

There is little in the way of medieval legend to suggest continuity in respect for antiquity, as seen, for
example, in Ireland. It is probable that later Presbyterianism is responsible for this loss of material (see 4:3, below). Thus, the 'Mittenfull of Stones' became corrupted to the Mutiny Stones (IV:1), and surviving stories tend to concern historical events, such as plagues, battles or Border reivers, rather than earlier legend (see I:1 Haylie; IV:2 Borrowston Rig; IV:3 Caverton Hillhead).

4:3 Rationalism and antiquarianism

The conceptual change accomplished by the Reformation in Scotland, which swept away the unwanted imagery of medieval churches, to be replaced by plain, post-Reformation buildings, has been associated by Makey (1979) with a social revolution of tenant farmers and feuars against the landed classes. A positive antagonism towards relics of the past thus accompanied agricultural improvement. The attitude is well figured in an account of Sir Walter Scott's lawyer and land agent father, said to hate old stones, preferring to see them utilised in building dykes and cowbyres (Veitch 1893, 125). In the same spirit the Standing Stones of Garleffin, near Ballantrae, were dislodged and removed by a farmer in 1989, to facilitate ploughing and to pre-empt a Scheduling Order (Glasgow Herald February 5th 1992).

Rational utilitarianism also underlay the systemic study of man and his social development undertaken by
David Hume and the other philosophers of the Scottish Enlightenment. Several commentators (e.g. Piggott 1976, 152-5) have noted similarities between the later Danish Three Age system of technological advance, and schemes devised by Adam Smith concerning phases of economic progress, or by Lord Monboddo in relation to stages of social development. Such approaches, however, were establishing linear evolutionist outlooks which laid the foundation for the long supremacy of the Whig Interpretation of history (Fry 1992), within the tradition of a Presbyterianism dismissive of the follies of unenlightened paganism. From such viewpoints Scotland in early times was seen to be a backward outpost, disadvantaged by reason of its lying outwith the influences of the classical world.

The early antiquarians shared these attitudes, their tastes formed on the Grand Tour to Italy (I.G. Brown 1977), inclining them to collection of classical antiquities, and, as with Scott's Antiquary, Jonathan Oldbuck, the search for Roman remains on Scottish ground. It was such work, however, that led to the foundation of the first structures supportive of archaeological work, the Hunterian Museum in Glasgow and the Society of Antiquaries of Scotland, with its attendant museum, in Edinburgh (Cant 1981; Stevenson 1981).

The Statistical Account of Scotland (1791-8) provides a vivid illustration of attitudes to
antiquity common among educated people at the end of the eighteenth century. Over 50% of ministers in the south of Scotland (165 out of 327), when asked for information on the antiquities of their parishes, mentioned no pre-medieval remains, and over one third of these replies (58) brought up the Romans. There was some discussion of Celts and Druids, often in relation to placenames, as in comment on the significance of Holywood as indicating a grove of sacred oaks (VI:h). There were other attempts to absorb prehistoric remains into historical frameworks, as 'Roman urns', 'Pictish castles' or 'Danish camps'. Cairns were taken as evidence for multiple burials after battles, recorded events, such as the Battle of Largs of 1265, being invoked where possible (see Haylie I:1). A representative response to the question of ancient remains came from the minister of Kirkgunzeon, Kirkcudbright: 'These things are very common in this part of the country and do not seem to claim any further attention' (Vol. VIII, 193).

4:4 The Romantic Movement

However little individual ministers may have understood of the prehistory of their parishes, cumulatively, publication of the volumes of The Statistical Account proved a major landmark in its provision of a mass of information on antiquities in the countryside. This seam was mined in topographic works
serving the demands of a new travelling public, anxious to experience the romantic aspects of Scottish scenery (e.g. R. Forsyth's * Beauties of Scotland* 1805-8). In historical studies, too, particularly Chalmers' *Caledonia* (1810-24), details were garnered from the various parish entries to produce an ordered account of the antiquities of pre-Roman Scotland. Growing interest in such matters, based on a Romantic vision of the past, is well illustrated by a letter of 1813 written by a local farmer to the landowner on whose property the long cairn of Cuff Hill was being despoiled for road-building, revealing cists and chambers (I:2). An appeal to save the cairn was based on 'the respect due to such a sacred spot. Perhaps here rest the defenders of our country - perhaps the remains of its invading forces - or perhaps the slaughtered inhabitants of some peaceful village by some hostile clan' (Dobie (ed) 1876, 404). As Girdwood so convincingly argues (1986) it was the Romantic Movement that rescued archaeology from the failures of antiquarianism and social theory.

Stimulus to this movement came from German romantic literature, owing much to Hegelian historicism, which set national or individual histories above universal principles. Sir Walter Scott, himself a translator of Goethe, absorbed this cultural relativism, and his novels portray the uniqueness and unity of past societies engaged in a clash of cultures (D. Brown 1979).
tangible relics of the Scottish past acquired a new interest, apparent in the increased attention given to antiquarian matters in *The New Statistical Account* of 1845 as compared to its predecessor. Nonetheless the time depth of prehistory was still lacking. It was with some justification that William Mackenzie (1841, 43) dismissed the pre-Roman period as being 'no better than empty fiction or baseless fable, plausible and curious, but uninstructive and deceptive'. The need for a framework within which to order early remains was still urgent.

4:5 The establishment of archaeology

In the second half of the nineteenth century, that framework began to be constructed. Scotland's leading role in the natural sciences prepared the ground for an understanding of stratigraphic method, and there was a ready acceptance of the discovery of the antiquity of man. Great interest was taken in the work of Danish antiquarians, ordering stages of technological development (Graham 1970, 250-1). In introducing his seminal work, *The Archaeology and Prehistoric Annals of Scotland* in 1851, Daniel Wilson acknowledged debts both to Sir Walter Scott, for his role in awakening interest in Scotland's past, and to the Danish scholars for their scientific advances; Wilson's own particular contribution lay in the field of ethnography. In
solving the practical problems of creating sequence from the Scottish material, however, Wilson found it necessary to refer to the 'intelligent research of Sir Richard Colt Hoare effected for Wiltshire' (ibid, p.42), lamenting the absence of such studies in Scotland. Despite all Wilson's awareness of the 'distinctive peculiarities' of the Scottish material, his frameworks were developed on the basis of English prototypes.

In 1851 the main series of the Proceedings of the Society of Antiquaries of Scotland began to appear, coinciding, as D.V. Clarke points out (1981, 120), with the introduction of the penny post, which facilitated speedy access to information across the country. The concurrent growth of interest was quite remarkable. The Berwickshire Naturalists' Club began to publish antiquarian items in 1850, and Transactions followed from the Glasgow Archaeological Society in 1857, the Dumfries and Galloway Natural History and Antiquarian Society in 1862, and from the Hawick Archaeological Society in 1864. Fellowship numbers in the Society of Antiquaries of Scotland began an upward curve in the 1850s from a previous steady level of c 200, the rate of increase only beginning to slacken off in the 1880s, with a peak of over 700 fellows being reached in the 1890s (Clarke 1981, 118). The numbers concerned must be seen in context as part of a countrywide gathering momentum of interest.
Also in 1851 plans were set afoot for a new Museum of Antiquities in Edinburgh, and in 1859 the building was opened and a Keeper appointed (Stevenson 1981). Donations began to flow in to this museum, as also to local ventures, such as the Chambers Institution in Peebles. Fig. 4:1 shows how the numbers of axeheads from the south of Scotland acquired by public museums leapt up from the 1860s, in part stimulated by the establishment of a purchase fund for the NMAS in 1881 (ibid, 160). There were also many private collections being formed, out of personal interest, or, as in the case of Dr. Grierson's Museum in Thornhill, for the benefaction of local education (Truckell 1964). Collection appealed to landowners and country-based professional people, and in certain areas an industry of artefact hunting grew up to service such interests. Compilation of a representative museum collection of prehistoric artefacts seemed to Joseph Anderson, Keeper of the NMAS from 1869 to 1913, to be the essential means of creating a scientific basis for archaeology (Stevenson 1981, 163), and he fostered collecting practice by regular publication of Scottish material in the Proceedings of the Society of Antiquaries of Scotland.

Interest in excavation, aroused by the recovery of artefacts from crannogs explored from the 1860s onwards in south west Scotland, was largely related to the potential here for adding to collections. Chambered
Fig. 4:1 Museum acquisition of axeheads from the south of Scotland
tombs in Argyll and Orkney were examined, and Anderson himself excavated cairns in Caithness. Within the study area, two graves were opened at Lang Knowe (V:2) in the 1840s, and the rest of the cairn was examined in 1870; Cuff Hill (I:2) following two episodes of accidental discovery, was likewise 'turned over' in 1874; in 1871 Lady John Scott trenched the Mutiny Stones (IV:1). Digging occurred at some stone circles, such as Burgh Hill, Roxburghshire (Table IV:3:3). No reports of these episodes were published, results in each case having been regarded as negative.

The information base for field archaeology, relied on throughout much of the twentieth century, was very largely established during the latter half of the nineteenth century. Between 1843 and 1861 the Ordnance Survey produced six-inch maps of the whole of the study area. Surveyors, trained in the Royal Engineers, were novices to archaeology (Davidson 1986), but the antiquities that they recorded in Gothic script on the maps acquired a measure of recognition and protection. Neolithic funerary monuments shown on the 1st edition maps seem all to have escaped subsequent destruction, except in the form of excavation.

Local topographical histories, such as Jeffrey's *History of Roxburghshire* (1859) and Irving and Murray's *Upper Ward of Lanarkshire* (1864), began to include descriptions of ancient monuments; a wide selection
of articles on prehistoric sites and artefacts appear in local journals and in the Proceedings of the Society of Antiquaries of Scotland. By the 1890s some very comprehensive work was available, such as papers by F.R. Coles on stone circles and cairns (1893); 1894(a) and (b); 1895; 1897), or by Christison on forts (1887; 1890; 1893). The conceptual frameworks within which prehistoric studies were undertaken, were, however, very various. As late as 1872 Sir James Fergusson was arguing for a post-Roman date for megalithic monuments, and Celts and Druids play major roles (e.g. Love 1876; Smith 1895). As D.V. Clarke has pointed out (1981, 125), a misleading impression of current attitudes will be gained if archaeological thought is charted on the basis of the writings only of major figures.

An important landmark in the establishment of an ordered view of Scottish prehistory was the series of Rhind lectures delivered by Joseph Anderson in 1879-82 and published with illustrations taken from museum material (1886). Anderson worked within a Spencerian model of progressive evolution, attempting to construct 'a logical .... history of culture and civilisation' on the basis of the 'succession of types and the stages of culture' (p.386). The static view of human nature that he inherited from Enlightenment philosophy was tempered by a Romantic, 'soft' primitivism, and he greatly admired the level of excellence of finely flaked and polished
stone tools, and accepted the capacity for social organisation that allowed for the construction of megalithic monuments. He saw the role of a 'scientific' archaeology, however, to be the imposition of linear order on chronologically diagnostic artefacts, and he had little interest in the reconstruction of past societies and the mundane fabric of daily life. The museum based approaches to archaeology that Anderson promoted had little appeal to the rising tide of interest in folk-loric aspects of the Celtic past, and must have contributed to the decline in enthusiasm for archaeology which had set in before the end of the nineteenth century.

4:6 Professional archaeology

The early twentieth century witnessed the emergence of the professional structures of archaeology in Scotland, co-incident with a period of stagnation in wider interest in the subject. Social causes, including the economic and psychological effects of the Great War, doubtless played a part in the decline. Changing fashions are reflected in local journals in which articles on historical subjects, legends, and folk lore gradually oust accounts of prehistoric sites and artefacts. Exceptions include contributions to the Berwickshire journal by J. Hewat Craw and to the Transactions of the Dumfries and Galloway Society by John
Corrie. Artefact collection was now in fewer hands, and Fig. 4:1 shows the sudden influx of axeheads into museums in the 1950s caused by bequests from L. McL. Mann and A. Henderson Bishop. A few collectors did now give accounts of the location and context of artefact recovery (Corrie 1916; Mason 1927; 1931).

Excavation, probably fortunately, remained a relatively rare amateur pursuit in Scotland, and no enthusiastic landowner in the south emulated the efforts of Walter Grant on Rousay. T.H. Bryce's work on Arran pursued a specialist goal of osteological study. L. McL. Mann undertook excavation while only rarely publishing results (e.g. Mann 1903), except in the form of newspaper articles (see Welfare 1975), in which he developed speculations on lunar religion and serpent temples, as at Knappers, Dunbartonshire (Ritchie and Adamson 1981). J. Hewat Craw published accounts of careful excavations at cairns (1922; 1931; 1933), including the Mutiny Stones (IV:1). Work by Fairbairn around Muirkirk (1920; 1922; 1924; 1927) demonstrated repeated failure to understand the nature of the sites examined, as did the amateur excavations at Loanfoot (I:3) in 1922 and at Fleuchlargs (VI:7) in 1937, which were never published.

In 1908 the Royal Commission on the Ancient and Historical Monuments of Scotland was set up, with A.O. Curle appointed Secretary, the first professional archaeologist in Scotland outwith the museums; James
Richardson, appointed Inspector of Ancient Monuments in 1914, was the second such professional. With very limited resources, Curle carried out his fieldwork largely on the basis of the sites already noted by the Ordnance Survey (Murray 1986), and produced Inventories for Caithness and Sutherland in 1911, Berwickshire in 1909 (revised 1915) and Galloway (1912; 1914). He also worked on Dumfriesshire, not published until 1920, which was followed by volumes on East Lothian in 1924 and Mid and West Lothian in 1929.

The Introductions which Curle wrote to each volume of the Inventories were expanded to form the basis for his Rhind lectures of 1919 (Typescript in NMS), with a general consideration of chambered cairns in south west Scotland, incorporating work by T.H. Bryce in Arran. The restricted area of distribution of these cairns persuaded Curle that they were the work of settlers, probably from North Africa. His discussion of tomb types, like that of Anderson on artefacts, was typological and gave little consideration to settlement background. This approach went hand-in-hand with the site orientated format of the Inventories, which grouped monuments within each parish by type. The illusion of completeness which these works conveyed seems to have tended to fossilise knowledge and to preclude amateur contribution.

The Ancient Monuments branch of the Office of
Works was also concerned with individual monuments, and James Richardson, Inspector of Ancient Monuments in 1914 and from 1920 to 1948, co-operated closely with the Royal Commission (Proc. Soc. Antiq. Scot. 102 1969-70, vii-x). Neither of these bodies, concerned respectively with curation and with record, had a direct concern with excavation, although it could be used by them, or by the National Museum, as an occasional tool. In 1922 A. Edwards, Assistant Keeper at the NMAS, examined the chambers at Nappers, Dranandow KRK 8; in 1928 Curle, at the request of the Office of Works, explored and tidied the newly exposed chambers at the cairn on the Water of Deugh KRK 13. The total absence of artefactual finds from both these sites could not encourage further efforts. Sand dune excavations in East Lothian, on the other hand (II:iii) produced artefacts but failed to elucidate settlement structures. The real advance of these years still lay in artefact studies, such as J.G. Callander's work on neolithic pottery (1929) carried out in his capacity as Keeper of the NMAS from 1919 to 1938. Callander's somewhat chauvinistic refusal to look outwith the bounds of Scotland for comparative material, perhaps served as a positive advantage in this field, allowing the material to be assessed on its own terms rather than on the basis of English sequences.

The appointment in 1927 of Gordon Childe to the newly founded Abercromby Chair of Archaeology at the
University of Edinburgh added a dimension of academic research to the professional structures of Scottish archaeology. Childe, already an authority on the Neolithic of Europe and the Near East and innovative in his theoretical approaches, might have seemed the ideal person to transform understanding of the Scottish Neolithic. He took seriously his obligations to Scotland, excavating all over the country including sites on Orkney and the chambered cairn at Kindrochat, Perthshire (Childe 1930; 1931); he published articles on the Scottish Neolithic (1933; 1934; 1947) and works of general synthesis of Scottish prehistory (1935; 1946). If his impact on perceptions of the Neolithic of Scotland was not immediately revolutionary this may, in part, be attributable to the suspicion with which this professedly Marxist colonial interloper was regarded by the archaeological establishment. Angus Graham (1981) has amusingly etched the three-way clash of personalities between Childe, Sir George Macdonald, the great power in Scottish archaeology in the 1930s, and J.G. Callander, rooted in a parochial tradition of artefact studies. Relationships were not improved by Childe's delight in ruffling sensibilities, flaunting both his personal eccentricities and his left wing sympathies (Trigger 1980, 18), and the atmosphere was clearly not conducive to acceptance of his work.

Trigger agrees with Piggott, that Childe was not a
perceptive excavator (ibid, 83), but his methods were undoubtedly superior to those of most other workers in southern Scotland at the time. Likewise Trigger's judgement (ibid, 90) that Childe's interpretation of British prehistory was 'conceptually arrested by comparison with his coeval writings about the Near East' takes insufficient account of the basis of research from which he had to develop his readings. Almost inevitably, Childe under-estimated the local Mesolithic, basing his explanations of the inception of farming on the invasion hypothesis, and attributing insular difference to ecological adaptation and resultant social adjustments.

Geographical approaches to prehistory had already been explored by Crawford (1921) and Fox (1932), but were largely new to Scotland. Childe used them in consideration both of overall distributions and individual siting of chambered cairns, and extended the geographic paradigm in examining not only prehistoric economies but social organisation. He noted the correlation between tomb siting and pockets of good agricultural land around the Firth of Clyde and Loch Fyne (1946, 35), and from this evidence postulated the existence of a small scale clan society practising agriculture in a system of 'primitive communism'. Childe's methodology has proved to be a favourite as a means of coming to terms with the nature of the
evidence for the Scottish Neolithic (e.g. Davies 1946; Scott 1969; Hunt 1987). His conclusions, however, depicted a static, non-innovative society, peripheral to the main thrust of the European Neolithic from which it received its ideas. The individual identity and evolutionary momentum of the Scottish Neolithic continued to be under-estimated and under-valued.

4:7 Post war progress

In his demonstration of the potential of monuments as a key to understanding of neolithic society in Scotland, Childe was to influence the direction of research over the succeeding quarter century, which culminated in the publication of the second volume of Henshall's *The Chambered Tombs of Scotland* in 1972. Childe's mantle was taken up by Stuart Piggott, second Abercromby Professor of Archaeology from 1946 until 1977, and a leading neolithic scholar. Approaches were transformed during this period by the introduction of radiocarbon dating techniques, first used on neolithic sites in Scotland in the 1960s.

Influential excavations were those at Cairnholy I and II and at Bargrennan by Piggott and Powell (1949), by Corcoran at Mid Gleniron I and II (1969(a)), and by Masters at Lochhill (1973) and Slewcairn (1981). There was work on Clyde cairns by Scott (1956; 1961; 1964), and at Monamore on Arran by MacKie (1964) and Dalladies,
Kincardineshire by Piggott (1972), these last producing radiocarbon dates, which, together with those from Lochhill, demonstrated the unexpected precocity of monument building in Scotland. Piggott's work at Cairnpapple (1948) produced the first evidence for a henge in the area, allowing further recognition of the site type then to be achieved with the help of aerial photography (Atkinson 1950).

Aerial photography also proved of assistance in the work of the RCAHMS, greatly increasing site numbers in the Borders Inventories (1956; 1957; 1967). Prospective field walking in Peeblesshire showed that ground survey could also add new classes of monument to the record (Halliday and Stevenson 1991, 131-3).

A synthesis of mesolithic research was presented in 1954 in A.D. Lacaille's *The Stone Age in Scotland*. As Woodman (1989, 4) points out, this work, appearing on the eve of the radiocarbon revolution, viewed the Scottish mesolithic as an Epipalaeolithic remnant of extreme marginality and of short duration, and its effect may have been to subdue interest in the period over the next twenty years.

Piggott's *Neolithic Cultures of the British Isles*, also published in 1954, gave an equally foreshortened view of chronology, justified by the limited development of pottery styles during the Neolithic. His culture-based approach was in the traditions of Childe, using
Clyde-Carlingford cairns as the type site of a culture group (Chap. VI), and suggesting long cairns to be stone-built versions of English long barrows, demonstrating east coast links with the Windmill Hill culture (p.220-1). Passage graves were associated with a Secondary Neolithic culture representing acceptance of neolithic ideas by the indigenous Mesolithic (p.276-301).

The Prehistoric Peoples of Scotland (ed. Piggott 1962) used the same framework in discussion by Daniel of The Megalith Builders and by Atkinson of Fishermen and Farmers. Atkinson, looking at economy and settlement, used artefact types, particularly pottery, primarily as a means of identifying cultures, but did also discuss arrowhead distributions as a key to population densities, an exercise which demonstrated the limitations of the funerary evidence. Pottery continued to be viewed primarily as an indicator of chronology and cultural association, its role here being examined also by McInnes (1969) and Henshall (1972, 166-179).

A major focus of interest, however, was the complexity of site histories being demonstrated by excavation of megalithic and non-megalithic cairns. At the Liverpool Symposium entitled Megalithic Enquiries in the West of Britain (Powell et al, ed., 1969) important new theories on the construction of chambered cairns were set out (Corcoran 1969(c); Scott 1969(a)). Patterns of extended use, adaptation and remodelling of cairns,
observed, for example, at Mid Gleniron, gave the sites a chronological depth which could help to fill the longer period now known to have been covered by the Neolithic. Excavation at Pitnacree, Dalladies and Lochhill showed similar sequences occurring at non-megalithic sites. The publication by Henshall of her second volume on The Chambered Tombs of Scotland (1972) became the occasion for a full exposition of theories of multi-period cairn accretion on the basis of the Scottish evidence (p.198-286). Availability of a compendium of Scottish sites thus coincided with a recognition of the complexity of these monuments, marking a turning point in Scottish neolithic studies.

The work of excavation and of synthesis had been very largely achieved by University- or Museum-based archaeologists, but the period had also seen considerable involvement in archaeology by amateurs. In 1944 the Council for British Archaeology (CBA) was set up, including from the first a Scottish Group, to co-ordinate the work of local societies and to encourage co-operation between amateur and professional. The Scottish Field School was established to provide training opportunities, and in 1955 Discovery and Excavation in Scotland was launched, proving an invaluable means of disseminating information on archaeological work of all kinds. Members of the Field School worked at Cairnholy excavations; local helpers...
joined Scott at Crarae and Piggott at Dalladies; Lochhill and Slewcairn were excavated with extra-mural students from Glasgow University.

Individual amateur workers also made important contributions. General Scott Elliot, in a programme of survey and excavation, demonstrated the scale of survival of early remains in the small cairnfields of Dumfriesshire (Scott Elliot and Rae 1965; 1967). W.F. Cormack, with help from John Coles, 'discovered' the south west Scottish coastal Mesolithic (Cormack and Coles 1968; Cormack 1970), and carried out rescue excavations at neolithic sites near Lockerbie (Cormack 1963(a), (b)). R.W.B. Morris began a programme of survey of cup-and-ring marks in southern Scotland (1966; 1968). Professor Thom embarked on investigations into the mathematics and astronomical aspects of megalithic monuments (1967; 1971), destined to compel reassessment of the scientific skills of the Neolithic. Some amateur efforts have not been so successful, however, and relationships between amateur and professional have, in general, been in decline.
Recent trends and future outlooks

The wealth of information on Scottish chambered tombs available in the post-Henshall era opened the field to the model builders of the New Archaeology. Use of Scottish material has, however, continued to be coloured by perceptions of peripherality. Renfrew (1976) linked the need for 'territorial markers' with the limits to settlement expansion set by the Atlantic seaboard, and the inception of monument construction has been attributed to the stress caused by efforts to establish agriculture in marginal environments (Chapman 1981). Yet, as these social explanations for the appearance of chambered tombs were being produced, understanding of the nature of the evidence for the Neolithic in Scotland were being transformed. For example, excavation at the eight hectare stockaded enclosure at Meldon Bridge was published by Burgess in 1976, and by 1980 Burgess was characterising a whole segment of prehistory as 'the Meldon Bridge period'. The same years, from 1976 to 1981, saw excavation of the timber hall at Balbridie and establishment of the undoubted Early Neolithic origins of this massive structure.

An important tool in this exploration of a wider Neolithic has been aerial survey, which, since 1976, has been a part of the routine work of the RCAHMS. The palimpsest cropmark landscapes revealed are not always

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easy to disentangle and interpret, but of particular interest for neolithic studies has been the discovery of a wide range of pit-defined, probably timber monuments - pit circles, alignments, double alignments and enclosures. Ground survey, too, has enormously widened in scope, and Halliday and Stevenson (1991) have given an account of changing practice in the RCAHMS and the revolution in recording methods achieved by the use of the Electronic Distance Measurer (EDM).

Another area of increased knowledge of the achievements of the Neolithic derives from the environmental studies which now form an accompaniment to any major excavation. The extent of mesolithic and neolithic impacts on the environment is beginning to be charted (see Chapter 7).

The 1970s and 1980s have seen the emergence of a new breed of trained professional archaeologists with a whole range of technological methods and expertise at their command. At the same time, growing awareness of environmental issues has enforced perceptions of the need to protect both the natural and the cultural heritage. Yet, in this period, the philosophy of non-interventionist government has prevailed, leaving the agencies concerned with the difficult and frustrating task of supervising protection of the heritage and enforcing planning guidelines, while lacking the obligation or means to utilise skills in advancement
of understanding of the material being conserved. Increasingly, archaeological work is undertaken by independent 'Units' working to high standards of professional expertise, but with a fixed brief in which preservation and conservation almost always have priority over investigative excavation. The research priorities that led so much University based work in the past can no longer attract funding and have little place in the structures of state archaeology. It is to the credit of the archaeological community and the staff of Historic Scotland in particular that funding has been found for so many important projects, leading to excavation at Balbridie and Douglasmuir, Balfarg, North Mains and Balfarg Riding School. Too often, however, exploratory work, such as the trenching of Blackhouse Burn (III:c,d), is not followed up with fuller excavation, and important sites, such as the possible cursus at Monktonhall (II:a), or classes of sites, such as the double pit alignments, only briefly examined at Bannockburn (Tavener 1987), remain ill-understood and unabsorbed into perceptions of the Scottish Neolithic.

Economic realities and the paucity of state funding cannot be ignored. What is important, however, is to recognise that archaeology is dependent on the existence of public will (Harden 1988, 21). This chapter has charted the contributions to archaeological research in Scotland made, in many instances, by amateurs. The
term itself is often an artificial one: amateurs may possess training and experience comparable to that of professionals, while the true professional will have the same enthusiasm for his work as the amateur. As the complexity of archaeological work has increased, however, involving teams of specialists and advisers, laboratory analyses and intricate, often computerised, recording systems, so the potential for individual participation and independent initiative has been diminished. Legislative controls are no substitute for public support, which is fostered by committed involvement. If the problems of the Neolithic are to be solved, perception of the challenge must be shared. Enthusiasm can only be built on information, however, and what is needed is an interpretation of the Neolithic, presented in positive, creative form, a process which, as Hodder points out (1991), goes beyond simple explanation of the data.
5: PHYSICAL SETTING AND ENVIRONMENT

5:1 Spatial parameters

5:1:1 Introduction

As set out in section 1:2:2, the area covered by the present study consists of Scotland to the south of the Forth and Clyde estuaries, excluding the islands of Arran, Bute and Cumbrae and c 3000km² in the south west of the country. The remaining 16,000km² have been divided into six Regions, the physical characteristics of which are described in the Gazetteer in Volume III. Information on the immediate physical environment of each monument is given in the Catalogue site entries in Volume II, and correlation between monuments and the environment is discussed in Chapter 10. The present chapter consists of an overview of the physical and environmental characteristics of the whole area under review.

In analysing social development within the six Regions of the study area, account is taken of a variety of factors influencing each situation. These include local settlement history, tradition, and areas of cultural contact. Important among such influences, however, must always have been ecology. Environment does not predetermine social pattern, but must pre-dispose societies towards particular organisational modes.
Subsistence potential sets limits on community size, and economic strategies require different levels of social cooperation. Options available on the coast are not the same as those of the uplands; the forest farmer follows routines different from those appropriate in the prairies. Environment thus sets conditions within which society must adapt itself according to its own preconceptions and ideals.

Before turning to geomorphology, climate and natural resources, however, it will be useful to discuss the boundaries of the study area and the basis of the Regional divisions.

5:1:2 External boundaries

The northern limit of the study area is formed by the line between the estuaries of the Clyde and the Forth following the old county boundaries between Dunbartonshire and Stirlingshire to the north and Lanarkshire and West Lothian to the south. The isthmus is the narrowest east-west point of the British Isles, making it a logical position for a strategic frontier, such as the Antonine Wall. In settlement terms, however, the lower Clyde is a focus, not a dividing line, occupied by the modern city of Glasgow, and probably formerly central to a Clyde Basin Region encompassing the Kilpatrick Hills to the north and the Renfrew and Cathkin Hills to the south. Equally, West Lothian should not, perhaps, be separated from
Stirlingshire, Strathearn and Fife. Research convenience does not always match prehistoric reality.

Coastlines offer a clear cut definition to the east and west of the study area, but may themselves represent accessible marine communications, rather than barriers. The Firths of Forth and Solway are both narrow, and distribution of Cumbrian axes shows the latter to have acted as a highway rather than a frontier. Pottery styles suggest a Firth of Forth community, stretching, more tenuously, from Yorkshire to the Moray Firth. The Firth of Clyde has been treated by Hughes (1987; 1988) as a cultural province, the island of Arran acting as a focal point for communities in Ayrshire, Cowal and Kintyre. Clearly there was contact across this area, and Arran pitchstone can be traced across Scotland as evidence of some form of 'trade'. Differences between local tomb types, however, are echoed by variation in material culture, increasing over time. Beachararra ware is confined to Kintyre and the islands; impressed wares to the mainland. A focus on monuments, as seen on the island of Arran, may reflect the special needs of islands for distinctive forms of self-expression (Cherry 1981). This characteristic perhaps relates to the need of small, island communities for external input, if only in terms of mating networks, a situation discussed by Woodman (1981, 104-5) in relation to the Isle of Man. Events on the islands may, however, remain peripheral to the consciousness of their mainland neighbours.
The most arbitrary boundary of the study area is that drawn along the Scottish - English Border. In the east the River Till and the Milfield Basin are cut off from the remainder of the Tweed Basin. In the west a distribution of long and chambered cairns straddles the Kershope Hills, and Liddesdale might, more appropriately, have been treated as a part of north west England (Masters 1984). Cumbrian stone circles spill over into Dumfriesshire. The illogicality of this frontier must, however, help to maintain awareness of the need to look beyond the artificial limits of the study area. Discussion of monuments will necessarily include cognisance of published material in northern England, Arran, Bute, Dunbarton, Strathearn and Fife.

5:1:3 Regional divisions

Diversity is a dominant characteristic of the British environment (Stamp 1960, 18; Pearsall 1968, 17), a reality of particular relevance to the present study area. In looking at prehistoric settlement in the northern counties of England, Rosemary Annable (1987) found that the central Pennine chain effectively divided her study into two sub-Regions, Cumbria and north east England. Ecological contrast, derived from differences in geology, soils and climate, re-inforced physical separation, perpetuating what may have been originally diverse ethnic origins and re-inforcing cultural difference, maintained by continued use of alternative networks of exchange and contact.
North of the Border, however, the Southern Uplands run south west from the Berwickshire coast to the Galloway Hills, cutting across any simple duality between east and west, or, indeed, between north and south. Climatic zones are crosscut by physical boundaries and regional patterning is complex.

The natural regions created by lowland basins of river systems do not always coincide with clusters of monument distributions, and in defining Regions of the Gazetteer it has seemed more important to match the latter than the former. Whether in part distorted by loss of lowland sites, long cairns have a tendency to group around an upland massif, rather than a valley, and thus relate to different river systems. An example is seen in the morphological similarities between the long cairns of Stiddrigs (VI:8) in upper Annandale, three cairns in Upper Nithsdale (VI:6, 7, 9) and Cairn Avel (VI:1), at the junction of the Waters of Deugh and Ken. Similarly the Bargrennan Group of round passage graves appear to represent a social entity around the Galloway Hills (Murray 1992).

Social territories will not, in any case, coincide with uniform natural regions, but are likely to include a variety of ecosystems to widen the resource base and to allow for seasonal variation in strategies. Island fishings or upland summer grazings may have a crucial role to play in the annual routines of lowland communities. In a review of Robin Holgate's study of the Neolithic of the
Thames Basin, J.G. Evans (1989) draws attention to the artificiality of basing discussion on the geographic unit of the river basin, omitting the full range of adjacent opportunity in the surrounding uplands. The Regions of the present study do include a wide variety of landforms, but should not, nevertheless, be supposed to be entirely discrete entities. Each Region was clearly articulating with its neighbours, although the extent of contact may have varied with social and political factors over time. It must be relevant to note that the open landscapes of southern Scotland offer full opportunity for awareness of topographic variety. No one could feel confined to his patch of tillage while standing on Cairnpapple Hill, with views to Arran and the Ayrshire Hills, Tinto and the Southern Uplands, the Pentlands, the Firth of Forth, the Lomond hills of Fife and the Highland line.

The six Regions defined are described in detail in the Regional Gazetteer. Briefly, Region I, the Firth of Clyde, and Region II, the Lothians, encompass the natural regions of the Ayrshire Basin and the Lothian plain, although the Lower Clyde has been added to Ayrshire for reasons of completeness. Region III, the Biggar Gap, and Region IV, the Tweed Basin, both consist of a central core area and dependent valleys which may have maintained a certain detachment. Region V, the Borders, is clearly truncated, consisting of the Scottish half only of the Border hills and the Solway plain. Region VI, Nithsdale and the eastern
Stewartry, is a complex Region, including both upper Annandale, closely related to Nithsdale, to the east, and the Glenkens to the west.

5:2 Geomorphology

Note: Much information in this and the following sections is taken from the British Regional Geology Series and the Memoirs of the Soil Survey of Great Britain, used in conjunction with the associated maps of soil, land capability and climate.

5:2:1 Geology

Geologically the south of Scotland is divided by the Southern Upland Fault, running north east to south west, from Dunbar to Loch Ryan. To the north west lies the Midland Valley and to the south east the Southern Uplands, divisions treated in separate monograph volumes in the British Regional Geology Series (Greig 1971; Cameron and Stephenson 1985). The fault line itself is strongly marked in its north eastern section, where the steep north face of the Lammermuir and Moorfoot Hills forms an uncompromising southern border to the Lothian plain. To the south west it becomes less prominent, merging into high ground in the Central Lowlands.
The Midland Valley is an ancient rift valley lying between the parallel fault lines of the Southern Uplands and the Highland Boundary. Its name is misleading in that the 'Valley' includes much high moorland and rough pasture, chiefly of resistant lavas, with hard conglomerates along the southern margins. The carboniferous lavas of the Renfrewshire Hills in the north west rise to over 500m OD, and the volcanic range stretching thence to the south east forms a barrier between the Clyde Valley and the Ayrshire Basin. Further east the sharply defined Pentland Hills of intrusive igneous rock have several peaks at over 550m OD in the northern part of the range, but in the south they are masked by overlying Upper Devonian or Lower Carboniferous strata. To the south west is a large area of high ground with intrusive peaks; Tinto Hill at 707m is the most notable, both in terms of its absolute height and in its prominence above the encircling Clyde. In the high ground south of Muirkirk Devonian sandstones and conglomerates are important. Further south west, north of Dalmellington, coal measure strata and resistant dolerite sills form more striking hill forms. South of Ayr are the Carrick Hills of Devonian lavas.

Three distinct lowland districts of the study area fall within the Midland Valley. These are the Ayrshire Basin, the Clyde Basin and the Lothian plain. These areas, divided from each other by hills of basaltic lava, consist of coal measure strata and rocks of Calciferous
sandstone. Glacial drift conceals much of the lowland geology, with basalt extrusions and volcanic vents creating dramatic features, such as Edinburgh Castle Rock and Arthur's Seat, Traprain and North Berwick Laws.

The Southern Uplands, lying to the south of the fault line of that name, consist almost ubiquitously of Ordovician and Silurian sediments except where igneous intrusions, in the south west of granite, occur. In north west Galloway granite masses, with summits at over 800m OD, form the most rugged group of hills in southern Scotland, resembling a miniature Highlands. Criffel and the Dalbeattie Hills extend the areas of granite outcrop to the Solway. The Lowther Hills, around the headwaters of the Annan and Tweed, have much smoother forms, cut through by some deep narrow valleys such as the Moffat Water. South of the Tweed, the Eastern Uplands are more dissected still, again with rounded summits, rising up towards the andesite lavas of the northern flanks of Cheviot. North of the Tweed the Moorfoot and Lammermuir Hills barely exceed 600m. These smoothly rounded hills to the east of the Nith contrast with the more rugged, boulder strewn ranges of south west Scotland. Intrusions of Lower Old Red Sandstone, however, create landmarks, such as the Eildon Hills and numerous peaks around Jedburgh. Also of Carboniferous age are the limestones of Liddesdale.

The lowland parts of the Southern Uplands region
are geologically complex. The extensive Border lowlands of the Tweed Basin consist of Carboniferous and Old Red Sandstone sediments, the latter stretching inland to Galashiels, to Hawick and up Lauderdale. Along the Solway Firth, Permian sandstones are important in Annandale and Nithsdale, with Carboniferous limestones to the east. Silurian rocks underlie the lowland plains of the Stewartry, areas which have been subject to considerable scouring by glacial action.

5:2:2 Effects of glaciation

While the whole of Scotland has been affected by the work of ice, the most recent dispersal areas in the south were confined to the Galloway Hills and the White Coomb area around the headwaters of the Tweed, Clyde and Annan. Erosion has been most severe in the south west, therefore, laying bare rocky knolls and ridges, deepening the basins of St. Mary's Loch and Loch Doon, and moulding the till into drumlins.

Ice movements from the Southern Highlands affected the Firth of Forth, creating depressions and crag and tail features, such as Edinburgh Castle rock. Thick layers of till with elongated drumlin features were deposited in the Forth and Clyde valleys, and in Ayrshire and Lanarkshire the depth of glacial drift created areas of poor natural drainage. As the ice retreated, fluvio glacial deposits were left along the south side of the Midland Valley
from Dunbar to Lanark, forming a complex system of eskers around Carstairs. Kames and eskers can also be seen in Teviotdale and along the Kale Water, and glacial outwash forms a drumlinoid landscape around the lower Tweed. Fluvio-glacial hills also occur around Darvel, in the upper Irvine valley and in Nithsdale and Annandale. The lighter soils of these deposits offer a very different agricultural prospect from those of the heavier boulder clays laid down by ice.

The question of soils as a natural resource is returned to in section 5:4:1.

5:2:3 Drainage patterns

The geological division between north west and south east, created by the Southern Uplands Fault, is not respected by the river systems of the study area which cut across its line. The major rivers of the south of Scotland all rise in the Southern Uplands and flow radially outwards towards the coasts.

The Rivers Clyde and Tweed both initially flow north from the Southern Uplands before diverging. The Clyde has apparently 'captured' its upper streams from the Tweed; at c 200m OD the river curves to the north west around Tinto Hill, although in times of flood it may still overflow into the Biggar Water to join the Tweed, 10km to the east. This is the 'Biggar Gap', an upland basin, receiving streams from north and south, and drained by both the Clyde and
Fig. 5:1 The Rivers of the south of Scotland

1. Clyde
2. Tweed
3. Nith
4. Girvan
5. Doon
6. Ayr
7. Irvine
8. Garnock
9. Gryfe
10. Avon
11. Almond
12. Esk
13. Tyne
14. N. Medwin
15. Douglas
16. Lyne
17. Gala
18. Leader
19. Blackadder
20. Whiteadder
21. Teviot
22. Kale
23. Jed
24. Ettrick
25. Yarrow
26. Liddel
27. Esk
28. Annan
29. Cluden
30. Urr
31. Dee
32. Ken
33. Deugh
the Tweed. Below Lanark and the Falls of Clyde the river passes through a confined valley, flowing strongly towards Glasgow, in contrast to its earlier meanderings. The lower basin of the Clyde, now entirely built up, has been subject to considerable alluviation, burying earlier land surfaces.

The Tweed flows north east through the Southern Uplands to Peebles, where it enters a narrow valley between close set hills, in which it runs for c 35km to Melrose. It then opens out into a broader basin where it is joined by a series of important tributaries. The lower valley is wide and fertile, but the Tweed has no significant estuary, joining the North Sea between cliffs.

The Forth estuary, forming the northern boundary of the study area, is joined by a series of short rivers which have cut deeply into the carboniferous sediments of the Lothian plain, creating topographic variety rather than major settlement foci. The rivers which cross the Ayrshire basin to join the Firth of Clyde are more considerable, particularly the Irvine and the Ayr, and see much variety throughout their course.

A series of rivers flow into the Solway Firth, the Liddel, Esk, Annan, Nith, Urr, Dee and Ken. Divided by intervening hills, the valleys tend to serve as discrete settlement areas, encouraging local variation. The length of the course of some of these valleys, however, makes them important inland communication lines through the hills.
Fragmentation of valley-based settlement pattern is thus balanced by the cohesiveness of these cross-Regional routeways.

5:2:4 Coastlines and marine history

While solid geology and drainage patterns have remained relatively constant throughout the Holocene, the form and location of the coastline has been subject to considerable fluctuations resulting from post-glacial rises in sea level, balanced by isostatic sinking of the land. These events have had direct effect on opportunities for human settlement, referred to again in Chapter 6, on the Mesolithic. Maximum transgression limits appear to have been reached by c 5000 bc, truncating knowledge of the earlier coastal Mesolithic. In the Firth of Forth sea levels were falling by c 4540 ± 125 bc (Sissons and Brooks 1971). On the west coast the comparable regression seems to have begun somewhat later, or, at least, to have constituted a more gradual event (Jardine and Morrison 1976). At Newbie Cottages, Dumfriesshire, sea levels were still high until c 3650 bc, and at Southerness, in south eastern Kirkcudbright, the coastline was 1 - 2km further inland than today until c 3000 bc (ibid 189-192). It is clear, however, that Irish Sea movements were by no means uniform or unidirectional. Tooley (1974) has shown how at Lytham, in south west Lancashire, following the major marine transgression of 4935 to 4075 bc, the next two
millennia witnessed alternating episodes of transgression and regression, largely reflecting local sequences of consolidation of biogenic sediments. Local variability is also an important theme along the Solway Firth. At Lochar Moss Jardine and Morrison (1976) showed that by c 5450 bc the sea had penetrated an inlet for 16km from the present coast, but that by c 4650 bc the build up of gravel and sandbars across its mouth had excluded marine water from the area, which became a series of lakes and swampy reed beds gradually consolidating into peat. The recovery of an oak canoe dated to 1804 ± 125 bc SRR 3201 from the Moss shows that open water persisted well into the second millennium bc (Jardine and Masters 1977). Local topography and conditions dictate many variants on this estuarine theme along the Solway coasts, creating changes which will have had direct impact on the subsistence of coastal communities.

The deeper water of the Firth of Clyde was less susceptible to the effects of fluctuating sea level. Morrison (1980, fig. 5) projects a maximum transgression shoreline for Ayrshire at about the present 10m contour, creating a 4km inland penetration of the sea at Girvan, likely to have subsisted as a freshwater lagoon after the formation of gravel bars. Boyd (1982) has made a detailed study of conditions at the mouth of the Irvine, where the shore apparently lay 1.5km to 2km inland from the present line until c 2000 bc (see I:i,ii).
The raised beaches that form such a well marked feature of the Ayrshire coast were covered by transgression seas, which, in many stretches, found their limits against a pre-existing cliff. Restriction of access to the shore is reflected in the characteristic location of mesolithic artefact scatters in the south west, beside the streams which cut through the cliff line (Cormack and Coles 1968). If the late date of regression at Shewalton Sands beside the Irvine is of wider validity, this restriction may have continued well into the Neolithic, and, indeed, bronze age cairns and burials are rare on the lower raised beach. There is a contrast here with East Lothian, where cists, cairns and 'kitchen middens' are recorded from below 10m OD (Kilspindie golf course; Archerfield), and the land may have sunk considerably in relation to the sea since early prehistory.

Another effect of transgression was the accumulation of sand and shingle from the continental shelf onto the raised beaches (Price 1982, 69). Price suggests that regression may have been followed by the creation of dunes of blown sand, again affecting coastal settlement.

Marine transgression has also been held responsible for the creation of some, at least, of the oyster shell heaps or 'middens' along the foot of the fossil cliffs of the inner Firth of Forth (Jardine 1984).
Fig. 5:2 Rainfall in the south of Scotland
(after the Map of Climatic Conditions in Scotland, Soil Survey of Scotland 1970)
5:3 Climate

5:3:1 Present Climate: While the whole of Britain is classified as possessing a temperate or oceanic climate, there is still much variation between regions. The west, subject to prevailing south west winds, has the most oceanic regime. This side of the country is thus vulnerable to the most disproportionate effects of altitude, small rises in height being associated with large rises in rainfall and wind exposure, and average upland temperatures are consequently low. In the Stinchar valley of south Ayrshire, coastal rainfall of 45 inches (1143mm) doubles at inland altitudes of 600m. In the east, with a coastal rainfall of less than 30 inches (762mm), there are still only 40-45 inches (1016mm - 1143mm) at 600m in the Moorfoots. In the Tweed Valley, the low coastal rainfall is maintained well inland to St. Boswells, at 86m OD.

Mean temperatures on the coastal lowlands of 8-9°C fall to 7.1° at Eskdalemuir at 250m OD, to 6.7° at Leadhills at 400m OD, and to 4° at 700m on Lowther Hill. These figures conceal considerable local variation, largely dependent on shelter. Coastal areas may be very exposed, as, for example, between Dunbar and Berwick, while inland valleys offer sheltered micro-climates. Direction of slope is of critical importance, especially on steeper hillsides. south facing and north facing slopes of 20° may experience climatic regimes as different as areas 20° apart in latitude. This variability is of importance in assessment of the ecological potential of settlement sites.
Factors of seasonal difference extend some of the regional variations. The dry springs of the east aggravate the seasonally prevalent cold north and east winds in this area, delaying the onset of growth. In May sea fogs, or 'haar', penetrating some kilometres inland from the Firth of Forth, retard rising temperatures. On the other hand, heavy autumn rainfall in the west may extend the grass growing season in low-lying, frost-free areas.

Fig. 5:3 shows the generalised climatic regions of Scotland. The 'Hyperoceanic' coastal strip offers the mildest year round conditions, although subject to wind exposure. The 'Hemioceanic' regime of the middle Tweed and its tributaries makes this the area with the warmest summers and greatest degree of overall shelter. Comparison with Fig. 6:1 shows an interesting correlation between these favoured areas and the distribution of mesolithic material.

5:3:2 Neolithic climate

Traditional approaches to the reconstruction of past climates have been based on palynology. Vegetation spread may, however, be based on factors other than climate (e.g. Smith 1984), and anthropogenic activity may also distort the picture (see Chapter 7). Other sources of information on climate must be particularly welcome.

By c 4000 bc the post-Glacial optimum had been reached, and summer temperatures were perhaps 2° to 3°
Fig. 5:3 Climatic regions of the south of Scotland (after the Map of Climatic Conditions in Scotland, Soil Survey of Scotland 1970)
warmer than today, while winters, comparable in terms of temperature, were drier, and there was consequently less snow (Lamb 1966; 1977). The climax vegetation of mixed oak forest was established, and tree lines were probably some 200m to 300m higher than today (see 5:4:2). Warm water fish species are present in mesolithic deposits, perhaps benefitting from the shallow coastal waters of the maximum transgression seas; such warm shallows will themselves have contributed to maintenance of temperate equilibrium, especially in the immediate littoral vicinity, increasing the attractions of the 'Hyperoceanic' regions.

After 4000 bc the trend was towards milder, moister winters and cooler, drier summers. Nonetheless, both the continued altitude of the tree line (Lamb 1977, 293), and evidence from the Oronsay shell middens (Andrews et al 1987), suggest that wind circulation and storms continued to be less than today. Upland and coastal occupation must have benefitted from the wind free conditions, and marine travel would have been facilitated.

There is little evidence for major climatic constraint inhibiting vegetation before the mid-third millennium bc. The Elm Decline is generally agreed to be unrelated to colder temperatures since other sensitive indicators, such as ivy, fail to show ill-effects. Nonetheless, a short lived period of increased wetness at c3200 bc seems possible. Such an event was suspected by Moore (1975) and Pennington (1975) as a factor in
increasing podsolisation at this time. It would correspond to the so-called 'Piora Oscillation' on the continent, in which an unsettled cold spell produced effects on tree growth (Bogucki 1988, 22). Evidence from the Somerset Levels shows a decrease in the incidence of bog oaks and an increase in saturation and in the construction of bog trackways, such as the Sweet Track (Hillam et al 1990), although with no general inhibition in growth rates as revealed by tree ring studies (Baillie 1988). A rising water table in the Galloway Hills led to the demise of pine trees on the peat, one of which was dated to c 3130 ± 100 bc, but it was thought that local factors might have been responsible (Birks 1975) (see 7:3:3).

In the mid third millennium bc there may have been a short period of wetness before, later in the millennium, a trend began towards sub-boreal conditions, drier and cooler, with shorter, more 'vigorous' summers, slightly warmer than at present, and harder, longer winters. Drier conditions may have had a severe effect on the chalklands of southern Britain (Whittle 1978), but in the north the colder winters were probably more critical, especially at higher altitudes.

5:3:3 Climatic constraints

A study by Parry (1978) of the effects of climatic variation on medieval agriculture in south east Scotland isolated three factors chiefly influential in inhibiting
upland cereal cultivation. These were excessive moisture in summer, wind exposure, and insufficient insolation. It has already been observed that wind circulation does not appear to have been a problem during the Neolithic. Excessive moisture, a particular constraint in the west, could have been minimised by use of well drained, alluvial soils, on raised beaches or gentle slopes (see below, 5:4:1). A lack of pressure on available land resources would facilitate such choices, as also selection of a direction of slope which would maximise insolation and temperature. There must, nonetheless, have been constraints on arable cultivation in Neolithic Scotland, and a general advantage would lie in the adoption of livestock based regimes.

5:4 Natural resources

5:4:1 Soils and land capability

In contrast with the relatively static qualities of solid geology and landforms, soils, in common with climate and vegetation, constitute an evolving system. Soils derive from parent rock and from glacial drift, but follow a cycle of development, maturation and degradation closely integrated with the zonal sequence of climate and vegetation, and vulnerable to the effects of human activity. In consequence, modern soil surveys, and, in particular, land capability assessments, are often of restricted utility in relation to neolithic conditions.
Even at the period of climax forest, the uplands of the south west can only have carried poor, thin soils, and such areas were vulnerable to the effects of erosion, podsolisation, gleying and peat formation (Ball 1975). Nearly thirty years ago Dimbleby, commenting on the occurrence of podsolised soils under British barrows, observed: 'mass movement of mineral material, sometimes by wind, sometimes by hillwash, has been more general in our soils than we realise' (1965, 359). Subsequent work has confirmed this assessment, both in terms of erosion from higher ground and as regards the depth of sediments accumulating in some valleys (Barber 1982(c)). At Cairnpapple, Piggott noted (1948, 82, 119) a 6-inch (152mm) depth of clay below the henge bank, representing the original capping of the hilltop. Inwash of inorganic material is reported from a loch in the Galloway hills at dates of c 2200 bc and c 2150 bc (Jones et at 1989). Whether the agency involved was natural or human (see 7:4:1), soil movement has clearly been considerable, to the detriment of upland environments.

Processes of podsolisation and gleying, leading to the formation and spread of peat, had already begun in hollows and confined basins in the early Post-Glacial (ibid). By the third millennium bc blanket bog was spreading in upland and saturated locations from south east Scotland (Newey 1969) to the Galloway Hills (Birks 1972; 1975). The peaty podsols now common on many well
drained hillsides in upland areas may, in general, however, be assumed to represent some of the better soils of such locations, offering cultivatable ground in earlier times.

Modern assessment of land capability sets the highest value on deep soils derived from drift deposits. Such soils are, however, the product of centuries of improvement, including, in particular, artificial drainage. In a discussion of early agricultural practice on Arran, Davidson (1983, 52) has drawn attention to the medieval preference for naturally drained hill slopes, and argues that neolithic priorities would have been similar; cultivated soil appears to have been washed downslope into the forecourt of the chambered tomb at Monamore. Thus the Category 1 and 2 loams of the Lothians and the Merse may have appeared less attractive to neolithic farmers, and the poorly drained clay loams of Ayrshire and Lanarkshire would have presented even more serious problems. In lowland situations freely drained soils are found on the raised beaches (but see 5:2:4), on the outwash sands and gravels of some river terraces, and in areas of fluvio-glacial deposition, found on the southern edges of the Lothian plain, in the upper Irvine valley and in lower Tweedside and in some of the Tweed tributary valleys (see 5:2:2). On higher ground some agricultural opportunity will have existed on thinner, stonier drifts, such as those derived from basaltic and andesitic lavas.
5:4:2 Natural vegetation

The natural vegetation of southern Scotland in the early temperate period consisted of mixed oak forest with birch playing a major role on higher ground and in the wetter west (Godwin 1975). Alder often appears to dominate pollen diagrams, as, for example, at Bigholm Burn, Dumfriesshire (Moar 1969, Fig. 16), but this effect may be exaggerated by the recurrent location of sampling sites in damp places. High levels of coryloid pollen, unlikely to represent bog myrtle where other taxa suggestive of mire communities are absent, must be indicative of mosaic types of woodland, as hazel produces no pollen when shaded by oakwood (Rackham 1990, 28; although see Edwards and Ralston 1984, 25-6). Within the patchwork were small areas of pine in the Galloway hills (Birks 1975), and locally restricted stands with lime and elm. Although Simmons and Innes (1987, 390-1) suggest an upper woodland limit of 400m in the north of England, Birks (1977, 126) thought that birch, aspen and rowan were growing up to at least 610m OD in Galloway, a finding supported by recent sampling at Creag na Caillich in Perthshire, where 'a dense hazel woodland with rowan, some birch and (probably) elm growing on patches of drier base-rich soils', together with some tall herbs, flourished around the axe extraction site at 760m OD in the earlier part of the third millennium bc (Edmonds et al 1992, 102-3). Arboreal pollen levels of c 80% are recorded on the north side of the Cheviots at Din Moss.
(Hibbert and Switsur 1976), and the Southern Uplands could have been tree covered wherever soil depths were sufficient to allow for growth.

Anthropogenic disturbance and curtailment of vegetation are discussed in Chapter 7. It may here be appropriate to note the high proportions of non-arboreal species in most pollen diagrams from the west of Scotland (e.g. the Galloway Hills, Birks 1975); even at Kennox Moss, in lowland Ayrshire, grasses and bracken constitute a by no means negligible component of the vegetation (Turner 1975). After c 3000 bc blanket bog with moorland vegetation communities was spreading in the uplands, while the onset of dune formation accompanying marine regression must have contributed to the establishment of coastal open species zones (see Price 1982 and 5:2:4, above). Thus, by the early third millennium bc the vegetation was sufficiently open for small scale arable cultivation to be taking place, while also offering considerable potential for livestock related activities, whether herding or hunting.

5:4:3 Fauna

There are no faunal collections from neolithic sites in the south of Scotland to cast direct light on the relative importance of various species to human populations. Undoubtedly present were red and roe deer, aurochs, wild pig, beaver, bear, wolf, fox, lynx, wild cat, otter, hare, the mustelids, marten, hedgehog and smaller
species such as moles, voles, mice and shrews. Reindeer are not thought to have survived into Atlantic times (Clutton-Brock and MacGregor 1988). Red deer and wild pig feature in mesolithic middens both on Oronsay (Grigson and Mellars 1987) and at Morton, Fife, and at the latter site, with few identifiable mammal bones, there were a minimum of two aurochs, as well as two red deer (Coles 1971, 349). The absence of sea mammals and cetaceans at Morton cannot represent non-availability of the species (Coles 1983, 12). Grey and common seals and rorqual whale occur in maximum transgression deposits in the Firth of Forth (Lacaille 1954, 86), as in the Oronsay middens, which also have probable porpoise or dolphin (Grigson and Mellars 1987). Shallow water fish species, such as saithe, figured prominently on Oronsay, but at Morton, where fish bones represented 63% of the total bone assemblage, cod was the dominant species. Salmon are likely to have been important in most of the larger rivers and around the Solway coasts and estuaries. Estuarine areas can also furnish other species such as sturgeon, shad, smelt, sea bass, mullet, lampreys, sea trout, eels, flounders and plaice (Maitland 1970), emphasising the attractiveness of these locations.

At both Morton and Oronsay seabirds were present, a useful resource for early summer. Wintering geese and other wildfowl would have been another estuarine speciality, but inland aquatic environments, especially
marsh and fenland, could also be prolific in both breeding and wintering wildfowl.

5:4:4 Lithic resources

Sources of flint and chert in Scotland have been mapped by Wickham-Jones and Collins (1978, 10, fig.1; 13, fig.2) and by Wickham-Jones (1986, 2, fig.1). Flint occurs in a limited number of raised beach and drift deposits; some such deposits may have been worked out by prehistoric quarrying, others doubtless remain to be discovered. Beach pebble flint is also relatively plentiful. Antrim flint sources, easily accessible from south west Scotland, were certainly exploited from Kintyre, where a recent find of five flint axes, 170 flakes and other pieces came from this area (Sheridan 1992). Hoards found near Portpatrick, now in Kelvingrove Museum, Glasgow, are probably from the same source, although large flint nodules do occur in drift deposits locally (e.g. Dally Bay NX 966 690). Yorkshire flint was probably imported into the Tweed Basin Region (IV:vi), and finished axes reached across country to north Ayrshire (I:vi). It is probable that some flint was also imported from Aberdeenshire.

Relatively plentiful, if localised, deposits of chert were much utilised during the Neolithic. Recent survey has identified sites of chert extraction and in situ manufacture of artefacts in the Tweed valley, but no date or cultural attribution can be attached to these sites as yet (Wickham-Jones 1986, 6; DES 1986, 49; 1989, 8).
Quartz is widely available in the south west, both in rock strata and as pebbles, and agate and jasper are also present (Cameron and Stephenson 1985, 33). Pebbles of these materials also occur on beaches. Pitchstone, almost certainly from Arran, is found across the study area (Thorpe and Thorpe 1984), utilised primarily for the production of small blades (Wickham-Jones 1986, 7). Cormack has drawn attention to the possibility of confusion of pitchstone with tholeite (DES 1964, 25-6), which forms some of the Tertiary dykes running south east across Dumfriesshire (Greig 1971, 96).

Petrographic analysis of axeheads in Scotland has been primarily directed towards identification of the products of known extraction sites, none of which lie in the study area (Ritchie and Scott 1989). This work has made clear that many axes, particularly in the south west, were imported from Cumbria, while there is a scatter of finds, mostly across Renfrewshire and north Lanarkshire, of Antrim porcellanite. A few finds of Perthshire hornfels have also been identified. Work on the petrology of battle-axes and axehammers, however, has shown that there was a strong preference for the use of local materials in the manufacture of these implements, with greywackes and igneous rocks most widely used (Fenton 1989). There are certainly instances of the use of greywacke for neolithic axeheads, and quartz dolerite is also employed (Clough 1989, 10). Volcanic rock, available locally, was used
for manufacture of axes found in Renfrewshire (I:vi), and there are other instances of possibly local cobbles being used (III:vii). Ritchie and Scott note one axe made of rodingite, less than 10km from known sources of the stone (1989, 233). The accessibility of the fine-grained Cumbrian tuffs, however, probably reduced reliance on locally available, but inferior sources.

The Ordovician and Silurian greywackes that constitute so much of the Southern Uplands and Galloway hills provide, in general, intractable building stone. In certain localities this rock acquires a shaley character, and can be split off to provide thin slabs. The chambered cairn of Cairnholy II occupies the summit of a knoll the sides of which have been quarried for slabs, perhaps to form the chambers and tall facade stones at the two Cairnholy cairns (Piggott and Powell 1949). Carboniferous sandstone, available around Glasgow, Langholm and the Lower Tweed Basin, Calciferous sandstone in the Lothians and red sandstones of Permian or Triassic age around Dumfries, Thornhill, Annan and Mauchline, would all appear to provide more amenable building stone, as would the limestones of parts of Ayrshire, the Lothians, the Tweed Basin and Dumfriesshire. The limited use of these rocks for neolithic structures is discussed in section 10:4. Unwieldy boulders of granite, available in limited areas of Galloway, were used at the cairns of Slewcairn and Lochhill (VI:2, 3), and to create stone circles, such as the Standing Stones of Torhouse (Burl 1972).
5:5 Modern land use

5:5:1 Modern agriculture

Table 5:1 sets out recent Department of Agriculture Census figures for agricultural land use in southern Scotland. The Districts quoted here do not exactly coincide with the Regions of the study area, but do serve to give a useful picture of the variability present in farming practice across that area.

As the Table shows, rough grazing constitutes nearly half the agricultural land of the south of Scotland. The high potential that this may suggest for archaeological survival must, however, be balanced against the proportion of bleaker upland country included, never suitable for settlement, and the effects of blanket bog in concealing prehistoric remains.

Over a quarter of the area concerned is covered by improved grasslands, including permanent grass and cropped fields of hay and silage, as well as permanent, improved grasslands. In the west of the country, from Renfrewshire to Galloway, this proportion rises to one third. Grassland provides poor potential for archaeological recovery, as upstanding monuments are destroyed without the compensations of cropmark recording or opportunity for artefact recovery. The dairying and livestock breeding areas of the west may be expected to have an understated archaeological record as an artefact of modern land use.

Of the total of agricultural land in the south of
Scotland, 13% was under tillage in 1989, 11% being under cereals. Cereal crops, with their potential for cropmark recovery, are heavily weighted towards the east of the area, with 72% of the total of cereals being grown in the Lothians and Borders Regions. Cereal acreages in Ayrshire and the Stewartry, in particular, are negligible. The cropmark record may be expected to carry the same biases.

5:5:2 Forestry

In the South of Scotland Conservancy area of the Forestry Commission 342,349 hectares are recorded as being under Forestry Commission or private forestry in 1989 (inf: Forestry Commission leaflet). The figures include the island of Arran, with a large area of forestry, but exclude Renfrewshire and the Glasgow area. A rough estimate would suggest c 300,000 hectares of forestry in the mainland area, or 44% of the extent of rough grazings in the same area. The emphasis of these plantings is in the south of the study area, with the bulk of the forests being in the Borders, Dumfries and Galloway and south Ayrshire. Despite the readiness of both Forestry Commission and private companies to respect the sites of Scheduled Monuments, whole swathes of upland landscapes with archaeological potential have been swallowed up. The potential of areas of forestry ploughing for field walking projects has been followed up by Lanark and District Archaeological
Society (Clarke 19; Biggar Common III:4), but too seldom elsewhere.

5:5:3 Non-agricultural land use

At the time of the 1961 Census, 60% of the population of the study area was resident in the counties of Lanark (including Glasgow) and Renfrew; another 18% was found in Midlothian. This heavy preponderance of numbers in the Central Belt has caused distortions to the study, effectively obliterating the lower Clyde Basin, and having particular effect in coastal areas along the Forth and Clyde. Industrial land use, especially coal and oil shale mining, affects the same areas, besides parts of Ayrshire. The frequent siting of small towns in attractive settlement locations, on river, river junctions and estuaries, should also be noted. In this respect, the town of Dumfries can be mentioned, as coinciding with a centre of neolithic monument building (VI:ix).
<table>
<thead>
<tr>
<th>Districts</th>
<th>Total*</th>
<th>Rough Grazing Total</th>
<th>Grass Total</th>
<th>Cereals Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lothian Region</td>
<td>120,412</td>
<td>34,096</td>
<td>23,335</td>
<td>44,100</td>
</tr>
<tr>
<td>2. Tweeddale, Ettrick and Lauderdale</td>
<td>180,039</td>
<td>114,495</td>
<td>36,394</td>
<td>13,795</td>
</tr>
<tr>
<td>5. Dunbarton, City of Glasgow, Clydebank, Bearsden etc., Cumbernauld and Kilsyth, Motherwell</td>
<td>77,648</td>
<td>18,700</td>
<td>17,163</td>
<td>29,250</td>
</tr>
<tr>
<td>6. Hamilton, East Kilbride, Eastwood, Renfrew and Inverclyde</td>
<td>72,463</td>
<td>41,295</td>
<td>19,034</td>
<td>3,399</td>
</tr>
<tr>
<td>7. Clydesdale</td>
<td>64,348</td>
<td>23,593</td>
<td>24,767</td>
<td>3,584</td>
</tr>
<tr>
<td>8. Cunninghame</td>
<td>102,676</td>
<td>58,795</td>
<td>24,824</td>
<td>5,728</td>
</tr>
<tr>
<td>9. Kilmarnock and Loudon, Cumnock and Doon Valley</td>
<td>64,360</td>
<td>39,647</td>
<td>14,685</td>
<td>1,692</td>
</tr>
<tr>
<td>10. Kyle and Carrick</td>
<td>85,272</td>
<td>38,087</td>
<td>29,632</td>
<td>2,707</td>
</tr>
<tr>
<td>11. Wigtown</td>
<td>84,363</td>
<td>39,344</td>
<td>27,409</td>
<td>5,329</td>
</tr>
<tr>
<td>12. Stewartry</td>
<td>116,708</td>
<td>55,161</td>
<td>37,476</td>
<td>6,455</td>
</tr>
<tr>
<td>13. Nithsdale</td>
<td>102,982</td>
<td>52,679</td>
<td>33,579</td>
<td>2,480</td>
</tr>
<tr>
<td></td>
<td>107,911</td>
<td>57,936</td>
<td>27,956</td>
<td>5,425</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,400,960ha</td>
<td>687,229ha</td>
<td>369,151ha</td>
<td>151,990ha</td>
</tr>
</tbody>
</table>

* Total Crops, Grass and Rough Grazing
6: MESOLITHIC PRELUDE

6:1 Introductory

In section 3:1:1 the Neolithic was defined for present purposes as a period of monument building, the corollary being that the Mesolithic must be described as the pre-monumental period. It was argued in the same chapter, however, that the appearance of monuments cannot have been an isolated phenomenon, but must be seen as an aspect of social and cognitive changes. In order to understand this process, it is necessary to explore the nature of the Mesolithic and to consider the mechanisms of transition.

6:2 Models of transition: general theory

The commonly accepted distinction between Mesolithic and Neolithic is dependent on economy. The hunter-gatherers of the Mesolithic were dependent on the wild environment, which, to the agriculturalists of the Neolithic, was a supplementary option only (Bender 1975). It is also recognised, however, that economic change was everywhere accompanied by a compendium of new technological accomplishments and social practices, integral to the characterisation of the period. Models of transition must take account of this wider social revolution, completion of which appears to have varied in pace and emphasis from region to region.
Two particular problems arise in relation to the process of neolithisation in the British Isles. In the first place there is an apparent hiatus in the archaeological evidence covering the period from c 3600 bc to c 3200 bc (Thomas 1988(b), 61). Secondly, direct continental prototypes for British neolithic cultures have proved elusive (Whittle 1977). There is thus not only a shortage of evidence for the process of transition, but also ignorance of the immediate ancestry, indigenous or immigrant, of the monument builders.

Explanatory models concerning the British transition were long dominated by the supposed necessity of invoking colonisation in relation to the island situation, if only in terms of the transport of domestic livestock and seed corn. Within this paradigm Humphrey Case (1969) provided a graphic solution to the above problems in a reconstruction of the processes of colonisation. The sequence envisaged, involving seasonal exploration, short term exploitation visits, settlement journeys carrying young animals in skin boats, and a long period of pioneer struggle in adjusting to the new environment, filled the hiatus in the evidence, accounting both for deviation from European progenitors, and for the invisibility of material culture in the period of transition. The image proved understandibly persistent. Despite the waning role of diffusion in archaeological explanation, the place of colonisation in the inception of the British
Neolithic was long, tenaciously, retained. Attempts to redress the balance for Case's neglect of the native contribution were confined to discussion of the interaction between an indigenous Mesolithic and the incomers (e.g. Renfrew 1976).

The potential role of the Mesolithic in the instigation of change is now, however, being more fully explored. Graham Clark, who had earlier (1966) felt the need to accept the invasion hypothesis in relation to the spread of farming, has pointed out (1977) that familiarity with the seaways lay with the deep sea cod fishers of Morton rather than with the loess-bound horticulturalists of the Linearbandkeramik, and he has traced the confluence between the seasonal migrations of the hake and the distribution of passage graves in north west Europe (Clark 1980, 99). The concept of mesolithic peoples as seekers rather than as receivers of knowledge has transformed approaches to explanation. In practical terms, Burenhult may have failed to demonstrate a direct relationship between a coastal Mesolithic and the passage graves of Carrowmore (Burenhult 1984; Caulfield 1983), but the British Mesolithic can now be envisaged as being in contact with an agricultural frontier, and it is thus no longer isolated, and undergoing transition processes different in kind from those of the European mainland. Models for change in northern and western Europe can be tested against the British evidence, and the role of
native peoples as innovators, intensifiers or social revolutionaries is being explored (Dennell 1985).

There remains, however, a problem in terms of the hiatus in the evidence so satisfactorily covered by Case's model of cautious colonisation. Transference of the concept of gradualism to mesolithic innovation (e.g. J. Thomas 1988(a), 64) should result in a fully visible archaeological record, particularly if instigated by population pressure (Dennell 1985, 186). Domestic items appearing within a basically mesolithic setting can be recognised in caves in the Alpine foreland, across the north German plain, in the Rhine delta at Hazendonk, at Ertebolle shell middens in Jutland and in the Dalkey Island shell middens of Co. Dublin (Gregg 1988; Whittle 1985; Woodman 1978), yet in the Oronsay shell middens, a rare example of fourth millennium mesolithic occupation in Scotland, there is no sign of any awareness of the neolithic alternative.

There is a temptation to ascribe archaeological discontinuity to cataclysmic events, natural disaster or ethnic replacement. Even where internally generated change is accepted to be at issue, explanations fall most naturally into the 'conflictual models' of the Marxist dialectic discussed in section 3:2. Where conflict is seen to be inherent in every social system (Tilley 1981), alternative modes of production are presented as irreconcilable opposites, and it is argued that the
predatory hunter can only become a herdsman, conserving resources, through a complete reversal of outlooks and values (Meillassoux 1973; Ingold 1980). Ethnographic evidence, however, fails to support this polarity (Gregg 1988, 1-2). Hunter-gatherer strategies of the Late Mesolithic appear well able to handle the multidimensional layering of relationships demanded by plural systems (Bogucki 1988). There would seem to be no a priori reason to dismiss a model of gradual progression from hunting to farming were it not for the absence of evidence for such a process taking place in the British Isles.

Discontinuities can, however, be accommodated within an evolutionary model if based on theories of 'punctuated equilibrium' (Gould and Eldredge 1977). Zvelebil (1986) has offered a descriptive framework for the process of evolution from Mesolithic to Neolithic consisting of a sequence of successive phases: - an availability phase, a substitution phase and a consolidation phase (ibid, fig.3). The model is not in itself explanatory, and the events leading to the initiation of each phase are acknowledged to have been locally various. Particular phases of the sequence may sometimes occupy a prolonged timespan, the equilibrium achieved postponing further transition. Zvelebil and Rowley-Conwy (1986), surveying the different trajectories within separate areas of Europe, comment on the length of the availability phase in southern Scandinavia, amounting to some 1300
radiocarbon years, as the coastal alternative here proved as attractive an option as farming until c 3100 bc (p.79). In middle Sweden they observe (p.81-2) two separate attempts to introduce agriculture through immigration, success only being achieved in the second, at c2300 bc. In Brittany (p.72-3) they note delay until perhaps the mid-third millennium in reaching the consolidation phase in terms of economy (cf. Hibbs 1983), although other 'trappings' of the Neolithic, pottery, polished stone artefacts and monuments, had been adopted early in the fourth millennium. This separation between economy and cultural apparatus is a significant departure from the Scandinavian experiences, and one which may be of direct relevance to events in Scotland.

The triggers of change suggested by Zvelebil and Rowley-Conwy remain specific to each local situation. Marine transgression is thought likely to have affected the estuarine economy of the Netherlands (1986, 75); in Jutland a decline in marine salinity, reducing oyster populations, is suggested to have opened a seasonal resource gap, increasing the desirability of cultivating storable foodstuffs (p.80); in Finland, a reduction in the seal population may have forced the eventual adoption of the agricultural option (pp.83-5). Bogucki (1988), who distrusts the 'alimentary determinism' of the economic school, yet considers that some general factor must have affected communities across the north European plain
and southern Scandinavia, and he suggests that a short but influential period of climatic deterioration ('the Piora oscillation') may have engendered a widely felt need to explore alternative strategies. The explanation for change is thus set out in terms of a stimulus or pressure external to society itself.

Zvelebil and Rowley-Conwy marshall the evidence for overlap or hiatus in Britain, and admit that the situation here remains 'confused' (1986, pp.73-5). 'In the absence of much information about the Later Mesolithic, the reasons for (the extended availability phase) can only be guessed at, and the substitution phase cannot be discussed'. They suggest that future research should be directed to investigation of evolving social complexity.

The theme of increasing social differentiation has been pursued by Julian Thomas (1988(a)), who suggests that it was the increasing desirability of the status items of the Neolithic in Britain, as in Denmark, that created the material culture of the Early Neolithic in both areas. The thesis, which certainly might be applied to the Breton situation as set out above, seems inappropriate in the Danish case, where the complexity of the Mesolithic appears rather to have postponed adoption of neolithic practices (Zvelebil and Rowley-Conwy 1986, 79), perhaps, according to Madson (1987), until over-complexity created such stresses as to lead to a breakdown of society and
a need for change (cf. Shanks and Tilley 1987, 184). It remains difficult to apply concepts of social complexity to the near invisibility of the Late Mesolithic in Britain. The paucity of evidence for the period, which Case (1969) attributed to the problems of pioneer agriculture, could be an aspect of reorientation as the indigenous population grappled with the new technology, but hardly seems appropriate for a period of success within a mesolithic technological base.

A possible indication of mesolithic experimentation comes in the evidence from south west Ireland (A. Lynch 1981) and the Central Pennines (C.T. Williams 1985) for short lived early agricultural episodes. Such ventures, perhaps abandoned for their lack of incremental return, could equally have been the work of immigrant groups. In either case, however during the experimental period, subsistence must have been guaranteed by continuing hunter-gatherer activity. Co-operation and mutual support between agricultural and hunting groups, documented, for example, in the north Alpine foreland (Sakelleridas 1979), is a factor likely to be essential in the early stages of farming in marginal environments (Gregg 1988). The gradualism of neolithic spatial expansion, discussed by Whittle (1990) in relation to the Kennet Valley and Cranborne Chase, is likely to have applied as well to the Scottish case. Some recent models of neolithicisation in Scotland, which examine aspects
of gradualism, are discussed in the following section, before the evidence from the study area itself is examined.

6:3 Transition models in Scotland

A recent discussion of the inception of the Neolithic in north west Europe by Armit and Finlayson (1992) makes the point that diversity is likely to have been an essential theme in modes of transition in this area, echoing the ecological variety present. The specific example of Atlantic Scotland is considered, where it is suggested that a high degree of marine dependence was established during the Mesolithic on an island-hopping basis, involving logistic exploitation of resources. Such patterns, they argue, are likely to have continued throughout the Neolithic, for which settlement evidence, whether in the Outer Isles (Armit 1992) or on Rhum (Wickham Jones 1990), remains insubstantial, in contrast to the position in the Northern Isles. Elements of farming may have been added to task-specific routines, while the material symbols of the Neolithic - pottery, polished stone tools and chambered tombs - would have been utilised as a means of establishing positions in power negotiations. The parallels with the Breton sequence, as set out by Zvelebil and Rowley-Conwy (see above), are striking.

The very different environment of the Dee Valley in
Aberdeenshire is examined by Edwards and Ralston (1984), who make the point that palynological evidence cannot always provide clear-cut distinctions between mesolithic hunting and neolithic pastoralism. They suggest that the early third millennium BC, which witnessed cereal cultivation in middle Deeside, at Balbridie, may have seen continued mesolithic hunting in the uplands around the upper river. They comment on spatial coincidence between mesolithic and neolithic lithic and settlement evidence on lower ground, implying a history of succession here, whether through acculturation or replacement by immigration. Their model of upland mesolithic survival, would, however, seem to be equally open to interpretation in terms of the logistic economy as described by Armit and Finlayson. The principle difference between Deeside and the Hebrides lies in the greater permanence of the settled base at Balbridie from which logistic hunting expeditions could have been organised. This variation in strategy is clearly related to the greater potential for cereal growing on Deeside as compared to the west; the disproportionately massive nature of the Balbridie structure also requires some explanation, perhaps related to the extent of contacts across the North Sea. Interestingly however, it is in upper Deeside that long cairns make their appearance. It would seem, however, that postponement of complete dependence on agriculture, long after acceptance of material culture items of the
Neolithic, could be a characteristic of both eastern and western Scotland.

Possible continuity of mesolithic economic practice, whether as independent survival or within the context of adoption of neolithic symbols, sets heightened importance on an understanding of the earlier period in explanation of the later. The following section, 6:4 examines the evidence for the latest phases of the Mesolithic within the study area, before a reconstruction of economy and settlement in the period is put forward in section 6:5. Section 6:6 considers questions of relevance to the argument for continuity or discontinuity, and suggests a model for the transition process in the area. Following Edwards and Ralston's warning on the non-specific nature of environmental evidence for clearance, discussion of this aspect is reserved for a general review of the topic in Chapter 7. References to environmental aspects made throughout the present chapter are kept to a minimum, in order that the model proposed can then be tested against the environmental evidence for change.
6:4 Evidence for the Latest Mesolithic in the south of Scotland

6:4:1 Fields of evidence

In view of the small number of excavated mesolithic sites in the study area, and the almost total absence of organic material from such sites, the principal source of evidence for mesolithic occupation in southern Scotland must be that of lithic recovery, together, perhaps with the environmental impacts discussed in Chapter 7. Lithic distributions do have their problems, not least of which, as Woodman has pointed out (1989, 7), is the unevenness of coverage of collection in Scotland, even in the south of the country, where activity has been greatest. Distortions proliferate, as, for example, in the local densities of recovery created by the work of individual collectors, and the over-emphasis on certain ecological niches that results from recurrent exploration of areas of high recovery potential, sand-dunes and plough soils. Unsuspected misrepresentations can be caused by the preferences and perceptions of collectors, as, for example, in the absence of micro-burins from the Tweed, which Mulholland (1970) ascribes to discard of these tools as 'waste', by collectors who yet retained the notched flakes which demonstrate use of micro-burin technique in the area.

Before discussion of lithic distributions (6:4:3) and resource procurement (6:4:4), however, it is necessary
to examine the means of recognising the period under discussion, which remains a crucial area of difficulty.

6:4:2 Chronology and the Latest Mesolithic

The absence of a chronological scheme applicable to technical aspects of Scottish material (Woodman 1989), is of particular relevance in relation to attempts to identify the Latest Mesolithic. Narrow blade technology with a microlithic component may characterise the Late Mesolithic, but this period runs from c 6500 bc (Wickham-Jones 1990) to c 3600 bc (Morrison and Bonsall 1989, 140). It is possible, as Woodman suggests, that microliths decreased in importance in the fourth millennium bc. A date of 3520 ± 80 bc - Ox A 1594 comes from the unpublished microlithic site of Smittons in inland Galloway (Morrison and Bonsall 1989, 140), where the microliths have been shown to have been used as projectile points (Finlayson 1990(b)). This survival probably relates, as Finlayson suggests, to the role of the microlith in an easily maintained tool kit, suitable for use by mobile parties. In more settled coastal locations the microlith may have been less valued. Only small numbers of microliths were recovered, for example, in excavations of Late Mesolithic coastal sites in Wigtownshire (Cormack and Coles 1968; Cormack 1970). They are also absent from the task specific shell middens of Oronsay.

One coastal alternative, the barbed bone or antler
point, has been recovered from two estuarine locations in the study area, Cumstoun on the River Dee in the Stewartry and Shewalton on the River Irvine. The latter, biserial antler point has been dated to 3890 ± 80 bc - Ox A 1947, falling neatly into the Latest Mesolithic slot. A similar point from the MacArthur Cave, Oban, however, was dated to 4750 ± 80 bc - Ox A 1949, while a uniserial bone point, also of Obanian type, from the Druimvargie rock shelter was found to be as early as 5860 ± 90 bc - Ox A 1948 (Bonsall and Smith 1989). These points did not, therefore, appear as a Late Mesolithic replacement of the microlith, although it is still possible that an increased use of the coastal environment and a sedentary lifestyle led to a decrease in reliance on microliths in these locations. There is, however, no shortage of microliths at Shewalton, and while these may include some Early Mesolithic broad blade types (Morrison and Bonsall 1989), there are also small rod microliths in the Late Mesolithic tradition (Lacaille 1954, 286, fig.127). Function is clearly an important factor here, and absence of microliths would, in any case, be too negative a characteristic to apply to identification of Latest Mesolithic assemblages.

The traditional route to dating the Mesolithic has involved correlation with sea levels. Lacaille attempted to emulate the work of Movius in Northern Ireland in discerning phases of typological evolution which could be related to beach stratigraphy. The Scottish sites,
however, lacked stratification, and Lacaille was oversimplifying sequences in identifying the pre-transgression phase as 'Early Larnian', the post regression period as Neolithic. The complexity of marine fluctuations and the length of time involved in regression were both under estimated, as also the need to establish the individual palaeoenvironmental history of each location. Work by Jardine (1980), Jardine and Morrison (1976) and Boyd (1982), referred to in section 5:3:4, has shown the problems involved in any direct correlation of sea levels with archaeological evidence.

Alexander Morrison has, nonetheless, attempted to identify locations where mesolithic finds from the surface of the raised beach are likely to date from a late period, after the onset of regression (1982, 3, 5-6). Material from shingle ridges at c 10m OD at Terally, Wigtownshire and Tallowquhairn on the Nith Estuary, may, however, have been in such sheltered locations, being on east facing coasts away from the Atlantic, as to have escaped the action of the maximum transgression sea. Boyd has shown that sand and gravel ridges at Shewalton lay above maximum sea levels (1982). Present evidence does not seem to demonstrate any certain location of Latest Mesolithic occupation, although potential for work in this area is still present. It may further be questioned whether the recurrent association between lithic collection and transgression shorelines around the
western and southwestern coasts can, indeed, be attributed to the Mesolithic. Occupation of the same locations during the third millennium BC is highly probable, particularly around lagoonal estuaries such as those at Girvan, Shewalton and the mouth of the Nith. As the preceding discussion has shown, the basis for distinguishing the periodicity of assemblages on technological grounds is simply not present. The same uncertainty applies to collections from the Tweed Basin.

6:4:3 Distribution evidence

Fig. 6:1 shows the distribution of supposed mesolithic material, based on a list of such sites by Hunt (1987, i, Appx.2), with some additional material, taken from sources such as *Discovery and Excavation in Scotland*. Regional distributions are mapped and discussed in the Gazetteer. The criteria for inclusion of sites are variable; some have produced microliths, but these may consist of single finds only; others, described as mesolithic by the collectors responsible, have no such period-specific material. As Woodman (1989) points out, such attributions must be treated cautiously. Of the ninety-four sites in the Tweed Basin listed by Mulholland (1970), only fifteen produced microliths. To some extent the map records the perceptions of collectors rather than original distributions. There is also distortion
Fig. 6:1 Distribution of Mesolithic material in the south of Scotland

- Lithic finds
- Bone point
- Dated sites (see text)

1. Biggar Common
2. Smittons
3. Starr
4. Barsalloch
caused by the presence of individual collectors, as, for example, in the dense distribution in the Glenkens, achieved by the work of Tom Affleck.

It can, nonetheless be accepted that lithic material is only retrieved where there has been a prehistoric presence. To some extent, density may correlate with in situ knapping, probably beside the source of the raw material. This factor could help to explain the predominantly waterside character of the distribution. At riverside sites in inland Ayrshire and Galloway, however, flint had apparently been imported from the coast (6:3:4), and choice of these locations must represent actual preference. Comparison of Fig. 6:1 with Fig. 5:3 of climatic regimes, highlights the correlation of 'mesolithic' findspots with the mildest coastal areas and with the most sheltered inland parts of the Tweed Basin. Lithic material is found on the terraces of the Lower Tweed, the Ettrick and the Teviot Water, but not in the steeper valleys of the Jed, Gala and Upper Tweed. Coastal flint scatters are found along open beaches in Ayrshire and estuaries on the Firth of Clyde and the Solway, but not along the rocky shores of the Stewartry or above the tidal flats of the inner Solway. Although to some extent these 'preferences' may be the creation of collector bias, alluviation and availability of plough soil, there is good correlation here with the ecological potential of the aquatic resources.
Hilltops have produced occasional finds of microliths in the Lothians (Table II:1), and larger upland collections come from certain locations in the Tweed Basin (IV:ii). Some of this material seems to be technologically assignable to the Early Mesolithic (Morrison and Bonsall 1989), and, as climax forest spread, much of the hill country of the Tweed Basin Region may have become difficult of access by 4000 bc. The limited evidence for mesolithic upland clearance is discussed in section 7:2:3. The largest lithic collections from the Tweed Basin Region tend to be riverine (the Rink; Dryburgh Mains; Kalemouth; see Mulholland 1970), and if these are contemporary with upland collections, it is the riverside sites that must represent base camps, the upland ones being special purpose logistic camps. This pattern is different from that suggested by Finlayson (1990(b)) for Galloway, where coastal sites, unidentified but on the Eskmeals model (see Bonsall et al 1989), were thought likely to have acted as bases, while the riverside assemblage from Smittons seemed to derive from a hunting expedition. This variation in pattern would suggest flexibility in adaptive response to opportunity, but is discussed further in section 6:5.

6:4:4 Lithic resource procurement

All the above lithic collections are dominated by the use of locally available raw material. In Ayrshire and
Wigtownshire this is beach pebble flint, with a little chert, jasper, quartz and the occasional piece of pitchstone (Morrison 1980). A greater variety of raw material was noted in Dumfriesshire collections, perhaps because there is less flint available on the beaches. Some better quality flint and chert seems to have been imported here (Cormack 1970, 78). Pebbles of local chert, flint and other materials were used on the Clyde (Lacaille 1954, 188) and on Corse Law (A. Clarke 1989, 45). Lacaille notes the selection of a superior green chert at one site, and it is possible that this material was quarried locally, as several chert extraction sites, of unknown date, have been identified in the nearby Peeblesshire hills. Use of poor beach pebble flint in the Lothians makes period attribution of lithic assemblages doubtful (e.g. Mercer 1976). At Darvel, in the Irvine valley, agates from the glacial drift were knapped at source (McFadzean 1985), and at Glengavel, where local chert was the main raw material, this was supplemented by easily available poor quality quartz, together with some flint and pitchstone, presumably imported from the Ayrshire coast over 40km distant (McFadzean 1981).

Local material is also chiefly used in the Tweed Basin, especially in the south of the Region where chert and coarser rocks dominate assemblages. Some flint is available in the Region in pebble form, but the high percentages used in Lauderdale, and, especially, the
use of a translucent chocolate brown flint here, suggest import (Mulholland 1970). Possibly some doubt should be placed on classification of the relevant assemblages as mesolithic.

The most detailed work on resource procurement is that of Finlayson (1990(a),(b)) in relation to assemblages from Smittons on the Water of Ken and Starr on Loch Doon, excavated by Tom Affleck (1986). The industries at the two sites, only 15km apart, show considerable differences. At both sites local chert was the chief raw material, but while flint constituted less than 25% of the Smittons assemblage, it reached nearly 50% at Starr, showing a decline over time from 56% in early levels. Nonetheless, it was at Starr that a higher value appeared to be placed on the flint which was the more heavily used material. Finlayson suggests that while flint procurement was embedded into routines at Smittons, it was the subject of special expeditions at Starr. The Smittons group may have been the more mobile, their route perhaps marked by the string of sites along the Water of Ken, while settlement at Starr may have been more permanent. Certainly the Smittons microliths had been used as projectile points for hunting, which was not the case at Starr.

The only material other than flint for which there is evidence for long distance transportation in southern Scotland is Arran pitchstone. While pitchstone was certainly used during the Mesolithic on Arran itself
(Affleck, Edwards and Clarke 1988), there is no evidence for its appearance elsewhere in assemblages of this date. Pieces from, for example, the Tweed Basin (Thorpe and Thorpe 1984, 25), or from Corse Law on the Pentlands (Clarke 1989) are surface finds. The small blades often reported may represent appropriate use of the raw material, rather than diagnostically mesolithic technology (Wickham-Jones 1986, 7). There is no pitchstone in excavated assemblages at Starr or Smittons (Finlayson pers comm), and so-called 'microliths' from Knapps, Renfrewshire, come from a site with neolithic pottery (Newall 1965, 21, fig.4). It is possible that quantities of worked pitchstone from Luce Sands, including 'fine needle points' (Palace of History 1911, 822, no.30A), and considered mesolithic in style by Truckell (1963, 56), does indeed represent movement by 'strand loopers' in the period. Although very little pitchstone is reported from coastal collections in Ayrshire and the south-west, this may be an under-representation. While only four pieces of pitchstone are recorded in large collections made by Edgar at Ballantrae (Lacaille 1945), small scale excavation there in 1985 produced three further pieces (NMRS: NX 08SE 5). It is clear, however, that restricted movement of raw materials was a characteristic Scottish pattern. Rhum bloodstone, equally, did not travel far from its island source, and its distribution was apparently exclusive of that of banded mudstones from Skye (Wickham-Jones 1986, 7; 1990, 152).
Rich surface recovery of lithic material may itself be an indication of disturbance of original ground surfaces and of poor excavation potential. This was the situation at three sites examined in test trenches by Mulholland at Kalemouth, Springwood and Rink Farm (1970, 81-5). Mulholland notes, however, that excavated lithic material occurred in discrete clusters, perhaps offering opportunities to identify integral assemblages.

Severe ploughing damage had also eroded sites on the Wigtownshire coast examined by W.F. Cormack (Cormack and Coles 1968; Cormack 1970). At Barsalloch, in particular, only traces of features survived in a natural hollow, although it proved possible to obtain a radiocarbon date from charcoal sealed below a stone setting, or pavement. This date, 4050 ± 115 bc - GU K 1601 must be recognised as representing a single event only from a site of multiple occupation, and not be supposed to provide a context generally applicable to the prolific lithic collections from the holocene shoreline. At nearby Low Clone, an artificial scoop was found, 0.6m below present ground level, measuring 13.7m x 5.5m. Lithic material was distributed throughout the fill of the scoop, showing it, too, to have been well disturbed. Stakeholes, stone settings and a clay patch, however, survived as indications of structures, while beside the scoop stretched a large hearth measuring 3.6m x 0.75m. The
size of both scoop and hearth suggests this to have been a settlement site of greater permanence than is indicated by descriptions of the occupants as mobile 'strandloopers'.

Excavations on a gravel ridge at Starr, beside Loch Doon, again found pits, gullies and stakeholes in a natural depression (Affleck 1986). The soil fill was dark with a high micro-charcoal content, but no actual hearths were identified, and it is clear that this was again a severely truncated site. Discrete lithic clusters were noted, and the excavator considered these to suggest repeated use of the area by small family groups.

Great heaps of oyster shells along the foot of the old sea cliffs beside the Firth of Forth have produced mesolithic as well as later dates (Stevenson 1946; MacKie 1972; Sloan and Murray 1980; Sloan 1982; 1984; DES 1985,6). Some later structures were cut into the Nether Kinneil mound, but there was no occupation material nor artefacts suggestive of the Mesolithic to accompany the early dates from mounds at Inveravon and Cadger's Brae. The mounds, clearly in use over extended periods, can give little information on the nature of the local mesolithic economy or settlement pattern.

An unexpected pair of dates came from charcoal in posthole features below the long barrow situated on Biggar Common hill at 320m OD (III:4). At 4350 ± 130 bc and 4130 ± 60 bc - GU 2987, 2988, the dates are internally consistent,
and sealed under a layer of redeposited subsoil on which lay an Early Neolithic hearth. The postholes may have defined the corner of a structure, but there was no associated material, nor have any recognisably mesolithic artefacts been recovered from the hillside despite intensive field walking (T. Ward, pers comm). Lithic collections have been recorded from beside the Clyde, 3km to the south west and 140m lower in altitude (Lacaille 1954, 187-9), which, if contemporary, could represent another aspect of a single economy. As suggested for the Tweed Basin Region, upland collections in the north are usually treated as representing hunting stations (Jacobi 1978). In the present case the more substantial occupation traces are upland, although, perhaps, the absence of lithics may suggest the site to have been used as a meeting place, rather than as a settlement, foreshadowing the role of the later hearth and barrow.

A recent excavation report from GUARD (Pollard 1993) suggests that structures on the edge of an old meander of the River Annan at Kirkhill, north of Lockerbie (NY 1041 9258), demonstrate mesolithic origins. These include rectangular and circular buildings and a burnt mound. Radiocarbon dates will be obtained on the latter.
Economy and settlement pattern in the latest Mesolithic

The only direct evidence for subsistence from the study area consists of dated oyster shells in the Inveravon middens. Pieces of red deer bone were recovered at Low Clone, in Wigtownshire, as also at Morton, Fife, and on Oronsay. The numbers of aurochs at Morton was equal to those of deer, and on Oronsay wild pig and sea mammals were present. Fish were important at both these sites (5:4:3).

Microliths at the inland site of Smittons had been used as projectile points, presumably for hunting, but those from the lochside site of Starr showed no such evidence. Given the presence of a boat on the loch, some fishing or fish processing activity may be supposed likely. Barbed antler points both from river estuaries, the Irvine at Shewalton, and the Dee at Cumstoun, Kirkcudbright, are likely to have been used as fish spears, and Cormack (1970) has suggested that notched flakes at Barsalloch could have been used for cleaning withies to make wickerwork fishtraps.

The predominantly waterside distribution of lithic material does not necessarily demonstrate the principal subsistence focus. Proximity to raw materials, and the opportunities for recovery afforded by eroding sand dunes and loch margins can influence patterns. The sites are attractive for settlement on account of their access to
fresh water and the opportunities for waste disposal that they provide; there may be increased potential for trapping land mammals at the water's edge. Nonetheless, the site types selected, while varied, do appear to correlate with aquatic resource potential.

The broad ecological base of estuarine subsistence has been discussed by Bonsall (1981) in relation to Eskmeals in Cumbria. Similar resources would have been available at the Irvine and Girvan estuaries and at the mouth of the Nith. Salmon, an important mainstay of the Eskmeals cycle, and known to underpin the economy of the Bann River settlements in Ulster (Woodman 1977, 192-4), is likely to have been a major resource at the above sites, as also on the inland waters of the Tweed, and the Solway and Ayrshire rivers. The site at the Rink, at the junction of the Ettrick and Yarrow Waters, is at 110m OD, and other sites on the Teviot and Tweed are at even lower altitudes, making them eminently suitable as sheltered base camps, depending on salmon runs in the early months of the year, and with access to the hills in summer. The predominant use of local raw materials supports the view that these were settled communities. Use of these sites remains, however, undated.

The inland Galloway and Ayrshire sites studied by Finlayson (1990(a)) supplemented local chert with flint probably brought in from the coast, a distance of c 40km. Journeys were thus rather longer than the 25km
travelled in transporting raw materials from the Sidlaw Hills to Morton, Fife (Coles 1983, 15), but were similar to those from Lough Neagh to flint sources on the Antrim coast (Woodman 1978, 187). The different patterns of raw material exploitation seen at Smittons and at Starr (see 6:4:4) led Finlayson to suggest that the two sites were involved in different 'cycles' of activity involving the Solway and Ayrshire coasts respectively. The distances involved, however, seem more appropriate to peripatetic Early Mesolithic patterns than as part of the model of increasing sedentism, combined with logistic, task specific forays, suggested by Armit and Finlayson (1992) to have characterised the Late Mesolithic. Certainly in terms of a 'hunting expedition', Smittons can have been of little value to a coastal settlement base, and mobile routines encompassing both riverside and coast on an annual round might seem the more appropriate.

One solution to this problem would be to postulate a semi-permanent settlement site, or series of sites, on Loch Doon, using boats to move around the loch for fishing or hunting. The decline in the use of flint over time at this site could correlate with increasing sedentism here, as journeys to the coast became less frequent.

Excavated evidence at Starr was so truncated as to offer neither support nor refutation of the above thesis. At Low Clone, on the Wigtownshire coast, however, despite truncation, the settlement had clearly been sizeable. The
seasonal use of the special purpose shell middens on Oronsay presumably relate to some more settled bases on Islay, Jura or the mainland.

It may be appropriate on present evidence to conclude that, while aquatic resources were a major and perhaps increasingly important resource in the Late Mesolithic, exploitation patterns remained various, adapting to locally specific opportunity. The overall trends which it may yet be possible to explore further, were not simple or uniform.

6:6 Social change in the Latest Mesolithic

6:6:1 Population levels and site numbers

The general European trend of rising population throughout the Mesolithic, evidenced by decreasing territory size in the period (Constandse-Watermann and Newell 1989), is probably applicable to the situation in southern Scotland. The wealth of lithic recovery above maximum transgression shorelines suggests a considerable Late Mesolithic population, while the general absence of long distance transport of materials indicates that population density was probably sufficient to maintain endogamous mating networks within restricted territories. The contrasting transport of Arran pitchstone, possibly reaching Luce Sands (6:4:4), highlights the different situation for a small island population, needing to maintain links with the outside world (cf. the Isle of Man: Woodman 1981).
Rising trends in British populations from the upper Palaeolithic and throughout the Mesolithic have been demonstrated by Christopher Smith (1992) on the basis of increasing numbers of sites (grouping together sites within each 10km by 10km square). Site numbers, and therefore, it is supposed, population levels, begin to fall after c. 4000 bc, an event which Smith regards as unsurprising 'within the context of the spread of the Neolithic' (ibid. p. 38). The event, as dated by Smith, must seem a little premature for the context. In Ireland Woodman and Anderson (1990) attribute a similar decline in evidence to increasing mobility and the lack of a recognisable technology. While the latter point may be of relevance to the Scottish situation (see 6:4:2), and is considered in the following section (6:6:2), it is more generally supposed in Britain that the Late Mesolithic was a time of increasing sedentism, resulting, perhaps, in a reduction in overall site numbers because of settlement agglomeration. This question is returned to in section 6:6:3.

It must, however, be open to question whether site numbers do actually decline in the north of Britain after 4000 bc. The later fifth millennium furnishes dates from Biggar Common, Smittons and Morton, besides from shell middens, both east and west, while Barsalloch, at 4050 ± 115 bc, straddles the millennia (see 6:4:2 above). In the fourth millennium there are dates from an antler
mattock from Meiklewood, Stirlingshire and a biserial point from Shewalton (Bonsall and Smith 1989), a second date from Smittons and a series from Eskmeals, besides shell midden determinations. Site types may be changing, but site numbers would seem to be maintained until the mid-fourth millennium.

6:6:2 The 'hiatus': or a vanishing technology

Comment has been made above (6:2) on perceptions of a hiatus in evidence occurring between c 3600 bc and c 3200 bc. In the north, dates from Smittons and from Eskmeals bring the former point down to c 3500 bc, and evidence from Oronsay shell middens suggests that in some respects, at least, there is continuity in subsistence practice throughout the period. As van der Waals has pointed out (1984), apparent archaeological discontinuity may relate merely to an absence of evidence, which, in the present case, could be generated by a decline in the use of the microlith. Other aspects of lithic technology display essential continuity from the fourth to the third millennium, with only a minor increase in the proportion of flakes over blades (Armit and Finlayson 1992, 670-1; see also Pitts and Jacobi 1979).

In the absence of diagnostic technology it becomes impossible to know whether lithic material derives from mesolithic or neolithic activity, and, indeed, the distributions around maximum transgression sea levels
in the south and west include occasional arrowheads, both leaf-shaped and barbed and tanged, and very probably other later material (6:4:2).

Disappearance of the microlith could, however, be a symptom of decreased mobility, its late survival at Smittons probably being associated with the transient occupation of a hunting party (Finlayson 1990(b)). This is a proposition that can be looked at separately.

6:6:3 Sedentism in the Latest Mesolithic

Adoption of sedentism has long been regarded as an important step on the road to neolithicisation (e.g. Binford 1968), the villages on the Euphrates, for example, being seen as being predisposed towards agriculture. With increasing appreciation of the range of adaptive practice within hunter-gatherer communities (Mithen 1990), the evolutionary role of sedentism loses some of its significance, and indeed, in Ertbølle, Denmark, the success of sedentary hunter-fisher coastal communities seems rather to have delayed adoption of farming (Madsen 1987). Concomitant factors, of storage, permanency and intensification are, nonetheless, still being stressed as having a bearing on the development of social complexity (J. Thomas 1988(a)). While there may be an element of retrospective reconstruction here, the question of the extent of sedentism in the Latest Mesolithic is still of relevance.
Argument for increasing sedentism in the south of Scotland remains, however, largely hypothetical. The timber platforms at Eskmeals, suggestive of permanence in the mid fourth millennium bc, are not directly associated with settlement evidence (Bonsall et al 1989), and, in arguing for the use of similar estuarine locations in Scotland as fixed bases, Finlayson (1990(a)) relies primarily on the evidence for rising numbers of complementary, task specific sites.

Lithic distributions (Fig.6:1), discussed in section 6:5, can certainly be interpreted in terms of base camps and logistic exploitation, most convincingly in the Tweed Basin, where sites are wholly undated. The distances involved between Late Mesolithic coastal and inland sites in Galloway and Ayrshire, however, would more suitably be seen to represent the extensive routines of the Early Mesolithic. Despite evidence for use of coastal flint at inland sites (Finlayson 1990(b)), increasing sedentism here would seem to involve a distinction between inland lochside settlement, and coastal, 'strand looping' patterns.

The most realistic conclusion would appear to be that some variation is to be expected in modes of exploitation of the very various ecological niches offered across Scotland. While sedentism may have been an option in some environments, the significance of the aspect may be less than the levels of social organisation being achieved.
Reduction in resource availability, related to forest density, falling sea levels and increasing saturation, may have set requirements of accommodation between independent or inter-dependent social groups.

6:6:4 Late Mesolithic social complexity

Theoretical models which base the passage from Mesolithic to Neolithic on a rising trend of social complexity have been discussed above (6:2) as being doubtfully relevant in view of the diminishing evidence base of the fourth millennium. Artefact elaboration is not in evidence, the biserial bone or antler point having evidently been in currency early in the fifth millennium (Bonsall and Smith 1989). As Finlayson observes (1990(a), 50), the hafted microlith is so little visible as to leave small scope for 'stylistic messaging'. Perforated cowrie shell beads from the Oronsay middens (Mellars 1987) thus constitute the only example of art or ornamentation from the period.

The same middens have produced the only mesolithic skeletal material from the north of Britain, in the form of small bones particularly from the hands and feet, perhaps suggesting the decay of corpses in situ (ibid 290-300). The form of the evidence is important as presaging neolithic practices of circulation of human bodies, and it must be added that the Oronsay sites are the only recently excavated sites of the period that offer the potential
for preservation of such material. Less weight can be place
on Morrison's suggestion (1982, 6) that extended
inhumation under a shell layer in a ridge of the old raised
beach at Ballantrae, found in 1879, could be mesolithic.

The case for increasing sedentism, often regarded as a
correlate of social complexity, has been argued in the last
section to be attractive but unproven. Doubts were raised
over the variability of the patterning, a feature which
may, however, itself suggest an adaptive flexibility akin
to social complexity. Varying evidence, for example, from
the neighbouring sites at Starr and Smittons, demonstrates
the probable co-existence of alternate strategies,
involved in different programmes of raw material
procurement. Complexity and mutual respect of other
economic patterns, perhaps involving a degree of
territoriality, would seem to be at issue here.

The Oronsay middens may again provide support for such
an interpretation. Mellars and Wilkinson (1980) have shown
how these apparently special purpose sites were visited on
a rigid seasonal rota in patterns which can hardly be
reconciled with any model of settlement shift by a single
group. Respect for social rules would appear to be acting
here to regulate rights of access to particular mounds at
particular times. If this interpretation is correct, it
goes almost beyond social complexity, to suggest social
tension. The decaying corpses on the mounds may have had a
role in enforcing rights. This is in contrast to the
fifth millennium pattern of use at Morton, where recurrent short visits were made to the site at various seasons (Deith 1983).

Another significant piece of evidence is the dated structure on Biggar Common, high above the lithic collection sites beside the Clyde (III:4). Whatever its contemporary role, the site was being returned to, perhaps as a place of congregation, a millennium later.

The platforms constructed at the water's edge at Eskmeals at c 3500 bc have not been discussed in any detail, although the possible role of the site as a 'base camp' has been mentioned. Unquestionably, however, the scale of the project here is of significance. While practical in function, and without the self-proclaiming visibility of Early Neolithic timber enclosures, the platforms demonstrate a capacity for social organisation and co-operation in planned effort (Bonsall et al 1989).

It may be concluded that, despite apparent invisibility, the Latest Mesolithic was handling complex issues without the need for stylistic or monumental display. Modes of organisation of society are not well understood, but the period was clearly not a time of retreat into simple subsistence strategies and random patterns of exploitation of resources.
6:6:5 Pressures for change

As discussed above (6:2), explanations of the mesolithic - neolithic transition have recurrently sought for 'triggers of change', originally immigration, more recently environmental disaster, whether climatic or resource-related. In the present instance, constraints must certainly have been present in the fourth millennium. Climax forest was now established across Scotland, and eastern hills must have been tree covered to their summits (5:4:2). The trend was towards cooler summers and wetter winters, the latter, perhaps, increasing the incidence of snow. Sea levels were everywhere falling, turning familiar littoral habitats into sterile stretches of salt flat, shingle or sand, the latter blowing into dunes (5:2:4). Certain estuarine environments must have changed quite suddenly, as rivers shifted course and sand bars built up, turning tidal inlets into lagoonal backwaters. The compendium of changes does not amount to disaster; the resources of rivers and sea remained rich. Adaptation and adjustment of long established patterns must, however, have been a frequent necessity, giving rise to social tension and the need to establish new patterns of accommodation and rights of access.

It is against this background that another important factor must be taken into account. As Clark recognised (1977; 1980), the cognitive context of the British Mesolithic was fundamentally altered by a new awareness
of the presence of a neolithic alternative. Around the North Sea successful continental mesolithic communities to some extent kept the Neolithic at bay until the establishment of pottery making, agricultural communities at the mouth of the Rhine in the latter half of the fourth millennium. In north west France, however, passage graves and long mounds were being built by c 3800 bc (Scarre et al 1993; Kinnes 1982; 1992(b)), together with the use of a range of other neolithic symbols, such as pottery. There was thus a five hundred year 'availability' phase, in Zvelebil's terminology, during which the British Neolithic had to come to terms with the fact that other, and more flamboyant, modes of social organisation were in operation across the Channel.

Within this period there are possible instances of early cereal growing, particularly in the west of the British Isles, discussed by Edwards and Hirons (1984). Other evidence for clearance episodes, including a premature Elm Decline at Eskmeals coincident with the mid-millennium platform building there, is discussed in section 7:3. In contrast to the situation in south Scandinavia and the Rhine delta there is no evidence for early adoption of pottery or other items of the neolithic cultural assemblage. As discussed by Herne (1988) and E. Williams (1989), radiocarbon evidence suggests that this 'substitution phase' was not reached until the last quarter of the fourth millennium, earlier dates from
Ballynagilly, Broome Heath and Hembury all appearing to be somewhat doubtful.

This postponement could, in part, relate to the special position of an island community, maintaining a distinctive self image within which there was no place for adoption of foreign techniques. Given, however, the near-disappearance of a visible Mesolithic in this period the strength of that sense of identity may be questioned. Concepts can be borrowed here from colonialist theory, in particular Fanon's 'Peau noir, masque blanc' of 1952 (Caute 1970), in which Fanon discussed the inferiority complexes and racial guilt developed by peoples encountering a superior technology with which they are unable to compete. In this situation the less developed peoples will deliberately denigrate their own culture and seek to detach themselves from traditional practices. Applied to the present case, it may be postulated that a period of observation of continental developments intervened between the initial availability of neolithic culture and eventual acceptance of the range of innovation, during which time the Mesolithic lost self-confidence and abandoned some of its most characteristic technology. The silence was broken by a sudden leap forward taken in the final quarter of the fourth millennium constituting a determined effort to re-establish self esteem through equality of achievement.

Environmental evidence from both the fourth and the third millennia is discussed in the following chapter,
exploring the extent of anthropogenic effects whether within a mesolithic or a neolithic technology. The fourth millennium situation is examined in particular for evidence on the transition, although the picture from the third millennium shows that the changes effected even in the 'full neolithic' period were not sweeping.
7: MESOLITHIC AND NEOLITHIC ENVIRONMENTAL IMPACTS

7:1 Problems of environmental evidence

The importance of environmental studies in assessment of the intensity and spatial extent of human activity during the Mesolithic and Neolithic has long been recognised (Edwards 1989, 143). Recurrent contrasts between a near absence of archaeological evidence and the suggested impact of human activity, held responsible in some interpretations, for widespread environmental deterioration and the onset of the spread of blanket bog (e.g. Moore 1975), underline the need to take account of the contributions of disciplines such as palynology, sedimentology and pedology in the study of earlier periods of British prehistory.

Unfortunately, the problems attached to the use of these approaches remain considerable. Recognition of environmental change does not provide direct information on areas of human activity, but, rather, opens difficult questions of causation. In view of the complexity of climatic, vegetational and pedological sequences, the archaeologist is left dependent on interpretations offered by different specialists, all too often contradictory, and sometimes themselves derived from the archaeological hypotheses that they
are being used to support. The history of controversy over the causes of the Elm Decline may serve as a warning in relation to other areas of botanical speculation (Groenman van Waateringe 1983).

In consideration of the northern, and, more especially, the north western parts of the British Isles, a cautious approach to such evidence must be particularly necessary. More severe environmental constraints convert minor fluctuations, whether climatic or anthropogenic in origin, into major events. Temperatures are lower, growing seasons shorter, and soils thinner. The west is exposed to moisture-bearing winds, restricting the establishment of mixed woodland and increasing the propensity to saturation, podsolisation and the growth of peat (Ball 1975; Moore 1973). Especial care is needed if 'clearance' is to be distinguished here from natural processes of degeneration (Edwards 1979; 1982).

There is an increasing awareness of the many problems involved in interpretation of pollen diagrams. It is now recognised that traditional percentage figures, based on wide sampling intervals, cannot reveal small, localised clearance, particularly where arboreal levels are high (Turner 1975; Spratt and Simmons 1976, 199). Where tree cover is sparse, on the other hand, as is likely to be the case in many upland sampling areas, large amounts of distantly generated
taxa will be recorded, irrelevant to local conditions (Edwards 1979). Yet, as Hulme and Shirreffs (1985) point out, the contiguous sampling and high pollen counts needed to identify minor events are beyond the resources of most excavations.

Many of the published diagrams from the study area are without even a single radiocarbon date, and to infer dating on the traditional method of zonation of pollen spectra would be a circular exercise. Interpolation of a fixed horizon to correspond with the Elm Decline can no longer be regarded as acceptable. Dates for significant declines vary locally from 3490 ± 70 bc at Din Moss, Roxburghshire to 2790 ± 85 bc on Arran, and even wider variations are recorded elsewhere in Britain. Elm pollen may be too minimal in northern, upland areas to offer a clear horizon (e.g. Craigmaddie Muir, Stirlingshire: Dickson 1981). Elsewhere reductions in elm pollen recur repeatedly (e.g. Racks Moss, near Dumfries: Nichols 1968). At Eskmeals, Cumbria, two marked declines have been registered, one at c 3490 ± 70 bc - SRR 3065, the other at 2900 ± 80 bc - SRR 3068 (Bonsall et al 1989, 198).

An additional hazard derives from the widespread and long established practice of peat cutting in Scotland, truncating, for example, the record at the Dod, Borders Region (Shennan and Innes 1986), but not always recognised elsewhere (e.g. Burnswark,
Abrupt vegetational change must always be investigated with care.

7:2 The Mesolithic and the Environment

7:2:1 Clearance by fire

The thesis of mesolithic forest clearance by fire, argued by Dimbleby in the 1950s, became, by the 1970s, established orthodoxy (Mellars 1976), although, in the absence of evidence for upland mesolithic occupation in Galloway, Birks (1975) felt constrained to attribute indications of clearance, associated with weeds characteristic of fire-cleared ground, to lightening strikes. A mesolithic presence in the Galloway Hills has now been amply demonstrated (Edwards et al 1983), but doubt has been thrown on whether the recurrent association between mesolithic settlement, reduction in tree cover, and fire can be interpreted as being direct evidence for clearance by forest burning. Edwards (1979; 1989), emphasising the difficulties of firing damp, Atlantic woodland, points out that clearings do occur naturally in such forests, as trees fall and openings are maintained by grazing herbivores. Use of the spaces thus provided for domestic sites with camp fires, or, indeed, the coring of lake sediments coincident with favoured settlement locations, could account for associations between charcoal and clearance.
or between charcoal and settlement evidence (Bennett et al 1990). On the other hand, episodes of mesolithic clearance on Soyland Moor in the Central Pennines, revealed by peaks in *Potentilla* pollen, produced no accompanying evidence for fire (Williams 1985). Nor is there always the predicted rise in hazel pollen following signs of burning (e.g. Rhum: Wickham Jones 1990). Increasing quantities of charcoal in Late Mesolithic pollen cores can probably be accepted as evidence for human activity, but this cannot be certainly attributed to the numbers of domestic fires, burning of scrub vegetation and fallen branches, ground clearance, or game-driving; this last was suggested as a possible cause of reed-bed burning on Arran (Robinson 1983(b)).

7:2:2 The Pennine Analogy

Argument for mesolithic clearance by fire has been developed in particular in relation to the Pennines, where carbon is said to be ubiquitous throughout some profiles, suggesting recurrent burning (Jacobi et al 1976, 315). Continuous fire clearance would seem an improbable sequence, but finer sampling would presumably break the profile down into a more plausible succession of discontinuous episodes (Simmons et al 1989). The extent of the evidence is so impressive that it has been suggested that mesolithic activity could
have been responsible for a local Elm Decline (Sturludottir and Turner 1985, 327), and the drop in charcoal levels that accompanies the onset of the Neolithic is equally so striking that Simmons and Innes (1981; 1987) have argued that population pressure could have been responsible for such intensive use of resources in the Pennines, that the agricultural option became 'a necessary adaptive strategy'. The thesis is not one of total environmental disaster, but rather over-exploitation of a specific resource zone, the woodland edge at the upper limit of the forest, resulting in localised erosion and degeneration.

There is, however, a major difference between the Pennines and the south of Scotland in terms of records of mesolithic lithic recovery. In the former area flint scatters are confined to a limited altitudinal zone, suggesting very specific exploitation strategy. In 24,000km² in the south Pennines 57% of mesolithic sites occurred in the top 5.9%, at over 366m OD, with carbon present in almost all peat profiles at this height (Jacobi et al 1976). The question of recovery bias was examined by Williams (1985) in the Central Pennines, who concluded that potential for lithic collection from eroded soils occurred over a much wider altitudinal band than the 350m OD to 500m OD within which material is found. It is presumed that the attraction of this zone was the thinning woodland at the upland edge of the
mid-Flandrian forests. During this period *Fraxinus* occurs only between 480m OD and 590m OD in the north Pennines, and *Gramineae* between 490m and 680m OD (Turner and Hodgson 1983).

Lithic distributions in the south of Scotland follow quite different patterns from those of the Pennines. 'Upland' flint scatters in Galloway do not occur above 220m OD, and, although recovery has been facilitated by erosion of shorelines around Loch Doon at 210m OD, there would seem to be good ecological reasons for avoidance of the steep rocky hillsides at higher levels. Lochside and riverside lithic recovery in Galloway come from locations that must have been well-wooded, and subsistence priorities were obviously quite different here from in the Pennines.

The Tweed Basin sites also chiefly favour the river valleys. Recovery from higher ground, such as the hill slopes above Lauderdale, or on Selkirk Common, south of the Ettrick, is scantier and involves a more restricted range of artefacts. None of these sites is as high as 300m OD, and most are below 200m OD. Tree cover over the hill summits may have deterred mesolithic activity (5:4:2), and there is certainly no indication of over-exploitation.

7:2:3 Mesolithic clearance in Scotland

The evidence for early clearance in Scotland has
been reviewed by Edwards and Ralston (1984), who, as noted above (6:3), draw attention to the difficulties of distinguishing between mesolithic intensifiers and neolithic pastoralists on the basis of environmental evidence. Their attention is primarily focussed, however, on certainly mesolithic clearance episodes from the sixth, or in one case the seventh millennium, at Aros Moss, Kintyre, on Machrie Moor, Arran, and at Kingsteps Quarry, Nairn, together with possibly similar effects from sites in Aberdeenshire. They comment on a secondary rise in coryloid pollen at the Boreal-Atlantic transition occurring at various sites, including Side Moss, at 275m OD on the Moorfoots (Newey 1962), although some doubt must attach to this event in view of a possible confusion between hazel and bog myrtle here (inf: Dr. R. Tipping 1991). An anthropogenic explanation now seems acceptable for clearance in the Galloway Hills at 5591 ± 120 bc - Q 874, associated with weeds characteristic of fire cleared ground (Birks 1975). Edwards and Ralston conclude, however, that this evidence amounts to no more than small scale disturbance, strictly local in effect.

To the above instances of early clearance can now be added disturbance noted at Newton, Islay at c5000 bc (Andrews in McCullagh 1989). Within the study area interference occurs at Burnfoothill Moss, in the lowland parish of Kirkpatrick Fleming, over a five
hundred year period beginning at the end of the sixth millennium (Tipping, forthcoming). At the Dod, south of Hawick, at 200m OD, there are disturbance indicators from c 6500 bc to c 5000 bc, and Innes and Shennan (1991) remark on the cluster of such incidents from the sixth millennium bc across Scotland.

A peak of clearance activity at c 5000 bc or earlier does not, however, offer support to Christopher Smith's thesis (1992) of a trend of rising population, in step with rising temperatures, both reaching a peak at c 4000 bc (see 6:6:2, above). The same climatic trend was responsible for the spread of the Quercus-Ulmus-Alnus forest, reaching considerable densities, particularly in eastern Scotland by c 4000 bc. At Din Moss, for example, at 170m OD, between the Bowmont Water and the River Tweed, Hibbert and Switsur (1976) record sporadic Fraxinus together with some variation in herb taxa in the earlier fifth millennium, disappearing from mid-millennium until the Elm Decline, recorded here at just after 3490 ± 70 bc. It would hardly be surprising if tree density, here at c 80%, caused a shift in mesolithic settlement. Recent, as yet unpublished work from Yetholm Loch, just south of Din Moss, also at 170m OD, found some indication of limited openings in the dry woodland canopy in the early fourth millennium bc, but with no sign of the establishment of pasture. Deeper into the Cheviots, however, at Sourhope, at 250m OD
at the head of the Bowmont valley, pasture was established at this time, and maintained, despite some forest regeneration, for some 1500 years through the Elm Decline and into the 'Early Neolithic' (inf: Dr. R. Tipping 1993). A shift to higher ground, with lighter tree cover may have been taking place, even although neither at the altitude nor the intensity of the Pennine example. Note may be taken likewise of the first appearance at c 4000 bc of charcoal in a core taken at 198m OD on Craigmaddie Muir, Stirlingshire (Dickson 1981).

Forest density was never so considerable in south west Scotland as in the Cheviot foothills. *Fraxinus* with *Pteridium* spores and some *Plantago lanceolata* was present throughout the *Quercus-Ulmus-Alnus maxima* at Snibe Bog in the Galloway hills (Birks 1972, 206), and at the nearby Round Loch of Glenhead, at 290m OD, close sampling detected 'the onset of regional and local forest disturbance' in the form of small peaks of *Plantago lanceolata*, *Plantago maxima*, *Bidens* type and *Fraxinus* between c 4700 bc and c 3500 bc (Jones et al 1989). This environment was, however, vulnerable to rapid degeneration on removal of its trees.

A more accommodating ecological niche in the face of forest spread must have been the coastal zone. Woodland never became strongly established in parts of west coast Scotland, exposed to prevailing winds (Walker and
As discussed in section 6:4:3, lithic recovery from coastal areas is high, but there is little environmental work from this zone in the south of Scotland, apart from the undated study from Racks Moss, near Dumfries (Nichols 1968). On the Cumbrian coast, however, clearance has been registered in pre-Elm Decline levels at Barfield Tarn, Ehenside Tarn, Bowness Common and Williamson's Moss (Annable 1987, 16-17); at Ehenside Tarn these episodes occur in the earlier fourth millennium bc. Williamson's Moss is beside the Eskmeals timber platforms, directly associated with an elm decline registered in the infilled channel at c 3500 bc, accompanied by an opening of the woodland canopy, with Plantago lanceolata present (Bonsall et al 1989).

On lowland Machrie Moor, just inland from the west coast of Arran, tree pollen barely rose above 45%, in contrast to levels of 80% in Ireland, as also in Roxburghshire (Robinson 1983, 4). In the late fifth and early fourth millennia, levels of oak and birch were falling, while coryloid pollen rose, together with the appearance of open ground indicators, all suggestive of human interference (Robinson and Dickson 1988). There is a clearance episode at c 3800 bc, lasting for less than two hundred years. Charcoal, appearing sporadically from c6715 ± 155 bc, is always in herbaceous form, without woody fragments, and Robinson (1983) suggests that it could derive from reed
burning. Charcoal, already mentioned at Craigmaddie Muir, Stirlingshire, is seen besides at sites in the Galloway Hills, such as Cooran Lane. Robinson (ibid) also mentions unpublished records of mesolithic charcoal at Shewalton and Linwood Mosses, and at Carstairs, not far from 'mesolithic' sites on the Clyde, mentioned by Lacaille (1954).

7:3 Change in the fourth millennium

7:3:1 Pre-elm decline agriculture

As discussed in the last section, there is limited evidence from northern Britain for interference with vegetation in the later fourth millennium bc, before the Elm Decline. The appearance of Plantago lanceolata and other indicators suggests the establishment of pasture in the Galloway Hills, on Machrie Moor and on the Cumbrian coast, and there may be a longer maintained spell of open grazing in the upper Bowmont Valley. Evidence for cultivation in this period remains, however, slim. On Arran, a single grain of Hordeum-type pollen from levels dated to c 3425 bc is not accompanied by the weeds of cultivation that appear later in the same core (Robinson and Dickson 1988), and it is not clear that domesticated barley can readily be distinguished from Hordeum-type grasses. It is possible that re-deposited soil below the barrow on Biggar Common (III:4) was a product of cultivation, but if so, this
activity need not have significantly pre-dated the hearth of c 3250 bc, in which a grain of *Hordeum* was also recovered.

Pre-Elm Decline agriculture has been claimed on the basis of a pollen core from North Mains, Strathallan, to the north of the Forth (Hulme and Shirreffs 1985). Cereals first appear at the base of Zone NM F3, dated to c 3730 ± 70 bc – GU 1725, and the Zone then sees a marked fall in arboreal pollen, especially *Betula*, while herbs indicative of disturbance and cultivation occur. The indications differ so widely from those in neighbouring areas, while being entirely characteristic of the expected post-Elm Decline situation, that Dr. Tipping has suggested (pers comm) that the radiocarbon date must be open to question. The Elm Decline which Hulme and Shirreffs identify 25cm above the base of Zone NM F3 they admit to be 'not as distinct as that seen in diagrams from more southerly areas of Britain' (ibid, p.109), and as elm values were falling from a peak registered 10cm lower than the base of the Zone, coincident with the first appearance of charcoal in the diagram, there would appear to be serious doubt over whether the later event can be regarded as the Elm Decline proper.

Indications of the establishment of pasture from dates in the earlier fourth millennium could relate either to 'intensification' of exploitation of wild fauna, or actual domestication, if such a distinction is
meaningful. There are no faunal assemblages from the
period to support either interpretation, other than
those from Oronsay, where red deer bones together with a
few meat joints appear to have been imported for tool
making on short term visits only (Mithen and Finlayson
1991). The bimodal size distribution of these bones
could suggest herding, but is as likely to relate to
different sources of import, perhaps from the open
hillsides of Jura and the richer pastures of Islay.
Pasture was short-lived, both at Williamson's Moss and
on Machrie Moor, and, in general, clearance indications
from the fourth millennium remain slight until the final
two centuries.

7:3:2 The charcoal curve

As discussed above, the presence of charcoal in
mesolithic pollen cores provides a probable indication
of a human presence, although mechanisms of dispersal
remain unclear, and probably various. As mentioned in
relation to the Pennines (7:2:2) the abrupt
disappearance of charcoal just before the Elm Decline
has been used as an argument for mesolithic clearance by
fire being succeeded by the use of the axe (Jacobi et al
1976). The same sequence has been observed at other
sites in Britain, but with doubt over the case for
mesolithic clearance by fire (7:2:1) the significance
of the change must be open to question. The classic
argument for neolithic 'slash and burn' clearance methods in any case necessarily incorporated a phase of burning of brushwood after tree felling, to clear the ground for cultivation (Iversen 1956).

Edwards (1989) has made a study of the charcoal profiles from sites in the Galloway Hills and in Aberdeenshire, which confirms the presence of mesolithic charcoal in both areas, but which shows a difference in pattern between Aberdeenshire, where levels continue unabated over the Elm Decline, and some of the Galloway sites, notably Cooran Lane and Loch Dungeon, where levels drop at or before the Elm Decline (ibid, fig.4). At the lower Galloway site of Clatteringshaws, where mesolithic artefacts are recorded, charcoal levels remain low throughout the diagram. Meanwhile, at Yetholm Loch, Roxburghshire, 'extraordinarily high' levels of microscopic charcoal are noted, perhaps emanating from a distance, and again falling at the Elm Decline (Mercer and Tipping 1988). The significance of these falling curves is not clear except in so far as they must suggest shifting patterns of human settlement or subsistence practice, and thus constitute a further element in the compendium of late fourth millennium changes.
7:3:3 Changes in hydrology

In two papers published in the 1970s, P.D. Moore argued for the onset of the growth of blanket bog in western Britain synchronously with the Elm Decline, and which he attributed to anthropogenic influence, including grazing pressure and an increase in the supply of ground water caused by arboreal clearance (Moore 1973; 1975). The thesis is open to question on several counts, notably the non-synchronicity of the Elm Decline and the even wider range of dates for the onset of peat formation. There are, however, instances of increased saturation and water run-off possibly attributable to anthropogenic influence, some of which pre-date the Elm Decline.

Within the study area two episodes of water run off at Burnswark Hill, undated, but pre-Elm Decline, suggest disturbance (Squires 1978). A reduction of pine begins in the Galloway Hills at c 3650 bc (Jones et al 1989), probably the same episode as that observed by Birks (1975) at Clatteringshaws (see 7:2:3, above), after which peatland taxa begin to rise. Jones et al suggest it to be 'possible that anthropogenic interference in the catchment woodland had begun to change the hydrological balance of the catchment, favouring the spread of blanket peat'. Upland clearance episodes, already discussed, may have been building up to hydrological effects which were to become more general after the Elm Decline.
The Elm Decline and associated clearance

While the Elm Decline can no longer be accepted as being the principal indicator of the arrival of neolithic agriculturalists embarking on an onslaught on the forests, and selecting the elm, despite its patchiness of distribution, as fodder for their herds of cattle (Groenman van Waateringe 1983), the Decline does, nonetheless, form a distinct event in almost every pollen diagram from the study area, somewhere between the mid fourth millennium and c 2700 bc. No entirely convincing explanation in terms of disease or climatic constraint has been demonstrated, and, in view of continuing uncertainty among palynologists, the archaeologist would seem well advised to avoid the construction of elaborate hypotheses on the basis of this ill-understood phenomenon.

It may be pointed out that in a number of instances secondary declines have been recorded, before or after the main event, often associated with other indications of clearance. If an anthropogenic role is to be accepted in these cases, it would be perverse to deny all human agency in relation to the main Decline, also frequently accompanied by signs of clearance. An interesting sequence is observed at Williamson's Moss, Cumbria, where an initial decline at c 3490 ± 70 bc - SRR 3065 is associated with contemporary construction of timber platforms. Partial forest regeneration then takes
place at c 3200 ± 80 bc - SRR 3066, and birch-alder carr is established in the Moss, precluding human activity at the time of the Elm Decline elsewhere. A second marked fall in elm pollen at c 2900 ± 80 bc - SRR 3068 is followed by the onset of cereal cultivation (Bonsall et al 1989).

The Elm Decline proper, so far from being an isolated, self-contained phenomenon, is usually associated with other reductions in tree cover, now accompanied by signs of the establishment of pasture, and often, also with increased water run-off. This last is noted by Tipping (forthcoming) as a factor in peat formation at the valley bottom site of Overrig, Dumfriesshire at the end of the fourth millennium bc, and at Yetholm Loch, Roxburghshire, in the form of inwash into the loch at the time of the Elm Decline (pers comm 1993). At Clatteringshaws, at 180m OD in the Galloway Hills, increasing wetness led to the demise of pine trees growing on peat, one of which has been dated to 3130 ± 100 bc. This horizon coincides with the Elm Decline and other clearance, and the onset of the upward curve of Plantago lanceolata. At 251m OD at nearby Snibe Bog, the Plantago rise slightly post-dates the Elm Decline, and at both sites Artemesia and Rumex acetosa now appear (Birks 1975). The same sequence at the still higher Round Loch of Glenhead is accompanied by progressive podsolisation and peat expansion (Jones et al 1989).
In lowland Ayrshire Turner (1975) commented on low levels of herbs and grasses in the third millennium bc at Bloak and Kennox Mosses. Both groups do, however, increase after an undated but well-marked Elm Decline, some *Plantago lanceolata* is present, and *Pteridium* rises. Arboreal percentages are at only just above 50% at the time of the Elm Decline, and, as alder and birch predominate. Edwards (1982) has pointed out that these trees probably formed a fringe around the damp edges of the bog, screening out pollen from the surrounding countryside.

At Newton, on Islay, an Elm Decline at an interpolated date of c 3150 bc was followed by some clearance of the already open woodland and the appearance of herbs suggesting agriculture - *Plantago*, *Rumex*, *Polygonum*, *Potentilla* (Andrews in McCullagh 1989). At Machrie Moor, on Arran, tree levels were fluctuating at around 3000 bc, but with no overall reduction in woodland, although there was a slight rise in *Plantago lanceolata* and other herbs, as also in bracken and heath (Robinson and Dickson 1988). It should, however, be added that the late Elm Decline here, at 2790 ± 50 bc - GU 1346, was taken from an 8cm increment of peat, representing c 160 years, and its phragmites content might be expected to yield over-young dates. It is possible that the Elm Decline should be
assigned to a slightly earlier date, pushing the fluctuations in tree level back to the mid-fourth millennium. Following the elm event, the *Fraxinus* curve becomes continuous, pastoral herbs increase, and, slightly later, heath begins to grow.

At sites in Cumbria, Pennington (1975) noted an increase in inwash into Ullswater, Ennerdale Water and Barfield Tarn following the Elm Decline, and at the last, lowland site, where previously clearance indicators had been minor, grass and herbs, including *Plantago lanceolata*, began to expand, followed later by cereals and weeds of cultivation. Pennington drew attention to the contrast between this sequence and that usual in Ireland, where cultivation precedes pasture. Meanwhile, in the Cumbrian uplands, Bradley and Edmonds (1988) note minor modifications of the environment suggestive of use for summer grazing.

The above instances of change at the time of the Elm Decline may be contrasted with the continuity noted by Edwards and Ralston (1984) in Upper Deeside, where they suggest that hunting practice may have continued unchanged. A continuous presence of charcoal over the period has been noted above (7:3:2). The absence of pastoral indicators here draws useful attention to the reality of the changes discussed above. Similar instances of continuous exploitation may be passing unremarked in the Southern Uplands, perhaps, for example, in the Moorfoots (Newey 1969).
All the above evidence points to the significance of changes occurring at the time of the Elm Decline. Whatever the cause of this event, a relationship to human settlement history must be suspected. Recurrent, smaller declines may suggest that elm was turned to in times of stress, whether for animal fodder or, as Dimbleby has suggested (1967, 29), as a human food supplement, stripping the bark in spring. The Elm Decline proper must be added to the strands of evidence for change already noted.

7:3:5 Mesolithic-neolithic transition: environmental summary

It was argued in section 6:6 that there is good reason to suppose that the cultural innovations of the Neolithic may have been the work of native mesolithic peoples, despite declining artefactual evidence for the presence of such populations in the fourth millennium, and the absence of indications of evolving social complexity. Environmental evidence would appear to support the argument for mesolithic survival and success throughout the greater part of the fourth millennium, as indications of clearance increase, albeit within more restricted ecological niches, favouring the coastal zone, the more open forests of the west, and the higher summits. There is no firm evidence for agriculture from the study area, and little sign
of the establishment of pasture at least on a sustained basis. At the time of the Elm Decline, however, patterns change. The charcoal curve drops, clearance and water run-off increase, pasture is more generally being established, and cereal cultivation makes an appearance.

7:4 The third millennium

7:4:1 Landnam and regeneration

The post-Elm Decline clearances discussed in the last section tend to be quite small scale, achieving permanent reduction in tree cover only where acidic soils fostered the development of heathland. Such temporary clearances are regarded as characteristic of the Early Neolithic 'landnam' phase of shifting agriculture as discussed by Iversen in 1941. This was Birks' interpretation of the evidence from the Galloway hills (1975), with rapid regeneration setting in. At Newton, on Islay, clearance with both pastoral and arable indicators following the Elm Decline, was soon replaced by open woodland; Ericaceae pollen in a pit dated to 2930 ± 60 bc - GU 1951 was held to suggest acidification, possibly due to over-grazing (Andrews in McCullagh 1989). There are instances of rapid regeneration in Cumbria, for example, at Ennerdale Water, by c 2800 bc (Pennington 1975), and at upland Stake Beck a cycle of grazing and burning of regenerated
scrub was suggested as characteristic of the third millennium (Bradley and Edmonds 1988). In Northern Ireland A.G. Smith (1975) suggests regeneration by c 2700 - 2600 bc. A pattern of short-lived clearance episodes, followed by regeneration may be accepted as being likely to have characterised the early third millennium in the study area. Such sequences could mask evidence for clearance where sampling was not of fine enough resolution, a situation which may explain the relative absence of reduction of tree cover at, for example, the Ayrshire mosses studied by Turner (1975). The pattern also has implications for the permanence of neolithic settlement (see 8:6).

7:4:2 Mid to late third millennium bc

At Creag na Caillich near Killin a rapid acceleration in soil inwash with declines in elm and birch at c 2620 ± 50 bc - GU 2975 was accompanied by signs of fire. The clearance is attributed not simply to local activity at the axe quarries, but to a wider regional picture (Edmonds et al 1992, 103). It seems that this was a time of settlement expansion into more marginal environments.

There is little recorded evidence for mid-millennium forest regeneration, as discussed for other parts of Britain (Whittle 1978; 1980; Bradley 1978), and individual instances of such regeneration would be
difficult to distinguish from the short lived episodes which characterised the earlier period. Tipping (forthcoming) does, however, discuss evidence for a prolonged spell of reduced intensity of land use in Dumfriesshire in the second half of the third millennium. On Machrie Moor a short lived regeneration phase is dated to c 2360 ± 155 bc (Robinson and Dickson 1988), an event quite characteristic of earlier patterns.

By the last quarter of the third millennium, however, henges were being built to the north of the Forth in open landscapes, with hazel scrub and alder in damper parts (North Mains: Hulme and Shirreffs 1985; Moncrieffe: Caseldine 1982). The lavish use of timber at Meldon Bridge (III:b) and probably also at Blackhouse Burn (III:c), Forteviot in Strathearn, and Dunragit on the Wigtownshire coast, suggests ample woodland resources to be available, perhaps on the hillslopes above the cleared valleys. Timbers above 0.50m in diameter are rare, in contrast to the 1.0m diameter timbers used for the circuit of the large Greyhound Yard enclosure at Dorchester (Woodward et al 1984), perhaps because trees were still growing in closed stands in Scotland, in contrast to a more open English landscape.

In the more vulnerable uplands of the Galloway hills, tree cover was already thinner in the early
third millennium bc. At c 2250 bc arboreal percentages fell to c 10%, and the presence of Plantago and Gramineae suggest anthropogenic causation; inwash, perhaps instigated by clearance, occurs in the Round Loch of Glenhead at 2200 bc and 2150 bc (Jones et al 1989). The onslaught on the forest coincides with the phase of timber circle and enclosure building (9:6:4), but no such sites are known near the hills, and some more general shift in settlement may be involved.

Turner (1975) considered that the first major clearance at Bloak Moss, Ayrshire occurred after 1875 ± 110 bc, the first date from Site A here. Arboreal percentages are low throughout the diagram, however, and show considerable fluctuations. Shortly before the dated level tree pollen dips to only c 20%, which would seem to represent a significant Late Neolithic clearance episode, that closer sampling should have been able to detect, despite the presence of screening alder.

In conclusion, any mid-millennium forest regeneration was probably short lived. The final centuries of the millennium saw renewed onslaught on the forests, perhaps now across a broader range of upland and lowland environments, and producing permanent effects in the more fragile ecosystems of the west.
Whatever the status of some of the evidence for pre-Elm Decline cereals discussed by Edwards and Hirons (1984), there can be little doubt but that by the final quarter of the fourth millennium bc cereals were available in Britain. There is thus no a priori reason to question the single grain of *Hordeum* and possible cultivated soil below the Biggar Common mound (III:4) with dates of c 3250 bc. The evidence here is, in itself, slight, but circumstances of recovery echo those at Boghead of Fochabers, where both naked 6-row barley and emmer were found in a black layer dated to c 3000 bc (Burl 1984). Substantial quantities of emmer, some naked barley, and a little *Triticum aestivum*, or bread wheat, were associated with the timber structure at Balbridie, on Deeside, together with flax seeds, hazel nuts, crab apple remains and two grains of *Avena*, probably wild oats. Dates ranged from 3060 ± 90 bc on the crab apple, to 2795 ± 160 bc on cereal (Fairweather and Ralston 1993). Although emmer is common in southern England, barley is more usually found in Scotland, presumably as an adaptation to environment.

The first pollen evidence from cereals in the study area is reported by Dr. Tipping from Yetholm Loch and from Swindon Hill in the Cheviots at c 2750 bc (pers comm). At Burnfoothill Moss in lowland Dumfriesshire a second elm decline at c 2600 bc was associated with
clearance, apparently for cultivation (Tipping, forthcoming).

Although eastern Scotland would seem to have climatic advantages for cereal growing, cultivation is reported from Williamson's Moss on the Cumbrian coast following an elm decline dated to c 2900 bc (Bonsall et al 1989); it is also noted after an undated decline at nearby Barfield Tarn, here following the establishment of pasture (Pennington 1975). At Newton, Islay the Elm Decline was probably followed by establishment of both arable and pasture (Andrews in McCullagh 1989). At Monamore chambered cairn, soil, apparently from cultivation on the slopes above, was washed into the entrance of the chamber while still under construction (MacKie 1964). One grain of *Hordeum* pollen was found in post Elm Decline levels on Machrie Moor, together with weeds of cultivation (Robinson and Dickson 1988).

Although the above evidence all points to a wide area spread of cereal cultivation within the first half of the third millennium, it gives little indication of the extent of reliance on this resource. There is also considerable evidence for the establishment of pasture (see 7:3:4, above). The use of the Cumbrian mountains for summer grazing is suggested by Bradley and Edmonds (1988), figuring an integrated system of arable and pastoral use of lowlands and uplands. Fence lines of the early third millennium at Newton, Islay appear to
have been for stock control, and it is suggested that intense grazing pressure here could have initiated soil deterioration (Andrews in McCullagh 1989). Also on Islay, below the chambered cairn at Port Charlotte, sheep bones dating to the Early Neolithic were recovered (Harrington and Pierpoint 1976).

It seems that in the early third millennium bc the expected components of a neolithic agricultural economy were widely available. At Knap of Howar, in the Orkneys, a farmstead in occupation from c 2800 bc, there were present cattle and sheep in equal numbers, with some pigs, while barley was being grown nearby (A. Ritchie 1983). The cattle, it may be noted, were of large size, possibly being domesticated aurochs, while the sheep, necessarily imported, were exploited for meat and/or hides, not for wool.

The renewed clearance of the Late Neolithic seems increasingly likely to have been implicated in cereal growing. Cereal pollen comes both from the ditch and from associated stakeholes at the small henge at Moncrieffe, Strathearn (Caseldine 1982, 43), while further inland, at North Mains, cultivation had taken place before the henge was built (Barclay 1983). Below the nearby barrow, where a surface deposit was dated to c 1855 ± 100 bc - GU 1134, a 'puddled' topsoil, probably trampled by livestock, overlay cultivation ridges of different widths on various parts of the site.
(Barclay 1989(b)). A pit containing naked barley in the enclosure at Wellbrae, near the middle Clyde, is likely to belong to the Late Neolithic (III:iv). It remains impossible to assess the contribution of such products to the economy, particularly in the absence of excavated faunal remains. A useful warning must lie in the suggestion that a date of 2470 ± 130 bc - SRR 453 on a beaker burial from Skateraw, East Lothian may have been distorted by the marine diet of the individual, despite the presence of cereal grain impressions on beakers at nearby coastal sites (Close Brooks 1977; Childe 1945).
8: APPROACHES TO THE CHRONOLOGY OF THE NEOLITHIC

8:1 Approaches to the chronology of the Neolithic

Although early analyses of the Neolithic in Scotland were much concerned with typological sequences which could be related to patterns of settlement expansion (e.g. Curle 1919), there were no means by which the length of such stages could be assessed. Immigrant cultures were supposed to have settled in core areas from which later dispersal led to divergence in cultural characteristics (e.g. Childe 1935; Daniel 1941). Piggott (1954, 373-6) presented a scheme in which Early Neolithic groups were identified by the contacts that they maintained with continental cousins, Middle Neolithic groups demonstrated increasing communication with neighbours in Britain, and late Neolithic groups consisted largely of the 'Secondary Neolithic' cultures whose origins were thought to lie with the native Mesolithic. Thus the Early Neolithic built European style long barrows and used plain bowl pottery of Michelsberg or Chasseen origin; the Middle Neolithic developed insular styles of chambered tombs and used decorated, round bottomed pottery; the Late Neolithic built henges and used Peterborough pottery.
or grooved ware. The terms related to the origins of cultures, and, as Piggott himself wrote (p.381), there was 'no reliable data by which to estimate the duration of our three phases'.

The advent of radiocarbon dating not only enormously expanded the timescale of the Neolithic, but disrupted established, typological sequence. 'Devolved' types of chambered tomb were shown to be as early as southern long barrows, and decorated pottery to be in use concurrently with plain bowl styles. Regional cultures, particularly the Lyles Hill group at Ballynagilly, produced dates as early as anything in the south. Isobel Smith, summarising the situation in regard to the British Neolithic in 1974, felt that it was only practicable to divide material culture evidence into 'an earlier and a later phase, imprecisely separated around the second quarter of the third millennium' (p.100), although she hoped that, as more evidence became available, it might be 'possible to distinguish an initial phase in the earlier part of the 4th millennium' (p.103) representing Case's (1969) colonising period. With the continuing failure of this Earliest Neolithic to take tangible shape, there has been a tendency to treat the Neolithic as consisting of two phases, Early and Late, or Earlier and Later (e.g. Holgate 1988), based on the long recognised division between Neolithic A and B cultures (Piggott 1931).
This coarseness of chronological control has already been commented on (2:6) as a constraint on attempts to chart social evolution throughout the millennium and a half of the Neolithic in Britain. The 'Two Neolithics' are characterised in static terms (Bradley and Hodder 1979; Whittle 1980), and, as Thomas points out (1991, 27), the separation fosters perceptions of discontinuity, discouraging analysis of social process. The possible recessionary interlude, discussed above in relation to forest regeneration (7:4:1), acquires credibility from the existence of this apparent cultural break. Yet there is considerable overlap in cultural types between the two periods, expressed, for example, by Bradley in a chart showing the Early Neolithic lasting till c 2500 bc (chambered tombs, round bowl pottery), and the Late Neolithic beginning at c 2700 bc (prestige artefacts, single burials) (1984, 5, Table 1:1). Chronological succession may, indeed, involve a period of co-existence with older forms surviving into a later era, but this effect can be exaggerated, or even created, by the imprecisions of radiocarbon readings. It is possible in the present case that apparent overlap derives from the conflation of differing regional sequences into a single overview, arguing for the need to explore local patterns in order to obtain a clearer perception of the wider picture.
Since publication of the volume *Neolithic Studies* in 1984 (Bradley and Gardiner (eds)), the extent of local difference in cultural characteristics and in the pace of change has increasingly been recognised. A series of regional studies have been produced (Fraser 1983; Mercer 1986(b); Annable 1987; Holgate 1988; Hughes 1987; 1988; Armit 1992), and comparisons have been drawn between adjacent areas (Müller 1988; Whittle 1990; Sharples 1992). The format of the present study is designed to facilitate just such a comparative approach. A smaller area of study, however, can suffer from an absence of chronological evidence, which may severely hamper interpretation. Niall Sharples (1985) has pointed out that Fraser's (1983) account of neolithic Orkney gives a static assessment of the data, and he has demonstrated how inclusion of a diachronic element can illuminate evolving social process. Isobel Hughes (1987; 1988), directly addressing the problem of continuity and change around the Firth of Clyde, found her study to be severely curtailed by the absence of chronological control (1987, 290-1), and she was obliged to use a period-based format, comparing Mesolithic, Neolithic and Bronze Age, rather than tracing social evolution through one of these stages.

The large number of radiocarbon dates generated by the monument-rich Avebury region has allowed Whittle (1993) to set out a chronological scheme for this
area, grouping the dates into six three hundred year phases, A to F, covering the period from 3500 bc to 1700 bc. The method, somewhat akin to excavation by arbitrary spits, exudes an air of precision which would seem beyond the scope of radiocarbon readings, often taken from insecure contexts, and always operating within broad bands of probability. The use of pre-determined limits disregards principles of continuity or discontinuity. The exercise, nonetheless, usefully highlights local variability of sequence. The Avebury region evidently lags behind surrounding areas both in its initial neolithisation, which Whittle sees in terms of settlement spread (see Whittle 1990), and in the date of the construction of its causewayed enclosure on Windmill Hill.

The existence of such local difference demonstrates the need to avoid relying on general chronological schemes for the British Neolithic, and to construct, instead, a regional framework, or frameworks, for the south of Scotland. Such an undertaking is constrained by the paucity of excavation evidence and of absolute dates from the area, and it has proved necessary to set the material within the context of adjacent regions and comparable site types. Some of these phenomena, such as the henge cluster in the Milfield Basin, are extremely localised, and comparisons must clearly be handled with caution.
Despite all its uncertainties, radiocarbon data must offer the most secure chronology, and is considered in the following section, 8:2, before discussion of the chronological information to be derived from ceramics (8:3), lithics (8:4), and stone and flint axeheads (8:5). This evidence, together with the environmental material discussed in Chapter 7, is then used to create an outline sequence of settlement and economy in the south of Scotland. The chronological framework constructed here supplies the background against which monuments and ritual activity are analysed in Chapter 9.

8:2 Radiocarbon evidence

Table 8:1 gives a list of radiocarbon dates from cultural material in the study area running from the later fourth millennium bc to the beginning of the second millennium, and the series is shown graphically in Fig.8:1. Dates from shell middens in the Firth of Forth are omitted as lacking cultural context, as are a few anomalous readings, such as one from a beaker inhumation at Skateraw of 2469 ± 130 bc (II:x). Environmental dating evidence is discussed in Chapter 7.
Fig. 8:1 Radiocarbon dates from the South of Scotland
Table 8:1 Radiocarbon dates from the south of Scotland

<table>
<thead>
<tr>
<th>Site</th>
<th>Years</th>
<th>Standard</th>
<th>Lab.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Linlithgow Friary, pit</td>
<td>3315</td>
<td>55</td>
<td>GU</td>
</tr>
<tr>
<td>2. Biggar Common hearth</td>
<td>3300</td>
<td>50</td>
<td>GU</td>
</tr>
<tr>
<td>3. &quot; &quot; &quot;</td>
<td>3200</td>
<td>70</td>
<td>GU</td>
</tr>
<tr>
<td>4. Lochhill mortuary structure</td>
<td>3120</td>
<td>105</td>
<td>I</td>
</tr>
<tr>
<td>5. Rotten Bottom longbow</td>
<td>3090</td>
<td>100</td>
<td>OxA</td>
</tr>
<tr>
<td>6. Meldon Bridge, pit</td>
<td>2736</td>
<td>90</td>
<td>SRR</td>
</tr>
<tr>
<td>7. &quot; &quot; &quot;</td>
<td>2726</td>
<td>180</td>
<td>SRR</td>
</tr>
<tr>
<td>8. Clochmabenstane - charcoal</td>
<td>2525</td>
<td>85</td>
<td>GU</td>
</tr>
<tr>
<td>9. Meldon Bridge, pit</td>
<td>2336</td>
<td>50</td>
<td>SRR</td>
</tr>
<tr>
<td>10. &quot; &quot; &quot;</td>
<td>2290</td>
<td>55</td>
<td>SRR</td>
</tr>
<tr>
<td>11. &quot; &quot; &quot;</td>
<td>2132</td>
<td>80</td>
<td>SRR</td>
</tr>
<tr>
<td>12. &quot; &quot; postpit</td>
<td>2330</td>
<td>80</td>
<td>HAR</td>
</tr>
<tr>
<td>13. &quot; &quot; &quot;</td>
<td>2150</td>
<td>130</td>
<td>HAR</td>
</tr>
<tr>
<td>14. Harehope cairn, pit</td>
<td>2180</td>
<td>90</td>
<td>GU</td>
</tr>
<tr>
<td>15. &quot; &quot; &quot;</td>
<td>2140</td>
<td>90</td>
<td>GU</td>
</tr>
<tr>
<td>16. Blackhouse Burn, post stump</td>
<td>2085</td>
<td>55</td>
<td>GU</td>
</tr>
<tr>
<td>17. Townfoot, pit</td>
<td>1980</td>
<td>90</td>
<td>GaK</td>
</tr>
</tbody>
</table>
The seventeen dates listed have been retrieved, very randomly, from only nine sites. Linlithgow Friary (Stones ed 1989) and Harehope cairn (Jobey 1980) were excavated on account of later periods of use, the former quite unconnected with neolithic activity on the site. The Rotten Bottom longbow (DES 1992, 21) was a chance find, and neither the Clochmabenstane (Crone 1983), nor the possible burnt mound at Townfoot (Scott Elliot 1972), would have been expected to produce neolithic dates. The enclosures at Meldon Bridge (III:b) and Blackshouse Burn (III:c) are exceptional sites, as is the mound on Biggar Common (III:4). Only the trapezoidal cairn at Lochhill (VI:3), with mortuary structure, stone chamber and successive timber and stone facades, meets expectations of the Neolithic. The sample is therefore not only too small to offer a statistically meaningful set of dates, but is unlikely to be representative of the Neolithic in the area.

A good scatter of five dates from four sites come from the late fourth millennium bc, but there is then a gap in cover over the first two centuries of the third millennium. If it were not for a date on charcoal from below the Clochmabenstane, which the excavator regarded as being of doubtful significance, and a long standard deviation on one of the Meldon Bridge pit dates, there would be an even longer hiatus in the middle of the third millennium. The final centuries of the millennium
have nine dates, but from only four sites, and the next readings fall at or after 1800 bc, with one on weathering cone charcoal from Meldon Bridge of 1791 ± 70 bc, and others from beaker burials at Boathouse Quarry (c 1780 bc) and Ruchlaw Mains (c 1770 bc).

A more substantive context for this somewhat eccentric selection has been sought by taking account of readings from adjacent areas. Fig.8:2 shows the number of dates for each century from an area stretching from Boghead of Fochabers in the north east to Islay on the west, taking in the Isle of Man, Cumbria, Northumberland and Street House, Cleveland, but not Ireland. In order not to overweight the diagram with multiple readings from single sites, averages have been used for separate phases of use. For example, Street House is represented by three figures, averages from the old ground surface, the facade trench and the mortuary structure, rather than the full run of ten readings (Vyner 1984; Bowman et al 1990). Apparently anomalous dates, such as the uncomformable early reading from Dalladies (Piggott 1972), are omitted, as are shell midden dates and dates from Jura with poor archaeological context.

The pattern of determination shown in Fig.8:2 not only completely lacks the early third millennium hiatus of the study area, but reaches its peak in the first century of that millennium. The years from 3000 bc to 2800 bc include dates from the mortuary structure at Street House,
from the axial chamber at Glenvoidean chambered cairn (Marshall and Taylor 1977), from the Douglasmuir timber enclosure (Kendrick 1980), from a black layer, associated with Grimston pottery, below

Fig. 8:2 Numbers of radiocarbon dates from areas adjacent to the south of Scotland, by century

3300 bc -

- 3200 *
- 3100 **
- 3000 ****
- 2900 ****
- 2800 ****
- 2700 **
- 2600 **
- 2500 *
- 2400 *
- 2300 ****
- 2200 ****
- 2100 ****
- 2000 **
a mound at Boghead of Fochabers (Burl 1984), from pre-cairn charcoal, again with Grimston pottery, at Pitnacree burial mound (Coles and Simpson 1965), and from pits with pottery at Machrie Moor, Arran (Haggarty 1991) and Yeavering henge (Harding 1981). It seems that it is only the effect of chance that there are no dates from these centuries in the study area.

Later sequence is more conformable between the two diagrams. Both see a lull in the mid-millennium. A reading of 2520 ± 50 bc - GU 2316 on mixed charcoal from the inner circle of a complex timber ring on Machrie Moor must be weighed against a second date from the same circle of 2030 ± 180 bc - GU 2325 (Haggarty 1991). Two dates from a ditch with grooved ware associations at Balfarg Riding School average c 2455 - GU 1670/1904 (Barclay, forthcoming).

A secondary peak of readings is spread over the four final centuries of the millennium. These include dates from timber circles, some within henges (Machrie Moor; Balfarg; North Mains), from cremation sites on the Isle of Man, from 'settlements' (Rothesay; Auchetegan), pits with impressed pottery (Thirlings; Grandtully), and several from deposits at earlier monuments (Boghead; Pitnacree; Monamore).

The earliest readings from northern Britain have particular relevance to the debate on neolithic origins. Within the study area the dated feature at Linlithgow
Friary, similar in context to adjacent features with Grimston sherds, seems precocious, but gains support from the dated hearth with Grimston ware sealed under the Biggar Common mound, from pits with Grimston ware at Thirlings, Northumberland with a date of 3280 ± 150 bc - HAR 451 (Miket 1976), and from the earliest of a series of dates from pits with similar pottery at Balfarg Riding School, at 3220 ± 90 bc - GU 2604 (Barclay forthcoming). The set would appear to indicate an early horizon for the use of this pottery on the east coast, probably established by c 3200 bc (see 8:3).

In contrast, as discussed in sections 9:2 and 9:3, erection of formal ritual structures does not appear to have begun significantly before the end of the fourth millennium, although dates from mature timbers, as at Inchtuthil timber enclosure (Barclay and Maxwell 1991), can give slightly earlier readings. The Biggar Common mound, sealing the early hearths probably shortly after they were in use, seems to have been an unstructured feature, of unknown original form (III:4). It is just before 3000 bc that dates do begin to accumulate, in a surge of activity that was to continue through the first two centuries of the third millennium. There are readings from monuments, such as Street House, from the timber hall at Balbridie (Ralston 1982) and from pits with Early Neolithic pottery below the Boghead of Fochabers mound, at Balfarg Riding School, at Whitton Hill, Northumberland (Miket 1985) and Newton, Islay (McCullagh 1989(b)).
To summarise, there is a group of readings with pottery associations from around the Forth and Tweed at c3200 bc, but the main onset of neolithic dates, which include structural associations, begins shortly before 3000 bc. There are large numbers of dates from the first two centuries of the third millennium, after which there is a lull until after c 2400 bc, when a new peak is reached.

8:3 Pottery sequence and chronology

(Each Regional section of the Gazetteer in Volume III includes a discussion of pottery sequence, and finds are listed in Tables I:1; II:2; and III:1).

For Piggott, in 1954, pottery offered a principal means for elucidation of cultural sequence. The styles present in north and west Britain, areas supposed necessarily to have been colonised from the south, demonstrated both the origins and the progression of immigration. Grimston wares, of fine texture, excellent technique and sharp profile, found in Lincolnshire, Yorkshire and under a barrow at Ford, Northumberland, were suggested to derive directly from shouldered bowls in south east England. The tradition was passed on to Northern Ireland, via Luce Sands, before being contaminated in the east by the development of coarser Heslerton ware. An early Grimston bowl was found sealed below the forecourt at Cairnholy I, while sherds of a
sharply carinated bowl with upright neck found in the blocking were thought to represent a reflux of developed Lyles Hill styles from Ireland (Piggott and Powell 1949). The absence of Lyles Hill pottery from cairns in the Firth of Clyde suggested to Piggott that this area had been settled from south west England by users of bag shaped pots with lugs, of Hembury affinities, before the introduction of Clyde-Carlingford tombs. Decorated Beacharra pottery seemed to be a local development from these Hembury wares, but Grimston influences could also be seen in the round based bowls with outturned, decorated rims found at Nether Largie and Achnacree. Thus, within the western neolithic tradition of Neolithic A wares, Piggott traced sequences of some complexity, although more informative on cultural origins than on chronology. Among the Peterborough pottery and grooved ware traditions of the Secondary Neolithic cultures, Piggott recognised that locally various forms again developed, but he made little attempt to distinguish regional styles.

The advent of radiocarbon dating has tended to blur the chronological implications of Piggott's schemes. Carinated, plain, and fluted bowls within the Grimston tradition at first seemed to persist throughout the Neolithic in Scotland (McInnes 1969), while decorated bowls in the north, as in southern England, have acquired ever earlier dates. Unstan ware was present at Knap of Howar and The Ord North by the second quarter of the
third millennium (Ritchie 1983; Sharples 1981), and a related style of decoration on open bowls appeared at Balbridie apparently by c 2800 bc (Ralston 1982). Scott (1977) has continued to argue a late date for bowls with exaggerated decorated rims on the basis of a single determination of 2120 ± 100 bc from Townhead, Rothesay, but the evidence, from an old excavation which also produced grooved ware, does not seem compelling. The period of use of grooved ware has now been extended over a millennium, taking account of dates from both Orkney and Durrington Walls (McSween 1992), while dates from Meldon Bridge (Burgess 1976) suggest that impressed ware may have been introduced by the second quarter of the third millennium.

A general loss of confidence in the utility of pottery styles as a chronological guide has, however, been countered by Herne (1988) in a discussion of the Grimston bowl. Herne has shown that the wide date range applied to 'Grimston-Lyles Hill' wares derives from loose classifications and a misuse of radiocarbon dating, both in the failure to appreciate the statistical limitations of the technique, and in the lack of rigour with which associations with dated material are treated. Building on Alison Sheridan's work on Irish pottery, Herne defines the Grimston bowl, very much in Piggott's terms, as a fine, shallow, carinated vessel with simple, everted and beaded rim. Statistical analysis of the radiocarbon dates
suggests a period of use from c 3150 bc to c 2850 bc. For Ireland, Sheridan also identified a restricted period, up to c 2900 bc, during which only 'traditional Western Neolithic pottery', that is, Case's Dunmurry and Ballymarlagh styles, is found. Sheridan, however, saw use of these styles continuing in conjunction with more elaborate, decorated wares and coarse pottery until c 2500 bc, whereas Herne considers that carinated bowls in later, mixed assemblages develop exaggerated features such as ledge shoulders and cordons. In England, too, so-called Grimston assemblages, such as those from Broome Heath and Hurst Fen, are seen by Herne as mixed, domestic assemblages with a variety of functional forms and developed features.

The radiocarbon dates discussed above (8:2) suggest that Herne's initial horizon for the appearance of the Grimston bowl may be a conservative one for south east Scotland. Variations in form then appeared early in the third millennium, as at Boghead of Fochabers, where a sealed assemblage, dated to shortly after c 3000 bc, included hemispherical and closed bowls, and the open, everted 'Grimston' rims carried fluted decoration (Burl 1984). This fluting, seen also on the large, undated assemblage from two pits at Easterton of Roseisle, may be a north eastern variant (Henshall 1983). Closed vessels of fine, thin fabric are present at Balfarg Riding School in association with open, carinated forms, dates here
ranging from 3220 ± 90 bc - GU 2604 to 2815 ± 556 bc - GU 1903 (Cowie in Barclay, forthcoming). On Machrie Moor, Arran, a globular bowl with contracted neck appears in a 'Grimston' assemblage displaying some sharp carinations and wide, flanged rims, with dates of 2870 ± 50 bc - GU 2321 and 2820 ± 90 bc - GU 2315 (Haggarty 1991). At Balfarg Riding School, Cowie distinguishes a thicker, heavier fabric as likely to belong to a later group of wares, but dates of 2880 ± 40 bc - Ut 1302 and 2750 ± 70 bc - GU 2606 effectively overlap the earlier set. Cowie has, however, observed (1992) that early pottery in eastern Scotland displays a distinctive mica-spotted appearance, resulting from the use of quartz grit, seen at Balfarg Riding School and at other sites, such as Pitnacree, dated to 2860 ± bc - GAK 601 (Coles and Simpson 1968), which may help in attribution of other assemblages using this technique, such as those from Linlithgow Friary and the Catstane (Table II:2).

Problems over chronological assignment of pottery also arise as a result of practices of continuous deposition or redeposition of material. The two pits at Easterton of Roseisle, for example, contained good quality carinated bowls, coarse wares, beaker and cordoned urn (Henshall 1983). At Wellbrae, adjacent pits contained separate deposits of western neolithic pottery, impressed wares, grooved ware and beaker (Table III:1:5); besides the length of time involved here, material
could have been brought to the site from a distance. Both pottery and lithic material occurred in pits at Whitemoss, Bishopton (Table I:1:1), and Henshall has commented on the variation present in the former assemblage, with its mixture of rim forms, some everted, and the small number of carinations, all being of ledge form (1972, 168, 172). Scott (1977, 32) has drawn comparisons between some of the Whitemoss forms and Manby's 'Towthorpe ware', an analogy also drawn by Cowie in relation to deep, unshouldered bowls from Inveresk Gate (G. Thomas 1988).

Variation in pottery forms may quickly have developed along regional lines. In the south west Irish borrowings can be seen in the upright necks and sharp carinations of the Lyles Hill vessel in the blocking at Cairnholy I, and there are other examples from Luce Sands, where a characteristically Irish T-shaped rim occurs (McInnes 1969). A similar upright, carinated vessel from a cairn at Hilton, Bute has an everted rim, closer to that of the Rothesay styles of round bowls found on the same island (Marshall 1976). The link may help to suggest a mid-millennium date as probable for these latter.

Emphatic, decorated rims, including T-shaped forms, also appear among Scottish impressed wares, suggesting a possible sequence of indigenous development. Dates from two pits with impressed ware at Meldon Bridge averaging c2730 bc threw doubt on this relationship (Burgess 1976; Gibson 1984), but it is possible that it is the dates
themselves that are in question, perhaps distorted by practices of deposition of recycled refuse (see III:b Monument Context). A date of 2726 ± 50 bc came from one of a pair of adjacent, identically patterned pit deposits, the second pit giving readings of 2336 ± 50 bc and 2290 ± 55 bc. These dates, together with a third of 2132 ± 80 bc from another pit with impressed ware, are unremarkable in Britain-wide terms; Morton (1990) gives a median date for British Peterborough pottery of 2280 bc. They are, however, quite early for the north. Impressed ware at Thirlings is associated with a date of 2130 ± 130 bc (Miket 1976), at Grandtully, Perthshire with dates of 2130 ± 190 bc and 1970 ± 100 bc (Simpson and Coles 1990), and on Machrie Moor with dates running from c 1890 bc to c 1820 bc (Haggarty 1991). There are associations with early beakers on Glenluce Sands (Atkinson 1962), and at funerary sites (Craw 1931; Ritchie 1970, no.10; see 9:6:2). At Wellbrae it has been suggested that grooved ware pits were avoiding earlier impressed ware deposits (D.Alexander, 1992 Clydesdale Conference; see Table III:1:5), but radiocarbon dates are still awaited.

There can be no question but that grooved ware overlaps in time with impressed ware in the study area. If the early pit dates from Meldon Bridge are excluded, it would, in fact, appear to be the earlier style in the north, in contrast to the sequence in southern Britain (cf. Bradley 1984, 72, fig.4:2). Morton (1990, 165)
calculates the median of thirty five northern grooved ware dates to lie at 2190 bc, while that of fifty three southern readings lies at 1950 bc. Two dates from grooved ware basal levels in an enclosure ditch at Balfarg Riding School fall at 2475 ± 50 bc - GU 1670 and 2455 ± 55 bc - GU 1904, while a nearby grooved ware pit is dated to 2300 ± 85 bc - GU 1902 (Barclay, forthcoming), and these readings, nearly as early as dates from Orkney (McSween 1992), set the onset of use of the style in southern Scotland well before the median figure quoted for northern Britain. Grooved ware is associated with the posts of the timber ring at Balfarg henge, dated to c 2150 bc (Mercer 1981(a)), and another ring, with central horseshoe of posts on Machrie Moor, where conflicting dates of 2520 ± 50 bc and 2030 ± 180 bc are available (Haggarty 1991). At Whitton Hill, Northumberland a grooved ware pit was dated to 2010 ± 130 bc (Miket 1985). Although there are no northern dates for grooved ware from the second millennium bc, at Wellbrae, the pottery appears to have been associated with beaker (Table III:1:5).

In summary, the carinated Grimston bowl is present in south east Scotland from at least 3200 bc and by 3000 bc the style is widely found from the north east to the Solway, and west to Islay (McCullagh 1989); stylistic variation is already developing. After c 2800 bc variability increases, with deep unshouldered bowls in the south east, upright Lyles Hill styles on the Solway, and
perhaps Unstan ware in the north east. Decorated Beacharra and Rothesay styles are unlikely to arise at a much later horizon.

Shortly after the mid third millennium grooved ware and impressed ware appear and are in use concurrently across the study area until 2000 BC, with impressed ware at least running on into the second millennium, contemporary with the earliest use of beaker.

8:4 Lithic chronology

Very little is known of the development of lithic technology in northern Britain, nor of patterns of raw material exploitation throughout the Neolithic. Excavated assemblages from Neolithic sites in Scotland tend to be exiguous (Sheridan and Sharples 1992, 7-8). Poor quality raw material is responsible for undiagnostic techniques, and surface collections can usually only be given period attribution if either microliths or pressure flaked pieces, particularly arrowheads, are present (A. Clarke 1989). It is arrowhead types that necessarily become a guide to Neolithic chronology.

Arrowheads are not, it seems, even necessarily assignable to the Neolithic since a securely stratified, small, bifacial leaf point from Kinloch Farm, Rhum has been dated to the seventh millennium BC (Wickham-Jones 1990, 163). Leaf arrowheads probably have a long floruit (Green 1980). On Biggar Common, where western
Neolithic pottery finds suggest an early context, arrowheads are predominantly of narrow, willow-leaf form (Table III:2:7), but such variation may reflect function or local preference, not period.

It is transverse and lopsided arrowheads of petit-tranchet derivative form that can most confidently be supposed to represent a particular chronological context, based on recurrent associations with Late Neolithic and, specifically, grooved ware sites (Wainwright 1971). There is only one such arrowhead from a henge excavation in southern Scotland (Wickham-Jones in Mercer 1981(a)), but surface finds from the field with the henge at Overhowden (IV:b) suggest direct association. Transverse arrowheads are, however, a common form in Lauderdale (IV:vi), and it must be open to question how significant is the relationship with the henge. The element of style and the social role of archery, and perhaps warfare, play such an important role in selection of arrowhead form as to make their use as a mere chronological indicator seem of lesser importance (Brown and Edmonds 1981).

Bamford (1966) has drawn attention to the extent of local variation across Scotland, as for example, in the high numbers of leaf and lozenge shaped arrowheads at Luce Sands, in contrast to the numbers of petit-tranchet derivative arrowheads in the Culbin Sands. The presence of grooved ware in Luce Sands, and the proximity of a Late Neolithic pitted complex at Dunragit, on the north side
of the Sands (DES 1992, 90-1), might have suggested that the latter form would have been more abundant here.

Raw material procurement may have influenced such patterns, south west Scotland turning to Ireland for flint and hence for technological expertise, while the east formed a cultural province with Yorkshire. Such links may have strengthened in the latter part of the third millennium, with the import of Yorkshire flint axes (see 8:5 below), and the development of Late Neolithic artefact types, such as discoidal or edge polished flint knives, found principally in the east. Large flint spearheads found along the Solway are probably of Irish type (V:v; VI:vi). There is less exclusivity in the circulation of Arran pitchstone, which may have been in use throughout the period, appearing at chambered cairns, such as Cairnholy I (Piggott and Powell 1949), at North Mains henge (Barclay 1983) and also at bronze age cairns, as at Knockjargen, Ayrshire (Hughes 1987).

A southern English distinction between the recovery of Early Neolithic lithic material from pits, Late Neolithic assemblages being found in scatters (Healey 1987), does not seem to apply to the south of Scotland, where lithic material, in contrast to pottery, occurs seldom found in pits. An arrowhead and a scraper were found in pits at Whitemoss, Bishopton (Table 1:1:1), but only one of nine pits with neolithic pottery at Kirkburn, Lockerbie held flint, and these were largely in upper
levels (Cormack 1963(a)). At Meldon Bridge (III:b), where pit deposits of pottery were described as 'spectacular', lithic finds were sparse. Contexts for deposition of lithics include funerary sites. Material was found at Slewcairn (VI:2), both in the forecourt and the mortuary structure, and is frequently encountered below cairns (see Cloburn Quarry cairn, Table III:2:2).

8:5 The chronology of stone and flint axeheads

(Axe distributions are discussed in section 10:10:3, with a map of findspots fig.11:1)

Axes were an early component of the British Neolithic. Flint was being extracted in Sussex in the late fourth millennium, and the fine, jadeite axe found beside the Sweet Track in Somerset is dated to c 3200 bc (Coles et al 1974). Axe morphology, however, offers few clues to chronology except in the case of certain specialised Late Neolithic forms (Darvill 1989).

Cumbrian sources seem to have been providing axes to southern Scotland from an early period. Quarries at Harrison Stickle have dates of 2920 ± 50 bc and 2930 ± 50 bc - BM 2625, 2626 (Hedges et al 1990, 217), and Group VI axes have been found in association with the post-built structure on Biggar Common which pottery suggests to be of early date (III:4). A recent find of axe flakes
in a pit deposit with plain bowl pottery at Carzield on
the lower Nith may provide material for a radiocarbon
date (A. Sheridan, pers comm). It is rare for axes to be
found in such secure contexts.

Production of Group VI axes increased in scale over
time, intensification probably occurring after c 2700
bc (Bradley and Edmonds 1988). Chappell, however, notes
a reduction in the circulation of Group VI products in
southern England in the Late Neolithic (1987, 338), and
it is possible that rising demand, and intensifying
production, seen also at the flint mines at Grimes
Graves (Mercer 1981(c)), was coupled with a greater use
of local sources, or, at least, a greater dependence on
particular sources, planned to supply demand.

Sources of hornfels at Creag na Caillich, Killin,
and of porcellanite at Tievebullieagh and Rathlin
Island, Antrim, seem first to have been exploited in the
Late Neolithic (Edmonds et al 1992; Sheridan 1986(a)).
Although no more easily accessible than the Langdale
Pikes, there are a few axes from these sources recorded
in the Biggar Gap Region, and several Group IX axes in
adjacent coastal parts of Ayrshire and Renfrewshire. It
is probable that analysis would identify more Group XXIV
axes in existing collections (R. Ritchie, pers comm).

At the predominantly Late Neolithic enclosure at
Wellbrae, axes and axe flakes were found made of local
stone including glacial cobbles (Table III:4:11). On
nearby Biggar Common, Group VI axes are associated with the early, post-built structure, but the axe deposited with the beaker in the long mound (III:4) was not of this material. There would seem to be supporting evidence here for an increased reliance on local stone in later periods. In Renfrewshire, where there is no certain evidence for the Early Neolithic in terms of pottery (see comment above on Whitemoss, 8:3) or funerary cairns, there are no records of Group VI axes, and use seems to have been made of local volcanic stone (I:vi). An axe of igneous stone found at Hillend on the Pentlands is apparently made in imitation of a bronze flat axe, and must be a very late product (Clarke, Cowie and Foxon 1985, 85, fig.4:6). At the same period, however, production in Cumbria was at its maximum, and was probably responsible for the density of axe finds from the Solway coasts, particularly in the west (Ritchie 1987). The intensity of this traffic may account for the total absence of flint axes from the Nithsdale Region, although lithic artefacts are suggested to show Irish influence (8:4). The axe traffic here would seem to have implicated different processes of circulation from those for flint. In west Wigtownshire there are nine flint axes, presumably mostly from Ireland, although very few finds of Antrim porcellanite (Sheridan et al 1992, fig.6).

The only Region to have produced numbers of
apparently utilitarian flint axes is the Tweed Basin, where most of the twenty four flint axes recorded may be regarded as an aspect of the import of flint for lithic artefacts, already noted. There are one or two large fine flint axes in this Region (IV:vii), but none of the Late Neolithic Yorkshire types of axe and adze that reach the Biggar area and the north of the Firth of Clyde Region. The deposit of a Seamer axe and flint knife in a burial pit in Biggar Common long mound (III:4) presents a direct parallel with a deposit in a mound at Whitegrounds, Yorkshire dated to 2570 ± 90 bc - HAR 5587 (Brewster 1984). The restricted distribution of these pieces suggests a relatively short lived currency.

Two fine all-over-polished, broad butted flint axes from near the Firth of Forth have been compared to Scandinavian prototypes (Sheridan 1992). Although undated, these types may be suggested as likely to belong to an early phase of the Neolithic.

An early date may also be appropriate for the eight jadeite axes from the study area, six of which are the thin, triangular axes of Campbell Smith's Type 1 (Smith 1963). A Class II axe was said to have been found 'in a canoe' at a depth of 7.6m beside the river Clyde (ibid 166, no.54), recalling the circumstances of deposition of a Class II jadeite axe beside the Sweet Track, Somerset, dated to c 3200 bc (Coles et al 1974). Axe deposition is, however, likely to have been practised
throughout the Neolithic, and, indeed, bronze flat axes were also regarded as appropriate items for deposition (Gourlay and Barratt 1984). The wide dispersal of jadeite axes across Scotland suggests an extended period of circulation, and this premise is supported by the abraded condition of a tiny fragment of jadeite axe recovered from the chamber entrance at Cairnholly I (Piggott and Powell 1949).

8:6 Neolithic settlement and economy in the south of Scotland

The evidence for the chronology of neolithic settlement cannot easily be divorced from that of monuments, which have provided much of the information discussed above, and which themselves offer a measure of economic and social patterns. Monument building and ritual activity is, however, considered in detail in Chapter 9, and the reconstruction of settlement history presented here utilises the evidence of the monuments as little as possible.

E. Williams (1989) has analysed dates for the Early Neolithic in Britain, and concludes that the only reliable readings from the fourth millennium are derived from small occupation sites and enclosures. The enclosures concerned, Hembury, Carn Brea, the Trundle and Abingdon, are all in southern England, and there
are no similar sites suggested to be of such precocity in the north. Early radiocarbon dates here, discussed in section 8:2, above, derive from occupation sites with pits, postholes, hearths and other minor features, associated with Grimston pottery. The earliest readings come from sites around the Firth of Forth and the Milfield Basin, south of the Tweed, although the numbers concerned are so few that the grouping may be the effect of chance. By 3000 bc there are dates from north east Scotland and from Islay, while similarity of cultural material suggests that the Solway should be implicated in the same horizon. There are now monuments, of various types, being built from eastern Scotland to the Solway.

This first evidence for the Neolithic coincides with the environmental changes noted in Chapter 7, falling at the time of the Elm Decline. In the Galloway hills this event was dated to c 3120 bc, and heralded an opening up of the arboreal canopy and the first indications of the establishment of pasture. On Islay an Elm Decline at the interpolated date of 3150 bc opens a similar clearance phase with some evidence here for arable cultivation. Fence lines, erected shortly after 3000 bc, may have been for stock control, and there are signs that environmental degeneration then rapidly set in, perhaps induced by grazing pressure. Sheep were present on Islay, but cattle seem more likely to have
been responsible for the effects noted. Cattle, too, would have been more effective in creating openings in the forest and in maintaining pasture. Hazelnuts and shellfish are, however, the more common finds on neolithic sites, and a long bow found in the Southern Uplands was presumably used for hunting. As with environmental evidence from the Howe of Cromar on Deeside (Edwards and Ralston 1984), however, no cultural attributions can be made for such activity.

These tentative, small scale beginnings must be contrasted with evidence from the massive timber hall at Balbridie, in central Deeside, dated to c 3000 bc. The hall, with its 12m span and squared timbers, must itself be classed as monumental (Ralston 1982). The carpentry and architectural skills involved are in a different class from the simple criss-crossing of lashed timbers seen five hundred years earlier at the Eskmeals platforms (Bonsall et al 1989). Carbonised remains from Balbridie included substantial quantities of grain, 80% emmer, 18% barley and c 2% Triticum aestivum, or breadwheat, this last was concentrated in one posthole and was not an accidental inclusion. Flax was also present, beside hazel nuts and crab apple remains (Fairweather and Ralston 1993). The unusual quantities of grain, and, in particular, the predominance of emmer, reversing the usual northern emphasis on barley, suggests this site to have had a special role,
perhaps concerned with storage. The possibility of immigration, or, at least, close contact with the continent, cannot be dismissed. Hunting continued around Upper Deeside, however, whether by pre-existent mesolithic communities, or as an aspect of logistic exploitation.

A cropmark at Sprouston (II:a) could represent another neolithic hall beside the Tweed, and other possible examples in eastern Scotland have been discussed by Ralston (1982). Irregular postholes on Biggar Common are indicative of some form of neolithic structure (III:iii), and parallel postholes at Kirkconnel, Dumfriesshire might derive from another (fig.8:3). More commonly, Early Neolithic settlement traces consist of minor features, pits, postholes and gullies, and a 'palisade slot' at Kirkburn, Lockerbie (Cormack 1963(a)) may suggest the use of upright split planks in slot trenches, as at the Fengate house (Pryor 1982). An undated slot at Meldon Bridge, 14m by 8m, has a two-part, apsidal outline resembling that of a structure at Ballygalley, 13m by 5m, dated to c 2880 ± 117 bc (Current Archaeology 134 (1993), 62). If domestic structures of the period were relatively insubstantial, this would accord with the evidence for characteristically short-lived clearance episodes early in the third millennium.

The Early Neolithic also sees the appearance of
Fig. 8:3 Neolithic and possible Neolithic timber structures

A. Meldon Bridge
Burgess 1976

B. Ballygalley
Current Arch 134

C. Biggar Common
Tam Ward

D. Kirkconnel
Clough and Laing
1969

E. Sprouston
Smith 1991

F. Doon Hill
Reynolds 1980

0 10m
polished stone axeheads. Probable Group VI axes occur in association with Grimston pottery in the postholes of the Biggar Common structure and in a recently reported pit at Carzield on the lower Nith (A. Sheridan, pers comm). It seems that the tuffs of the Langdale Pikes were being exploited early in the Neolithic, and were almost immediately in circulation in Scotland. It is possible that exotic axes of Alpine jadeite and of south Scandinavian flint, both highly polished and in specialised forms, were in circulation from an early period. In view of the undoubted import of the staples of the neolithic economy, sheep, grain and also flax, it is perhaps unsurprising that such desirable and eminently transportable objects should have been included in loads from the continent.

After c 2850 bc, as settlement spreads in Orkney (A. Ritchie 1983) and Shetland (Whittle et al 1986), there are indications of intensification of land use and more successful inroads into the natural environment. The evidence is still patchy, with local instances of forest regeneration, but cereals are now being grown on Arran and Islay, in Dumfriesshire and the Bowmont Valley, Roxburghshire (7:4:1; 7:4:2). Clearance in upland Cumbria is suggested to be for summer grazing as an aspect of axe exploitation (Bradley and Edmonds 1988), but assessment of the significance of the different aspects of the economy is hampered by a total absence
of faunal remains from the study area. At Knap of Howar, however, both sheep and cattle were important, the latter possibly recent domesticates (A. Ritchie 1983). Gathered foodstuffs, hazelnuts and shellfish, continued to play a part in economies (e.g. Dalgety Bay, Watkins 1982).

By c 2800 bc Balbridie had been destroyed, and there is no evidence, from Scotland or elsewhere, for the continued construction of substantial timber buildings (cf. Lismore Fields, Buxton: Garton 1987). It is possible, however, that enclosure became a settlement form in use at this time. The inner ditch of a circular, double ditched enclosure on a low glacial knoll at Collessie, Fife produced a date of 2775 ± 70 bc, although the pottery recovered, which included one rather fine, but abraded sherd from the same ditch, appears to be of Late Neolithic or Bronze Age type (Barber 1982(a)).

Two riverside enclosures of interrupted ditch type, recognised from cropmark photography, are described in the Catalogue. One of these, at West Lindsaylands (III:a), is at the foot of the slopes of Biggar Common, beside the Clyde; the other, at Sprouston, on the Tweed (IV:a), is beside the cropmark of a possible timber hall. It could be that enclosures succeeded the timber buildings after the latter had decayed. The principal building phase for such enclosures in southern England lies between c 2850 bc and c 2600 bc (Mercer 1990),
and a causewayed hilltop enclosure on Donegore Hill, Northern Ireland is of the same period (Sheridan 1986). It is possible that other enclosures of the time remain unrecognised in Scotland because, like Collessie, they do not use the interrupted ditch format. These could include stone ramparted sites, as at Carn Brea, Cornwall, which has a *terminus ante quem* of 3049 ± 64 bc (Mercer 1981(b)). Axes and lithic finds, particularly arrowheads, from the west terrace below the summit of Traprain Law, East Lothian (II:iii) and from the slopes of Ruberslaw in the Borders (IV:iii) point to neolithic use of these dramatic hilltops. Occupation evidence from Balloch Hill, Kintyre was associated with Rothesay style pottery (Peltenburg 1982).

While the Rothesay style remains undated, there is certainly an increase in regional variation in pottery styles after c 2800 bc. Coarse wares are present, upright vessels, exaggerated rim forms, and decoration on these rims, all make an appearance. Links may have been strengthened between Scotland and England on the east coast and between Scotland and Ireland in the west. Flint importation seems to reflect these connections.

After c 2600 bc, change is more fundamental. Early monument types cease to be built, and the introduction of Seamer and Duggleby axes, and their use in burial, suggest the establishment of new social structures. Cumbrian axe quarries are more intensively worked,
and the extraction of hornfels from Killin sites begins (Edmonds et al 1992). Clearance is first registered in the Perthshire hills, and in lowland Dumfriesshire there is a second elm decline with clearance, now apparently for agriculture (Tipping forthcoming). Settlement is spreading in the Northern Isles (Whittle et al 1986).

Forest regeneration has been suggested for the mid third millennium, but the evidence at present is unclear. By c 2400 bc grooved ware was in use in eastern Scotland, and new forms of enclosure were being introduced. Impressed ware was also adopted by c 2300 bc. A wide range of environments was exploited in the period, including coastal locations in East Lothian, at Shewalton and on Luce Sands. Cultivation was taking place in valleys, such as Strathearn, and there is settlement evidence from Annandale with grooved ware associations both in the form of individual structures (A. Pollard, pers comm), and an enclosure at Beckton, Lockerbie in which a large grooved ware pot was deposited against the palisade (Cormack 1963(b)). In the Galloway uplands tree cover disappeared towards the end of the third millennium, and episodes of water run off and erosion precede the establishment of heather moorland. On lower hills in Galloway, Dumfriesshire and the southern Pentlands, small cairnfields may represent clearance residues of this period.
Increasing clearance could be associated with the construction of timber settings, post circles and enclosures, which took place over the final centuries of the third millennium (see 9:6:6 and 10:8:3). The size of some of these enclosures has implications for the scale of social organisation in the period whether, or not, they were used for settlement. Burgess has suggested (1976) that Meldon Bridge (III:b) was built as a defensive enclosure, and the appearance of numbers of transverse arrowheads in Lauderdale may support the thesis of an increase in warfare in the period. Enclosures at Blackhouse Burn (III:c) and Dunragit are not, however, defensively designed, and there is no evidence for warfare from Meldon Bridge.

Equally, neither Meldon Bridge nor the excavated henge at Cairnpapple (II:b) produced much evidence for competitive display taking the form of circulation of exotic artefacts. The very limited evidence is discussed in section 10:10:2. Nonetheless transverse and lopsided arrowheads, discoidal and edge polished knives in the Tweed Basin Region, and found in smaller numbers elsewhere, do suggest an increasing access to imported flint. Differential use of brown flint for lopsided arrowheads and black or dark grey for knives may be noted.

Some additional evidence for Late Neolithic settlement choice may be extracted from information
on the location of lithic scatters in the Tweed Basin Region (IV:iii). Material appears frequently to have been recovered from sites on the brows of hills, often quite steeply sloping. Such locations, presumably less exposed at the period of occupation when tree cover was still present, need not necessarily have been for pastoral farming. The altitude of the sites would not preclude cultivation (5:3:3), and may have presented advantages in terms of well drained soils, exposure to sun, and avoidance of frost pockets. Possible structures on the hill at Airhouse, in an area noted for dense recovery of Late Neolithic artefacts, are discussed in the Gazetteer (IV:iii).

Axehead distributions are less informative on settlement choice, being subject to numerous distortions created by deposition practice (2:5:2). The recovery of axes from improved ground over almost the whole of the study area, must suggest, however, extensive neolithic activity. The low number of finds from certain areas, such as south Ayrshire, the Solway plain and some of the steeper valleys of the Tweed Basin, including the Gala, the Ettrick and the Yarrow, does give some indication of settlement choice.

The timbers at Meldon Bridge saw little replacement, although the site continued to be used for burial in the second millennium. At Blackshouse Burn, after timbers had rotted, the stone bank was refurbished
and capped with flagstones. Beaker burials took over at henges and long cairns. The Neolithic had changed the landscape of southern Scotland and was itself becoming a part of history.

8:7 Summary: a chronological framework

The evidence discussed in the present chapter suggests that it may be possible to characterise up to six phases of the Neolithic for which approximate chronological limits may be suggested.

An Earliest Neolithic is recognisable by c 3200 bc with the appearance of Grimston pottery. There is some evidence for clearance at this stage associated with the establishment of pasture, presumably for domestic livestock, but few signs of cultivation taking place other than very occasional finds of cereal grains.

Shortly before c 3000 bc there is a marked expansion of evidence for clearance, now sometimes associated with cultivation. By this time pottery and axes are in widespread use. The massive timber hall is built at Balbridie, and there are other post-built structures probably of the same period.

By c 2800 bc evidence for agriculture is more abundant. Pottery styles are becoming diversified, suggesting regional difference. Enclosed settlements may be in use.
After c 2600 bc numbers of radiocarbon dates decline sharply, perhaps reflecting a cessation of monument building. Nonetheless agriculture still appears to be intensifying, although there may be a later phase of forest regeneration, and axe quarrying expands and seeks out diverse sources. Prestige artefact types are in circulation.

By c 2400 bc new pottery styles are coming into use. After this date clearance and settlement evidence spreads into different environments, and there begins a spate of enclosure building. Impressed ware and perhaps grooved ware continue in use until c 1800 bc, overlapping with beaker. The period from 2400 bc to 1800 bc probably sees important changes, but continuity of pottery styles impedes recognition of the phasing involved.

Table 8:2 sets out the phases defined in the above resumé, using terminology which is adopted in the following chapters in discussing of the sequence of monument building practice. Dates must inevitably be approximate, and there is considerable overlap of characteristic styles. After c 2400 bc there is a six hundred year period which can only be treated as one Late Neolithic phase.
Table 8:2  Chronological phases of the Neolithic

<table>
<thead>
<tr>
<th>Years bc</th>
<th>Phases</th>
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<tbody>
<tr>
<td>3200</td>
<td>Earliest</td>
</tr>
<tr>
<td>3000</td>
<td>Early</td>
</tr>
<tr>
<td>2800</td>
<td>Developed</td>
</tr>
<tr>
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<td>Late Neolithic</td>
</tr>
<tr>
<td>1800</td>
<td>Final</td>
</tr>
</tbody>
</table>
9: MONUMENTS AND RITUAL IN THE SOUTH OF SCOTLAND: MORPHOLOGY AND SEQUENCE

9:1 Introductory overview

The Catalogue of Sites in Volume II has entries for fifty two Category A or B, acceptable or probably acceptable, neolithic monuments in the south of Scotland, besides seven doubtful Category C sites. Lists give briefer details of another thirteen Category C 'funerary monuments', and twenty three rejected Category D sites. Twenty six of the A/B sites are so-called funerary monuments, that is, cairns or barrows, twenty six are enclosures.

Only three of the A/B funerary monuments, Lochhill (VI:3), Slewcairn (VI:2) and Biggar Common (III:4), have been thoroughly excavated, and none of these have been fully published. A damaged chamber at Haylie, Largs (I:1) was excavated and published by Marshall and Taylor (1957), and there are accounts of its original discovery in 1772. The Mutiny Stones (IV:1) was examined in two trenches by Craw (1925), following earlier trenching in 1871. The long cairns at Fleuchlarg (VI:7) and Loanfoot (I:3) were subject to small scale investigations in 1937 and 1922 respectively, by amateurs who left brief, unpublished notes on their work. Chambers at Lang Knowe (V:2)
were opened in the 1840s, and the cairn 'turned over' in 1870, and Cuff Hill (I:2) was partly removed and examined in 1813, in 1864 and in 1874, leaving eye witness accounts of each event. The excavation record from funerary monuments is thus thin in the extreme.

Of the twenty six enclosures, two consist of cropmarks of interrupted ditches, six are elongated cropmark features of cursus related type, two are part-excavated and radiocarbon dated Late Neolithic enclosures, twelve are henges, of which three survive as cropmarks only, and four are stone circles. All the cropmark sites are subject to interpretation, and a trench across the ditches of the 'cursus' at Monktonhall (II:a), failed to recover evidence of date or function. Of the henges, Cairnpapple (II:b) has been excavated across the interior, and Blackshouse Burn II (II:d) and Overhowden (IV:b) have had their perimeters trenched.

Inclusion of stone circles is deliberately selective. All three surviving sites over 20m in diameter in Regions I to IV have been included (III:j; IV:d,e), but the Twelve Apostles (VI:h) is the only site from Regions V and VI to be given an entry, on the basis of its being part of the Holywood monument complex (see VI:b,c). Other stone circles in the Solway Regions, five of which are probably acceptable sites over 20m in diameter, are listed and briefly described in Tables V:1
and VI:2. These sites have all been planned and described by Thom, Thom and Burl (1980), are mostly very depleted, and are only doubtfully neolithic.

One further neolithic structure, the timber longhouse, is discussed in relation to a series of postholes on Biggar Common excavated by Tam Ward (III:4, Prehistoric Landscape) and a cropmark feature beside the interrupted ditch enclosure at Sprouston (IV:a). The Gazetteer also discusses funerary and other ritually structured activity, such as pit deposition, taking place without any durable monumental setting.

There is a general chronological division between the earlier funerary monuments and later enclosures, including henges and possibly stone circles. Interrupted ditch enclosures and cursus related sites probably fall towards the latter end of the 'earlier' period. The present chapter, examining the morphology of monuments and other funerary and ritual evidence, attempts to relate this material to the more detailed chronological framework outlined in section 8:7. The exercise is not concerned with typological sequence for its own sake, but seeks to explore the dynamic of developing ritual behaviour and monument construction within its social and historical context. Regional variability and locational strategies are considered more fully in Chapter 10.

As has already been shown, radiocarbon dates from
the study area are few, and, again, in order to elucidate sequence, material from neighbouring areas and sites of comparable type are examined. There is necessarily some speculative discussion, in which typology has a part to play. Fundamental to the approach, however, is the recognition that the chronological phases set out in Table 8:2 do not represent closed stages. The characteristics of the Earliest Neolithic, for example, with its tentative agricultural beginnings, transient settlement traces, and carinated Grimston bowl pottery, can all be found within Early Neolithic contexts, now incorporating greater local variability and more confident exercise of techniques, and spread over a wider geographical area. The dates applied to these phases offer guidelines, rather than constituting limits.

9:2 Monuments and ritual practice in the Earliest Neolithic: c 3250 bc - c 3050 bc

While evidence for agriculture in the Earliest Neolithic remains tentative, and, perhaps, primarily concerned with pastoral activity, material culture items, pottery and polished stone axes, were quickly adopted, and, among the first radiocarbon readings from the study area are a pair of dates from a hearth below a long mound on Biggar Common (III:4). The excavator
of the mound, Dan Johnson, and Historic Scotland have kindly given access to a preliminary excavation report, but before full publication much uncertainty remains over structural sequences. The hearth, used on at least two successive occasions, yielded pottery, lithics, hazelnuts and a grain of barley, and two dates averaging c 3250 bc. While still freshly upstanding it was sealed under stone and soil, although the form of this primary mound is not known, and it may not have been extended into a linear barrow until a later date. So successfully, however, did the mound mark the site that it retained significance to be re-used as a receptacle for prestige Middle and Late Neolithic burials. The location may, indeed, already have possessed a history as a special place, as the barrow sealed a posthole structure dating from more than a millennium earlier.

A complex of postholes 100m north west of the long mound produced pottery similar to that on the hearths, although this fact does not prove strict contemporaneity. Since it was the hearths that were commemorated under a mound, this may be a mark of their pioneering role in establishing the neolithic beginnings on the hillside. The posthole structure, it should be added, was preserved by the lucky chance of the slight protection afforded by topography. Excavation of the sites of other ceramic and lithic scatters nearby found no subsoil features, and erosion had clearly been severe.
The function of the Biggar Common mound in protecting early deposits may have been achieved elsewhere, for example at Thirlings (Miket 1976), and at Balfarg Riding School (Barclay forthcoming), by placing the material in pits. Long use of sites for pit deposition, as at Wellbrae, with western neolithic pottery, impressed and grooved ware, in pits which respected earlier features, suggests that some marker was erected over such deposits (Table III:4:11). A small cairn was used at Ford, Northumberland, however, to cover a discontinuous stratum on the ground consisting of burnt bones, wood and earth, with sherds of carinated Grimston bowls (Greenwell 1862; Kinnes and Longworth 1985, 100, no.188). A nearby food vessel cairn and other urns show the same remembered use of the hillside for burial as is seen on Biggar Common. At Boghead of Fochabers another burnt layer, dated to c 3000 bc, and containing fragments of bone and flint, barley, a little emmer and quantities of Grimston pottery, sealed a central stone-lined pit measuring 1.32m by 0.98m and 0.60m deep in which thin sandy layers and pottery sherds did not suggest an inhumation to have been laid. Small stone cairns were heaped around the pit, and the whole setting was sealed under a sandy mound, c 15m in diameter. A beaker pit was later dug beside the mound (Burl 1984). The practice of sealing cultural material in pits or under mounds may thus be
suggested to have been an activity of the Earliest to Early Neolithic.

No comparable examples attributable to the same period are known in the study area, although there is a recurrent tendency for neolithic features and material to be found under later cairns (e.g. Cloburn Quarry: DES 1987, 46; 1989, 90). Neolithic pottery was found at the supposed site of a cairn at the Catstane (Cowie 1978), and an undated pit containing burnt material lay below the edge of a 9m by 7m oval cairn on Fagyad Hill in upper Clydesdale (DES 1992, 68). There are older accounts of finds which could relate to neolithic practices, some of which, from the Tweed Basin Region, are detailed in the Gazetteer, IV:viii. There were, for example, patches of burnt material found at Langrew and on Bewlie Hill; a pit under a cairn on the Knock Hills contained pottery fragments and flint; at Sleepy Knowe a complex deposit of human and animal bone, fine pottery sherds, and cup marked stones was found within a stone setting under a cairn.

Comparability of size and shape suggests the oval cairns at Easton (III:3) and Lang Knowe (V:2) to be similar to the final mound on Biggar Common, but uncertainty over the date at which the Biggar Common mound achieved this outline undermines the significance of the comparison. Small oval mounds also occur among the small cairnfields of the south Pentlands and
south west Scotland, but probably only as casual variants of the more usual round cairns (see C:6); there was no such cairnfield on Biggar Common. Under one of a group of small round and oval cairns at Auchenfad, 3km north west of New Abbey, Kirkcudbright, James Williams recovered a little cremated bone and a 'dummy, imperforate axe' (DES 1966, 29; 1967, 29).

Ritual deposition of axes may well have been practised in the Earliest Neolithic in Scotland as in the Somerset levels, where a pristine jadeite axe from beside the Sweet Track can be securely dated to c3200 bc (Coles et al 1974). The eight jadeite axes from the study area are mostly Class I specimens of thin, triangular form, not necessarily contemporary with the plump, Class II Somerset axe. A Class II axe recovered in c 1780 at a depth of 7.6m below St. Enoch's Church, Glasgow, beside the Clyde, must, like the Somerset find, have been a 'wet' deposit, but the axes are very different in form and in raw material (Smith 1963, 167, no.54). It is hoped that a date will be obtained from a deposit of Grimston pottery and axe flakes found in an eroding stream bank at Carzield, near the lower Nith (J. Brann; A. Sheridan, pers comm).

Construction sequence at Slewcairn (VI:2) showed that the stone edged mortuary structure here post dated decay of large split tree trunks flanking a central posthole. The same sequence was not demonstrated at
Lochhill (VI:3), and this plank built structure articulating with a post-defined flat facade was so different from the longer Slewcairn setting with V-shaped boulder facade as to offer no certainty of shared phasing. Mortuary structure dates are considered in section 9:3:2 as being unlikely greatly to precede c 3000 bc, but the lapse of time at Slewcairn between erection of big posts and the building of the stone walls of the mortuary structure overlying their rotted stumps shows that the timbers could be considerably earlier. As a freestanding feature the paired posts could well have acted as supports for an exposure platform, as argued by Scott (1992, fig.8:7).

The same succession occurs at Dooey's Cairn, Co. Antrim, where charcoal within the structure gave dates of 3200 ± 90 bc and 2990 ± 50 bc (Collins 1976). While the later reading must be preferred for the mortuary structure, again the big posts may be much earlier. Very early dates do occasionally occur, as for example, a reading of 3555 ± 145 bc on the central facade post at Raisthorpe (Kinnes 1992(b), 117), but such large timbers incorporate not only an age factor, but the possibility of use of fallen, perhaps waterlogged trunks. The Dalladies mortuary structure, again post-dating D-shaped postholes, themselves perhaps subject to two phases of use (see 9:4:2), was dated as late as c 2650 bc (Piggott 1972), so sequences of succession,
as at Slewcairn, cannot necessarily confer Earliest Neolithic dates on primary phases.

9:3 Early Neolithic monuments and ritual practice:

c 3050 bc - c 2800 bc

9:3:1 General trends in the Early Neolithic

Shortly before the end of the fourth millennium bc evidence for the characteristic items of the Neolithic begins to become widely apparent. Clearance is now accompanied by indications of pasture, and weeds of cultivation are sometimes present. Grimston pottery is occurring throughout eastern Scotland, along the Solway coasts, and into the southern Hebrides. Axes are being brought into Scotland from the Langdale Pikes. Evidence dateable to the early third millennium bc is regularly encountered below later monuments, such as the port Charlotte chambered cairn (Harrington and Pierpoint 1976). A range of monument forms now makes an appearance.

9:3:2 Mortuary structures of the Early Neolithic

A date of 3120 ± 105 bc from a plank in the mortuary structure at Lochhill was rejected by E. Williams (1989) as being a single reading on material that had not been pretreated. The wide standard deviation does, however, allow it to be directly compared with dates from the very
similar site at Street House, Cleveland, where a series of four readings from the mortuary structure and two from the facade trench all cluster tightly in the years immediately after 3000 bc (Vyner 1984; Bowman et al 1990). Two dates from the old ground surface below the Street House cairn both fall at c 3010 ± 120 bc, showing no significant time lapse between construction phases. The structure at Dooey's Cairn, discussed above (9:2), may have been built at about the same time. There is a slab-built porch, resembling that at Lochhill, at this site, followed, however, by the addition of an entirely Irish style 'lobster claw' facade.

The boulder-built V-shaped facade articulating with the Slewcairn mortuary structure suggests a slightly later, megalithic context than that of flat facades, one timber, one stone walled, at Lochhill. Structural elements at these sites are so varied, however, that they do not appear to conform to uni-directional development sequences, and may be better perceived as being individual expression of ideas of 'linearity'. This characteristic is seen at Street House, where a splayed, 10m long avenue of, probably, six posts led into the structure between the arms of the facade, and the same line was continued by the provision of two slab pavements at the rear of the structure.

Deposition practice also varied between the sites, but is considered in a wider context in section 9:3:7.
Recognition of the different elements of mortuary structure and defined areas for deposition is highly contingent on the chances of excavation. If timber prototypes preceded megalithic chambers, such, as perhaps, the bi-partite chambers at Cairnholly I and II, which follow the same layout as the Nith Estuary sites, this will almost certainly remain concealed. A post built structure under a round mound at Courthill, Dalry (I:6) has been suggested to have possibly been neolithic, its axial, squared posts, 9m apart, being compared to those of the mortuary structure at Pitnacree, Perthshire (Coles and Simpson 1965). The interpretation is discussed in the Catalogue, but is regarded as improbable.

Paired posts occur, c 6m apart, forming an avenue at Meldon Bridge (III;b), in a layout possibly reconstructable as a series of mortuary platforms as suggested for the post pairs, only 2m to 3m apart, at Balfarg Riding School (Barclay, forthcoming). Recurrent associations between avenues and pitted enclosures, as at Forteviot, Dunragit and Walton, Radnorshire (see 9:6:8) must make it improbable that the posts had a separate, Early Neolithic origin.

The most promising means of identification of other Early Neolithic mortuary structures must lie in the identification of small trapezoidal cairns, comparable to those covering the features at Lochhill and Slewcairn.
9:3:3 Trapezoidal cairns

A double kerb along the front section of the surviving side of the Lochhill cairn suggests two-phase construction. The inner kerb could have articulated with the earlier timber facade, and curved around the rear of the mortuary structure, creating a heel-shaped cairn, although no internal evidence for such a phase was recognised. The outer kerb and trapezoidal cairn probably articulated with the stone facade, and thus with the small, megalithic chamber. At Slewcairn, as at Dooey's cairn, the mortuary structure was erected concurrently with cairn material, in which the slab platform to the rear was also set. A trapezoidal layout was prefigured at a similar stage at Street House (Vyner 1984), and it would seem that the form was a common one for Early Neolithic cairns, despite variations in the design of forecourts, discussed above (9:3:2).

Recognition of other, similarly shaped cairns is not, however, necessarily easy. Lochhill and Slewcairn are both low-built, and Street House appears never to have consisted of more than a low platform of stone, as represented also by the primary layout at Slewcairn around the mortuary structure and slab platform. It could have been much later that stone was added to create a mounded cairn at Slewcairn, perhaps concurrently with the addition of a slab revetment over the original kerb of granite boulders (see 9:4:5, below). Such low
monuments would clearly be very vulnerable to destruction or concealment, and, indeed, even the 1.8m height of the cairn on Lochhill escaped all recognition before 1968 under hillwash, while Slewcairn, in deep peat, appeared as an amorphous oval mound of uncertain overall dimensions.

The best match for the size and shape of these trapezoidal cairns in the study area is probably the pear-shaped mound at Macawston (I:7), looking out to Arran from a hillside above the Firth of Clyde. Balnowlart Hill, 23km further south, has another possible small long cairn, overlain by a round cairn, above an inlet of the maximum transgression sea at Ballantrae (RCAHMS 1981(b),8, no.12). There are three more small coastal cairns in Cumbria, Sampson's Bratfu', Haverbrack, and Skelmore Heads (Masters 1984, 59-63), but excavation of the last and smallest site, found no sign of kerb or facade; standing stones within the cairn, two of them flanking a robbed out area, perhaps suggest comparison with the paired posts of the mortuary structure sites (see fig.9:1).

Moving inland, on Broughton Knowe in the Southern Uplands, is another trapezoidal cairn, 28m in length (III:7), and to the south of the Border, on Dod Hill, Northumberland, is another trapezoidal 24m cairn (Masters 1984, 59). In inland Dumfries and Galloway is a series of trapezoidal cairns of moderate length (30m...
to 43m long), built on a much more massive scale than the low, coastal cairns, and likely to be a later phenomenon (9:4:4), although it is possible that they envelope earlier, smaller predecessors. There are also two-part structures, notably the Mutiny Stones (IV:1) and Greens Moor (III:2), that could be trapezoidal cairns with added, elongated tails (9:4:4).

9:3:4 Early Neolithic megalithic chambers

The complex structures excavated at both Lochhill and Slewcairn demonstrate that distinctions between chambered and unchambered cairns are not clear-cut. Both sites used stone in definition of the mortuary structure walls. Lochhill also had an 'ante-chamber', or porch, of two upright slabs, later converted into a chamber, 2m in length, with a gently curving stone facade. Slewcairn probably also had an early 'porch' of stone pillars at its south end, connecting with a small stone platform, as well as a V-shaped facade of granite boulders to the north. A lateral passage approached this porch, which the excavator suggested had also been converted into a chamber. Unfortunately the outer end of the passage had been destroyed and relationship with the cairn, or cairn kerb, was not established. The lateral passage could suggest symbolic access to the mortuary structure itself, to which it was at right angles, resembling the angled layout of the passages and
Fig. 9:1 Small trapezoidal long cairns in northern Britain
Key to Fig. 9:1

1. Slewcairn, after Masters c 1977 and Henshall 1972
2. Lochhill, after Masters 1973 and Henshall 1972
3. Street House, after Vyner 1984
4. Macawston I:7
5. Balnowlart Hill
   4 - 6 surveyed 1987 BJM
7. Sampson's Bratfu'
8. Haverbrack
9. Skelmore Head
   7 - 9 after Masters 1984
chambers at Hazleton North, dated to c 2990 bc (Saville 1990). Certainly both the Scottish sites demonstrate an early use of stone, and rapid succession of the megalithic idea.

The bi-partite, three post layout of these mortuary structures is echoed in stone at Cairnholy, where both chambers have tall terminal slabs, perhaps reminiscent of timber posts; the rear compartments may also have been accessible over the sides (Scott 1969(a)). The division recurs, on a less massive scale, at Glenvoidean, Bute, where charcoal below an orthostat of the axial chamber was dated to 2910 ± 115 bc - I 5974 (Marshall and Taylor 1977).

Small, simple chambers, such as those at Mid Gleniron I and II (Corcoran 1969(a)), are also likely to be early. Bones from just such a structure at Trefignath, Anglesey were dated to 3100 ± 70 bc - HAR 3932 (Smith and Lynch 1987). There are ten cairns with chambers and/or orthostatic facades in the part of south west Scotland excluded from the present study. Most of these cairns are small, and the regular, trapezoidal outlines of some examples, such as Mid Gleniron I, or Boreland (KRK 4), resemble those of 'unchambered' examples discussed in the last section (9:3:3).

The only axial chambers in the study area, apart from Lochhill, are the long segmented examples at Windy Edge (V:1) and probably at Haylie (I:1), where the
cairn is destroyed. These chambers are discussed in relation to the Developed Neolithic phase, below (9:4:3). A much damaged chamber, or cist, in the head of the bi-partite mound at Lang Knowe (V:2) could have been axial to this, as the primary part of the mound, before the addition of the tail (9:4:4).

There are three cairns in north Ayrshire with lateral chambers, besides similar chambers at Burngrange (III:1) and, possibly, at Greens Moor (III:2) on the south Pentlands. The best preserved chambers at Cuff Hill (I:2), as, also, the south chamber at Burngrange, have passages leading to the cairn periphery. Cuff Hill and Loanfoot (I:3) were both dubbed possible 'Severn-Clyde Cairns' by Scott (1969(a), 212-2), and the former site, at least, would be very much at home in the Severn-Cotswold group. Laterally chambered cairns in the south have been shown by Julian Thomas (1988(b)) to have dates of c 3000 bc, and recent excavations at Gwernvale (Britnell and Savory 1984) and Hazleton North (Saville 1990(a)) give no support to Henshall's thesis (1972, 64) that in Scotland 'subsidiary chambers are often, indeed probably always, earlier than the trapezoidal cairn under which they lie'. Internal walling at Cuff Hill, suggested to be evidence for cairn complexity (ibid p.8), is traced, in the Catalogue, to episodes of nineteenth century rebuild (I:2), and, while it is
possible that the use of limestone slabs for one only of the three surviving chambers is indicative of phased construction, the rocky ledge which the cairn occupies strongly suggests integration with an original design of a long cairn. Loanfoot has very probably undergone rebuilding and extension in antiquity to attain its massive size discussed in section 9:4:4, as also seems probable for Greens Moor. Big kerb stones at Dod Hill (I:5) and at Burngrange would tend to associate these sites with Clyde cairns, but the chronology of such features is entirely uncertain. The laterally chambered cairns of the study area may be concluded to be probably of the Early Neolithic, although, doubtless, incorporating some longevity of use and, perhaps, complexity of construction.

9:3:5 Timber mortuary enclosures

Recent excavation by Barclay and Maxwell (1991) has shown that rectangular ditched enclosures (Loveday and Petchey 1982) were a feature of the Early Neolithic in Scotland. The timber enclosure at Inchtuthil, measuring 50m by 10.1m to 8.6m, produced dates of 3210 ± 70 bc and 3120 ± 50 bc - GU 2760-1 on timbers estimated to be at least 190 years old. The site may have been mounded over subsequent to firing, as seems also to have been the case at shorter enclosures at Balfarg Riding School (Barclay forthcoming), opening the question as to
whether such enclosures could be regularly expected to lie below long mounds, as seen, for example, at Giant's Hill, Skendleby (Phillips 1935). Barclay and Maxwell draw attention to the close comparison to Inchtuthil at Kilham, 58m by 10.7m, and dated to 2880 ± 125 bc (Manby 1976). They also mention the structure under the mound at Courthill, Dalry (I:6), less closely similar, its dimension being only 14m by 6m. While the burning of the Courthill timbers, falling inwards as at Inchtuthil, offers some grounds for comparison, it is argued in the Catalogue that this structure is more probably a building of rather later date.

The Inchtuthil structure could also find comparisons in stone built kerbs, such as the edging of granite boulders around Slewcairn, later mounded over. Stone was clearly adopted early in Scotland as a preferred medium, and a stone cairn, such as Harlawmuir, measuring 61m by 15.5m - 12m (III:6) may be a lithic version of an Inchtuthil structure. Attention may also be drawn to the cigar shaped mound in the churchyard at Inveresk (III:2), although this has been considered to be doubtfully neolithic.

Cropmarks of elongated enclosures in the study area, both ditched and pitted, appear to belong to rather longer sites than Inchtuthil, and are discussed as probable cursus-related monuments in relation to the Developed Neolithic (9:4:5). Only Fourmerkland (VI:e),
visible for c 60m of its open-ended length, might be classified as a short, rectangular enclosure, and the wide spacing of its pits gives this site rather closer resemblance to the nearby cursus group at Holywood (VI:b,c).

A small, subrectangular banked and ditched site, classified as a possible mortuary enclosure, at Brownsbank (III:5), is also discussed below (9:5).

9:3:6 Timber longhouses of the Early Neolithic

Possible Early Neolithic timber buildings have been discussed above (8:6) in terms of their putative domestic role, and doubts remain over the dates of the structures at Sprouston (IV:a) and at Kirkconnel (V:iii), and the form of that on Biggar Common (III:4). The point may be made here, however, that the projected reconstruction of the Early Neolithic hall at Balbridie (Ralston 1982), with its roof ridge 8m above ground level, would dwarf stone built monuments known from the period. Such architectural virtuosity is not carried through for purely functional purposes, and if timber longhouses were, indeed, being constructed in the study area at this time, they must be accepted as incorporating an element of showmanship. Exactly what was being displayed, by whom and to whom, remains the question at the heart of the present enquiry, returned to in Chapter 11.
9:3:7 Deposition practice in the Early Neolithic
Deposition of cultural material in pits and below
mounds continued in the Early phase of the Neolithic, as
in the Earliest, discussed above (9:2). The black layer
below the mound at Boghead of Fochabers has dates of
c2943 bc (Burl 1984), and there are pits with neolithic
pottery with similar dates at Balfarg Riding School,
Yeavering henge, and Newton, Islay. This last pit was
certainly not mounded over, since it was cut by a fence
line erected before c 2930 ± 30 bc (McCullagh
1989(b)).

More structured modes of deposition were now,
however, available. At Slewcairn (VI:2), pottery, in a
very shattered state, lay both in the forecourt and on a
stone platform at the opposite end of the mortuary
structure. At Lochhill (VI:3), on the other hand,
scherds in rather better condition, seem to have been
disturbed from an original resting place in the chamber,
which may have functioned as a place for deposition when
it stood as a 'forestructure' to the timber facade.
Pottery at Street House was mostly associated with the
postholes of the facade here (Vyner 1984). Forecourt
deposition of early pottery is also seen at Cairnholy I
(Piggott and Powell 1949) and at Mid Gleniron II
(Corcoran 1969(a)). Sherds within the chamber at
Cairnholy I suggested that pottery might have been later
cleared out. The chambers at Glenvoidean (Marshall
and Taylor 1977) were used for deliberate deposition of complete pots, but these were in a secondary position, and consisted of later, Rothesay style bowls (see 8:3).

Lithic deposits in forecourts and megalithic chambers cannot be dated. At Slewcairn, however, two vertically set flint knives and a burnt leaf arrowhead were a sealed, and presumably, therefore, Early deposit in the mortuary structure.

Cremated bone was found only in small quantities in the Lochhill mortuary structure. There was more bone at Slewcairn, where a deliberate deposit of a skull set on a heap of rib-bones prefigures habits of selective deposition seen in Scottish chambered cairns. At Dooey's Cairn, cremation appeared to have taken place in situ, here anticipating a consistent Irish interest in cremation. At Street House, there were quantities of burnt bone, including parts of an articulated skeleton lying on the floor. Vyner (1984) suggested that the stone platform to the rear of the structure could have been used for exposing corpses before cremation, but Scott's suggested exposure platform, above the later structure (1992, fig.8:7), would allow for better protection from carnivores.

Deposits within chambers lack secure context, and may have been inserted at different dates. There was some cremated material in Cairnholly I, and in the
north lateral chamber at Mid Gleniron I there were parts of a skull; records of long bones from a structure on this farm could refer to the same deposit (Corcoran 1969(a)). In the north chamber at Cuff Hill (I:2), men digging out fox earths in 1864 found a number of human long bones and one which was bovine or cervid, with other skeletal remains, including a well preserved jawbone, but no skull. A possible dog bone and carnivore teeth may relate to the aforementioned use of the chamber by foxes.

9:4 Monuments and ritual practice in the Developed Neolithic: c 2800 bc - c 2600 bc

9:4:1 General trends in the Developed Neolithic

After c 2800 bc the number of radiocarbon dates from northern England and southern Scotland declines (fig. 8:2), setting constraints on chronological reconstructions. There is, however, environmental evidence for intensification and spatial expansion of land use, matched by archaeological evidence for settlement spread and by an increasing scale of activity at the Langdale Pikes quarries. Thomas (1991, 113-8) discusses a shift in monument building practice in southern Britain, which involves both extension of existing sites and the introduction of newly monumental forms, such as bank barrows, together with increasing
regional variability. While this latter aspect must make transference of information from one region of Britain to another increasingly hazardous, it must seem entirely probable that the same trends apply to the south of Scotland.

9:4:2 Mortuary structures and trapezoidal cairns in the Developed Neolithic

The mortuary structure at Lochhill was burnt and sealed over early in the Neolithic, and there is no evidence for continuing use of the succeeding megalithic chamber and forecourt. At Slewcairn deposition may have continued in the forecourt, although this activity is undated, and the cairn was refurbished a considerable time after original construction (9:4:5). Street House, like Lochhill, went out of use after the Early Neolithic, and scrub vegetation was established around Wayland's Smithy I by c 2820 ± 130 bc, when the ground was again cleared for construction of the later megalithic chamber (Whittle 1991). Dendrochronology shows, however, that timbers used in the mortuary structure at Haddenham have dates of c 4000 BC to c 3500 BC, setting construction here contemporary with, or slightly later than, the megalithic phase at Wayland's Smithy (Morgan 1990). The mortuary structure at Pitnacree was built on an old ground surface with charcoal dated to 2860 ± 90 bc (Coles
and Simpson 1965), while that at Dalladies produced two overlapping dates averaging c 2650 bc, which must supersede a preliminary date of 3240 ± 105 bc from one of the same timbers (Piggott 1972). Support for the later context comes in the recovery of a finely worked plano-convex flint knife, probably of Yorkshire raw material from the floor of the mortuary structure. Similar tools were found in a hoard in York, containing a Duggleby adze for which a Middle Neolithic date would be appropriate (Clarke et al 1985, 171-2).

It seems clear, therefore, that mortuary structures continued to be built in the second quarter of the third millennium, although it can be observed that at Dalladies at least two phases of use of the three D-shaped postholes probably preceded the dated mortuary structure, as the small postholes in the fill of the big pits are unlikely to represent the first use of the pits. The mortuary structure was bonded into the revetment of the 60m long barrow, which had been piled up around the structure as it was built. The angled, lateral placement of the structure probably suggests that use was being made of an alignment designed before the long trapezoidal barrow had been conceived. The barrow at Haddenham, of much the same dimensions, may not have been constructed until after the mortuary structure had been destroyed by fire. Another extended sequence occurs at Giants' Hill 2, Skendleby, where the facade
trench and mortuary structure have late fourth millennium dates, but the ditched mound has readings of 2890 ± 70 bc and 2700 ± 80 bc (Evans and Simpson 1986). These long, trapezoidal mounds may thus be characteristic features of this Developed Neolithic phase. Close comparison in size and outline between Dalladies and Harlawmuir (III:6) on the south Pentlands may suggest comparability of date. The morphology of long cairns in the study area is considered in section 9:4:4 below.

9:4:3 Megalithic chambers of the Developed Neolithic

In discussion above (9:3:4) of the megalithic chambers of the Early Neolithic, it was mentioned that there are two longer, segmented chambers in the study area, one at Haylie, Largs (I:1), the other at Windy Edge, Dumfriesshire (V:1). The first of these consists of three segments, the second of at least as many, and both measure c 6.7m in length, in contrast to the maximum of 3m for the simple chambers at Mid Gleniron or 4m for the two-part chambers at Cairnholly and Glenvoidean. Elongated chambers are part of the repertoire of the Firth of Clyde, where a technique of overlapping side slabs, not seen at Haylie or at Windy Edge, is commonly employed. Other elongated chambers use 'jamb stones' in the Irish fashion, to wedge the dividing septal slabs.
upright (Henshall 1972, 256). Despite the different styles, all these chambers may be seen as part of a progression towards increasing space, which, at its extreme, produced the stalled cairns of Orkney, probably at an even later date (Sharples 1985).

There are problems, however, over the dating of the Clyde Cairns. At Monamore, on Arran, a 4m long, three compartment chamber with overlapping side slabs, Dr. MacKie (1964) made an early assay at radiocarbon dating from charcoal deposits within forecourt silts. From near the base of the silts came a date of 3160 ± 110 bc - Q 675, while from near the top came a return of 2240 ± 110 bc - Q 676. The grey silt reached a depth of 0.9m against the forecourt blocking, but was a homogenous unstratified deposit, and although MacKie suggested that the charcoal came from 'small twig fires lit briefly in the forecourt' (ibid p.16), the lack of in situ burning must argue for other origins. There are considerable difficulties over supposing the grey soil to be an inwash deposit which had taken 800 years to accumulate, and, although the excavator felt that special pleading would be needed to explain away the earlier date, he recognised the need for more readings, commenting (p.21) 'one radiocative swallow does not make a chronological summer'.

The only relevant dates that have since been forthcoming from the Firth of Clyde are those from
Glenvoidean, already discussed as an Early Neolithic site (9:3:4), and from Port Charlotte, Islay (Harrington and Pierpoint 1976). This four compartment chamber, 6.7m in length, with jambstones supporting the surviving septal slab, has three dates from a spread of 'domestic' material from below the cairn, ranging from 3000 ± 90 bc to 2710 ± 90 bc, and two from charcoal from below a monolith in the second compartment of 2760 ± 70 bc - HAR 2086 and 2590 ± 70 bc - HAR 2084. A construction date in the second quarter of the third millennium is, perhaps, unexpectedly late in comparison with the cluster of dates from Irish court cairns at c 3000 bc (Herity 1987), as from Anglesey (Smith and Lynch 1987), and the Brecon Beacons (Britnell and Savory 1984), but, as discussed above, long cairns were still being built in eastern Britain at this period. Sharples (1986) has argued that dates from passage graves in northern Scotland show construction to lie before c 2800 bc, but another century could be added to this on the basis of the readings from Tulach an t'Sionnach and Ord North, while still later dates come from Quanterness and Isbister in Orkney (Davidson and Henshall 1989, 856).

The mutually consistent series of dates from Port Charlotte provide the best available assessment of the construction horizon for long, segmented chambers, likely also to be of relevance to the series of chambers on Arran. Grimston ware, known to be present on
Machrie Moor by c2845 bc (Haggarty 1991), does not appear in the Arran tombs; an absence of carinations, and the presence of heavy rims were noted in relation to the pottery at Port Charlotte. The same Developed Neolithic phasing may thus be appropriate also for the chamber at Haylie, very much part of the Firth of Clyde distribution, and that at Windy Edge, in a long, narrow cairn discussed below (9:4:4). It is possible that Lang Knowe (V:2) may also have contained a segmented chamber in its long tail, since it was said to contain 'a series of graves adjoining each other, placed across' the cairn. 'Four graves' opened in 1922 at Loanfoot could perhaps also have been segments of an elongated chamber (I:3).

9:4:4 Elongated cairns and bank barrows

Table 9:1 gives measurements and length : breadth ratio of every funerary mound in the Catalogue, excluding Haylie, where the cairn has been destroyed. Excavated measurements are given for Slewcairn (VI:2) and Lochhill (VI:3). The proximal end of Burngrange (III:1) has been truncated by a sheep rees, and that of Dod Hill (I:5) may be partially eroded. The two cropmark site measurements are estimated from aerial photographs.

As the Table shows, a sharp division can be drawn between the thirteen shorter mounds 44m in length or
<table>
<thead>
<tr>
<th>Cat.</th>
<th>Length (m)</th>
<th>Max breadth (m)</th>
<th>Ratio length:breadth</th>
<th>Number chambers</th>
</tr>
</thead>
<tbody>
<tr>
<td>III:4</td>
<td>20</td>
<td>12</td>
<td>1.7</td>
<td>-</td>
</tr>
<tr>
<td>VI:3</td>
<td>21</td>
<td>14</td>
<td>1.5</td>
<td>MS</td>
</tr>
<tr>
<td>VI:2</td>
<td>22</td>
<td>13</td>
<td>1.7</td>
<td>MS</td>
</tr>
<tr>
<td>III:7</td>
<td>28</td>
<td>12.5</td>
<td>2.2</td>
<td>-</td>
</tr>
<tr>
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<td>12</td>
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<td>-</td>
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<td>-</td>
</tr>
<tr>
<td>I:5</td>
<td>32</td>
<td>17</td>
<td>1.9</td>
<td>1</td>
</tr>
<tr>
<td>VI:10*</td>
<td>32</td>
<td>10</td>
<td>3.2</td>
<td>-</td>
</tr>
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</tr>
<tr>
<td>III:1</td>
<td>36+</td>
<td>12</td>
<td>3.0</td>
<td>3</td>
</tr>
<tr>
<td>VI:9</td>
<td>38</td>
<td>22</td>
<td>1.7</td>
<td>-</td>
</tr>
<tr>
<td>I:2</td>
<td>42</td>
<td>19</td>
<td>2.2</td>
<td>4+</td>
</tr>
<tr>
<td>VI:7</td>
<td>44</td>
<td>25</td>
<td>1.8</td>
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</tr>
<tr>
<td>III:6</td>
<td>61</td>
<td>15.5</td>
<td>3.9</td>
<td>-</td>
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<tr>
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<td>76</td>
<td>11.5</td>
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<td>-</td>
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<td>12.8</td>
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</tr>
<tr>
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<td>150+</td>
<td>20</td>
<td>7.5</td>
<td>-</td>
</tr>
</tbody>
</table>

* Cropmark ditches  MS Mortuary structure
less, with breadth : length ratios varying from 1:1.5 to 1:2.4 (excluding the Barndennoch cropmark (VI:10) and the truncated cairn at Burngrange(III:1)), and nine longer cairns, with one possible bank barrow, the breadth : length ratios here ranging from 1:3.9 to 1:9.7; the highest ratio at High Hendryton (I:4), comes from a site that has almost certainly been reduced in width. These ten long, narrow sites are very various, and can be suggested to encompass a number of versions of cairn extension, likely to have occurred in the Developed Neolithic phase.

The only one of the longer cairns to present a regular, trapezoidal outline is Harlawmuir (III:6), already suggested to resemble a stone version of Dalladies, and thus likely to share in that site's Developed Neolithic origins (9:4:2), although there could also be comparisons with mounds over Early Neolithic long mortuary enclosures, such as Kilham (9:3:5), and, there was, perhaps, a continuous tradition of construction of such 'classic' mounds throughout the first four hundred years of the third millennium. The massive, 105m long cairn at Loanfoot (I:3) may have possessed this regular outline before truncation along a fence line, although a slight kink in the tail on the other side of the cairn, to accommodate the lie of the ground, and the sheer size of the cairn, suggest complexity of construction history. The
nature of the lateral chamber or chambers here, simple or segmented, is unknown.

Four of the longer cairns have a clearly bi-partite appearance, suggestive of phased construction. Easton (III:3) and Lang Knowe (V:2) have oval heads and long, narrow tails, while Greens Moor (III:2) and the Mutiny Stones (IV:1) have trapezoidal heads and near parallel-sided tails. The last two sites could well have stood as trapezoidal cairns, c 25m and c 35m in length respectively, before addition of their tails. At the rather different site of Tulach an t-Sionnach in Caithness, a long cairn was added to envelope a heel-shaped passage grave after use of the chamber dated to c2735 ± 60 bc (Corcoran 1966; Sharples 1986), setting elongation probably within the Developed Neolithic phase. The two part structure of the 101m long cairn at Trainford Brow, observed and planned by Masters (1984, 63-4), appears to represent a 46m long trapezoidal cairn to which a bulky sub-rectangular fore-part has been added. In such conjectural reconstructions, however, alternative sequences must also be considered, with the long, narrow 'tails' representing primary mounds, possibly sealing Early Neolithic mortuary enclosures. The oval 'head' at Easton might, in fact, be a beaker addition, contemporary with the beaker burial and mound extension on Biggar Common (III:4).

One very long, narrow cairn with minimal
suggestion of terminal thickening is that at Windy Edge (V:1), probably originally a single cairn, split in two by construction of a sheepfold in the centre. Records suggest that a 104m long, narrow cairn at Caverton Hillhead (IV:3) was broad at both ends. Bellshiel Law, Northumberland, 109m long and only 10.7m to 12.2m broad along most of that distance, has a broader, originally trapezoidal head (Masters 1984, 55-7; Newbiggin 1936). The segmented chamber at Windy Edge has been suggested to be a characteristically Developed Neolithic form (9:4:3). Whatever the sequence at the bi-partite cairns, there does seem to have been an interest in elongation in the Developed Neolithic, perhaps also responsible for the construction of cursus enclosures (9:4:6).

One noteworthy point, perhaps, again, raising the cursus relationship, is the present appearance of some of these elongated cairns in the form of pairs of parallel banks. This effect is most obvious at Easton, but is also seen at Greens Moor and at Auchenlaich, Perthshire (NN 649 072), where a tail c 300m in length seems to have been added to a trapezoidal head (DES 1991, 9, fig.2). It may be that robbing, clearly the cause of the missing central stone, has avoided the edges, stabilised under invasive vegetation. At Bellshiel Law, however, excavation showed the cairn to consist of loose boulders filling a central space between parallel banks (Newbiggin 1936 Pl.xxiv).
The final site listed in Table 9:1 is Redbank (VI:4) consisting of the cropmarks of parallel ditches, running upslope with a gentle curve which distinguishes the site from the cursus enclosures on level ground in the Dumfries area, 18km to the north. The site has been suggested to be part of a possible bank barrow. Two upstanding ditched linear mounds at least 600m in length, and again running up slope have recently been reported from Eskdalemuir (Monuments on Record: RCAHMS Annual Review 1992-3, 11). A Developed Neolithic context for such mounds is suggested by dates from the Maiden Castle mound, 550m long, where animal bone from primary ditch silts was dated to 2700 ± 80 bc - OxA 1146 (Sharples 1991), and from North Stoke, probably a revetted barrow 250m long, dated to 2722 ± 49 bc - BM 1405 (Case 1986). A link with cursus enclosures, suggested by contiguity of types on the Dorset Ridgeway, appears to put the cursus in the primary position (Bradley 1983).

9:4:5 High cairns and cairn enlargement

As an alternative to elongation, it is possible that the Developed Neolithic was also concerned to increase the bulk and visual impressiveness of cairns. The only direct evidence for cairn enlargement, at Slewcairn, is undated, but could be symptomatic of this process. A slab revetment was added here, concealing the boulder
kerb at a time when a layer of black soil had accumulated around the cairn. Similar addition of upright revetment slabs against the east wall of the cairn at Glenvoidean, also post-dated build up of soil, which, in this case, seems likely to have occurred quite early in the history of the cairn, built along a hillside. Hill wash completely engulfed the Glenvoidean cairn while it was still in use, so that the line of the kerb wall had to be re-marked by slabs set along its upper edge. Revetment slabs against the south side of Cairnholy I were also found to have no stone holes, and could be an addition, perhaps concurrent with an extension of this 43m long cairn (Piggott and Powell 1949).

The Slewcairn revetment was concealed under 'extra-revetment' of small boulders and slabs, perhaps slippage from a high cairn, which can only have been created at the time of, or after, the addition of the slabs. At Lochhill, where there was no such addition, there was little cairn slippage, and the cairn must have been its present 1.8m maximum height when late beaker sherds were added along its spine. Piggott and Powell noted loose cairn material beyond the Cairnholy slabs to certainly be slippage, not deliberate addition. At Burngrange (III:1), another cairn revetted by upright slabs, this slippage extends for 1.5m beyond these kerb stones, suggesting that the original height of the cairn, still 1.2m at the tail end, must have been considerable.
Addition to the height and size of Slewcairn could have been in emulation of the group of inland Dumfriesshire and Stewartry cairns built with impressively high proximal ends, usually positioned at a brink of slope for maximum effect. Fleuchlarg (VI:7) and Capenoch (VI:6), both surviving to 3m in height, have retained their profiles with the help of layered internal revetment walls, possibly present also at Laggan Park (VI:a) and Stiddrigs (VI:8). Two skins of walling at Port Charlotte, Islay, were suggested to have given this cairn a stepped face, similar to that suggested for some Orkney cairns of Maes Howe type (Harrington and Pierpoint 1976; Sharples 1984).

Stiddrigs, the smallest of these possibly revetted cairns, has a low platform around its proximal end, which could be a prehistoric feature, perhaps similar to that added in the Late Neolithic to the revetted cairn at Pierowall, Orkney, serving to seal and to monumentalise the cairn (Sharples 1984). There is a similar platform around the high proximal end of the Mutiny Stones (IV:1). It is also possible, however, that slippage from these two high cairns has been formed into platforms by later use of the sites for sheep shelters, which, in both cases has involved considerable rebuilding of the cairns themselves, rather than simple robbing.
Cursus enclosures

The ultimate in neolithic forms of elongation is the cursus, its relative slightness of construction compensated for by its monumental length. As with the ditched barrow, the ditched cursus is rare in Scotland. Within the study area there is a group of perhaps four sites around Dumfries, and one triple ditched, 900m long example at Inveresk (II:a). North of the Forth the 1820m long Cleaven Dyke is a ditched bank barrow, with wide berm, closely similar to the cursus in form (Maxwell 1989; Barclay and Maxwell 1993). There is, however, in Angus, a series of parallel pit alignments, generally c 25m apart, visible for 180m to 500m of length, never with more than one terminal presently observed (RCAHMS 1978(b), 22, no.158 Balneaves Cottage; 1983(b), 32, nos.256 Inchbare 1, 257 Inchbare 2, 258 Kinalty). The longest alignment, at Balneaves, lies only c 1.5km from the Early Neolithic pitted enclosure at Douglasmuir, 65m in length (Kendrick 1980). Excavation of the terminals of two adjacent pitted enclosures at Bannockburn, Stirling, 25m and 35m in breadth, and visible for lengths of 100m and 30m respectively, produced plain bowl carinated pottery of early type (Tavener 1987). An Early or, more probably, Developed origin for the pitted enclosures seems likely.

Excavation at Bannockburn also revealed complexities, as the narrower enclosure consisted of
close set post pits, while the broader, was made up of more widely spaced pits, 1.0m to 1.3m in average diameter, with no evidence for posts. These pits had lain open before being partially cleaned out, having stone linings inserted, and burning occurring. Pottery was associated with an upper fill of topsoil in these pits, while a similar pit, also with pottery, was cut by two post pipes of the narrower setting.

One of the ditched enclosures at Dumfries, Holywood II (VI:c), is lined with pits along c 130m of its north end. The pits cross one of the lateral entrances through the ditched enclosure, suggesting them to have formed a distinct, earlier construction, similar to the sites in eastern Scotland. 3km west of Holywood, at Fourmerkland (VI:e) the U-shaped terminal of another pitted enclosure, c25m broad, is visible for c 60m of length, while a kilometre to the east, at Holm, recent photographs reveal a complex series of pit alignments, some double.

Succession at Holywood II must suggest the ditched enclosure to be not much later than the pitted. Ditched cursus enclosures in the south vary in date, from Drayton, Oxfordshire, with a combined date from primary ditch silts and from below the bank of c 2780 bc (Hedges et al 1990), to small sites at Barford A and Llandysilio, dated to shortly before c 2400 bc (Gibson and Loveday 1989, 45). The early associations for pitted enclosures
in Scotland suggest that earlier contexts should also be appropriate for ditched monuments. The triple ditched cursus on the south side of the Forth at Monktonhall is in the same geographical ambit as Bannockburn, making early origins again possible, although the triple ditch must suggest some phases of recutting here. The terminal of this cursus, consisting of a very broad, curving ditch, has been suggested possibly to have created a long barrow across the end of the cursus, again suggesting a date in the Developed Neolithic (II:a).

A small, ditched cropmark long barrow at Barndennoch (VI:10), 10km north west of Holywood, may be regarded as a peripheral member of the Dumfries complex. Morphological comparisons for the distinctive form of the Barndennoch ditches are discussed in section 9:5:2 as suggesting a possible Middle Neolithic attribution. Recent excavation of a small ditched barrow of similar form on Easton Down, Wiltshire opens the possibility of a Developed Neolithic context, perhaps as probable, given the relationship to the Dumfries sites (Whittle et al 1993).

9:4:7 Enclosure in the Developed Neolithic

Two riverside interrupted ditch enclosures, West Lindsaylands (III:a) and Sprouston (IV:a), have been discussed in terms of domestic settlement in section 8:6, where they are suggested to be likely products
of the Developed Neolithic. The degree of formality implicit in the act of enclosure gives such sites symbolic importance, whether or not they are to be classed as 'monuments'. The artefact associations which were quoted as suggesting certain hilltops to have performed similar functions, implicate the highly visible and dramatic summits of Traprain Law and Ruberslaw, again arguing for a central perhaps ceremonial, role.

Ian Smith (1991, 266) has drawn attention to an 'unfinished' ditch and rampart around parts of the palisaded enclosure on the 386m summit of Hamildean Hill, Peebleshire as a possible neolithic interrupted ditch. The site has not been visited in the course of present fieldwork, but it is noted that the avenue of Meldon Bridge enclosure (III:b) aligns onto the hill. On the Meldon Bridge promontory itself, a 'substantial palisade', with Late Neolithic pottery in the upper fill of the trench, was encountered in excavation (DES 1977, 27). It is possible that the Late Neolithic enclosure was a successor either to an earlier enclosure on the same promontory, or to the hilltop site. Possibly similar sequences may be noted elsewhere. A cropmark multi-ditched enclosure at Leadketty, near Dunning, 4km west of the palisade enclosure at Forteviot, has been suggested as a possible interrupted ditch enclosure (Driscoll 1991, 106), while at the mouth of the River
lucet, 5km east of the Dunragit enclosure, cropmarks reveal another possible interrupted ditch promontory enclosure (M. Brown, pers comm). The West Lindsaylands interrupted ditch enclosure, lying between the henges of Westside (III:g) and Balwaistie (III:h), is c 7km from the Blackhouse Burn enclosures.

A rather different enclosure, represented by a subrectangular cropmark palisade, c 40m by 30m in diameter, appears to be linked to the cursus of Holywood II by a palisade line. A similar enclosure, c 40m by 40m, occurs at Bowhouse, Caerlaverock, on the east side of the Nith Estuary, crossed by a pit alignment, of which a short, double section resembles an entrance avenue. Another possible subrectangular enclosure, 450m north of the interrupted ditch enclosure at Sprouston, is pit-defined. Interpretation and dating of these structures remains, at present, purely speculative.

9:4:8 Funerary practice in the Developed Neolithic

Accounts of eighteenth century investigation of the segmented chamber at Haylie (I:1) suggest there to have been a special deposit of skulls here, accompanied by a disordered mass of disintegrating bones. Five skulls, their teeth still inset, are mentioned from this occasion, and a further two crushed skulls were found in excavation in 1954 beside the septal slab of the
central compartment. Recovery of human remains from Clyde chambers is generally rare, owing, principally, to conditions of preservation. A mass of small fragments of bone in the rear compartments of the segmented chamber at Port Charlotte, Islay, suggested that the main deposit had been cleared out (Harrington and Pierpoint 1976). In the four-compartment chamber at Torlin, Arran (ARN 15), skulls and long bones are said to have been found, and there is a similar account from Clachaig (ARN 16), again, probably originally a multi-segmented chamber (Henshall 1972). An emphasis on skulls appears to have been characteristic of deposition in the later Orkney tombs.

At North Mains, Strathallan, a pit cut by one of two small ring ditches was dated to 2690 ± 55 bc (Barclay 1983); an adjacent pit was avoided by the ditch, which probably represented a small barrow, heaped over an inhumation laid on the ground surface. If unaccompanied inhumations of this nature were a regular site type in the Developed Neolithic, they will be hard to identify. Ploughed down ring ditches beside the Monktonhall cursus (II:a) produced no evidence for date or function on excavation. There are axial ring ditches in the Holywood cursus enclosures, and a double ring ditch within the site at Curriestanes (VI:b,c,d). Small cairns, barrows, ring ditches and ring banks are, however, common site types in southern Scotland, and the
potential here is discussed in relation to the Biggar Gap Region in the Gazetteer (III:viii), with special reference to ditched and unditched barrows on Broughton Knowe, near the long cairn (III:7).

9:4:9 Ritual deposition in the Developed Neolithic

Dates of c 2750 bc from two pit deposits at Meldon Bridge (III:b) have been argued to give a poor context for the impressed ware in the pits (8:3), but may nonetheless refer to re-incorporated deposition material. At Wellbrae, plain bowl, impressed ware and grooved ware occurred in adjacent, rather than mixed pit deposits, but the sequences involved may have been similar (Table III:1:5). Pits at Whitemoss, Bishopton also contained pottery in Developed Neolithic styles (Table I:1:1). Similar practices within a small enclosure ditch at Goodland, Co. Antrim, where one of the earliest pits was dated to c 2625 ± 135 bc - GU 3208, are discussed by Case (1973).

Developed Neolithic pottery is also found at chambered tombs. The blocking at Cairnholy I, sealing impressed ware deposits, incorporated sherds from a Lyles Hill vessel, perhaps, therefore, disturbed from an earlier context (Piggott and Powell 1949). A similar ledge-carinated vessel with more strongly everted rim seems to have been one of the latest deposits in a
clay floor at Hilton cairn, Bute (Scott in Marshall 1976). The Rothesay style bowls which, with a simple, heavy bowl, form a secondary deposit in the chambers at Glenvoidean, Bute, may also belong to this phase (Marshall and Taylor 1977).

Deposition of axes cannot be dated, but attention may be drawn to the numbers of large Group VI axes from boggy or wet locations in the vicinity of the Dumfries cursus complex (VI:vii).

9:5 Middle Neolithic monuments and ritual practice:

9:5:1 General trends in the Middle Neolithic

There is no evidence for the continued construction of long cairns and barrows in the south of Scotland after c2600 bc, although it remains possible that some monuments were being built or extended. In particular, bank barrows (9:4:4) and the small group of cursus related monuments (9:4:6) may well belong to this phase. Carinated Grimston pottery goes out of use, although more varied forms, still within the western neolithic tradition, were being produced. Grooved and impressed wares do not appear until nearly 2400 bc, or later, and henges not until c 2200 bc, although stone and timber circles may have been erected earlier. A break in practices of deposition at chambered tombs has been
noted in many areas, occurring, for example, in the north of Scotland from c 2700 bc to c 2200 bc (Sharples 1986). As discussed in section 8:6, however, settlement spread and clearance continue, and it seems that absence of evidence for ritual activity should not be confused with economic recession.

9:5:2 Funerary monuments in the Middle Neolithic

The extreme shortage of chronological information on the larger funerary monuments of the Neolithic (9:4:4) may be concealing continued construction activity into this phase. The cursus monuments in particular, could share Middle Neolithic dates seen at some sites in the south. If the Dumfries group is, indeed, of this date, the same may apply to the small, ditched cropmark barrow at Barndennoch (VI:10). As noted by Kinnes (1992(b)) there is a group of English barrows with a discontinuity in the north ditch, and this feature recurs at Barndennoch. The barrow at Beckhampton Road, furnished dates on antler from below its 'empty' mound of 2517 ± 90 bc and 2307 ± 90 bc (Ashbee et al 1979), setting it in the same range as small, oval barrows of Sussex. There are, however, slightly earlier dates from another barrow with discontinuous north ditch on Easton Down (Whittle et al 1993), and the value of such distant analogies must, in any case, always be doubtful.
Another ditched site which could be assigned to this period is the recently recognised 'mortuary enclosure' at Brownsbank, near Biggar (III:5). Aerial photographs of this banked, sub-rectangular enclosure with external ditch have not been published, but the site appears to resemble that at Normanton Down, another distant prototype, but one which carries a date on antler of 2560 ± 100 bc - BM 505 (Vatcher 1961). Decline of older traditions of monument building may have been opening the way to greater diversity of practice.

Within this diversity it is possible that an interest in formal cremation deposits may have developed. A ring of pits with cremations outside the entrance to henge A at Llandegai was dated to 2530 ± 145 bc - NPL 224 (Houlder 1968), and a comparison could be drawn between this feature and the arc of pits with cremations at Cairnpapple (II:b). These cremations are discussed in section 9:6:2 as being more probably a Late Neolithic setting.

9:5:3 Individual burial in the Middle Neolithic

A pit in the long mound on Biggar Common contained a Seamer flint axe, a flint knife, and, presumably, an inhumation (III:4), echoing practice in Yorkshire, where at Whitegrounds a pit dug into an Early Neolithic mound held an inhumation with similar axe and jet belt slider dated to 2570 ± 90 bc - HAR 5587 (Brewster
1984). As discussed in section 8:5 there are records of other axe burials from the Biggar Gap Region, the implements now lost (and see III:vii), while flint axes and adzes of similar type are known from around Biggar, from Castlesteads near the Monktonhall cursus (II:a), and from the Firth of Clyde Region (I:vi). A Duggleby adze was also found in a boulder-built cist at the ritual and cemetery site of Knappers, on the north bank of the Clyde (Ritchie and Adamson 1981). It is significant that these Yorkshire axes carried with them their role as grave-goods, showing that they did not merely arrive in Scotland as exotic items of exchange.

Another boulder-lined cist at Knappers, or perhaps, rather, a pit with boulder revetted sides, contained a broken, but effectively complete Rothesay style bowl containing 'carbonaceous earth' with traces of calcined bone and a flint knife (Mackay 1948, 234). As discussed above (8:3), the Rothesay style, with its exaggerated, decorated rims, appears to represent a Firth of Clyde development from western neolithic pottery, quite likely to have been established in use by this period.

9:5:4 Enclosure in the Middle Neolithic

As observed above (9:4:3), it is difficult enough to recognise enclosures as neolithic, let alone to assign such sites to specific phases. There are,
however, dates from charcoal-rich, primary silts, associated with grooved ware in a ditch segment excavated at Balfarg Riding School which fall within the latter end of the Middle Neolithic phase (Barclay forthcoming). The dates, at 2475 ± 50 bc – GU 1670 and 2435 ± 55 bc – GU 1904, considerably predate those from the nearby Balfarg henge, but are closer to a date of 2365 ± 65 bc – SRR 350 from ditch silts at Stenness henge, in Orkney, also with grooved ware (Ritchie 1976). The Riding School enclosure, probably c38m to 43m in diameter, encircled the northernmost of the two Early Neolithic timber structures, c 20m in original length, but, by this time, decayed and probably mounded over. There is no evidence for the position of either a bank or an entrance to the enclosure, and with much of its interior occupied by the mounded structure, it may be inappropriate to consider it as a henge. Rather, like the Maes Howe ditch (Renfrew 1979), the Riding School feature may be seen to have a role in demarcation of space around a ritual mound.

On this basis this Middle Neolithic enclosure is presently unparallelled in the study area, and there are no enclosures which can be suggested to belong to the same phase unless, perhaps, those defined by timber or stone uprights.
9:5:5 Timber and stone circles of the Middle Neolithic

Timber ring 1 on Machrie Moor gave two dates, one at 2520 ± 50 bc - GU 2316, the other at 2030 ± 180 bc - GU 2325 (Haggarty 1991). The former date was on mixed charcoal, inherently less likely to be reliable than the smaller sample of pure oak charcoal that gave the later date, with a very wide standard deviation. A central horseshoe of five posts with associated grooved ware suggests comparisons with Arminghall, Norfolk, where a horseshoe of eight massive posts gave a date of 2490 ± 150 bc - BM 129 on a post which may have been c 120 years old (Wainwright 1969). On balance, the Machrie Moor circle seems likely to be a Late Neolithic construction, as are also the timber rings at Balfarg and North Mains (9:6:4). Nonetheless, a half pit circle in the terminal of the Springfield cursus suggests earlier dates for timber circles to be possible (Hedges and Buckley 1981). There is also the possibility that the dated timber ring A at North Mains succeeded an earlier elliptical ring B, which opened onto the henge ditch, as though pre-dating it (Barclay 1983). This sequence would still not necessarily render Ring B as early as the Middle Neolithic.

Stone circles have generally been found to post date timber versions, as on Machrie Moor, Croft Moraig, Perthshire (Piggott and Simpson 1971) and Temple
Wood, Argyll (Scott 1989(b)). Nonetheless there is a date from charcoal below the packing of the Clochmabenstane, reported to be the survivor of a large stone circle, of 2525 ± 85 bc - GU 1591 (Table V:1:7). The Temple Wood stone circle produced the doubtful date of 3075 ± 190 bc - GU 1296. At Callanish the stone ring and tall central monolith have been shown to predate the small cairn around the central passage grave (DES 1981, 49), and it may be that, in the Highland zone stone circles were at least as early as timber ones.

Burl has proposed that the large, open circles of north west England and adjacent parts of Scotland should stand early in the sequence of circle construction (1976, 24). The recorded circle at the Clochmabenstane may have been a member of just such a group, and a series of circles around and among the cursus grouping of Lower Nithsdale could fall into the same category (VI:h; Table VI:2:3, 8, 14).

9:5:6 Passage grave art

The cover slab of a beaker cist at Wester Yardhouses, on the south Pentlands carried a series of designs, including triple pecked triangles, directly reminiscent of kerb stones at New Grange (MacLaren 1970). A cist slab at Ferniegair on the lower Clyde also carried passage grave motifs (Welfare 1975), while another at Coilsfield, Ayrshire, and a slab re-used
in the building of Hollows Tower, Dumfriesshire, were decorated with wavy lines and spirals in the same tradition (Morris 1981). So immediate are the similarities that these stones must be supposed to be contemporary with the Irish carvings, and certainly they have been broken for re-use at later periods. Welfare (1975, 12-13) suggests that the Ferniegair stone could have stood upright in the ground. Carved outcrop in southern Scotland, primarily concerned with cup-and-ring motifs, does not carry similar designs, other than occasional tight spirals. These rocks may be regarded as a separate phenomenon, of uncertain chronology, and are considered below in relation to the Late Neolithic (9:6:9).

9:6 Monuments and ritual practice in the Late Neolithic: c 2400 bc - c 2000 bc

9:6:1 General trends in the Late Neolithic

In discussion of the phasing of the Neolithic (8:7) distinction was drawn between Late, Latest and Final phases, throughout which the continued use of impressed and grooved ware made distinctions impracticable. The Latest phase, from c 2200 bc to c 2000 bc, appears to have been the central period for construction of the enclosures of the overall Late Neolithic, which, for
present purposes is treated as lasting from c 2400 bc to c 2000 bc.

9:6:2 Funerary practice in the Late Neolithic

Although there is no evidence for the continued construction of long or chambered cairns within the study area after c 2600 bc, chambered cairns were still being built in this period in the Northern Isles (Renfrew 1979; Müller 1988, 8) and in Ireland (Sheridan 1986(b)), and localised groups, such as Clava cairns (Barclay 1992) and perhaps Bargrennan cairns (Murray 1992) may not have emerged until late in the third millennium.

Funerary deposition at chambered cairns appears to resume late in the third millennium in many areas, for example, in northern Scotland (Sharples 1986), and impressed ware found in the chambers of Cairnholly I (Piggott and Powell 1949) and Mid Gleniron II (Corcoran 1969(a)) may have accompanied burial. Bones in the lateral chamber at Loanfoot (I:3), apparently from a single inhumation, may have been a late Neolithic insertion. At Bellshiel Law, Northumberland, a rock-cut pit, 1.8m by 1.1m by 0.6m in depth, probably for an inhumation, was adjacent to a disturbed section of kerb at the cairn head, and could, again, be intrusive (Newbiggin 1936). A comparable instance occurs in the Quanterness chamber, where a burial in Pit C was dated to

300
c 1938 bc (Renfrew 1979, 60). The burial pit with bell-beaker and stone axe dug into the Biggar Common mound was probably of similar date (III:4).

This last deposit is echoed at Wellbrae, where a beaker burial was accompanied by a stone wedge (Table III:4:11), and the axes recorded as having been found in cists in the same district could provide further examples of Late, rather than Middle Neolithic axe burial (cf. 9:5:3). Amber beads from a 'tumulus' probably in the same area have been suggested by Beck and Shennan (1991, 69) to resemble Danish Single Grave deposits of the later third millennium bc.

Other instances of Late Neolithic burial may be recognised through the presence of impressed ware, as in a boulder-built cist, with beaker, at Drumelzier cairn (Craw 1931), or another possible example at Old Kilpatrick, on the north side of the Clyde (Callander 1929, 31, 61-2). At nearby Knappers, impressed ware sherds were found among stones, perhaps the upper fill of an eroded pit, above a cist (Ritchie and Adamson 1981).

Impressed ware sherds were also found with AOC beaker among the cobbles in the interior of a ring cairn at Muirkirk (Table 1:1:3), although this instance need not have involved funerary deposition. Other ring enclosures and ring ditches could relate to the same phase. On Broughton Knowe (see III:7), a neolithic
An axe was found below the bank of a ring enclosure; nearby an excavated barrow with disturbed pottery of possibly neolithic affinities, was surrounded by a deliberately refilled ditch and stakeholes, for which parallels might be sought in a grooved ware ring ditch at Whitton Hill, Northumberland (Miket 1985), or the small henge at Moncrieffe, Perthshire (Stewart 1985). Again, these are not necessarily funerary sites. Impressed ware was associated with two ring ditch/ring cairn sites at Balfarg Riding School, one of which overlay the end of a timber structure of the Early Neolithic. The same spatial association with an Early Neolithic long house, is seen in cropmark form at Sprouston (IV:a). All these instances may have some affinities with the 'mini-henge', discussed in section 9:6:5(c).

Piggott compared the arc of 'cremation pits' at Cairnpapple to pit circles with cremations at Dorchester on Thames and to the Aubrey Holes at Stonehenge. Another such ring at Llandegai henge A is dated to 2530 ± 145 bc (Houlder 1968), and cremation cemeteries in the Isle of Man have dates of c 2400 bc to c2300 bc (Moffat 1978). A cremated burial lay below the bank of North Mains, a very similar henge to Cairnpapple (Barclay 1983). The shallow, stone filled pits at Cairnpapple, however, held no more than 'a mere handful of cremated bones', at the pit sides, or in adjacent scoops, and the setting might seem to be not so much
a 'cremation cemetery' as a feature with dedicatory offerings; similarly, cremated bone was in the stoneholes of the stone setting at Balbirnie (Ritchie 1974).

9:6:3 Deposition practice in the Late Neolithic
Impressed wares referred to in the last section as being found in chambered tombs and in ring enclosures, may have had no relation to funerary deposits, but could be part of widespread habits of pottery deposition in the Late Neolithic, frequently in association with enclosures or with earlier funerary monuments. At Slewcairn (VI:2) 'cord-ornamented' sherds, not illustrated, but presumably impressed ware, were inserted into a hollow below the kerb, and three such sherds were found with plain bowl material in the forecourt. The shattered state of both types of pottery may suggest that breakage occurred as a result of activity in the later period. Among the blocking stones, leaf arrowheads, serrated knives and scrapers were found, an echo of deposition of flint artefacts in the mortuary structure, perhaps, therefore early material, re-incorporated. The only finds in the blocking at Lochhill (VI:3) were pieces of bark.

Similar activity in relation to an earlier monument is suggested by the 'Late Neolithic or Early Bronze Age pottery' found in pits beside the Monktonhall cursus (II:a).
There are other instances of continuity or of resumption of Early Neolithic deposition practice in the Late Neolithic. At Wellbrae (Table III:1:5), impressed ware and grooved ware pits occurred in an area with pits containing western neolithic pottery. The excavator suggests that the shallow, rectangular enclosure trench around these deposits was constructed by grooved ware users.

The two sets of dates from the pits with impressed ware at Meldon Bridge (III:b), discussed in section 8:3, may again point to long term deposition practice here, however uncertain the association of the earlier dates with the pottery. Deposition certainly seems to have preceded construction of the palisade. In contrast to Wellbrae, little lithic material occurred in these pits, but one stone axe is reported.

Pits below the bank at North Mains (Barclay 1983, 126), and one recently reported by P.R. Ritchie from below the Cairnpapple bank (Barclay, forthcoming), contained only soil and stones, and cannot be dated other than by reference to the relationship with the banks. Pits outside each entrance to Yeavering henge proved to be Early Neolithic (Harding 1981). Pits appear on aerial photographs outside Balwaistie henge, at the north entrance, and on the west side, and two pits outside a circular ditched enclosure at Hillend (Table III:4:10) contained grooved ware. Associations between
grooved ware and henges are not, however, strong locally. One possible lugged sherd comes from Cairnpapple (II:b), none from North Mains, and only coarse wares with little decoration from the upper ditch fills at Yeavering. While grooved ware comes from lower levels of the ditch of an enclosure at Balfarg Riding School (Barclay, forthcoming), there was none in the ditch of Balfarg henge, where the grooved ware assemblage may relate to an earlier phase of use, being accidentally incorporated in postholes erected on the same site (Mercer 1981(a)). On the other hand, a large grooved ware pot was found against the inner side of a palisade at Beckton, Lockerbie (Cormack 1963(b)).

More general spatial relationships between enclosures and artefacts are discussed in sections 10:10:2 and 10:10:3.

9:6:4 Timber circles in the Late Neolithic

Within a 40km stretch of Strathearn, to the north of the Forth, three very different sites exemplify three classic types of Late Neolithic enclosure. A 9.5m diameter penannular ring ditch at Moncrieffe, enclosing a pit circle, was the site of two later successive stone circles (Stewart 1985); a Class II henge at North Mains, Strathallan, 35m by 32m in internal diameter, enclosed two separate pit-rings, one of which, at least, held upright timbers (Barclay 1983); between the two, at
Forteviot, the cropmark of a roughly circular, pitted enclosure, probably a stockaded site, measures c 265m by 220m, and has a cluster of small henges and ring ditches around its entrance avenue of large pits (St. Joseph 1978). Despite the extreme differences of scale, these sites are incorporating elements of circularity, and often, of concentricity, which recur throughout the Late Neolithic. The regular use of timber upright for definition of enclosures, or as internal or additional elements, has resulted in several dates being available from very different timber rings in southern Scotland. Table 9:2 shows the sites concerned.

Table 9:2 'Latest' dates from timber circles and enclosures in southern Scotland

<table>
<thead>
<tr>
<th>Site Description</th>
<th>Date (BC) ± 100</th>
<th>Site Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machrie Moor, inner timber circle</td>
<td>2030 ± 180</td>
<td>GU 2316</td>
</tr>
<tr>
<td>14.5m diameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machrie Moor, outer timber circle</td>
<td>2130 ± 90</td>
<td>GU 2324</td>
</tr>
<tr>
<td>19.5m diameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Balfarg, timber circle A</td>
<td>2085 ± 90</td>
<td>GU 1161</td>
</tr>
<tr>
<td>25m diameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>North Mains, timber circle A</td>
<td>2090 ± 70</td>
<td>GU 1354</td>
</tr>
<tr>
<td>27m x 25m diameter</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blackhouse Burn, timber revetment</td>
<td>2085 ± 55</td>
<td>GU 1983</td>
</tr>
<tr>
<td>300m x 280m</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meldon Bridge, stockade timbers</td>
<td>2150 ± 130</td>
<td>HAR 797</td>
</tr>
<tr>
<td>500m x 240m</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The dates quoted are taken from post packing, or, in the case of Blackhouse Burn, from a surviving, waterlogged timber. In each case the deliberately simplistic procedure has been followed of selecting the latest reading from the site, except at Meldon Bridge, where a date on infill charcoal has been rejected as representing extraneous, post-decay material. These 'latest' dates should thus be the figures closest to actual construction. They fall at an unfortunate point in the calibration curve, and may cover a wider spread than appears. Nonetheless, the clustering of determinations from a very different set of sites is so tight as to be of intrinsic interest.

The Machrie Moor timbers, 0.15m to 0.35m thick, were spaced c 1.0m apart in the outer ring of thirty four posts around a close set inner ring of about fifty three posts enclosing a central horseshoe of five timbers, 0.5m thick. Sherds from a single grooved ware vessel came both from the horseshoe pits and from those of the inner ring (Haggarty 1991).

At Balfarg probably sixteen timbers, 0.45m to 0.60m thick and spaced c 6m apart, were estimated to have been 2.1m to 4.72m in length, graded to the south west, where above ground height could have been more than 3m. A 'porch' of two 1m thick posts, just south of west, could have stood to 4m in height. The circle was concentric to a 65m diameter henge ditch, with the main entrance to the
west, and second break in the ditch to the south (Mercer 1981(a); Mercer et al 1988).

At North Mains, twenty four timbers up to 0.6m in thickness, were spaced from 2.6m to 4.2m apart, concentric to the ditch of a Class II henge, 35m x 32m in internal diameter. Postholes were up to 2.0m in depth, as opposed to the 1.35m maximum estimated as the original depth at Balfarg. Irregularity of posthole depths could suggest that the aim was to achieve a constant height with timbers of differing lengths (Barclay 1983).

At Blackshouse Burn (III:c) timbers 0.50m thick and with an estimated height of 1.5m had been inserted in a secondary phase as inner and outer revetment to a broad stony bank. The presence of timbers was confirmed at two separate points investigated.

Posts at Meldon Bridge (III:b), varying from 0.25m to 0.60m in thickness, with the largest around the north corner, were spaced from 3m to 4m apart, needing 135 posts to complete the enclosure circuit. Between the main members, two smaller posts were set slightly in advance, suggesting a linked stockade. On Mercer's calculations (1981(a)), the largest posts could have been up to 3.6m in overall length, or 2.5m in visible height.

The dates from these very various enclosures suggest there to have been a burst of activity in construction of timber rings between, perhaps, c 2200 bc and c 2000 bc. Yet in every case, the event represents a single phase of
activity on a complex and long lived site. Even the simplest and smallest concentric rings, on Machrie Moor, saw post replacement. A second date from the inner ring of 2520 ± 50 bc - GU 2316, on mixed charcoal, must argue for caution over acceptance of the later reading although grooved ware associations probably offer support. A circle immediately to the north remains undated. Long after the timbers had gone and the site had been ploughed over, stone circles were erected on the identical layout.

Henges, enclosures and stone circles are considered in turn in the following sections (9:6:5; 9:6:6; 9:6:7). Complexity of history, however, means that at several sites timber circles may have stood, as at Machrie Moor, as independent elements. There was a small pit circle, of unknown date, within the Meldon Bridge enclosure. The dated timbers of Ring A at North Mains had been erected before the henge ditch was dug, and although the excavator considered that close congruence between the layout of these features argued for synchronicity, the lapse of time between timber and stone rings on Machrie Moor shows that such reasoning is not conclusive. A smaller elliptical Ring B at North Mains opens onto the ditch, which it would therefore seem likely to pre-date. Similarly, at Cairnpapple (II:b), an egg-shaped ring of holes, either for standing stones, or, as Mercer (1981(a)) argues, for timbers, is assymetric to the henge ditch, its south
entrance slightly askew of the gap at the apex of the egg. A similar mismatch between entrances occurs at Balfarg henge, despite the concentricity of ditch and timber circle, suggesting dissynchrony. It is, however, possible that the arrangement is an expression of the characteristic assymetricality of henges and the regular offsetting of central features, such as coves (Burl 1988(b)). The intention may have been to shield the interior from external view, as with the double 'kink' of the Beckhampton Avenue at the entrance to Avebury henge (Barrett 1994).

There are no cropmarks of pit circles in the 25m to 35m range of the features at North Mains, Balfarg and Cairnpapple to suggest freestanding timber circles in the study area. Such records must, however, be subject to severe constraints of survival and perception, particularly in view of the small percentage of the landscape under cereal cultivation (see Table 5:1). There is a 10m pit circle at Skateraw, East Lothian, near which a beaker cist and a cairn with an Early Bronze dagger burial were found (II:vii:c), and rather larger pitted circles at Lauder Barns (IV.ix) and possibly at Kilduff, East Lothian (II:vii:c), may be better classified as enclosures (9:6:6).
9:6:5 Henges in the south of Scotland

Table 9:3 lists the probable henges of the study area and five possible sites. Harding and Lee's catalogue of henges (1987) included several other sites with the comment: 'Unlikely to be henge-related', and these have all been omitted apart from Hillend (no. 296), beside which grooved ware has recently been recovered in pits, tilting the balance in favour of possible acceptance. Other 'possible' sites listed by Harding and Lee have been treated on their merits, Overhowden (no. 244) and Dalswinton Mains (no. 248) being Catalogued as probable henges, Rachan Slack (no. 245) as a possible, while Craigie Burn (no. 293) is listed as a possible henge, but not given a Catalogue entry. Newlands (no. 286) is discussed in the Gazetteer (II:viii), but Bizzyberry Hill (no. 291) and Windy Gate (no. 300) are omitted as being probable ring-ditch houses.

All the sites would be regarded as small henges in Burl's (1969) classification, and four of them, being under 30m in diameter, would be called 'hengiforms' by Wainwright (1969). As Catherall (1976) pointed out, however, such similar sites fall to either side of the 30m line as to throw doubt on its usefulness. The sites have therefore been divided into Class I and Class II categories on the long established basis of the number of entrances (Piggott and Piggott 1939), with only the small penannular ring ditch with internal pit circle at Easter Cadder being distinguished as a mini-henge.
It may be remarked that only half of the twelve probable Class I and II sites, and three of the five possibles, receive mention by Harding and Lee (1987). Three of the eight additions derive from new or enhanced aerial photographs, but five constitute reclassifications of upstanding remains, only one as the result of excavation. This one was the 'banked' enclosure of Blackhouse Burn II, which proved to consist of a segmented and stone-filled ditch, perhaps doubtfully henge-like. Identification of henges is clearly an uncertain business and in the case of cropmark ditches giving no indication of the position of the bank, it may be impossible. It should be added that the functional basis of the distinction between ditched henges and palisaded or timber defined sites, such as Beckton with its grooved ware deposit (VI:iii:c), or the 80m - 90m diameter Lauder Barns (IV:ix), is not entirely clear.

Recent excavations of henges at Balfarg and North Mains, to the north of the study area, and in the Milfield Basin to the south, have produced several radiocarbon dates without clearly elucidating a sequence of henge building. The chronology of these sites, many of which conform to patterns seen widely across Britain, may best be examined in terms of the more general context of henge building.
Table 9:3 Henges in the South of Scotland

<table>
<thead>
<tr>
<th>Class</th>
<th>Henge</th>
<th>Internal diameter (metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I:a</td>
<td>Lindston</td>
<td>36</td>
</tr>
<tr>
<td>III:d</td>
<td>Blackhouse Burn II</td>
<td>40</td>
</tr>
<tr>
<td>VI:g</td>
<td>Pict's Knowe</td>
<td>23 x 22</td>
</tr>
<tr>
<td>II:b</td>
<td>Cairnpapple</td>
<td>42 x 32.5</td>
</tr>
<tr>
<td>III:e</td>
<td>Normangill</td>
<td>35</td>
</tr>
<tr>
<td>III:f</td>
<td>Weston</td>
<td>62 x 36</td>
</tr>
<tr>
<td>III:g</td>
<td>Westside</td>
<td>75 x 60</td>
</tr>
<tr>
<td>III:h</td>
<td>Balwaistie</td>
<td>52 x 38</td>
</tr>
<tr>
<td>IV:b</td>
<td>Overhowden</td>
<td>72</td>
</tr>
<tr>
<td>IV:c</td>
<td>Swallowdean</td>
<td>70</td>
</tr>
<tr>
<td>V:a</td>
<td>Broadlea</td>
<td>45 x 40</td>
</tr>
<tr>
<td>VI:f</td>
<td>Dalswinton Mains</td>
<td>16 x 12</td>
</tr>
</tbody>
</table>

Possible henges

<table>
<thead>
<tr>
<th>Class</th>
<th>Henge</th>
<th>Internal diameter (metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I:vii</td>
<td>Muir, Cathkin Braes</td>
<td>46 x 42</td>
</tr>
<tr>
<td>III:c</td>
<td>Rachan Slack</td>
<td>88 x 76</td>
</tr>
<tr>
<td>Table III:4:9</td>
<td>Craigie Burn</td>
<td>80</td>
</tr>
<tr>
<td>Table III:4:10</td>
<td>Hillend</td>
<td>25</td>
</tr>
<tr>
<td>Table III:4:7</td>
<td>Balwaistie</td>
<td>32</td>
</tr>
</tbody>
</table>

Mini-henge

<table>
<thead>
<tr>
<th>Class</th>
<th>Henge</th>
<th>Internal diameter (metres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I:vii</td>
<td>Easter Cadder</td>
<td>9</td>
</tr>
</tbody>
</table>
(a) Class I henges

The primacy of Class I henges was suggested by Atkinson in 1951 on what now seem rather tenuous grounds of pottery associations, mostly later beaker deposits (Atkinson et al 1951). Wainwright (1969) supported the sequence with early dates from Class I henges, which do not, however, apply to the ditches themselves. The reading from Llandegai A comes from a pit circle outside the entrance (Houlder 1968), and that from Arminghall from the central horseshoe of big timbers (Clark 1936), while the site of Barford A has been reclassified as a ditched barrow (Loveday 1989). The ditch at Stonehenge does have dates of 2460 ± 60 bc and 2440 ± 60 bc - BM 1583, 1617, but this irregularly cut feature, with internal bank, has been shown to have originally had two entrances (J. Richards 1991, 53). A similar date from the Class I henge at Coneybury comes from an internal pit, with the ditch giving a reading of 2250 ± 110 bc - OxA 1408, on bone (J. Richards 1990, 129), leaving Class I Stenness with the earliest date for the set of 2356 ± 65 bc - SRR 350, taken from ditch silts (Ritchie 1976). These determinations may still suggest an overall precedence for Class I henges. Balfarg, on the other hand, still classified by Mercer as a Class I henge on account of its circularity and the slightness of its second, side-set entrance gap (Mercer et al 1988), has no dates from the ditch, which was probably secondary
to the use of grooved ware on the site, a deposit which became incorporated into the postholes of Ring A, a setting contemporary with Ring A at North Mains Class II henge.

Overhowden (IV:b) and Rachan Slack (III:i) both now appear to have two entrances, not visible to Atkinson in 1950, leaving no larger Class I henges in the study area. As noted above (9:6:5) the stonefilled, discontinuous ditch of Blackhouse Burn II (III:d) gives the site an unusual character, and its sequential relationship with the adjacent large enclosure is not clear. The site at Lindston (I:a) is not only distant from other henges, but from other evidence for neolithic activity. Its hilltop situation is very similar to that of Class II sites at Cairnpapple (II:b), Arbor Low, Derbyshire, or Longstone Rath, Co. Kildare, all with wide views. The possible Class I site at Muir in the Cathkin Hills (I:viii) is similarly situated, as are a number of smaller penannular ring ditch sites in Ayrshire, discussed in the Catalogue in relation to Lindston henge (I:a). While Lindston certainly displays the features of a classic Class I henge, its context of construction may be rather different.

The small site at Pict's Knowe (VI:g), set across a hill ridge in a secluded coastal valley, away from the cursus complex around Dumfries, finds some comparisons in the idiosyncratic group of small sites around the
Beauly Firth (Woodham 1953), again unlikely to be early. The neighbouring monument complex could, however, suggest a more socially integrated context for Pict's Knowe. The small Class II site at Ballymeanoch (RCAHMS 1988, 52, no.22), distant from other similar monuments, is likewise adjacent to an important monument complex in the Kilmartin valley.

The barrow at Balwaistie, beside the Class II henge (III:h), has been suggested possibly to be occupying the site of a Class I henge, thus echoing the pairing of Class I and II sites at Llandegai. A barrow may also once have occupied the site at Muir (Chalmers 1807), and, in the same way, a cairn was built over the ditch at Cairnpapple (II:b) (see also West Ashby: Field 1985). The pairing at Balwaistie could be indicative of chronological sequence, and, certainly good quality grooved ware has been found in pits outside another possible Class I henge at Hillend (Table III:1:2), suggesting early dating. The Hillend enclosure could, however, have a second entrance opening onto the River Clyde where the cropmark fades.

A major problem over Class I henges remains that of identification. Circular penannular ring ditches must be expected commonly to represent homesteads (see, for example, East Coldoch, Plean: Maxwell 1983, 49, pl.2). It is even possible that the external bank of Pict's Knowe could derive from response to flooding of the
location, rather than defining a henge. There is also potential confusion arising from the numbers of funerary sites of the second, and, indeed, first millennia (see Rullion Green: Watkins 1984(a), (b); Watkins and Murray 1990). There may be elements here of deliberate continuity from earlier traditions, as suggested by Vyner (1988) in relation to the Street House 'Wossit' beside the long cairn.

(b) Class II henges

The characteristic unequal pair of opposed banana shaped ditches of the Class II henge have been recognised at nine sites in the study area, six of which are still definable on the ground. Three of these sites are c 70m in internal diameter, to which may be added the doubtful site of Rachan Slack (III:i); five have mean diameters between 35m and 50m. The small cropmark site at Dalswinton Mains (VI:f), c 16m by 12m, is defined by narrow ditches, suggesting it to have been an altogether less substantial monument. The medium sized sites conform closely to pattern, suggesting them to be the product of a short period of construction, which would also include the site at North Mains (see fig.9:2). Dates from post packing from the timber ring here offer a \textit{terminus post quem} for the ditch of c2125 bc. A \textit{terminus ante quem} could be suggested by ditch silt dates from the 15m diameter segmented ditch at Milfield North, of
1851 ± 62 bc - BM 1150 and 1824 ± 39 bc - BM 1149 (Harding 1981), although this site may be typologically rather later than the more regular Class II series. A date of c 2000 bc comes from the more distant, but regular, Class II site of the Devil's Quoits at Stanton Harcourt (Lambrick 1990). Also relevant is the introduction of funerary practice to Cairnpapple in association with Step 4 and Step 5/6 beakers, probably in use at c 1800 bc (Morton 1990). A bracket of c 2100 bc to c1900 bc may thus be supposed to cover construction of the Class II group.

Artefactual support for such dating is thin. Four tiny, unclassifiable body sherds came from post pits at North Mains, and a lugged sherd, possibly of grooved ware (McInnes 1969), from a disturbed context at Cairnpapple. Coarse 'domestic' grooved ware came from the ditch of Yeavering henge (Harding 1981).

As with Class I henges, it is probable that many Class II sites remain unrecognised, despite the distinctive appearance of their ditches. Upstanding banks and ditches appear to have attracted re-use as defensive enclosures, as at Westside (III:f), where an internal bank has been added probably by re-cutting the ditch, and at Flodden, where an external ditch has been dug (Harding and Lee 1987, 218, no.124). Narrow ditches or palisades have been added around Weston (III:g) and Swallowdean (IV:c), which could refer to early second
Fig. 9:2 Class II henges

Cairnpapple
Normangill
Balwaistie
Broadlea
Weston
North Mains
Westside
Overhowden

50 m
millennium use and adaptation, comparable to the addition of a massive palisade erected within the Mount Pleasant enclosure some three centuries after construction of the earthwork (Wainwright 1989). There is also a narrow palisade line visible on aerial photographs on the outer lip of the ditch at Broadlea (V:a), the same position as that in which a shallow groove was found at Overhowden (IV:b). These apparently insubstantial features may have been designed to give added definition or to screen the interior of the sites, rather than being for defence. A line of stakeholes, F7, was found to run along part of the inner lip of the ditch at Balfarg and traces of a palisade trench was also found (Mercer 1981(a)), and there were stakeholes on the outer lip of the little henge at Moncrieffe (Stewart 1985), perhaps performing the same function.

(c) Mini-henges

The 9.5m penannular ring ditch at Moncrieffe, enclosing a circle of nine pits, is echoed almost precisely at Easter Cadder in north Lanarkshire (RCAHMS 1978(a), 160, no.333). There is also an unenclosed 10m diameter pit circle at Skateraw, East Lothian (II:viii). Excavation of a pair of penannular ring ditches at Annieston, beside the Clyde, found that, while one circle was probably a domestic site, the other, with broad ditch, enclosing an area only 3m in
diameter, was probably ritual or funerary (DES 1992, 69). Distinction between functions may be impossible on cropmark evidence alone, and the picture may, in any case, be confused by the re-use of 'henges' for funerary purposes. A possible example is a cairn at Table Rings, East Lothian with penannular ditch and outer bank (RCAHMS 1924, 139, no.232), although the rather angular bank could have been a later addition.

The date of these small henges is probably close to that of the larger versions. Sherds from a flat-bottomed pot at Moncrieffe are not certainly grooved ware (Close-Brooks in Stewart 1985), but the period of abandonment between use of the henge and erection of stone circles (Caseldine 1982) resembles the sequence on Machrie Moor, where late third millennium timber circles, with grooved ware, were succeeded, after a gap of up to three hundred years, by stone circles (Haggarty 1991).

In the Milfield Basin, Miket (1985) excavated a pair of ring ditches on Whitton Hill, one segmented, 10.3m in diameter, the other penannular and 8.5m across. At the first site the ditch had been deliberately refilled, stone blocks being set into silts, over which deposits of burnt material, including coarse grooved ware sherds, gave dates of 2030 ± 110 bc - BM 2206 R. The second site had a date on ditch deposits of 1880 ± 110 bc - BM 2205 R (Bowman et al 1990, 70). The sites
confirm both the variability of small ring ditch or mini-henge construction, and the general validity of supposed contemporaneity with larger henges. As discussed in relation to Class I henges, however, it can be difficult to distinguish between some hengiform enclosures and later funerary ring enclosures.

9:6:6 Timber enclosures of the Late Neolithic

It was only after exploratory excavation that it was realised that a supposed pit alignment at Meldon Bridge (III:b) and a stone banked enclosure at Blackshouse Burn (III:c) were both Late Neolithic enclosures, encircled by upright oak timbers, covering areas of 8ha and 6.5ha respectively. The cropmark of a pitted sub-circular enclosure at Lauder Barns, in Lauderdale, measuring some 80m by 90m across (IV:ix), is probably a smaller version of the same site type, and there may be another such enclosure at Kilduff, East Lothian (II:viii).

The Meldon Bridge enclosure is dated by three readings from post pits of 2330 ± 80 bc, 2150 ± 130 bc and 1791 ± 70 bc; the third date, from a weathering cone, may be ignored for purposes of construction dating. The first reading, from burnt wood at the base of a pit, may refer to an actual timber, while the second, from post packing, probably dates construction. The stockade may slightly predate the erection of timbers at Blackshouse Burn, where a waterlogged, mature post gave a reading
of 2085 ± 55 bc. Timbers at the latter site constituted a secondary element, however, being erected within the pre-existing stone bank, which was repaired and capped with stone after the timbers had rotted. The Meldon Bridge site must also have had a much longer life than is represented by the stockade. Much of the excavated evidence from the promontory either preceded or postdated this period, and the presence of a fence line along the edge of the terrace scarp, and a reported substantial palisade from the interior of the site, suggest that other forms of enclosure were in operation at other times. Indeed, it is possible that the undated, smaller, paired posts between the main timbers represent secondary replacement rather than being an integral component of a unitary stockade.

The stone bank of Blackshouse Burn is a form seen also at Mayburgh 'henge', Penrith, although here built to a much greater height, and it seems reasonable to regard the technique as a variation on the usual henge format of bank and ditch. The size and shape of the Scottish enclosures certainly invites comparisons with the large earthwork sites of southern England. At Marden, for example, the ditch is sharply angled to form two sides of an enclosure against a river bank, a layout very similar to that at Meldon Bridge (Wainwright 1971).

Nonetheless, while stone banks may represent only
an occasional variant form, it is becoming clear that large timber enclosures constitute a numerically significant group of sites. At Forteviot, in Strathearn, a subcircular pitted enclosure, measuring c265m by c 220m (St. Joseph 1978), presents a similar outline to that of Blackshouse Burn, while its spaced pits and 35m long avenue resemble features at Meldon Bridge. At Dunragit, near Luce Sands, spaced pits form a triple concentric pitted enclosure, again with an abutting avenue c 35m long (DES 1992, 91). The outer enclosure is c 300m in diameter, the same size as Blackshouse Burn, while the inner, 100m circle is closer to the size of the ring at Lauder Barns. There is probably a similar enclosure at Walton, Radnorshire, where a curved segment of pits is apparent as a cropmark, in this case joined by a much longer pitted avenue (St. Joseph 1980).

At Greyhound Yard, Dorchester, an enclosure probably c 380m in diameter was defined by close set oak posts, c 1m thick, which gave a date of c 2110 bc - HAR 5508 (Woodward 1984). This date is intriguingly close to one from a nearby segmented ditch enclosure at Flagstones of 2130 ± 80 bc, while the Mount Pleasant earthwork enclosure on the same ridge, measuring 370m by 340m, is suggested to have probably also been constructed shortly before 2000 bc (Wainwright 1989). A massive timber palisade within the Mount Pleasant
ditch was not erected until c 1690 bc, belonging to a separate phase of development, probably with implications of defence.

The close contiguity of three very different construction methods within a short span of time at Dorchester must focus attention on the reasons for each choice of style, and the argument that the choice of timber, rather than bank and ditch, in Scotland should be seen as mere regional variation is, perhaps, weakened. Burgess suggested a defensive role for the Meldon Bridge stockade (1976; 1980), but the site is not a naturally defensive one, and no lithic evidence for warfare was recovered in excavation. Certainly, Blackshouse Burn, in a hollow among the hills, could not have been chosen for defence, and the posts seem more likely to have been added to the low bank for display purposes, rather than to convert the function of the site.

The contrast between the grooved ware associations of henges and the exclusive presence of impressed wares at Meldon Bridge has been commented on by Mercer (1981(a)). The difference suggests some functional distinction between site types. Nonetheless, at Wellbrae enclosure both types of pottery are found in pits, the structured deposits bearing strong resemblance to practice at Meldon Bridge (Table III:4:11). The two styles have also been found at
Balfarg Riding School, but here in different contexts, impressed ware being associated with ring cairns, grooved ware with pits and ditches (Barclay, forthcoming). In the south, grooved ware occurs not only in henges, but in association with later use of causewayed enclosures, such as Windmill Hill, and at the nearby palisaded enclosures at West Kennet (Whittle 1993), and is frequently found in association with impressed ware in the Avebury area (Thomas 1991, 168).

The two West Kennet enclosures were formed of continuous palisade trenches containing close set posts 0.3m to 0.5m thick, a similar range to that at Meldon Bridge. The widely spaced post pits of the latter site, however, create a distinctive cropmark, which it now seems possible to identify with reasonable confidence with the Neolithic. Palisaded enclosures, on the other hand, must be supposed likely to belong to later periods. Yet at Beckton, Lockerbie, a large grooved ware pot was found to have been dug in against the inner side of an eroded palisade trench, c 0.3m broad (Cormack 1963(b)). This chance recovery may derive from a class of neolithic palisaded sites more widely present than has usually been recognised. A 'substantial' palisade trench at Meldon Bridge contained Late Neolithic (impressed?) pottery, and at Balfarg traces of a
palisade were overlain by a deposit of grooved ware (Mercer 1981(a), 84-96). The shallow ditch, probably a palisade trench, creating a rectangular enclosure around the varied pit deposits at Wellbrae, may have been dug by grooved ware users.

The problem of the Late Neolithic enclosures is thus two-fold. Similar techniques were being used to create very different site types, while sites of similar size and perhaps function were being created by very different methods of definition.

9:6:7 Stone circles in the Late Neolithic

Possible early origins for stone circles in the Highland Zone have been discussed above (9:5:4). There is, however, a general presumption that stone will post date timber, as, for example, at Croft Moraig (Piggott and Simpson 1971). Mercer, discussing the likelihood of this sequence at Balfarg, assigned the phase of 'lithicisation' in southern England to c 1700 bc (Mercer 1981(a), 160-1). Stone circles succeeded timber on Machrie Moor after a long time lag, before c 1740 ± 50 bc (Haggarty 1993), and a similar chronological gap occurred at Moncrieffe (Caseldine 1982). The egg-shaped ring of twenty four holes at Cairnpapple, which, like the timber rings at North Mains, may have preceded ditch-digging, seems entirely likely to have held timbers, as suggested by Mercer (1981(a)). Piggott's
persuasion that they were stone holes could be met by supposing that stones had been set up in some, at least, of the pits after timbers had been withdrawn. This could have occurred in conjunction with the interment of a Step 4 beaker, probably at c 1800 bc, beside Hole 8, a pit containing a number of sizeable packing stones. Such a sequence would echo that on Machrie Moor.

The egg shape of the Cairnpapple timber ring is found at about fifty stone circles in Britain (Burl 1976, 43). Shared geometry might suggest chronological coincidence, setting the stone circles concerned back to the same period as the (circular) timber ring at North Mains, dated to c 2090 ± 70 bc if the Cairnpapple site can be dated by the North Mains comparison. Another egg shaped 20m diameter ring of twelve posts at Dorchester, Oxfordshire, pre-dating the Big Rings henge, is dated to c 2150 bc (Bradley and Chambers 1988). A late third millennium date may thus possibly be applicable to the Type II egg on Borrowston Rig (IV:c), 41.5m by 36.6m in diameter, and could presumably be extended also to the other large Lammermuir stone circle, the Crow Stones (IV:d), which, like Borrowston Rig, consists of small boulders, here defining an ellipse. Another upland elliptical ring at Wildshaw Burn, near Crawfordjohn (III:j), presents a different appearance in consisting of mostly prostrate stone slabs. Once again, however, the stone used is local material, and the 48m by 40m
ring would appear to be fulfilling a function similar to that of the Lammermuir sites. Another ring of stratified slabs occurs at Whitcastles in Dumfriesshire (Table V:1:1), measuring c. 56m in diameter. As suggested for Cultoon egg-shaped ring, on Islay (MacKie 1981), these circles may have been laid out, but never completed.

Another feature which links stone and timber circles is the contrivance of an emphasis on the south west, whether by axial alignment, grading of size, or the setting of a 'porch' of large stones, sometimes flanking a recumbent, at this point. The timber circle at Balfarg uses both grading of size, and addition of a porch, while, as Mercer points out (1981(a), 154), a timber recumbent would leave no archaeological trace. Of the large stone circles mentioned above, only Cultoon shows alignment and grading to the south west. In the Borders and southwest Scotland, however, there is a recurrent interest in this direction (Tables V:1: VI:3). At Burgh Hill in Roxburghshire a small Type I egg of twenty four flat slabs is aligned to the south west where there lies a long recumbent slab (Table IV:3:3).

A warning against accepting these morphological similarities, with their liturgical suggestions, as directly indicative of shared chronology, comes from Moncrieffe, where a stone circle considerably postdating the little henge, was graded to the south
west where small slabs lay as 'reduced' recumbents (Stewart 1985). Traditions in the Neolithic are frequently of great longevity.

9:6:8 Pit alignments of the Late Neolithic

The double pitted avenues at Meldon Bridge, Forteviot, and Dunragit all directly abut their respective enclosures, although there is no corresponding entrance through the stockade pits at Meldon Bridge. It is possible that the features do not represent approachways, but have some ritual function, required to be adjacent to an enclosure. At Walton, a longer, broader avenue approaches the enclosure perimeter at an acute angle (St. Joseph 1980); at Milfield North a pit alignment passes the henge at 180m distance, a relationship seen also at Thornborough (Harding 1981). At Dunragit, a shorter 'avenue' of six paired pits lies 500m north west of the main setting, on Drumflower (RCAHMS 1987, 73, no.458). Excavation of the Milfield pits showed that they had held posts, and grooved ware was recovered from subsequent weathering hollows with dates running from c 1820 bc to c 1655 bc. A 10m wide, curving alignment at Dalswinton Mains, on the Nith (VI:f), passing between a small henge and a ring ditch, may be related to this series of sites, rather than to the 25m broad pit alignments at Holywood II and Fourmerkland, discussed above as cursus related
monuments (9:4:6). There could, however, be closer relationships between the two classes of site than are apparent on present evidence.

Single pit alignments in the Milfield Basin appear to function as land boundaries (Miket 1981), a class of feature common in southern Scotland (Halliday 1982, 75-8) and generally attributable to the Iron Age (Barber 1985). The neolithic origins suggested by Miket for the Northumberland field systems have yet to be demonstrated north of the Border; pottery from open pit fills cannot conclusively demonstrate period of construction. If there are pitted boundaries of neolithic date, these seem more probably to be found among the less regular lines, sometimes of blurred, double pits, seen, for example, near the Kilduff possible pitted enclosure (II:viii), or across a promontory at Dryfesdalegate, near Lockerbie (VI:iii:c).

9:6:9 Rock art in the south of Scotland

Rare examples of passage grave styles of rock art have been discussed in section 9:5:6 as perhaps belonging to a Middle Neolithic phase, contemporary with the great passage graves of the Boyne. Much more common, on rock outcrop and on loose slabs, are cup and cup-and-ring marked motifs, for which the most frequent association is evident re-use in bronze age cists.
Bradley (1989), Mackie and Davis (1989), and Burgess (1990) have all argued for a neolithic origin for this material, and, certainly, plain cup marks were on a slab sealed in the mortuary structure at Dalladies before the Middle Neolithic (Piggott 1972). The one, clearly neolithic context for a cup-and-ring marked slab occurs at Cairnholy I, the stone being set upright in the corner of the inner chamber. Burgess argues that the slab must have been a primary deposit on grounds of difficulty of later access. The form of the chamber, however, resembling that of mortuary structures, may have given access over the side stones, perhaps up to the period of forecourt blocking, which may date from the early second millennium (9:7). The Cairnholy cairns are unique in Galloway in lying within a distribution of cup-and-ring marked stones which stretch up the valley to the stone circles at Cauldside, and which include one carving on a slab from the chamber at Cairnholy I itself (Morris 1979, 73, GAL 26). The valleys of the Rivers Cree and Luce, with numbers of chambered cairns, have no cup-and-ring marked rocks, and the contrast suggests that the Cairnholy association may not be primary. Insertion of the slab, and decoration of the capstone could be yet another instance of re-use of chambered cairns late in the Neolithic (see 9:6:2; 9:6:3). Such a dating could also account for the continuity of respect which led to the re-use of such slabs in Early Bronze Age cists.
The cup-and-ring carvings clearly mark rocks, or points in the landscape, and where there is a cluster of such markings, as, for example, on Tormain Hill (Morris 1981, 139), the site must have become a 'special place'. In two instances, rock faces beside rivers are used, secluded spots at Roslin Glen (II: ix) and Ballochmyle (I: ix), which must, in some senses, have served as monuments. A large, polished stone axe has been recovered from the River North Esk, near Roslin (NMS: AF 413).

9:7 Neolithic monuments in the second millennium

Insertion of an inhumation with beaker and stone axe into a pit in Biggar Common long mound may be seen as representing continuity of practice from the neolithic burial with flint axe and knife at the opposite end of the mound (III: 4). Subsequently, however, the mound itself was modified, cut back on the north, uphill side to be revetted by a stone bank, and encased in stone to resemble a long cairn. The episode is undated, but may represent a second millennium desire to recreate history and to acquire the symbol of an ancient monument of locally recognised form. The northern side of the mound is that viewed from the ridge summit where a handled beaker was deposited under a round cairn c 50m from the mound.
While the evidence from Biggar Common is the most detailed, half of the funerary monuments catalogued have some indication of re-use or adjacent funerary activity within c 200m, probably attributable to the second millennium. The final sealing of chambered cairns may well have occurred at this juncture, given the many cases of beaker association with chamber use or cairn blocking. At Cairnholy I, where beaker is indeed present, the stones which sealed the chamber blocking, filling the forecourt, could not be distinguished from the body of the cairn (Piggott and Powell 1949), and it seems possible that the cairn itself was added to at the time that the chamber was closed, enveloping the kerb stones in loose stone. This is the sequence suggested by Masters to have occurred at Slewcairn where three cord ornamented sherds in the forecourt point to a relatively late date for the addition of blocking material (VI:2). One possible interpretation of this activity might be to suppose an element of destruction in the process, cairn stone being deliberately dislodged to infill the forecourt and to tumble over the kerb. At Lochhill, where there was little in the way of 'extra-revetment' or tumble, sherds of a northern beaker had been deposited along the spine of the cairn.

There are three probable instances in the study area of round cairns being built over long, at High Hendryton (I:4), at Easton (III:3), and, more doubtfully, at Cairn
Avel (VI:1), where the high built head of the cairn is not perfectly circular. The raised and bulging head of the cairn at Macawston (I:7) could also have had the same treatment. At Easton it is clear that the round cairn overlies a very low mound, its centre apparently already robbed out, and it must be possible that the long cairn was plundered to build the round. The same explanation would account for the very robbed out tail of Cairn Avel, the aim here being, perhaps, to create a mound equivalent in height to that of the round cairn at Lagwine, 1.5km distant across the Carsphairn valley, rather than to create a perfectly circular cairn. Whether such plunderings of the early monument amount to disrespect must be open to doubt (cf. Chippendale 1993, 30). Adaptation of earlier forms to meet current expectations could be seen as a form of continuity of respect. Certainly, bronze age cairns have frequently been found to overlie sites in use in the Neolithic, as, for example, at Harehope (Jobey 1980) and Cloburn Quarry (DES 1987, 46; 1989, 60). There are also possible cists inserted into Lang Knowe (V:2) and into the tail of Burngrange (III:1), and records perhaps relating to cists found at Cuff Hill (I:2). Elsewhere, decorated slabs, probably from neolithic contexts, were broken up for re-use in cists of beaker or bronze age date.

The same ambivalence between respect for an ancient site and the urge to re-appropriate its power for
other ends is seen at henges. Excavation at Cairnpapple (II:b) revealed a complex sequence, perhaps involving destruction of a central axial feature, leaving only a scooped rectangular area, containing beaker sherds, and certainly entailing the addition of burials, first in individual pits, then under a cairn of increasing size, which finally overran the henge ditch. It is suggested above (9:6:7) that stones may have been erected beside earlier beaker burials, later removed, probably, as Piggott suggests, to be used as kerb stones for the food vessel cairn. The Balwaistie barrow (III:h) may be enveloping another henge. Palisade lines around henges are discussed in section 9:6:5(2), as possibly pertaining to second millennium use.

At Blackhouse Burn (III:c) beaker sherds were found in the interior, perhaps contemporary with refurbishment of the stone bank after rotting of the timbers; 'urns' have also been found in the bank, and a series of cairns occupy the surrounding ridge. The interior of Meldon Bridge seems to have been taken over by second millennium funerary and ritual activity, and cairns and standing stones were raised across the River Lyne on the Sheriffmuir plateau. Even after its decay and physical disappearance, a location of neolithic importance held its power.
10 MONUMENTS AND RITUAL IN THE SOUTH OF SCOTLAND:
LOCATIONAL AND SPATIAL ASPECTS

10:1 Regional variation in the sequence of monument building and ritual

Within the 16,000km² of the study area twenty six acceptable, or probably acceptable, neolithic funerary monuments have been identified, giving a density of one site to 615km². In the 3000km² of south west Scotland omitted from the present study there are about thirty funerary monuments, including a dozen probable Bargrennan round cairns of distinctive, perhaps later, type (Murray 1992). The eighteen remaining sites give a density of one cairn to 167km² in south west Scotland, a striking illustration of regional variability, whether attributable to original high levels of construction, the size and/or durability of the monuments, or low rates of subsequent destruction (see fig.10:1).

Some inter-Regional variation within the study area has already been noted in Chapter 9, discussing monument morphology and construction sequence. These patterns may be recapitulated here as a prelude to analysis of locational and spatial factors observable in the siting of monuments.

The earliest neolithic dates from Scotland and
Fig. 10:1 Funerary Monuments in the South of Scotland, omitting Bargrennan round cairns
northern England all come, with Grimston pottery, from the east of the country. The sites concerned are Thirlings, on a tributary of the Tweed, Linlithgow Friary and Balfarg Riding School, just inland from the Firth of Forth, and Biggar Common, 40km from the Forth, and overlooking the Clyde, but still within an eastern ambit. Cowie (1992) lists several sites around the Firth of Forth which have produced Grimston pottery, making this a core area for early activity, but the finds from Biggar Common mound, the furthest inland of all the funerary monuments in the Catalogue, and, at 320m OD, the third highest site, show that adoption of pottery was not confined to the coast. Chances of discovery may, however, be distorting effects, and dates are awaited from a pottery deposit at Carzield on the lower Nith.

It is around the Nith estuary that the first evidence for formal monuments has been documented, probably as part of a distribution stretching along the Cumbrian coastal plains, and related to the wider Irish Sea province, with megalithic and non-megalithic monuments in Galloway, northern Ireland and north Wales. Perhaps as early are some upland monuments, the laterally chambered cairns of north Ayrshire, and small trapezoidal cairns in the eastern hills.

A mortuary enclosure at Inchtuthil, in inland Perthshire, has been shown to be as early as any of the above, but the earliest known monuments on the Firth of
Forth are the massive cursus with possible terminal barrow at Monktonhall (II:a), and an enclosure of large posthole features at Balfarg Riding School, both likely to find a context after c 2800 BC in a phase of 'Developed Neolithic' monumentality. The situation here may demonstrate the destructability of Early Neolithic monuments. The only other cursus monuments in the study area are around the Nith Estuary, but elongated or enlarged cairns, likely to be of the same period, appear in inland parts of Dumfries and Galloway, the Biggar Gap, Tweed Basin and north Ayrshire. Outwith the study area, in eastern Scotland there are pitted enclosures of cursus type, probably a development from long mortuary enclosures of the Early Neolithic, while to the west elongated chambers are built in Clyde cairns, developed from the simple or bi-partite chambers of the Early phase. One such elongated chamber survives at Largs (I:1), overlooking Cumbrae in the Firth of Clyde, and another is incorporated into an elongated cairn of eastern type above Liddesdale, at Windy Edge (V:1). Two interrupted ditch enclosures, one beside the lower Tweed, the other on the middle Clyde, may also date from this phase.

Cessation of cairn building in the middle years of the third millennium does not appear to represent a decline of activity in the Biggar Gap Region, where there is a small mortuary enclosure (III:5), and at least
one prestige axe burial. The same types of Yorkshire flint axes are found around the Forth and Clyde, but not in the Tweed Basin, the Borders, or Dumfries and Galloway, where stone circles may have begun to be erected at this time.

Apart from one ditched site at Balfarg Riding School, there is no evidence for the construction of Late Neolithic types of enclosure until the final two centuries of the third millennium, when timber circles and large enclosures, henges and possibly stone circles are built. The Biggar Gap Region is central to this activity, with five of the twelve Catalogued henges, and both of the large enclosures (see fig.10:2). Despite a cluster of henges in the Milfield plain, the remainder of the Tweed Basin has few recorded monuments of the period, except in Lauderdale, with a henge (IV:b), a pit defined enclosure at Lauder Barns, and a stone circle (IV:d). There is, however, a rich record of lithic recovery from the Tweed Basin, particularly from Lauderdale, in which Late Neolithic types, such as transverse arrowheads and edge polished knives, play an important part. Elsewhere henges are remarkably isolated, both in terms of other monuments and of artefact recovery. Single henges occur in West Lothian, on the lower Whiteadder, in lower Annandale and in south Ayrshire, with a possible site in Renfrewshire. There are two small henges on the edges of the cursus complex in Lower Nithsdale, which, together
Fig. 10:2 Distribution of Late Neolithic Enclosures and Stone Circles over 15m in diameter

- Enclosure
- Henge
- Possible henge
- Stone circle (extant)
with several stone circles and some pit alignments, may represent continuity from the earlier monument building traditions. Stone circles are, or have been, common in Dumfries and Galloway, although rare elsewhere (see fig.10:2). There is a remarkably tight cluster of cup-and-ring marked rocks in the west Stewartry, extending into the Wigtownshire Machars, but in the north of the study area such rocks are more widely dispersed, and there are none in the Tweed Basin or Dumfriesshire (see fig.10:3).

In summary, while the Biggar Gap Region seems to have served as a centre of monument building from the Earliest to the Latest phases of the Neolithic, elsewhere patterns shift over time. Earliest activity around the Firth of Forth and then the Solway is succeeded by a fanning out, which sees monuments being widely built across the study area. Throughout a mid-millennium lull in monument building the Biggar Gap Region continues to show interest in burial and in prestige artefacts, and this Region produces a distribution of Late Neolithic enclosures suggestive of complex social network. Elsewhere monument building was sporadic, although the Tweed Basin was engaged in circulation of sophisticated lithic technology. Outwith the study area there is a cluster of Late Neolithic monuments in the Milfield Basin, and a more dispersed distribution in Strathearn, while at Dunragit an important ritual complex may have been
Fig. 10:3 Distribution of cup-and-ring marked rocks in the South of Scotland: after Morris 1979; 1981
related to artefact exchange centred on the adjacent Luce Sands.

10:2 Approaches to locational analysis

Scottish neolithic monuments have long attracted interest in terms of their distribution patterns, which served as a guide to settlement and economic interest (see 4:7). With the development of analytical techniques in the field of spatial geography, interest was renewed in the 1970s and 1980s. Renfrew (1976) utilised the dense island distributions of chambered cairns on Rousay and on Arran to define territorial and social organisation, and the Arran material has again been used as the basis for detailed site catchment analysis designed to elucidate neolithic settlement preference (Perry 1983; Davidson and Green 1989). Work by Fraser (1983) on Orkney has explored the use of statistics and cluster analysis in assessment of locational factors, incorporating information on the visual impact made by cairns, their outlook, and inter-site relationships.

Particular constraints attach, however, to the use of territorial or site catchment analysis in relation to neolithic monuments. In the first place, it must be improbable, even in terms of the high ratio of site survival on Orkney, that the available data set will be anything approaching original completeness, or that it
can be a representative sample of the whole. In the present case, it has already been conceded that survival will be weighted towards the most massively built, peripherally sited, and recognisably distinctive forms of monument (Chapter 3).

Secondly, the need for integrity in the data set is confronted here by a Catalogue of monuments of very various type, function and scale, constructed, reconstructed and adapted over long periods of time. However discriminatory the approach, it has to be accepted that building phases cannot be adequately explored without excavated evidence, that regional styles of monument building followed various patterns, and, as an additional confusion, that different monument types appear to have been constructed within restricted localities at near contemporary periods. Thus in the uplands of the Borders Region monuments of the Developed Neolithic phase comprise a high, trapezoidal cairn (V:3), a bipartite cairn consisting of oval head and long tail (V:2), an elongated, narrow cairn with axial, segmented chamber (V:1), and two possible bank barrows (V:vii). Although all these sites seem likely to be near contemporaries, and all are roughly comparable in scale of construction, it could be misleading to regard them as members of a single set.

A constraint derived, in part, from those above is created by data sets not large enough to bear
statistical analysis. In these circumstances, one unusual site can distort interpretations, and single items of evidence can create wholly unwarranted conclusions.

A final difficulty arises from the inappropriateness of site catchment analysis, developed as a tool of settlement studies, when applied to ritual sites. Priorities of tomb location, perhaps deliberately invoking principles of liminality and apartness, are very different from those of settlement siting. Davidson and Green (1989) have discussed the need for using large enough catchment areas, and the advisability of selecting natural, not geometrically devised, boundaries. Nonetheless, the 5km² that they have chosen to analyse, with a radius of only 1.1km to 1.5km from each Arran tomb examined, can by no means cover the whole territory exploited by the tomb builders, while the boundaries that they employ to define each catchment could be the very features that served to separate the tomb from the core agricultural territory of the settlement.

Apparent correlation between Irish megalithic tombs and land with good agricultural potential persuaded Gabriel Cooney (1983, 188-9) that for these builders 'the landscape of the living and the landscape of the dead may well have been indivisible'. The same relationship, however, that is seen between court cairns and
agricultural land recurs in the case of the clustered passage grave cemeteries, where tomb and settlement cannot coincide. Cooney has come to accept the term 'ritual landscape' for such groupings (1990, 750), and he argues that tomb types other than passage graves also tend to agglomerate into cemeteries, creating a landscape in which 'apartness' between the living and the dead must be recognised.

Locational aspects of monument siting included in the Catalogue are examined in the present chapter without anticipation that any consistent patterns will be revealed. The emphasis is on discrimination between sets rather than deductions from overall averages. It is the small scale regularities, comparisons and contrasts that are sought, and which are regarded as likely to be the most illuminating on cognitive attitudes to monuments and their role in society.

The primary distinction is that between funerary monuments and Late Neolithic enclosures. The two causewayed enclosures do not offer a valid sample for analysis, and the cursus enclosures constitute too tight a spatial cluster for inter-group comparison, although the locational placement of the set as a whole does offer an interesting contrast with that of other site types. Stone circles, often doubtfully neolithic, have not been closely studied, and are not generally included in discussion. Beyond these distinctions between basic
sets, the chapter seeks to explore the patterns of regional and/or morphologically defined groups, and the monuments of different chronological periods. In every examination of the data, however, acknowledgement is made of the incompleteness of surviving information, although in some instances it may be possible to compensate by predicting areas of site destruction.

10:3 Topographical aspects of monument location

Table 10:1 lists some geomorphological aspects of the topography of the twenty six funerary monuments in the study area, and Table 10:2 does the same for the Late Neolithic enclosures. Table 10:3 presents the two sets of figures, together with the uniform set from the cursus enclosures, as comparative percentages.

There is a strong upland and inland component to the funerary sites, 50% being at or above 230m OD, and one third at 30km or more from the coast. An even higher percentage of the enclosures are at the same altitude, however (57%), and 50% are over 30km from the coast. These latter figures are influenced by high numbers of enclosures in the Biggar Gap Region, penetrating into Upper Clydesdale, where there are four sites at 40km or more from the coast, further inland than any of the funerary sites. Despite this 'upland' emphasis, however, the enclosures favour valley bottom
### Table 10:1  Funerary Monuments: Topography

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<th>Cat.No.</th>
<th>Length (m)</th>
<th>Altitude (m OD)</th>
<th>Distance from sea (km)</th>
<th>Solid Geology</th>
<th>Soils</th>
<th>Land use</th>
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Mean: 54.4m  213m  22.9km
Table 10:2 Late Neolithic Enclosures: Topography

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Mean: 193  27

Solid geology:
ORS = Old Red Sandstone
NRS = New Red Sandstone
Volc = Volcanic rock, andesitic or basaltic
ORD = Ordovician
Sil = Silurian
Lime = Limestone
Nam = Namurian millstone grit

Soils:
BFS = Brown Forest Soil
PG = Peaty gley
PP = Peaty podzol

Land use:
Rec = Recreational, including Ancient Monuments in Guardianship
Ag = Agricultural
Graz = Grazing, includes rough grazings and permanent pasture
Table 10:3  Percentage comparisons between Topographical aspects of Monument Types

<table>
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<th>Cursus Enclosures</th>
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<td>Gley/peaty gley</td>
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<td>Recreation</td>
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locations, giving them an average altitude of only 193m OD, as against 213m for the funerary sites.

Given the small size of many of the coastal cairns, such as Slewcairn (VI:2), Lochhill (VI:3) and Macawston (I:7), and the upland situation of many of the largest sites, it was thought probable that there would be a correlation between size of cairn and height above sea level. The cropmark bank barrow at Redbank (VI:4), a rather different type of site, was excluded from this consideration, leaving an average length of cairn of 50.5m and a height above sea level of 224m OD. As fig.10:4 shows, shorter cairns display a slight preference for below average altitudes, at a proportion of 9:6, while longer cairns are weighted, at 7:2, towards higher situations. At above average altitudes, however, long and short cairns constitute virtually equal numbers (7:6), and it could be that the absence of longer cairns from lower situations relates to the destructive processes that have removed all trace of the coastal cairns at Lochhill (VI:3) and Haylie (I:1), and have ploughed the Redbank bank barrow down to a cropmark level of survival. In terms of distance from coast, rather than altitude (fig.10:5), the shorter cairns show a 9:6 preference for inland situations, refuting any hypothesis of increasing size with distance from coast. It is perhaps simply that it is in upland situations that sites are likely to be given added length, as more stone would have been awaiting clearance in the hills.
Fig. 10:4 Length of cairns and height above sea level (23 sites)

Cairn length (m)

Fig. 10:5 Length of cairns and distance from sea (23 sites)
Table 10:1 shows that the first geological preference in site selection for cairns was for Ordovician or Silurian greywackes and shales. The abundance of these rock formations to the south of the Southern Upland Fault, must make such an association inevitable if upland situations are being utilised. It is of greater interest to observe that the three Borders cairns are all on the Carboniferous limestones that occupy only a small area to the north of the Border, running south west across the Solway plain to Southerness Point, where the sites around Criffel, two on granite (VI:2,3) and one on greywacke (VI:4), are adjacent to the limestone of the coastal plain.

The second geological preference among the funerary sites is for Old Red Sandstone (eight sites), which, together with the Permian New Red Sandstone of the Dumfries Basin, provides the first choice for Late Neolithic enclosures (seven sites). Again, this selection is of particular interest in view of the limited extent of the formation in southern Scotland. Old Red Sandstone occurs in a narrow band running along the northern side of the Southern Uplands Fault, where it is interleaved with Coal Measures, Millstone Grit and igneous intrusions, in a swathe around Kelso, stretching to the mouth of the Tweed and northwards into the Lammermuirs and Lauderdale, and in a narrow strip along the Clyde coast north of Irvine. These three areas
have all been selected by neolithic monument builders. In the Biggar Gap Region five of the six funerary sites and three of the seven enclosures are on sandstone, the remaining cairn being on Namurian grit, and the enclosures on andesitic lavas, or in the case of the peripherally sited Meldon Bridge (III:b) and Normangill henge (III:e), on the Ordovician greywackes of the Southern Uplands. The Old Red Sandstone of the Tweed Basin provides sites for the long cairn at Caverton Hillhead (IV:3), and the henge at Swallowdean (IV:c), and is overlooked by Overhowden henge (IV:b) from the Silurian greywackes of the Moorfoots. The pitted enclosure at Lauder Barns (IV:ix) is also on the Lauderdale Old Red Sandstone. In the west, Loanfoot (I:3) is on Old Red Sandstone in the Irvine valley, overlooked also by High Hendryton (I:4) from the volcanic hillsides on the north side of the valley. This sandstone stretches in a band to the south west, where it provides sites for Lindston henge (I:a) and Macawston cairn (I:7). The chamber at Largs (I:1) is perched on a narrow strip of the same rock fringing the shores of the Firth of Clyde. Soils developed on Old Red Sandstone offer good drainage and high base status, but their attraction has been so strong that it may be wondered whether it was not the very visibility of the red soils that attracted agriculturalists, perhaps even suggesting community with the red sandstones of eastern Scotland and the Orkneys.
Over 50% of the funerary monuments and 86% of the Late Neolithic enclosures are within areas of Brown Forest Soil, although the sites themselves are often on rocky ledges or hilltops with thin, eroded cover. Several of the Biggar Gap and Borders cairns are on peat or podzols which must have undergone acidification since the Neolithic, and the gleyed soils around Normangill henge (III:c) and in the carselands of Pict's Knowe (VI:g) must, equally, have declined from former status. Small cairns around the Pentlands cairns, Slewcairn (VI:2), and Stiddrigs (VI:8), demonstrate earlier land use, and elsewhere there are remains of pre-improvement farming, either around sites (e.g. Cairn Avel, VI:1) or in the valley below (e.g. the Mutiny Stones, IV:1). It seems that all the sites are within close range of present or previously viable agricultural land.

10:4 Local resource exploitation

It is possible either that site selection was influenced by the availability of appropriate raw materials for construction, or that the materials to hand influenced choices in site types built. At its simplest level a cairn is a heap of cleared stone, and is therefore most likely to be built where there is stone to be cleared. The correlation between cairn length and altitude is discussed above (10:3); besides length,
however, height of build controls the amount of stone to be consumed. The high, trapezoidal cairns of inland Dumfries and Galloway are at an average altitude of 210m OD, and even the lowest sites, Capenoch (VI:6) at 170m OD, and Fleuchlarg (VI:7) at 130m OD, are in areas littered with glacial detritus, the fields of Fleuchlarg farm are punctuated by enormous clearance heaps. In contrast, the nearby Barndennoch barrow (VI:10) is on a fluvio-glacial riverside terrace, where cleared stone, thrown into an adjacent kettlehole, can be seen to be of small size. Local conditions clearly influenced the decision to construct the only small ditched barrow recognised in the study area, and presumably, also, the presence of stone, being gathered into clearance heaps on the Pentlands, fostered traditions of cairn building here.

The type of stone available locally has influenced the appearance of sites, from the large, angular boulders of the Mutiny Stones (IV:1), to the tumble of small stones at High Hendryton (I:4) and at Loanfoot (I:3). Larger boulders appear to be present at Loanfoot, in a basal layer, as if the first stage of construction utilised the largest stones available. A similar basal layer of boulders at Slewcairn (VI:2) was found on excavation to be intermixed with earth, perhaps derived from deturfing, but likely to have created a striking contrast between the graded kerb of gleaming white granite boulders and the soil-filled interior. The use of the rough granite, extremely painful material to work
with, is another example of exploitation of locally present opportunity.

On the north side of Criffel, at Lochhill, large glacial erratics may have been less freely available, and smaller stones were used for the kerb. Timber was the first choice of material for the facade here, and it could, perhaps, be tentatively suggested that this was a resource available from fen carr in the New Abbey basin, directly below Lochhill; sub-fossil tree trunks have been found in coring meadows beside the March Burn on the north side of the inlet (Barber and Crone 1993).

Old Red Sandstone furnishes good stone slabs which are surprisingly little used, at least as visible components of the monuments on this formation. Burngrange (III:1), with megalithic chambers and kerb stones, is unusual in the Pentlands area in this respect, although two set slabs visible within the Greens Moor cairn (III:2) may suggest that chambers or other structural elements are also present here. Similarly, the limestones of Liddesdale have been used to construct a long chamber at Windy Edge (V:1) and perhaps, also, at Lang Knowe (V:2), although chambers are not common in the long cairns of the Border Hills (Masters 1984). Cairn Avel (VI:1), as the westernmost of the inland group of high, trapezoidal cairns in the study area, uses the amply available lithic resources of the Galloway uplands for big kerb stones, and at Dod Hill (I:5), on a
volcanic mass in north Ayrshire, stone available on the adjacent cliff face is used to form a kerb. It may be that elsewhere similar kerb stones, horizontally laid, are masked by cairn stone, and occasional slabs can be glimpsed, for example in the Borders' cairns. Haylie, Largs (I:1) and Cuff Hill (I:2), are both, like Dod Hill, built beside cliff faces, which have furnished orthostats for chambers, although at Cuff Hill more amenable thin slabs of limestone have been fetched, probably from sources about a mile distant, for construction of one chamber.

In western Galloway megalithic chambers are commonly built, despite the unmalleable nature of much of the local greywacke. In some areas, however, this rock takes on a shaley character and can be easily split. Just such an outcrop was selected for construction of Cairnholy II, and the sides of the knoll have clearly been quarried, probably at various times in history. The results of the site selection are seen in the dramatic use of tall portals and facade stones here and at the adjacent Cairnholy I. The knoll itself is utilised to give definition to the north side of the Cairnholy II cairn, built along ledge outcrop, and the rocky ridge which runs out to the west beyond the cairn itself gives this site the impression of having a tail as long as the 40m length of Cairnholy I. This practice of adaptation to natural formation can also be seen at Cuff Hill, Loanfoot,
Lang Knowe and Cairn Avel, where the long cairns are built along rock ledges on escarpments, giving definition to one side of the cairn.

Stone circles seem also to have been constructed adjacent to sources of stone, as has recently been observed at Wildshaw Burn (III:j). Most of the stones at Cairnpapple came from a neighbouring volcanic sill, supplemented by weathered sandstone blocks, likely to have been present on the hill as glacial erratics (F.W. Anderson in Piggott 1948, 120-1). Despite the ready availability of sedimentary rocks to the north of the Southern Uplands Fault, stone circles do not seem to have become a part of local tradition here. There are many individual tall standing stones in the Lothians, but the only circles of any size which still survive are the Lammermuirs rings of tiny stones, not easily distinguishable from the glacial boulders which litter the surrounding area (IV:d,e). In Dumfries and Galloway rather larger boulders have been collected to form circles which, in themselves, are not impressive, although these sites must have given definition to ceremonial space. In the west small circles of tiny boulders surround a more impressive centre stone, as at Lairdmannoch (Table VI:2:4). On the farm of Graitney the huge Lochmabenstane, manoeuvred to stand upright in a shallow stone hole to reach a height of 2.9m, seems likely already to have been present on the terrace, dictating
the choice of location for the monument (Table V:1:7). Large erratics may also have been available at Holywood to form the basis of the Twelve Apostles circle (VI:j) although some of the stones used here may have been quarried from outcrop not far distant. Elsewhere smaller stones were used to enhance natural features, such as the boulders set around a rock platform on a shoulder of Easthill, forming a circle (Table VI:2:3). At Holm of Daltallochan (Table VI:2:2) glacial boulders appear to have been set up against the flanks of a level topped drumlin, giving definition to the knoll. As at Cairnholy II, the resultant monument is crafted from opportunity.

The split trunks used to define mortuary structures or to support exposure platforms of the Early Neolithic may be another form of expression of control over natural resources. As mentioned above, the structure at Lochhill (VI:3) was embellished by a timber facade, built of quite slender poles. Apart from possible long houses on Biggar Common and at Sprouston there are, however, none of the Early Neolithic timber enclosures, known in eastern Scotland, in the study area, and when, in the Developed, or possibly the Middle Neolithic phase, pitted cursus enclosures began to be constructed (Fourmerkland VI:e; Holywood II: VI:b), the form was soon superseded by ditched enclosures, easily dug on the gravels of the Nith terraces and Monktonhall, and perhaps incorporating
reference to English, rather than eastern Scottish sites.

In the Late Neolithic more widely dispersed enclosures began to be built, at first, again, of timber, whether for the small, ceremonial rings of the Firth of Forth henges, or for large stockaded enclosures at Meldon Bridge (III:b), Forteviot and Dunragit. At Blackhouse Burn (III:c) an even more localised format was first employed, of heaped stone with flagstone divisions, a style probably adopted from cairn building practice. Timber was introduced as a secondary phase here, while elsewhere ditch digging practice began at henges.

The timbers at Meldon Bridge and Blackhouse Burn range up to 0.5m or 0.6m in thickness, considerably less than the 1.0m thick timbers set up in close formation around the Dorchester enclosure of Greyhound Yard (Woodward 1984). The Scottish oaks may have been culled from close canopied forest, growing tall but slender trees. 1.0m thick timbers were found for the portal at Balfarg, and large pits mark the Meldon Bridge avenue. In the westerly exposure of Machrie Moor, timbers were only 0.15 to 0.30m thick, with trunks of 0.5m being used for the central horseshoe feature of Ring I (Haggarty 1991).

The digging of ditches in the creation of henges may have found occasional precedent in the study area in the interrupted ditch enclosures of the earlier neolithic
recorded at Sprouston (IV:a) and West Lindsaylands (III:a). An uninterrupted ditch at Collessie, Fife has produced a date of c 2775 ± 70 bc (Barber 1984(a)), and a ditched enclosure was dug around one of the decayed and mounded over timber monuments at Balfarg, dated to c 2455 bc. Nonetheless, the henge format adopted at the very end of the third millennium seems to owe little to local practice. The form was adopted on most unsuitable subsoils, the ditches at both Cairnpapple (II:b) and Overhowden (IV:b) being cut into rocky brash, producing shallow profiles, and, at Cairnpapple, irregular depth. The unexcavated ditch at Weston (III:f) can be seen to be rock cut, and at 10m in breadth must be comparable in scale to the ditch at Stenness, 7m broad and 2m deep, its lowest metre rock cut. Weston, 62m by 36m, is slightly larger than the 44m diameter Stenness, and the 50,000 work hours calculated as necessary to dig the latter ditch (Ralston in Ritchie 1976, 50-52) would probably be an under-estimate for Weston. Orkney was equally an area without early ditch digging traditions, but quarrying of rock was a well established skill, and the cutting of ditches may have formed a variation on this means of expression of control over natural resources. The most flamboyant display of this power produced the 104m diameter ditch of the Ring of Brodgar, 10m broad and over 3m in depth, with its complement of tall standing stones (Renfrew 1979, 39-43). The choice for a proportion of the
henges of the study area may fit into this same pattern of emphasising the special qualities of locality.

10:5 Situation, slope and prominence

Virtually all the funerary monuments are located in areas of complex topography, and are situated on the brink of a slope, on a ridge, or terrace. To show this complexity each Catalogue entry includes a contour map covering a 500m radius around the sites. The range of relief within this area is listed in Table 10:4, so that actual altitude can be given local context. The mean range of relief for each funerary site within this radius is 83m, as against 56m for the Late Neolithic enclosures, in more level country. Only Stiddrigs (VI:8), Greens Moor (III:2) and Harlawmuir (III:6) in open moorland, have a more restricted range than the average for enclosures, and all are beside short, sharp slopes. The funerary sites with steepest local terrain are near the coast, at Haylie, Largs (I:1), Slewcairn (VI:2) and Redbank (VI:4). Each of these sites sit low in relation to their surroundings.

50% of the funerary sites are above the centre of the local range of relief, and there seems to be no correlation between this relationship and the steepness of local terrain. As absolute altitude rises, however, cairns tend to sit higher within their local terrain.
<table>
<thead>
<tr>
<th>Cat.No.</th>
<th>Altitude (m OD)</th>
<th>Relief Range within 500m (m)</th>
<th>Over 5km</th>
<th>Over 500m - 5km</th>
<th>Under 500m</th>
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<tbody>
<tr>
<td>I:1</td>
<td>30</td>
<td>0-190</td>
<td>39</td>
<td>18</td>
<td>43</td>
</tr>
<tr>
<td>2</td>
<td>150</td>
<td>124-210</td>
<td>8</td>
<td>38</td>
<td>54</td>
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<tr>
<td>3</td>
<td>215</td>
<td>160-240</td>
<td>13</td>
<td>56</td>
<td>31</td>
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<tr>
<td>4</td>
<td>230</td>
<td>160-250</td>
<td>56</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
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<td>265</td>
<td>205-276</td>
<td>53</td>
<td>0</td>
<td>47</td>
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<tr>
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<td>90</td>
<td>50-120</td>
<td>65</td>
<td>35</td>
<td>0</td>
</tr>
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<td>260</td>
<td>235-310</td>
<td>31</td>
<td>69</td>
<td>0</td>
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<tr>
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<td>240-290</td>
<td>65</td>
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<td>57</td>
<td>43</td>
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<td>250-350</td>
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<td>7</td>
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<td>0</td>
<td>40</td>
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<td>39</td>
<td>53</td>
<td>8</td>
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<td>11</td>
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<td>70-200</td>
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<td>210</td>
<td>155-266</td>
<td>16</td>
<td>56</td>
<td>28</td>
</tr>
<tr>
<td>10</td>
<td>60</td>
<td>30-105</td>
<td>15</td>
<td>85</td>
<td>0</td>
</tr>
</tbody>
</table>

Mean: 213m | 83m | 34 | 39 | 27
As shown on fig. 10:6, 50% of all funerary sites lie above 220m OD, nine of these sites being above the centre point in the local range, four at or below the centre. These proportions are exactly reversed for the 50% of sites at lower altitudes. It would seem that in the uplands cairns exhibit greater dominance over surrounding terrain than in the lowlands.

Assessment of visual prominence in the field, suggests, however, that any such dominance was very local. Profiles have been drawn of four cairns in the Biggar Gap Region (III:1-3, 6), the sections showing that actual summit situations have consistently been avoided, so that the cairns are not easily seen in silhouette. In the Nithsdale Region, where inland cairns are built with high proximal ends, these are emphasised by the cairns being set on the brink of a slope. In every case, however, rising ground behind the sites prevents a skyline view of these facades being achieved, and actual siting, as for example at Fleuchlargs (VI:7) and Cairn Avel (VI:1), is often inconspicuously low in the landscape. Other cairns are set back from the edge of the terrace, so that even the massive, high built cairn of the Mutiny Stones (IV:1) is invisible on approach from below until nearly reached. The only summit site, Macawston (I:7) is on a hill low in relation to surrounding countryside, so that from a distance the cairn is viewed against higher ground. Surprisingly, it is the henges, situated in relatively
Fig. 10:6 Funerary Monuments: Altitude and Dominance

(26 sites)
level country that have been found to occupy the more prominent locations. Cairnpapple (II:b) and Lindston (I:a) are summit sites; Weston (III:f) and Overhowden (IV:b) are on hillsides overlooking valleys; Normangill (III:e), Westside (III: g), Balwaistie (III:h), Swallowdean (IV:c) and Broadlea (V:a) are all on the terrace edge above a lower watercourse, as is Meldon Bridge (III:b), and all can be alternately looked down on from the hills above, or looked up to from the lower valley. The Blackshouse Burn enclosures (III:c,d), however, in a hollow among the hills, can only be viewed from above.

Cairn locations, on the other hand, while not dominant, are often dramatic. This applies in particular to the North Ayrshire sites, Dod Hill (I:5) atop the cliff-side of a widely visible basalt plug, Cuff Hill (I:2), on a rock ledge beside a spring, below another cliff, and Loanfoot (I:3), its proximal end above a sheer scarp beside a waterfall. Other dramatic landscape features can be mentioned, such as the ravine of the Harlaw Muir Burn, below the cairn on its ridge (III:6), the steep hillside down which a spring flows from beside the Broughton Knowe cairn (III:7), the narrow glen with waterfall and pool lying in front of the Mutiny Stones (IV:1), or the glacial moraine of ridge and hollow around Barndennoch (VI:10), Fleuchlarg (VI:7) and Cairn Avel (VI:1), masking the sites from view in certain
directions. There are, besides, some remarkable views from the cairns, which have been further analysed.

10:6 Outlook and local landmarks

Following Fraser (1983), fieldwork included measurement of the percentages of the horizon around each funerary monument that fell into categories of 'Distant', or more than 5km from the site, 'Restricted', or less than 0.5km, and 'Intermediate', between these limits. Each Catalogue entry gives these percentages, and the outlook is also shown graphically on contour maps. Table 10:4 gives the individual figures and overall averages which are compared with Fraser's results from the Orkney tombs, and with fieldwork carried out for the Bargreennan group of round passage graves in south west Scotland, in Table 10:5.

Table 10:5 Outlook from Cairn Groups

<table>
<thead>
<tr>
<th>% Outlook</th>
<th>S. Scotland</th>
<th>Orkney</th>
<th>Bargreennan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distant</td>
<td>34</td>
<td>38</td>
<td>25</td>
</tr>
<tr>
<td>Intermediate</td>
<td>39</td>
<td>37</td>
<td>49</td>
</tr>
<tr>
<td>Restricted</td>
<td>27</td>
<td>25</td>
<td>26</td>
</tr>
</tbody>
</table>

As the Table shows, the extent of each category of outlook from cairns in the study area is fairly similar to that from the Orkney sites, despite the very different
landscapes involved. The Bargrennan Group, however, set in hilly country, has reduced opportunity to achieve a wide extent of Distant landscapes, and this percentage is accordingly lower. The same effect can be observed among the inland Dumfriesshire cairns, which tend to have a below average extent of Distant views. Over one third of the cairns in the study area have 50% or more of Distant views, and limitations on this category would seem to derive from topography rather than site selection. There may be deliberate avoidance of sites with Restricted views, as only three cairns in the study area have as much as 50% Restricted outlooks, and six sites have no Restricted horizons. This result is the same for all cairn groups.

The views selected are also of very specific interest. In certain cases, as with the views of Arran obtained from Macawston (I:7), or of the Cumbrian coast and mountains from Dumfriesshire and Stewartry sites, the outlook may constitute a form of contact with neighbours. In the Biggar Gap Region there appears to be deliberate selection of views of Tinto Hill with its massive summit cairn, a priority seen both at funerary monuments and at henges, including a glimpse of the hill from the otherwise enclosed sites at Blackhouse Burn (III:c,d). Caverton Hillhead (IV:2) would have had a view up Teviotdale to Ruberslaw, and the narrow (7%) window of Distant views from the Mutiny Stones (IV:1) takes in the summit cairns on the landmark of Great Dirrington Law.
Some sites are in closer relationship to landscape features, as in the placement of Easton (III:3) on a ridge extending from the foot of the craggy Dunsyre Hill, or Capenoch (VI:6), on the saddle below Barr Hill. There is a certain ambivalence, however, in the avoidance of direct alignment onto such features. Loanfoot (I:3) may have its tail end aligned onto Loudon Hill, but the volcanic plug is only just visible over the neighbouring ridge; it is out of sight of High Hendryton (I:4), on its own side of the valley. It must also be acknowledged that there are many prominent hills and landscape features with no monument associations, such as those in the Lothian plain and many in the Tweed Basin. It may, indeed, be possible that some of these landmarks served as substitutes for man-made settings, with ceremonies being performed or deposits made on the flanks of hills with little in the way of formal structures (10:10:4).

10:7 Orientation and alignment

Fig.10:7 shows the orientation of twenty long cairns in the study area, omitting the two cropmark sites and three east-west cairns, High Hendryton (I:4), Biggar Common (III:4) and Caverton Hillhead (IV:3) of uncertain primary orientation. Preference for the east is strong, and eleven of the sites lie in the 90° segment between north east and south east, which Ashbee (1970) suggests
to contain four fifths of English long barrows. Burl (1981b) draws attention to regional variations in orientation, but notes that Clyde Cairns and Irish court cairns tend to lie between north north east and east south east. The present group certainly lies to the north of east (seven sites) rather than to the south of east (four sites), but not one cairn is aligned north north east, which Burl points out to be the direction of midsummer sunrise.

On Arran Burl shows (ibid, 253-4) that only two out of twenty two cairns face east or south, between 55° and 255°, the preference here being for the north, with ten sites facing between 325° and 55°, and west, with seven sites between 230° and 300°. Four cairns in the study area face north, and two north west, but in four cases the direction seems to be chosen to utilise rock outcrop. Three of these six cairns face uphill, as do five of the eleven cairns facing easterly, and topography seems to be as important here as orientation. It is possible that the significant factor was the views to be obtained from the proximal end of the cairn, looking downhill, over the tail.

The three cairns around the Keir Hills are unconformable with the remainder in having an identical alignment of 205°, to south south west; the cropmark barrow at Barndennoch (VI:10), to the east of the hills, probably had its broader end at c 235°, to the south west. In these cases the ground falls away in front of the
Fig. 10: Orientation of cairns in the South of Scotland (20 sites)
cairns, giving distant views in this direction. Morphologically similar high trapezoidal cairns in other districts, the Currick (V:3), Cairn Avel (VI:1) and Cairn na Gath (WIG 5) do not share this orientation, although it is repeated by the West Gallaberry (VI:a) and Holywood II (VI:b) cursus enclosures, but not the other cursus sites, of lower Nithsdale. It is also in Dumfriesshire that stone circles show a recurrent interest in the south west (see 9:6:7).

The south west emphasis seen at Balfarg henge (Mercer 1981(a)) is little in evidence at henges in the study area. Only Weston (III:f) and Balwaistie (III:h) have south west - north east alignments, with entrances to the east or south east and north west more common; Cairnpapple aligns north to south. Harding (1981) suggested that the Milfield Basin henges were aligning onto skyline features, but an appropriate summit in the study area has only been observed at Swallowdean (IV:c); the pit circle at Cairnpapple, rather than the henge, aligns with a local hilltop. In general layout appears to correlate with the lie of the land, facilitating approach.

Blackshouse Burn II (III:d) has its probable entrance to the south east, here opening onto the main, north west entrance of the large enclosure (III:c). The north west recurs at Meldon Bridge, where the avenue is aligned north west to south east. The alignment here could be onto the summits of Hamildean Hill and Cademuir
Hill, although MacKie (1981) suggests calendrical implications to be involved, utilised also at Castlerigg stone circle in Cumbria. The Forteviot avenue aligns north north west to south south east, and that at Dunragit south south west to north north east, so there is no regularity of astronomical involvement.

10:8 Inter-site relationship

10:8:1 Funerary site relationships

Despite probably high levels of site destruction already discussed (2:3), some regularities of relationship do seem to be observable. Eight of the funerary sites in the Catalogue (31%) are records new since the publication of Henshall's 1972 compendium, and it is of interest that these discoveries tend either to fill in, or to extend, previously known groups. The cairn at Macawston (I:7) may be set alongside other newly identified sites in south Ayrshire, on Balnowlart Hill (RCAHMS 1981(b), 8, no.12), on Loch Hill (ibid, 7, no.5) and at Craigance (ibid, 7, no.4) as creating a new site grouping.

The two most isolated cairns in the study area are both exceptionally long examples, in the Tweed Basin Region. Total removal of the 100m long mound at Caverton Hillhead (IV:3) itself offers some explanation of this position in demonstrating the effectiveness of local
agricultural practice in the removal of all traces of such monuments from cultivated ground. Although the grasslands of the Southern Uplands can provide excellent conditions for the preservation of slight archaeological remains, the cratered state of the cairn on Broughton Knowe (III:7) shows how stone monuments could attract destructive efforts. The Mutiny Stones (IV:1), however, in heather moorland on the Lammermuirs, must always have been an isolated site.

Two new identifications in north Ayrshire, High Hendryton (I:4) and Dod Hill (I:5), have reduced the 26km gap between Loanfoot (I:3) and Cuff Hill (I:2) to lengths of 3km, 17km and 11km. A missing site in the longest stretch might be suggested for the Lochgoin area, where a find of a Duggleby adze with a projectile point raises an echo of the Biggar Common burial (III:4). Equally, there may have been lowland components to the set, perhaps represented by some of the flat-topped mounds discussed by Linge (1987), or by an oval mound, such as that at Kennox Moss (C:1), 9km south of Cuff Hill.

The most nearly contiguous set of sites, representing, perhaps, original spacing patterns, consists of three cairns and a cropmark barrow at distances of 2.8km, 3km and 3.8km, apart, around the Keir Hills. A lost site might be suggested for the 6.4km space between Capenoch (VI:6) and Barndennoch
(VI:10), on the north east side of the hills, and there is another possible long mound at Gledbrae (C:10), 5km west of Capenoch.

There are indications from other areas that this Keir Hills clustering may not have been atypical. In the Irvine valley, High Hendryton is only 3km from Loanfoot. In the Borders, Lang Knowe (V:2) is 3.6km from the Currick (V:3), in turn 3.8km from Lamb Crag, where there is a record of a 'cremation trench' and of long cairns (Masters 1984). The three sites around Criffel, Lochhill, Slewcairn and Redbank (VI:2,3,4) are 5.75km, 4.25km and 7.5km apart respectively, and may be the residue of another Keir Hills grouping around a central hill massif.

Survival in the Biggar Gap Region has been weighted towards areas of heather moorland, and the distribution is likely to represent partial survival only. Thus Harlawmuir (III:6) is 11km from its nearest neighbour, across agricultural land, and Biggar Common mound is 8km from another cairn. Original spacing may have been closer to the 5km between Burngrange (III:1) and Easton (III:3) and 4.5km between Brownsbank (III:5) and Broughton Knowe (III:7). Burngrange and Greens Moor (III:2) are unusual in the study area in being only 750m apart, intervisible across the Westruther Burn. Greens Moor might appear, at 83m in length, to be the later site, but is so likely to have had earlier phases
incorporated as to make the observation unhelpful. Each site occupies a separate landscape of small and large round cairns, Greens Moor overlooking the slopes above the North Medwyn, while Burngrange lies in the valley of the Westruther Burn. Similar pairings at Mid Gleniron (Corcoran 1969(a)) and at Cairnholy (Piggott and Powell 1949), where cairns are 450m and 150m apart respectively, involve such closely similar structural details and sequences as to argue for contemporaneity. Each cairn of these pairs looks out over a different area of valley ground from that of its neighbour, suggesting separate territorial interest.

A 3km to 5km spacing between cairns thus seems to have been a common pattern. It recurs on Arran, again with some paired sites (Henshall 1972) and among the Bargrennan group of round cairns (Murray 1992), as well as in the Luce valley, in a more linear layout. Such regularity suggests close identity between cairn and social grouping, although the spatial relationship to particular 'territories' is not prescribed. Cairn pairings suggest neighbourly relationships between groups, but other sites on higher hills may have been peripheral to settlement. There remain questions, however, over the social role of the more isolated cairns, as well as over areas without recognised funerary monuments.
The close clustering of monuments seen, for example, among Irish passage graves, is not generally characteristic of the earlier neolithic of mainland Britain, although, as Cooney (1990) points out, a pairing of cairns with multiple chambers, such as those at Mid Gleniron, does create a 'cemetery' area, in this case consisting of five chambers. There are, however, areas with clusters of henges, such as those in the Milfield Basin, which have been dubbed 'Ritual Landscapes' (Harding 1981). There are also site groupings, as at Dorchester-on-Thames (Atkinson et al 1951), which appear to have been cumulative over long periods of time. Such associations, including long mortuary and cursus enclosures, henges and ring ditches, are now being widely recognised, for example in the English Midlands, as a result of aerial photography (Loveday 1989), 72, fig.4:10). The only possible example of such a 'ritual landscape' in the study area occurs in Lower Nithsdale, where five cursus-related enclosures, a series of pit alignments, three stone circles, two henges and several ring ditches have been recorded (see VI:a-h; VI:ix, fig.VI:iii). The inter-site relationships here are of particular interest.

The central grouping consists of the two Holywood cursus enclosures, each with internal ring ditch, 160m apart, and the Twelve Apostles stone circle, 250m to
the west, across a small valley. Alignments and small ring ditches on the farm of Holm, 1km to the east, where a stone circle is also recorded, may have constituted an even denser distribution of features, as yet unelucidated. The northern Holywood cursus, however, may be part of a wider landscape linkage, in that it aligns onto a pair of ditches, possibly a longer cursus, at West Gallaberry, to the east of the Nith, and, in the opposite direction, the line passes through the Twelve Apostles to reach Easthill stone circle, 6km to the south west.

Such patterns could be interpreted as suggesting large scale landscape organisation. It must, however, also be possible that individual monument building groups obtained power and prestige for their constructions by the incorporation of such links. The second interpretation is favoured by the dispersed nature of the remainder of the Nithsdale set, with the Curriestanes, 'ovate' cursus 5km south of Holywood, and the Fourmerkland double pit alignment 3km to the west, both on east-west alignments. 4.5km to the north is the pitted avenue, small henge and ring ditch at Dalswinton Mains; 4km to the east, the Greystones stone circle; and 8km to the south the Pict's Knowe henge. The impression is one of individualist participation in a locally divergent monument building practice, at distances very similar to those of the funerary groupings.
It may be noted, besides, that the monument types around Dumfries appear also to have influenced a wider regional picture. At Bowhouse, 10km to the south, on the east side of the Nith, is a pitted alignment of possibly neolithic character (VI:ix); at Shillahill, 15km to the east, there may be another ditched cursus; the Redbank bank barrow (VI:4) lies 16km to the south, on the west side of the Nith estuary; and 10km to the north west is the ditched barrow at Barndennoch (VI:10). In some senses the Nithsdale Region can be viewed in terms of a 'core' and a 'periphery'.

10:8:3 Late Neolithic enclosures: inter-site relationships

Problems over the identification both of henges and of other forms of Late Neolithic enclosure were discussed in section 9:6:5, and it is clear that characteristics of the distribution pattern presently discernible must be accepted tentatively and in full recognition of probable future revision.

Two types of distribution in the study area can be identified. In the first place, there is a series of isolated henges, all at a distance from similar sites, and, indeed, from earlier neolithic funerary monuments. Lindston (I:a) is in a part of south Ayrshire from which few artefacts are recorded, and Cairnpapple (II:b) is set among hills, away from coastal sites with
pottery. Swallowdean (IV:c) and Broadlea (V:a) likewise are peripheral to nearby areas with evidence of neolithic occupation. All these sites, however, follow prescriptive formulae, to produce a very regular henge morphology of Class II, or, at Lindston, of Class I type.

In the Biggar Gap Region, on the other hand, the henges, apart from Normangill and the possible site at Hillend, are all within 5km of earlier funerary sites. They also maintain a close spatial relationship with each other, each site lying within 7km of another henge (III:ix). There is no intervisibility between the sites, whose distribution could well be interpreted as being territorial.

The two Late Neolithic enclosures, sited at opposing ends of the Biggar Gap, are very differently located in relation to the henges. Meldon Bridge (III:b) is isolated in a narrow valley among steep hills, its nearest neighbour the possible henge at Rachan Slack, 11km up the Tweed. Such isolation must, however, be seen against the position of the enclosure at the hub of a valley system, the Tweed, Lyne, Meldon Burn and Manor Water all meeting at the two promontories of Sheriffmuir and Meldon Bridge. Blackshouse Burn (III:c), on the other hand, secluded among encircling low hills, is central to a distribution of Late Neolithic sites, including the contiguous 'henge' of Blackshouse Burn II (III:d), three other henges within a
10km radius, and the site at Wellbrae (Table III:4:11), 1.5km away across Swaites Hill, with a long history of pit deposition, and an enclosure phase apparently attributable to grooved ware users.

10:9 Relationship to settlement

The only clear instance within the study area of direct spatial relationship between a monument and a near-contemporary settlement is on Biggar Common, where, about 100m from the long mound (III:4), plain bowl pottery, lithic material and stone axes have been found in association with a post built structure, possibly a long house. The pottery is similar in type to that under the mound, dated to c 3250 BC, and many more sherds, and lithic material, including leaf arrowheads, have been collected from the hill. The dates from the hearth are exceptionally early (cf. Herne 1988), and this would seem likely to have been the earliest feature with pottery associations on the hill. The probable sequence would thus appear to be one of the mound, or simple monument, preceding occupation, a reverse of the pattern which sees settlement sites re-used for monument building, as, for example, possibly occurred at Ballyglass, Co. Mayo (O'Nuallain 1972). Dates and more published information on this settlement would be helpful, and with neolithic pottery also being found
on the river terraces beside the Clyde below the hill (Table III:1:3), and a probable interrupted ditch enclosure on the bank of the Clyde at West Lindsaylands (III:a), it would appear likely that early neolithic settlement was also occurring on lower ground. The only other probable interrupted ditch enclosure in the study area, at Sprouston, beside the Tweed (IV:a), is near the cropmark of another possible long house in a riverside situation more usually expected of such structures (cf. Balbridie: Ralston 1982; Lismore Fields: Garton 1987).

The small cairnfields around some of the long cairns were noted above (10:3) in terms of the relationship of these sites to cultivable land. There are also present occasional hut circles, probably of the first or second millennium, and ring ditch houses, again of first millennium origin. Such remains are informative on prehistoric settlement choice. Of particular interest is a group of structures 100m east of Burngrange long cairn (III:1), just out of sight, on a sheltered terrace below the hill slope. There are two stone walled hut circles, a small, perhaps later, structure, and two heather covered circular platforms suggestive of house stances. The site seems a promising one in terms of early settlement. On the other hand, best views of the cairn are obtainable from the peat-covered lower terrace, towards the Westruther Burn, where some
lithic material has been found, and any settlement traces would be well concealed.

The Biggar Gap and Nithsdale sites all appear suitably placed to have been adjacent to settlement. The Borders' cairns and the Mutiny Stones are on higher hills, perhaps at the upper limits of a settlement territory. The north Ayrshire sites, on the other hand, appear to have been deliberately placed in situations remarkable for their dramatic landscape features, presumably secluded from actual settlement locations. There may be genuine contrasts in Regional preference and practice here, for which no global generalisations can be made.

The Late Neolithic enclosures, despite a consistent association with good agricultural soils, are not necessarily centrally placed in relation to settlement. Cairnpapple (II:b) and Lindston (I:a) are on hill summits, while Weston (III:f) and Overhowden (IV:b) overlook valleys from above. Side valleys, out of sight of the main corridors, are used by Normangill (III:e), Balwaistie (III:h), Broadlea (V:a) and Pict's Knowe (VI:g). Equally, Blackhouse Burn (III:c,d) is tucked away in a hollow among low hills, although the surrounding hill slopes appear to have been well used by early agriculturalists, and Meldon Bridge (II:b) is in a narrow valley, unlikely to have supported a large population.
Possibly indicative of settlement is the lithic material that has been collected near Normangill and Weston henges. Lithics can, however, involve ritual rather than domestic contexts, as with the material collected around Overhowden, which must be considered under a separate heading.

10:10 Monuments and artefacts
10:10:1 Artefact associations of funerary monuments

Except in the case of the two Later Neolithic burial pits in Biggar Common long mound (III:4), artefactual recovery from funerary monuments in the study area is sparse. Pottery from Slewcairn (VI:2) and to a lesser extent, that from Lochhill (VI:3) was badly shattered. 'Earthen urns' said to have come from Haylie cairn may well, in the tradition of Clyde Cairns, have been neolithic; a flint knife from this site is also a common type of find around the Firth of Clyde. An urn containing burnt bones, possibly associated with High Hendryton long cairn (I:4) is, however, as likely to have been a bronze age cinerary urn. Flint knives, scrapers and leaf arrowheads were also found at Slewcairn, both in the forecourt and in special deposits in the mortuary structure, but at Lochhill only a few chips of flint were found. Records of finds from a
cairn or cairns on Barndennoch could refer to the cropmark long barrow here (VI:10); these comprise an axe of Shetland riebeckite felsite, a pitchstone barbed and tanged arrowhead, and a plano-convex flint knife. The only other finds from long mounds are a clay bead and a piece of copper said to have been found when cists or chambers were being demolished at Cuff Hill (I:2).

There are also some records of finds less directly associated with monuments, but nonetheless perhaps involving linkage. A stone axe, a battle axe and a bronze flat axe are all said to come from the farm of Harlawmuir (III:6), and a large, stone axe comes from Byrecleugh farm, on which the Mutiny Stones cairn (IV:1) is sited. Another stone axe comes from Barr Hill, on the saddle below which is Capenoch cairn (VI:6), and two axes come from the ridge on which Caverton Hillhead (IV:3) is sited. There is an axe from Dunsyre Hill, which overlooks Easton cairn (III:3), and another from New Abbey, at the foot of Lochhill (VI:3), from where there is also an ovoid macehead and a biconical incense cup. Despite all these neighbouring finds, clear evidence for axes being found in long or chambered cairns in Southern Scotland remains rare (Henshall 1972, 305, 307).
Artefact associations with enclosures

Neolithic artefacts from excavation at Cairnpapple were few (II:b), as were those from Balfarg (Mercer 1981(a)) and North Mains (Barclay 1983). Two pottery sherds and two stone axe flakes were classified by Piggott as residual finds; one of the sherds may, however, have been grooved ware, while the axe flakes were of Group VI and Group VII stone, the latter, from Graig Llwyd, the only find of this material in north Britain. Lithic finds were few, but two bone or antler pins were recovered with cremated material from the 'cremation cemetery'.

One petit-tranchet derivative arrowhead has been found within Overhowden henge (IV:b), an outlier from a dense distribution of such pieces and other lithic material centred on an area about 200m from the henge. A piece of jet bangle was picked up within Swallowdean henge (IV:c). Grooved ware found in a pit just outside the entrance to a circular ditched enclosure at Hillend provides reason to suppose the site to be henge-related (Table II:4:10).

Pits within the enclosure at Meldon Bridge (III:b) contained impressed ware and in one case a stone axehead, but few lithics. Dates suggest that some at least, and possibly all these neolithic pits pre-date erection of the perimeter stockade. A similar sequence occurs at the small, rectangular enclosure at
Wellbrae where both western neolithic pottery and impressed ware, besides lithics, were deposited in pits before the enclosure ditch was dug, apparently concurrently with the deposition of grooved ware (Table III:4:11).

Finds are also made in the vicinity of henges, which may, in some instances at least, be related. The petit-tranchet derivative arrowheads from Overhowden have already been mentioned; there was also found half of a flint macehead, higher up the hill, about half a kilometre from the henge. An axe and an axe-shaped stone have been picked up near Cairnpapple (II:b); a large Group VI axe was found across the Water of Mein from Broadlea henge (V:a); an axe is recorded from Mabie Moss, adjacent to Pict's Knowe (VI:g); three axes come from Bizzyberry Hill, above Balwaistie henge (III:h), and another five, including three over 200m in length, from Biggarshiels, immediately to the north. On the farm of Lyne, adjacent to Meldon Bridge, a cup-and-ring marked slab and an Early Bronze Age halberd have been found.

Large numbers of axes from around the Holywood cursus complex suggest that the area, and perhaps therefore the monuments also, were active in the procurement of axes from Cumbria, just across the Solway. There are eight sectioned Group VI axes from around Dumfries, besides others possibly of the same
material. Findspots do not, however, coincide with monuments. Two or three axes are said to have been found in the Nith, one from near its junction with the Cluden (NX 97NE 34), and two large Group VI axes come from farms beside the Nith, between the West Gallaberry and Holywood enclosures (DMF 13, 15). A recent find of early neolithic pottery and axe flakes, probably including Group VI material, comes from the bank of a stream at Carzield on the edge of the flood plain of the river, just south of Gallaberry (A. Sheridan, pers comm). Other finds come from either side of the river in Dumfries town (NX 97NE 23, 39, 44). A Group VI axe was found, its blade embedded in the ground, in a rock shelter known as 'Pulpit Rock' in Maidenbower Crags on the south east side of the town (DMF 3). Other Nithsdale finds associated with rocks are the jadeite axe from Mains of Southwick (Archaeologia 7, 1785, 414-7), and a set of axes found at the 'Siller Stane', beside a spring above Barndennoch barrow (VI:10). The implication would seem to be that axe deposition was a separate activity from ceremony at monuments, involving performance at special locations of another kind. Axe deposition as a form of neolithic ritual is considered in section 10:10:4, after a discussion of patterns of relationship between monuments and axehead distributions.
Axeheads: distribution patterns and relationship to monuments

Polished stone axes offer one of the most reliable indications of a neolithic presence, thus acting as a measure of settlement distribution. As already discussed (2:5:2; 8:6) the correlation is distorted by post-depositional effects influencing recovery rates, and by the many different factors shaping original deposition patterns. The long chronology of axe usage must detract from any certainty of equivalence between monuments and artefacts. Nonetheless, axehead densities, being largely independent of evidence derived from monuments, must furnish possibilities of setting the monuments within a settlement context.

Records of provenanced stone axes from within the study area have been collected from museum records and published sources, and Regional distributions are discussed in the Gazetteer. The information is summarised in Table 10:6, giving numbers of finds from each Region and density of finds in relation to the extent of 'improved land' as mapped by Ordnance Survey in 1953. Such a classification, however, includes land of very different potential in terms of artefact recovery. Arable areas of the Lothians and the Tweed Basin will furnish more finds than improved grassland in Dumfries and Galloway and Ayrshire, while the depth of soils in the Ayrshire Basin and on the Lothian plain will
conceal finds that would be revealed on the slopes of the Biggar Gap Region or the valleys of the Tweed Basin.

Giving all due weight to these provisos, it is nonetheless clear that density of axehead recovery in the Biggar Gap Region is exceptionally high, and that finds from the Tweed Basin, the second most prolific Region, are also considerably greater than those from other Regions. In the Biggar Gap this recovery correlates with the presence of both earlier and later neolithic monuments. The number of finds from the Tweed Basin is, however, out of all proportion to the

Table 10:6 Flint and Stone Axeheads in the South of Scotland, by Region

<table>
<thead>
<tr>
<th>Region</th>
<th>Axe Numbers</th>
<th>Density per 100km²</th>
<th>Axes over 190mm</th>
<th>% of large axes*</th>
<th>Flint Axe Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Improved land</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>120</td>
<td>5</td>
<td>13</td>
<td>14</td>
<td>7</td>
</tr>
<tr>
<td>II</td>
<td>100</td>
<td>8</td>
<td>8</td>
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<td>15</td>
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<td>23</td>
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<td>4</td>
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<td>1</td>
</tr>
<tr>
<td>VI</td>
<td>120</td>
<td>7</td>
<td>16</td>
<td>23</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>830</td>
<td>10</td>
<td>96</td>
<td>15</td>
<td>41</td>
</tr>
</tbody>
</table>

* Percentage relates to numbers of axes for which lengths are known
scatter of monuments in the Region. Apparent coincidence of monuments and axes in Lauderdale, does not offer close coincidence between actual findspots and the location of the henge at Overhowden (IV:b) or the pitted enclosure at Lauder Barns (IV:ix). A density of finds from the south of the Tweed is matched only by the records of one long mound (IV:3) and some possible stone circles (Table IV:3). The weighting to this area may relate to import routes over the Cheviots, and certainly, as in the case of the Biggar Gap finds, figures are inflated by the local record of collection in the area. Nonetheless the presence of axes must relate to an axe using population at some stage during the Neolithic. Either the monuments, like Caverton Hillhead long mound and so many of the stone circles, have been destroyed without leaving recognised trace, or the construction of permanent monuments was not integral to the Neolithic of the Region.

The low density of recovery in the Nithsdale and Borders Regions is surprising in view not only of the numbers of monuments in these Regions, but of proximity to sources in Cumbria; the Biggar Gap and Tweed Basin material might be supposed likely to have travelled through the southern Regions. Finds cluster at the mouths of rivers, notably the Dee, the Nith and the Annan, suggesting close correlation with import from Cumbria. The same traffic presumably explains the heavily coastal bias of the finds from western Galloway, in the
Machars, Luce Sands and the Rhins (Ritchie 1987). There are high percentages of very large axes, and a number of Group VI rough-outs from these Regions.

The percentage of large axes is slightly lower in the Tweed Basin Region than on the Solway, and very much lower in the Firth of Clyde, the Biggar Gap and, in particular, the Lothians Region. The pattern would seem to correlate with increasing distance from the Cumbrian sources, but cannot be taken as a direct reflection of such movement. The low density of axe finds from the south of the Firth of Clyde Region appears to represent the general limit of Cumbrian distribution in this area, and the greater density of finds in the north of the Region may be largely made up of locally sourced axes. In the Lothians, the greatest density of distribution is coastal, and while such finds do include some probable Group VI axes, possibly imported from eastern England, there may be a use of northern sources, particularly Killin, Perthshire, the products not, as yet, identified. A cluster of axes in the Esk valley may be noted, as suggesting a link between the Firth of Forth and the Biggar Gap Region. The Monktonhall cursus at the mouth of the river may be related to use of this routeway.

It is clear that while there is some correlation between monuments and axehead distributions, notably in the Biggar Gap Region and in Nithsdale, the coincidence is by no means uniform, and there are many areas, in
particular, the Tweed Basin where axe densities and lithic finds must suggest the presence of populations not building monuments. One factor which needs to be considered in this regard is the practice of artefact deposition as an alternative form of ceremonial.

10:10:4 Ritual deposition of axeheads

Instances of pottery deposition, at chambered tombs, in pits, and at enclosures, have already been discussed by virtue of the chronological information that pottery carries. Axeheads, on the other hand, are generally chronologically insensitive, and the lack of archaeological context for most of the finds of the study area has precluded any consideration of the sequence of deposition practice. There is a general recognition that recovery of axes from lakes, river and bogs is likely to relate to practices of deposition in watery places that recur throughout prehistory, but the perception cannot be used to classify particular finds as being ritual offerings; loss of artefacts in such locations would itself preclude easy recovery. Use of axes for forest clearance may result in losses away from settlement, so that remoteness of location is not, in itself, proof of ritual deposition.

An alternative approach to the examination of such practices, is to consider the distribution and circumstances of recovery of prestige artefacts.
Original value may have depended on factors of history and association, not recoverable by archaeological means, but large, handsome and finely worked pieces, at a distance from source, are likely to have carried intrinsic value, which could be realised either for exchange purposes (gift exchange; bridewealth), or in ritual gestures. The general absence of axes from funerary contexts (10:10:1), except in the specific case of the Yorkshire flint axes, suggests that, unlike flint knives, they were not regarded as appropriate grave goods, and perhaps not as personal possessions. The piece of jade axe from the chamber at Cairnholy I was small and abraded, and its value may have lain less in its status as a fragment of an exotic axe than in its symbolic role as a treasure handed down from earlier generations.

Other jade axes, however, appear in pristine condition, and in terms of distance from source material across the Alps in Piedmont (Ricq-de-Bouard 1993), must have been among the most highly esteemed pieces. The eight such axes from the study area are discussed in individual Gazetteer entries. These are highly polished, distinctive pieces, five of them falling into Smith's (1963) Class I category of thin, triangular forms, two Class II axes, from Glasgow and from Berwickshire, also being large and finely polished, with only a small dumpy axe from Penicuik (NMS; AF262) not being obviously a prestige piece. The Glasgow axe, found below St.
Enoch's Church in the eighteenth century, 'in a canoe' at a depth of 7.6m beside the Clyde, and that from Mains of Southwick, Kirkcudbright, found in a hollow in a rock (Smith 1963, nos.53, 52) must both have been deliberate deposits. An axe from near Douglas Castle (not Castle Douglas as previously published: Murray, forthcoming), had been snapped across, probably in antiquity. This specimen, from a valley with no records of neolithic axes or other artefacts, together with two from Cunzierton in the Cheviots and one from Greenlawdean, on the southern Lammermuirs (ibid, nos.51,58,59,45), may all be regarded as peripheral finds.

The same classification is not applicable to most of the flint axes, even the very fine, large, all-over polished specimens discussed by Sheridan (1992), as being probably of south Scandinavian flint, and both found near the Firth of Forth. Peripherality would not be expected of the axes of Seamer or Duggleby adze type, which constitute most of the finds from the Firth of Clyde and Biggar Gap Regions, and which find a context in burial, as on Biggar Common (III:4), alien to most neolithic axes (Kenworthy 1977). Twenty four of the forty one flint axes from the study area come from the Tweed Basin, and twenty of these are less than five inches (127mm) in length, and may most appropriately be regarded as an aspect of the distribution of smaller lithic finds in this Region.

The Tweed Basin does also, however, display an
interest in fine and large axes, with four of the jadeite finds, an axe of polished white quartz from Ladyflat, near Duns (NMS: AF681), and a number of large 'Cumbrian Clubs'. These axes are discussed in the Gazetteer (IV:vii) as showing a strong correlation with upland areas, including some prominent peaked hills, such as Ruberslaw and the Dunion. 18% of the axes of known size in this Region are over 190mm in length (see Table IV:2), a proportion only exceeded on the Solway, closest to the Cumbrian sources.

In the Biggar Gap Region, with 11% of sized axes being of equivalent length, there is again a correlation between size and upland locations, and three of the largest axes come from the flanks of Tinto Hill (Table III:3). This is a pattern not seen in other Regions, where finds of large axes show preferential association with lowland areas, particularly the coasts, and many come from 'watery' places.

Wetland deposits and finds of axes from rivers and streams occur in every Region. There are two axes from the lower Clyde, one the jadeite axe 'from a canoe', the other of possible Perthshire origins. There is also a record of 'six stone celts' with 'an oaken war club and a considerable piece of deer's horn' being found in a canoe on the north side of the Clyde (Buchanan 1870, 77). A piece of flint axe comes from the River Irvine, and an exceptionally large axe from the River North Esk, near
Roslin. Four of the Biggar Gap finds come from rivers, as do four of the Tweed Basin finds. A large, broken Group VI rough out was found protruding from the bank of the River Annan near its mouth, and, as already mentioned, there are records of three finds of axes from the River Nith, besides others from 'mosses' near the estuary, and one axe from the Kinnel Water.

Finds from peatland mosses are even more numerous, and include several instances of group deposition. Four axes found together at Fairslacks, near Carlops, on the south Pentlands, are all small and mostly weathered and chipped (NMS: AF510-513), as were three axes found together in Biggar Moss, a little further south (Biggar Museum 26-28/25/88). An interesting contrast in 'values' is seen on the Solway, where three 'Cumbrian Clubs' found together at Bogue Knowe, near Southwick, were all fine, large axes (Ritchie and Scott 1989, KRK 16,17,18), and another set of slightly smaller 'Cumbrian Clubs' are said to have been found together at Twynholm motte, near the Dee (ibid, KRK 10,11,20). A recent find of Grimston bowl pottery with axe flakes, probably including Cumbrian stone (10:10:2) must suggest early movement of axes from the Langdale Pikes to the Nith, although it is not known whether the series designated 'Cumbrian Clubs' by Fell (1964) can be assigned to any particular period.

It may be concluded that the deliberate deposition of axes, like that of pottery, was an important activity
in neolithic Scotland, although variability of practice, and of the symbolic status of the pieces deposited, suggests that habits of deposition carried very different meanings locally. A type of ceremony is here documented, however, for which monumental setting seems to have been superfluous.

10:10 Beaker relationships

In spite of the poor correlation between beaker typology and chronological sequence evinced by the British Museum programme of dating (Kinnes et al 1991), there would appear to be evidence from the study area to support the sequences of Lanting and van der Waals, as set out by Burgess (1980, fig.2:12). In particular, there are associations between impressed ware and AOC beaker, discussed in sections 8:3 and 9:6:2, besides a burial with neolithic axe and bell beaker, again with associated AOC sherds, in the Biggar Common mound (III:4), all of which must uphold the primacy of these forms. Dates with step 4 beakers from Boatbridge Quarry (Clarke et al 1984) confirm a horizon of c 1800 bc – c 1700 bc for this stage.

Case has suggested (1977) that AOC may have been a long lived style among sand dune communities, but in the East Lothian sites, at Shewalton, and on Luce Sands, there are ample finds of Late Neolithic pottery, besides beaker, to suggest that early forms of the latter could have
been absorbed into a Late Neolithic culture, as seen at the Biggar Common mound. Other finds of AOC tend either to be directly associated with impressed wares, as already discussed for Drumelzier cairn and Muirkirk ring site, or to be close to contexts of Late Neolithic activity, as under Harehope cairn (Jobey 1980) or at Kirkburn (Cormack 1963(a)). Finds from Bathgate sand quarry lie 4km south of Cairnpapple (II:b).

Association of beaker with larger monuments, tends, however, to implicate later styles. Sherds of a Step 5 beaker were scattered along the spine of Lochhill cairn, while at Dalladies a Step 6 beaker burial was placed into a massive cist built into the top of the barrow (Pigott 1972). The handled beaker found under a small cairn on the hill overlooking Biggar Common mound may date from as late as c 1500 bc, by analogy with the handled beaker central to Balfarg henge (Mercer 1981(a), 133-6). It is possible that the refurbishment of the facing side of the long mound, cut back, and stone covered to give it the appearance of a long cairn, could be associated with the beaker burial, showing continued concern with the appearance of the earlier monument. A Step 4 beaker burial beside a stone hole at Cairnpapple (II:b) has been suggested possibly to be associated with the erection of a stone in this pit, which may formerly have held a timber upright (9:6:7). Building of the North Grave here, with Step 5-6 beakers, had involved dismantling of the
'cove', but Morton (1990) suggests that the burial may have been secondary to the deposition of the central food vessel under this intrusive cairn.

There are other, less direct, associations of beaker and henges, such as the cist at Newbiggin Quarry, overlooked by Weston henge (III:f), and a cluster of beaker cists around Swallowdean (IV:c), three falling within a 4km radius of the henge. There has been little exploration of the interior of these sites, and small scale trenching at Blackshouse Burn enclosure (III:c) turned up beaker sherds. No beaker was found, however, in much larger scale investigations at Meldon Bridge (III:b), despite its presence at the nearby Harehope cairn.

A large cluster of beaker cists in eastern East Lothian (II:x) may suggest settlement shift, after c 1800 bc, into an area with little evidence for the Neolithic. To the west, however, there are sand dune sites prolific with pottery, and Traprain Law has furnished many neolithic artefacts, so that the apparent absence of monuments in this area may be the effect of chance. Another cluster of beakers comes from the Kelso area, rich in artefactual finds, including axes, and with apparently earlier neolithic monument types at Caverton Hillhead (IV:3) and Sprouston (IV:a), although there may also be Late Neolithic activity at this latter site. The only beaker finds from Lauderdale, however, with its
prolific artefactual recovery, henge and pitted enclosure, is a doubtful sherd. While much continuity from Late Neolithic to beaker does seem to be present, patterns followed are of great variability and unpredictability.

10:11 Ritual landscapes: Neolithic to Bronze Age

The long sequence of use revealed at Cairnpapple henge only finds a possible parallel at Balwaistie (III:h), where a ditched barrow, 200m from the Class II henge, could be overlying a Class I site. Such sequences can, of course, obliterate all surface traces of earlier monuments, and other examples may exist, unrecognised, perhaps for example, at Newliston, where the 30m mound of Huly Hill is set around by standing stones (II:viii). There is, however, little visible evidence for accretion of use at henges, other than a possible small cairn at Weston (III:f). It must be remembered, however, that the Meldon Bridge promontory showed no sign of funerary activity before excavation of the enclosure (III:b).

The long cairns, by contrast, appear in some cases to have acted as 'founder cairns' for later cemeteries. The building of round cairns over long has been discussed above (9:7) in terms of the chronological evidence provided by the sequence. Small round
cairns also occur directly beside Loanfoot (I:3), Windy Edge (V:1), Stiddrigs (VI:8) and Barndennoch (VI:10), as well as on Biggar Common, as already discussed (10:10). Excavation of a small round barrow 15m from the tail of Broughton Knowe long cairn (III:7), was unable to establish either its date or the nature of any burial deposit below it (Ward 1970). At Broughton Knowe, however, a string of small barrows stretch up the hillside overlooking the long cairn from the south, and there are more such sites on the north side of the hill, out of sight of the cairn. Whether these barrows relate to the Neolithic or later, they are likely to post date the long cairn, whose presence may have influenced the location of the cemetery.

Equally, around Burngrange (III:1) and Greens Moor (III:2), besides the small cairn fields already mentioned, there are a number of large, often impressive round cairns and one round barrow. Intervisibility is maintained with the long cairns, again suggesting that these acted as founder sites, marking the area out as a place for burial. These hillsides, with their small cairns and settlement sites, were not kept exclusively for funerary use, but burial under visible marker cairns was clearly regarded as an appropriate mode in this area. There is, however, another major cemetery area on the South Pentlands, at Slipperfield (RCAHMS 1967, 53-4, nos.16,17; 56-7, nos.46-8), with no identifiable neolithic site. It must, at present remain an open
question as to whether this ridge was also used during the Neolithic, or whether such cemeteries had no need of earlier histories.

Other examples of similar spatial relationships are seen at Largs, where there has been an extensive cemetery on the raised beach below Haylie cairn (I:1), and in the string of major cairns on Underlaw Hill, the ridge on which High Hendryton cairn is sited (I:4), also visible from Loanfoot (I:3). Round cairns on lower ground look up to the long at Easton (III:4), Harlawmuir (III:6), and Caverton Hillhead (IV:3). Such relationships appear to be less common in the Borders and Nithsdale Regions, although Cairn Avel (VI:1) is in view of two large cairns across the valley. Further west in Wigtown District, pairs of long cairns both at Cairnholy and at Mid Gleniron, have attendant large round cairns.

There are remains of what was described as a stone circle directly adjacent to the south end of Windy Edge long cairn (V:1); Cairn Avel overlooks a circle at Holm of Daltallochan; Cuff Hill long cairn is 700m from the remains of a Four Poster on the southern face of the hill; and Dod Hill cairn looks out over Moyne Moor, where, 2km distant, the Covenanter's Stone may be a member of another small stone setting. The time range of these sites may be extensive, but in every case the choice of location for the stone setting is likely to have been influenced by the presence of the earlier
monument, conferring status on the later site.

Individual standing stones have been observed near several monuments, and it may be that some of these stones are contemporary with the monument itself, acting as markers of the space around the site. Such demarcation of the ground, whether achieved through the erection of standing stones, or by original choice of a well defined natural area, can be seen as part of a process of declaring a location to be a 'place for monuments', thus setting the scene for the later agglomeration of other monuments around the original neolithic site. Such demarcation was achieved in the Late Neolithic by building enclosures, and it has already been noted that it is the big enclosures which, despite the size of their internal space, have served as a focus for an external encirclements of later funerary sites.

Patterns of continuity into the Bronze Age differ. There are, however, locations with a history of monument use stretching from the Earliest Neolithic markers, through the construction of complex funerary structures, and on into the second millennium as places for burial. Elsewhere, sites were selected as areas for congregation, which again continued to be marked out and used through hundreds of years. The designation of a place as being a location for ritual could influence attitudes over many generations to come.
11.1 Perceptions of monuments

Discussion of the monuments of the south of Scotland in Chapters 9 and 10, looking at morphology and chronology, and at spatial and locational aspects of the distribution, has had to take account of two related problems. In the first place there has been a need to extend outlooks, considering funerary monuments within the range of other evidence for contemporary funerary practice, and examining rituals of deposition not only at monuments, but at other locations. Secondly, recurrent recognition of the fragility and vulnerability of monuments has underscored the reality of the constraints discussed in Chapter 2. Complex histories of remodelling and re-use of sites show how easily early evidence can be eliminated, and examination of the range of evidence for a neolithic presence has re-inforced appreciation of the disjunction between monument and settlement distributions.

A familiar metaphor to the upland archaeologist figures site survival in terms of the residues left by a succession of waves breaking on the shore. The ebb and flow of human settlement washes away traces of
earlier occupations, leaving only the highest altitude sites safe from later tides. The resultant selective preservation of bronze age hut circles and medieval farmsteads above the head dykes of Improvement farming creates an unrepresentative image of the periods concerned as consisting of small scale, subsistence enterprises. Surviving material has to be re-assessed in terms of its place in a wider scene.

Survival of neolithic monuments is likely to have been relatively less constrained by coincidence with unimproved land. The relevant factor of selection here is the scale of the monuments themselves. As the tides of time wash away more fragile remains, there is left a biassed distribution of the most massive structures, imposing concepts of the Neolithic as a time of monumental achievement. Again, this material needs to be re-evaluated as a partial selection from an originally more extensive range. The forms of earlier, less durable ritual structures may be glimpsed through the preservation afforded by surviving mounds. The paired split timbers of the mortuary structure, the pit, hearth or slab platform receiving deposits, or the standing monolith, may all commonly have served as ritual foci, perhaps deriving significance from location beside a sacred spring or rock formation with no archaeological status as a monument.

The reality of the problem is demonstrated by the
many examples of sites used and re-used over immensely long periods of time despite an absence of evidence for permanent markers. At Kirkburn there were traces of a palisade around the central pit of a site used for deposition from the Early Neolithic through to the addition of collared urns (Cormack 1963(a)). At Wellbrae similar long term deposits were surrounded by a palisade apparently constructed in the Late Neolithic (Table III:4:11). Pits outside each entrance to Yeavering henge held Early Neolithic deposits (Harding 1981). Demarcation of ritual areas was achieved on the Lammermuirs by rings of small boulders (IV:d,e), and, presumably, elsewhere by even less permanent means. These sites were, perhaps, places for ritual activity rather than monuments, and offer another perspective on Barrett's argument (1988, 31) that there are no such things as ritual sites: 'ritual is made up of actions not things'.

Demarcation of sites for ritual action was clearly, however, common practice in the Neolithic, although the means of signalling the nature of the site may have been intrinsically insignificant. Hodder considered that simple or natural markers, such as the boulder or tree that Kinnes (1981, 59) suggested could have taken the place of the funerary mound as a focus for ritual life among some communities, lacked archaeological interest (Hodder 1984, 52). To Hodder the value of the
chambered cairn lies in the wealth of detail that it provides, and he has shown how the ordering of space in the tomb can reflect domestic pattern, thus illuminating daily life in the neolithic world.

A problem with such an approach would appear to arise from the artificiality of divorcing the specific case of the surviving monument from the wider ritual context. Neolithic monuments are constantly shown to exist on a continuum of scale. Circles are built of low stones and tall ones, with small diameters and large; trapezoidal cairns can be under 20m or over 100m in length; chambers consist of single or of multiple units. Survival favours the more substantial forms, but, as Barclay (1989(a)) has argued in relation to Clare's classification of henges (1986), rigid distinction of types on the basis of surviving and visible morphology fails to come to terms with long histories of development at such sites, their use and function, and factors of inter-site relationships.

While Hodder and Barrett argue for study of the detail of individual monuments within their social context, Bradley has turned to the meaning and function of monuments as a class. In his Rhind lectures of 1992, *Altering the Earth*, Bradley (1993) advocated the study of monuments across space and time, 'in their own right', in contrast to practices of treating monuments as 'cultural traits' or artefactual types (p.4).
Monuments are defined for this purpose in terms of their permanence; they endure and survive amid changing interpretations; they 'alter the earth', creating new attitudes to time and place which are imposed on the consciousness of those who use them. Yet these same monuments 'are enhanced and changed, and new constructions are created around old ones' (p.129). There is a dichotomy here between permanence and mutability that may stem less from the original intentions of the builders than from the accidents of history and the success of the site in retaining a central role in the consciousness of society.

At this point it is appropriate to look again at use of the word, and the concept, of a monument. As discussed in section 3:1:2 the term has been employed in the present thesis as a convenient shorthand to indicate a well known range of site types. Almost inevitably, however, terminology shapes concepts, in the present case carrying implications of the monumental that may derive from the selectivity of site survival. An example is a published reconstruction of Mid Gleniron I, used in illustration of the characteristics of a chambered tomb, which shows human figures in the forecourt dwarfed by facade stones that actually stand to 1.2m in height (Laing 1976, 13, fig.1). David Clarke in 1968 drew attention to the dangers inherent in misuse of terminology (1978 ed, 23-9). He listed the
propensity to incorporate ethnocentric value judgements, the application of non-specific generalisations of no particular usefulness, and the prevalence of ambiguity in using one term either to cover a range of different phenomena, or to cover different levels of hierarchies of sets. All these charges must potentially be applicable to uses of the word 'monument', perhaps illustrated in Bradley's approach.

Bradley's broad based study of the origins of monuments incorporates material from a wide cultural spectrum, drawing on the role of monuments in aboriginal Australia and the eastern United States, as well as in various provinces of neolithic Europe, from Malta and Corsica to the north west, in illustration of the role of monuments in creating social structures and relationships, and in giving order to cognitive concepts of the world. In one example of his method he discusses enclosures under the heading of 'Monuments as Ideas' (p. 69-90), tracing the history of enclosure across neolithic Europe. Bradley is at pains to stress the very real differences of scale, of function and of form between enclosures in different stages of the *Linearbandkeramik*, the Michelsberg and Paris Basin cultures, western France, Britain and Denmark. He finds a possibility of shared sequence in the move from settlement function to ritual, sometimes reverting to
settlement, and in a tendency to an increase in size over time. Such trends are not, however, occurring contemporaneously, nor does Bradley regard it as useful to compare labour input, a 'reductionist approach' which 'fails to take account of much of the evidence' (p.89). The set of sites is very disparate, and it remains unclear what they have in common that is better covered by the term 'monument' than by the neutral, descriptive word 'enclosure'. Clarke's caveats all seem of relevance to a classification which must fall into ethnocentricity in its use of a concept of more significance to the prehistorian than the original users of the enclosures, and which links into one set sites of different scale, function, and social role.

The monuments of the south of Scotland catalogued in Volume II may thus be acknowledged to be representing selective survival only of the most durable forms of ceremonial setting. Their archaeological importance is not diminished by such a recognition. The palaeontologist accepts the limitations of the fossil record on the basis of which the original life forms of the Cretaceous and Jurassic eras have to be fleshed out. Similarly the role of monuments in the archaeological record may be to inform on ceremony and ritual practice; they are the carapace that confers visibility on evanescent patterns of activity.

Equally, at the upper end of the scale of
monumentality, there are structures which will have had enormous importance within their contemporary societies, monuments which must, as Bradley argues, have come to impose their image on ways of life and thought. The effort involved in their creation would have played an active part in welding community, and, in retrospect, such effort will have added to the intensity of relationships invoking the symbolism of the monument.

The following discussion is thus concerned with the role both of monuments and of ritual within the Scottish Neolithic. Section 11:2 reviews the diachronic sequence set out in Chapter 9 in terms of the social background to evolving ritual practice. Section 11:3 adds brief observations on the significance of spatial aspects of variability within the above sequence. Section 11:4 explores ideas on the symbolic role of the monuments, testing hypotheses against the evidence from the study area. Section 11:5 comments on the way in which monumental settings may have actually been used for ceremonial.
11:2 Ritual, monuments and society: the sequence

11:2:1 Altering modes: the mesolithic-neolithic transition

The onset of the Neolithic remains a key area in understanding of the changing modes that led to the first monumental structures being built in Scotland. Exploration of the processes of transition in Chapter 6 found no compelling reason to assume substantial immigration other than an absence of evidence for mesolithic intensification. Case's model (1969) of pioneer neolithic agriculture, designed to fill the mid-fourth millennium hiatus, cannot simply be represented in terms of mesolithic experimentation when there is almost no evidence for the establishment of cultivation or pasture, or for neolithic material culture, before the final quarter of the millennium.

The model proposed was therefore one of mesolithic retreat from earlier extensive patterns of exploitation as Atlantic forests reached their climax. Dependency on aquatic resources is unlikely to have brought economic deprivation, but self-images may have suffered, and narrow ecological niche width must have increased vulnerability. Falling sea levels were transforming marine, and, especially, estuarine environments, creating recurrent need for new adaptations. Platforms built at Eskmeals to secure access to the water's edge had to be abandoned as the course of the river shifted (Bonsall et al 1989).
Economic stress is, as Hodder points out (1984, 51; 1990, 180), hard to gauge, and observed effects of stress may be due to social or psychological causes rather than deprivation. Among such possible effects in the present case are the disappearance of the microlith, and shortlived experiments with cereal cultivation; the rigidity of pattern on Oronsay suggests social tensions, perhaps leading to the enforcement of rights by placing corpses on unoccupied shell mounds. A crucial factor in creation of this stress is suggested to have been awareness of alternatives. Around the North Sea, a cordon of coastal mesolithic communities kept the agricultural option at bay until the later fourth millennium, when components of the neolithic way of life began to be adopted around the mouth of the Rhine. In north west France, on the other hand, long and chambered tombs were being built by pottery making communities by c.3800 BC, and along the Atlantic seaways there must have been awareness that the world was a changing place.

It was suggested in section 6:6:5 that relevant comparisons for the above situation could be drawn from colonial history. The availability of a technologically superior paradigm can cause a loss of confidence among the peoples with the lower skill levels, who come to accept their own inferiority and to abandon traditional mores (Boahen 1987, 107). Once
the decision is made to participate in the new technologies, a complete revolution in attitudes can follow. Material culture symbols of the superior peoples acquire an almost magical status as an avenue to the desired end, and old traditions will be violently eschewed as a reminder of former 'degraded' modes.

Certain items of the new technology, particularly ceramics, lithics and extraction of stone for polished stone tools, could be quickly absorbed. The uniformity of the early style and fabric of the Grimston bowl, and perhaps, also, a particular dependence on the single source of supply of axes from Cumbria, demonstrate this adherence to acquired technique. The mastery of agricultural methods in a new environment would take longer, and Entwistle and Grant (1989) are probably right to argue that cereals did not play a major role in early neolithic economies in Britain. It is of considerable interest that cattle at Knap of Howar in Orkney were considered likely to have been domesticated aurochs (Noddle in A. Ritchie 1983, 95-7). Although there is no direct evidence for livestock in the Early Neolithic of Southern Scotland, other than one record of sheep from Islay, the process of domestication could be suggested to account for much of the environmental evidence for change at the time of the Elm Decline, and, indeed, could have had a direct effect on the elms themselves. The role of secondary products at this
period remains open to controversy (ibid), and, as Bogucki (1993) points out, cattle breeding is a costly way of producing meat on a household scale. In terms of prestige, however, possession of cattle could have offered a highly visible and attainable goal and a means of achieving the overt neolithisation that the proposed model suggests to have become a desirable end.

By c 3000 bc Grimston bowls are found northwards to Fochabers, southwards to Lochhill, and westwards to Islay. It has been suggested that wares being made at Het Vorner in the Netherlands were imitating the same style (Louwe Kooijmans 1980). Circulation of axes lacks dated contexts, but jadeite axes may have already been brought to Scotland from the Rhine. As discussed in section 9:2 evidence for monument construction before c3000 bc is not convincing. The wider context of ritual behaviour may, however, be noted as being already in evidence. The very earliest finds of Grimston pottery come from pits, and, at Balfarg Riding School, from a site that was to develop into a major ritual centre. At Biggar Common, where no pits were dug, a hearth with pottery sherds was mounded over. It would seem that, from the very first, the consciousness of being neolithic required the adoption of behaviour patterns unknown in the preceding Mesolithic. It is within this context of incipient ritual pattern that the first monuments make their appearance.
11:2:2 The first monuments

Although the Early Neolithic of Scotland may not have advanced beyond Zvelebil's 'substitution phase' in economic terms (1986(b)), already by the beginning of the third millennium bc there would seem to be established a self-image of a neolithic society. At about 3000 bc formal monuments make their appearance. On present evidence the first structures in north Britain seem to be the paired split timbers which define a mortuary space, perhaps, supporting an exposure platform. Absolute priority for such features cannot be asserted, however, as the same period sees a wealth of expressions of ritual form: timber enclosures, pit deposits, embanked mortuary areas with stone walled or timber structures, trapezoidal and round cairns and barrows, facades defining variously shaped forecourts, built of timber, orthostats or stone walling, megalithic chambers of simple or segmented form, with or without passages, a variety of combinations of the above elements, and a wide range of deposition practices. The variation present is so great that it seems inappropriate to refer to the monuments as conforming to a set of 'rules', as suggested by Julian Thomas (1991, 122). Familiar items from the wider neolithic repertoire are being selected, rather as Kinnes suggested that 'modules' were manipulated additively by chambered tomb builders (1975), and interpreted
within an opportunistic use of local resources. Sparkling granite boulders define the outline at Slewcairn, while the facade at Lochhill and enclosures in eastern Scotland use timber. Cairns are sited to take advantage of local topographical features, both in their location and their outlooks, integrating the monuments into the landscape. Chosen monument form and siting would appear to be creating a strong focal point for the locality.

Although the two early trapezoidal cairns at the mouth of the Nith were only c 21m to 22m in length and not built to any height, larger monuments were also built in the Early Neolithic. These may have included large chambered cairns, such as Cuff Hill, 42m by 19m with three surviving megalithic chambers, still 2.4m high at the head. Timber enclosures at Douglasmuir and Inchtuthil measured 65m and 54m in length respectively, and the structure at Balbridie, measuring 24m by 12m has been suggested to have supported a ridge pole 8m above ground level (Ralston 1982). The scale of monumentality was already impressive, sharing a concern with the production of ambitious, and morphologically varied monuments found among Early Neolithic communities in various parts of north west Europe. This is seen at an early date in Normandy (Chancerel et al 1993) and Brittany (Cavanagh and Laxton 1990), and relatively late in the Northern and Western Isles (Müller 1988).
The common factor would appear to be the wish to make a statement of achieved status, for which no particular prescription of form was yet established.

11:2:3 Regionalism triumphant

By the second quarter of the third millennium BC scale had become an important aspect of the construction of monuments, an activity now taking place over a wide area. Immensely long cairns were built, either as unitary structures, as at Dalladies, or by the addition of 'tails' to earlier cairns; very high cairns with revetted sides and elongated chambers probably also belong to this stage, and bank barrows and cursus enclosures appear.

Some of those exaggerated forms have a tendency to cluster. Cursus enclosures occur in a group around the Nith estuary, only 10km from the Keir Hills grouping of high trapezoidal cairns, while on Arran a set of cairns with distinctive, multi-segmented chambers finds its home. A group of upland sites in the western Borders, however, consists of decidedly various cairn types, and include a high trapezoidal cairn, an elongated narrow one, segmented chambers, and possible bank barrows; perhaps eclecticism was here the prevalent characteristic. It seems that individualism should not be confused with isolationism, and there is much openness to borrowed ideas. Note may be taken here
of an axe of riebeckite felsite from Shetland found in Nithsdale, and a possible Group XIII axe from South Wales in Upper Eskdale (Ritchie and Scott 1989, DMF 18, DMF 9).

It is also clear that there are parts of the study area that did not build substantial monuments at this time, and regions in which monuments occur in isolation, presumably acting as centres for wider areas. The Monktonhall cursus is one such site, with the structures at Balfarg Riding School, on the opposite side of the Forth, perhaps acting as another. The two very long cairns of the Tweed Basin Region are also very isolated. The wealth of axes from this Region, which include numbers of large and fine specimens, coming, particularly, from isolated areas, may suggest alternative forms of ritual to be being practised here, and forms of enclosure may have been explored, as at Sprouston (IV:a). This is the period from which there is evidence of conflict in south west England (Mercer 1981(b)), and the extravagant scale of some of the Scottish monuments may suggest a competitive ethos to be at issue here, too.

11:2:4 A caesura

The long and chambered cairns of southern Scotland seem to have ceased to be built after c 2600 bc. Whether the same applies to the elongated monuments of bank
barrow or cursus form must be open to question, until, perhaps, some dating evidence is forthcoming from the Cleaven Dyke (Barclay and Maxwell 1993), or elsewhere. There would appear, however, to be a caesura before habits of monument building resumed, following rather different forms, in the Late Neolithic. This pause does not, however, seem to coincide with onset of economic recession, and, in the north of the study area, a distribution of axes and adzes of Seamer and Duggleby type, in some instances associated with burials, suggest that networks of exchange were developing an interest in prestige goods. It is possible that stone circles began to be built around the Solway, perhaps inheriting a role in relation to the circulation of Cumbrian axes formerly maintained through the Nithsdale cursus complex. Exotic axes from this region have been noted in the preceding sub-section (11:2:3).

It is at this period that the most complex of the passage graves were being built in Orkney and on the Boyne, and it might be suggested that, as with the mesolithic hiatus, it was the effects of these external developments that inhibited construction on traditional lines in the study area. Contact with the Boyne is confirmed by the presence in southern Scotland of several slabs utilising Irish passage grave motifs and styles. Again, the inability to compete on equal terms could be responsible for a withdrawal from the field.
Resumption of monument building in the Late Neolithic was on restructured lines, carrying resonances, perhaps, of the circularity of the passage graves with their defining kerbstones.

11:2:5 Enclosure in the Late Neolithic

It is unfortunate that so little is known of enclosure in the earlier Neolithic, not an unpractised form to judge by the presence of two semi-circular interrupted ditch enclosures in the study area (III:a; IV:a), but likely to be unrecognised where less distinctive forms were used. The date of 2775 ± 70 bc obtained from a circular, uninterrupted enclosure ditch at Kinloch Farm, Collessie (Barber 1982(a)), 10km north of Balfarg, might offer a local context for the Riding School enclosure, its ditch silts dated to c 2455 bc (Barclay, forthcoming). This latter site, with its associated grooved ware, may have comparisons in Orkney, but there is no other local evidence for enclosure building before c2200 bc, following a possible period of forest regeneration. The unfilled gap in the record hampers explanation of events in the Latest Neolithic.

Timber defined and ditched enclosure covers, on present evidence, a short lived phase within the final two centuries of the third millennium (9:6). The former range from small 'pit circles' and larger rings of
uprights, often subsequently surrounded by henge ditches, to massive enclosures, their wide spaced timbers probably linked to form stockades. The henges, on the other hand, conform to standard morphological patterns, only making necessary adaptation to the exigencies of topography and the facility of ditch digging.

The modestly sized Class II forms, exemplified at Cairnpapple and at North Mains, find almost identical relatives in Derbyshire (Arbor Low), Oxfordshire (The Devil's Quoits) and Devon (Bow) (Harding and Lee 1987, nos.37, 148, 46). Explanation of the Scottish phenomenon must take account of the national picture, and should, perhaps, be seen as part of a wave of changes in agriculture and settlement pattern, occurring across north western Europe with the spread of Corded Ware and Single Grave cultures, and perhaps involving a more general use of the ard (Barker 1985, 175-9). Clearance certainly appears to have made headway, for agricultural purposes, in Strathearn. Changes occur in ritual practice in Orkney, where, for example, the cairn at Pierowall was levelled shortly before occupation dated to c 2135 bc (Sharples 1984). In many parts of Britain there was renewed interest in deposition of burials in earlier cairns.

Adoption of enclosure suggests involvement of larger numbers of participants in ritual activity.
The spacing of the Biggar Gap henges would indicate 'territories' at least three times as large as those around long cairns. More isolated henges and larger enclosures may have called on the co-operation of people from still wider areas. The location of the henges of Cairnpapple, Lindston and, possibly, Muir, on hilltops, suggests that they could have been attracting peoples from a wide surrounding area, and perhaps acting as links in networks of communication. Broadlea, Pict's Knowe and Normangill henges are in valleys adjacent to through routes between the Solway and the Clyde.

There is, nonetheless, an almost total absence of prestige artefacts from the henges of the study area or from the excavated sites of North Mains and Balfarg; the link between these sites and grooved ware remains weak. At Meldon Bridge, local styles of impressed ware were present in quantity, but no grooved ware. Communication may have been in terms of ideas rather than objects. Such ideas must have included standardised design concepts, both for henges and, perhaps, for the geometric shapes of stone circles found across the British Isles. In contrast, local variants are developed in some areas, including, perhaps, in the north east, Recumbent Stone Circles and the Clava cairns and ring cairns which share some of their features. These sites exhibit an interest in the south west point of the compass which recurs among the stone circles.
of the south west, but the forms of monuments remain distinct. The pattern suggests a short lived period to be involved, changes in ritual requirements perhaps accounting for the failure to erect stones brought to such sites as Wildshaw Burn, Whitcastles and Cultoon.

11:2:6 The end of the Neolithic

The second millennium saw continuity of interest in the sites of the Late Neolithic, but considerable changes of direction. There may have been a 'lithicisation' of some timber circles (Mercer 1981(a)), as on Machrie Moor (Haggarty 1991). At Cairnpapple this phase was perhaps associated with beaker burial and the destruction of an earlier feature represented by the central scoop. At North Mains rotted timbers were burnt, and at both henges funerary concerns became paramount. After the timbers at Blackshouse Burn had rotted, the stone bank was capped with flags, and, again, beaker has been found in the interior. Palisades may have been added to some henges, but at Meldon Bridge there is little evidence of timber replacement, and, although beaker has not been found, Early Bronze Age burial takes place.

Beaker is regularly present at chambered cairns, and it may be that the fan-shaped blocking of slabs over several axial entrances is a second millennium device, perhaps deliberately burying facades under an
undifferentiated rounded end to resemble a round cairn. The mound on Biggar Common was reworked to look like a stone-built feature rather than a barrow. Round cairns were built on long, perhaps using stone robbed from the earlier site. Cairn cemeteries gathered around long mounds. The monuments of the Neolithic were not forgotten, but were utilised for new ends.

11:3 Spatial variation

Changes of practice over time, detailed in the last section, followed spatially various patterns that can be commented on further.

Early morphological variation adheres to broadly based trends, with an eastern tendency to utilise timber and to produce elongation of form, while in the west megalithic practice dominates; high, revetted cairns are a speciality of developments in inland Dumfries and Galloway. The tendency of sites to cluster suggests an original pattern, and the dispersed cairns of north Ayrshire may be the residue of an originally denser distribution. Such losses probably account for the apparent isolation of certain sites, such as the cropmark cursus at Monktonhall (II:a).

In the Late Neolithic, timber circles and enclosures are erected in both east and west, but it is chiefly in eastern and central Scotland that these
are succeeded by henges. Stone circles become of major importance in north east and south west Scotland, some of these probably being built in the Late Neolithic. Large timber enclosures and some of the henges show a dispersed distribution pattern, but henges also cluster in the Biggar Gap Region and in Strathearn, and, more closely, in the Milfield Basin (Harding 1981). Similar variation occurs in the case of cup-and-ring marked rocks, clustered in parts of Galloway, dispersed in central Scotland, and absent from the south east. In both cases widely recognised forms were being used to serve local purposes.

Early Neolithic monument clusters must be the work of local social groups, but represent only a small part of a wider settlement distribution, the decision to build monuments apparently representing stylistic choice rather than defining ethnic or cultural entities (Hodder 1982(b), 191-4). Ideas are borrowed, eclectically, within the limits of local stylistic preference, as expression of self image (cf. Wiessner 1990, 107). In the Late Neolithic, on the other hand, distinct monument sets, Bargrennan and Clava cairns, Recumbent Stone Circles, or Centre Stone Circles, do appear to relate to social entities, sometimes emerging, as in the Bargrennan uplands, in areas with little earlier evidence of neolithic activity. In the Biggar Gap Region, however, henges appear to represent a
continuing interest in monuments and in external contact. The two large enclosures on the peripheries of this Region could have been directly concerned with wider communication, although there was no evidence for artefact exchange at Meldon Bridge. The large-pitted enclosure at Dunragit, on the edge of Luce Sands, is likely to have been involved in contacts across the Irish Sea, perhaps acting as successor to the Nithsdale cursus enclosures in relation to the Cumbrian axe traffic. In Nithsdale the Twelve Apostles are presently the only example of a large, probably late Neolithic enclosure. There is also an absence of Late Neolithic monuments in North Ayrshire, despite earlier funerary cairns and active exchange networks here. It seems that formally defined, enclosed space was not everywhere regarded as an essential adjunct to ritual activity.

11:4 The symbolic role of the monuments

11:4:1 Function, symbol and use

The above discussion of the sequence and spatial patterning of ritual and monument building has focussed on the part played by such activity in confirming group identity. This function has surfaced at different scales of shared persona. The mound on Biggar Common commemorated activity by a small party around the original hearth; shared cairn morphology linked
several families living on the flanks of the Keir Hills; a regular distribution of henges around the bend of the Clyde seems to constitute a coherent province; while an interest in elongation found around the North Sea, or in megaliths on the Irish Sea, appears to be an expression of shared heritage. At its most broadly based, early monument building demonstrated a neolithic identity, a sense of self-image very different from the networking which produced the prescriptive Late Neolithic format of enclosure building.

Some motivation for various stages of monument building emerges from this survey. The Early Neolithic built monuments because such things were understood to be an integral part of the state of being neolithic, and they were used to assert achievement of status. The increasing extravagance of Developed Neolithic monument forms may have been driven by engagement in a competitive ethos, and the cessation of construction in mid-millennium was perhaps produced by the recognition that ever increasing elongation could never match the *tours de force* being produced in Orkney and on the Boyne. The stimulus to enclosure building is ill-understood, but is likely to relate to some major and apparently sudden social pressure, perhaps related to the effects of new technology and increasing scale of agricultural production.

Such 'explanations' do not, however, reach close
understanding of the meaning of the monuments to those who built and used them. Cognitive perceptions will have been formed by symbolic associations and by modes of ceremonial use within and around the sites. These are aspects which need further consideration.

Function, symbolic meaning, and mode of use constitute integral components of the role of monuments, each aspect derived from and illustrating the others. In turning to the question of symbolism, no clear-cut distinctions are possible, but suggested interpretation will incorporate comment on other aspects of the role of monuments with fuller consideration of modes of use deferred to section 11:5.

There has been a considerable body of analytical work devoted to the symbolic meaning of earlier neolithic monuments, but perhaps the most comprehensive is Hodder's *The Domestication of Europe* (1990), considering the principles and outlooks which underlie neolithic societies across Europe. The structured framework that Hodder provides is used in the following sections to give a means of approach to various aspects of neolithic cognition throughout the period under review.

As his title indicates, Hodder's concern is with 'domestication' in all its forms, a concept to be seen in opposition to the undomesticated, or the wild. Hodder chooses to express this antithesis by use of the
terms domus and agrios, leaving scope for the interpretation of these concepts according to circumstance. The tensions produced by this opposition are wide ranging, providing a framework within which not only the Neolithic, but perhaps all problems of human nature and of society, could be explained. The female principle is set against the male, inside against outside, front against back, nurture against destructiveness, besides the more predictable neolithic opposites of the domestic and the wild, or agriculture and hunting, and the issue of the transformation of raw materials achieved by human skills. Much of the suggested symbolism of the Neolithic can be accommodated within these structures, although the ambiguities of the evidence are not always straightforward, particularly, perhaps, in relation to death.

Using Hodder's agenda, the following sections discuss the question of the tomb as domus, the house of the dead (11:4:2); the neolithic monument as a system of definition and entrances, the foris (11:4:3); and the antithesis between the domestic and the wild, the agrios (11:4:4). These sections incorporate discussion of the transformations effected by death and by culture, analysing the evidence from monuments of the study area. Ceremonial use of these monuments is further discussed in section 11:5.
The hearth which formed the central symbol of the *domus* in the Neolithic of south east Europe was superseded in the *Linearbandkeramik* by the timber long house, which, in immediately succeeding cultures, acquired a characteristically trapezoidal outline. Long barrows of similar trapezoidal form make their appearance in later *Trichtbandkeramik* cultures, and the suggestion has often been made that the barrows offer a solid representation of the houses (Childe 1949; Piggott 1967). Detailed points of similarity between long barrows and the trapezoidal long houses of Brzesc Kujawski have been set out by Midgley (1985, 207-216), who argues for chronological overlap between the phenomena. Long mounds appear at Passy, in Burgundy, within a post-*Linearbandkeramik* context (Hodder 1990, 222).

In Britain, however, these links become more tenuous. Few timber houses are known, and these are mostly short and rectangular, not trapezoidal. Chronology does not permit British long barrows to have been built by immigrants as mementos of native tradition (Reed 1974), or in direct imitation of contemporary structures across the Channel (Whittle 1977). It would seem altogether more probable that trapezoidal cairns and barrows were built in response to established funerary tradition, such as the long mounds at Passy.
seen in acutely trapezoidal or near triangular form at Les Fouillages, in Guernsey by c 3800 bc (Kinnes 1982).

Ashbee's (1970) reconstruction of the evidence from below the barrows of Fussell's Lodge and Wayland's Smithy in the form of ridge roofed mortuary houses cannot be applied to the narrow, walled structures at Lochhill and Slewcairn. The two half tree trunks, however, which are so regularly used to define a mortuary space, may be regarded as symbolic representations of the kingposts of such a house. The tall end slabs at the two Cairnholy cairns could carry the same recall, at still further remove. The small, rectangular chambers here do not suggest a direct relationship with the forms of contemporary houses, although perhaps symbolising an interior as opposed to exterior world.

It is in this symbolic sense that long cairns may most appropriately be regarded as being 'houses of the dead'. Sites occasionally overlie structures (e.g. Ballyglass: O'Nuallain 1972), and more often occupation material or hearths. The same succession is perhaps recreated by the erection of timber end posts in primary phases of cairn construction. Other points of domestic recall could have been incorporated into funerary structures in lintelled entrances, 'post-and-panel' revetments, and perhaps in the reproduction of a
ridged outline, resembling a house. In an apparent reversal of this sequence, the entrance to the Late Neolithic island settlement on Loch Olabhat, North Uist was built to resemble the facade of a chambered cairn (Armit 1992).

Sherratt (1991) sees domestic replacement in the complementary distributions across Europe of substantial neolithic settlements and funerary mounds. He does not, however, suggest the latter to provide commemorative symbols of the former, but rather shows how the monuments met social needs current among communities engaged in establishing agricultural practice in co-operation with local mesolithic populations. Domestic meaning here becomes subsumed in the role of social integration.

Hodder, on the other hand, regards continuing domestic symbolism as an important part of the role of monuments in Britain. He has suggested (1982(a); 1984) that the interior layout of Orkney chambers can be read as a direct symbol of contemporary domestic structures, Quanterness using the cellular arrangement seen at Skara Brae, while the slab divisions of tripartite and stalled cairns echo those at Knap of Howar. Colin Richards (1988, 55), studying the same material, concluded that the parallels of the cellular structures constituted a special case, a 'short lived political expression mediated through ancestor rituals', in which
forms were deliberately duplicated for political ends in a manner not representative of normal use of communal burial monuments. It seems possible that the facade structure built at the approach to the settlement on Loch Olabhat (Armit 1992) was another such example of power manipulation. As regards the Orkney - Cromarty tombs, Richards would understand their layout of slab divisions in a symbolic sense as doorways to be passed through in ritual use of the tomb. This reading of the meaning of the structures can be directly related to another of Hodder's symbolic principles, the foris, or entrance.

11:4:3 The foris

With the paucity of evidence for domestic settlement in the Neolithic of north west Europe, Hodder, like Sherratt, considers that tombs came to replace homes as the central symbolic structure in neolithic society. The domesticating role that he ascribes to the long barrow lies in an exercise of control over the unknown realm of death. Hodder here introduces a new metaphor, the foris, or doorway, as an expression of this concept, and he suggests that this symbol played an important part in the increasing monumentalism of the Neolithic. 'The conceptual dependence of the domus-foris on the domus-agrios means that the symbolic power of the domus-foris has
continually to be reproduced either by increasingly monumental works, or by closer association with and reference to the *agrios'* (1990, 279-280).

Entrances undoubtedly constitute a feature of enormous symbolic importance, a junction to be passed through from an outer world to an inner, the point of transformation from the world of the living to that of the dead, or to a realm of 'otherness' away from domestic concerns. Such features may be emphasised in different ways.

A very effective means of constricting and controlling access is provided by the lateral passages at Cuff Hill (I:2) and Burngrange (III:1), and their entrances may have been additionally hidden from view by a blocking incorporated into the cairn revetment, as at Gwernvale (Britnell and Savory 1984). The lateral passage at Slewcairn (VI:2) communicated with a small 'porch' at the rear end of the mortuary structure, and may have had symbolic meaning only.

At the fore end of the Slewcairn structure a broad, V-shaped facade of granite boulders led into what was effectively a false entrance to the infilled space, similar to that at some Cotswold cairns, such as Belas Knap (GLO 1). The small 'chamber' at Lochhill (VI:3) may also have been intended, even after extension, as a fore structure, again acting as a false entrance. The 'antechambers' at the two Cairnholy cairns offered no
access over tall 'septal' slabs to the inner chambers, which may, as with some of the timber mortuary structures, such as Haddenham (Shand and Hodder 1990), have been open at the sides. The tall portal stones and facades thus magnified the importance of a non-functional 'entrance', unequivocally emphasising exclusion. The principle is very different from that of the series of entrances defined by the stalled cairn, as discussed by Richards, or the similarly reduced access over slabs into the inner reaches of segmented Clyde cairns.

Most of the long cairns of the study area totally exclude entrance, and their rounded axial ends are probably not concealing either facades or megalithic chambers. This position was demonstrated by excavation at Bellshiel Law (Newbiggin 1936) and Dalladies (Piggott 1972), and at this latter site symbolic door jambs were built into the lateral revetment at the 'entrance' to the infilled mortuary structure (ibid, p.34), as a professedly exclusive feature. It may be that the tiny lateral 'chamber' at Mid Gleniron II, with no sign of having ever had a backstone, should also be read as being a false entrance into the solid cairn (Corcoran 1969(a)).

A totally sealed monument poses a problem in terms of the transition being symbolised by the threshold between the inner and the outer world. There is here
no access to the transformations of death, which elsewhere appear to have been a customary neolithic concern. The deposition and redeposition of disarticulated and sometimes cremated bone in neolithic tombs is often interpreted as an expression of the common ethnographic concept of the 'Cult of the Ancestors' (e.g. Barrett 1988, 31; Richards 1988, 84-5; J. Thomas 1991, 76). The 'Ancestors' become an abstract entity, and their power is invoked and directed to particular ends by use of these dehumanised relics. Any link between these 'Ancestors' and the sealed long cairns of eastern Scotland is, however, less obvious.

The limited funerary evidence from the study area is enough to show that practices of structured deposition did occur here, most notably at Slewcairn (VI:2), and probably also at Haylie (I:1) and elsewhere (I:2; I:3); in contrast, only traces of cremated bone were found in the Lochhill structure (VI:3). In the Developed Neolithic, however, while segmented chambers such as Haylie were being built around the Firth of Clyde, and used for the deposition and circulation of skeletal material, structures appearing in the east were not only sealed, but demonstrate little interest in the accommodation of human remains. At Pitnacree, built after c 2860 bc, the only mortuary deposits consisted of small patches of cremation on the old ground surface (Coles and Simpson 1965); at Dalladies, there was only a
part of an unburnt child's skull in the fill of the foremost large posthole, perhaps predating the burnt mortuary structure of c 2650 bc, built concurrently with the barrow (Piggott 1972, 32). A declining association between long barrows and funerary deposition is also observed in southern England (Thorpe 1984, 51-8), while at North Mains, Strathallan, there is evidence for alternative forms of funerary deposition below small round barrows contemporary with the Dalladies structure (Barclay 1983).

There may be a parallel here with the change in attitudes to the dead that Richards has charted for a rather later period in Orkney (1988). Skeletal material passing through the 'doorways' of stalled cairns is associated by Richards with 'specific ancestors' (p.50), whereas the broken and burnt masses of bone found later in cellular tombs he would see as evidence for destruction of individual identity which 'effectively creates a unified ancestral body' (p.55).

The concept of a Cult of the Ancestors, with its implications of extended historical awareness, should, perhaps, be used with circumspection in relation to prehistoric societies. The very limited interest in lineage displayed by the mediaeval peasantry of Montaillon in south west France offers a warning here; the living family of consanguine cousinship, paternal and maternal, carried far more central symbolic
importance, a concept latinised in contemporary documents as the *domus* (Le Roy Ladurie, trans. Bray 1980, 48-50). The movement of bones from one tomb type to another, as suggested by Richards, would break direct ancestral-territorial links, and may suggest that it was a more generalised power of the tomb itself that was being accessed. In southern Scotland the increase in visual impressiveness of long cairns in the Developed Neolithic combines with exclusion from the interior. Julian Thomas (1988, 554-6) has discussed the 'antiquation' of long cairns in the Cotswold-Severn region at this time, with the addition of extra-revetment material to create an impression of longevity. The sealed past became remote and unassailable, and the cairn itself now represented the *foris*, a closed doorway separating the external world from the otherness within the mound.

The cropmark avenues at Meldon Bridge, Forteviot and Dunragit suggest a continued concern with the importance of entrances in the Late Neolithic, echoing the avenues of posts leading to the facades of some long cairns, such as Street House (Vyner 1984). It is, however, possible that the Meldon Bridge avenue did not correlate with an entrance into the enclosure and acted as another 'false portal'. At Forteviot a small, circular cropmark apparently obstructs the inner end of the avenue, although, like the feature at the
entrance to the Sprouston enclosure (IV:a), it may be a later addition.

Entrances through the ditches of henges, on the other hand, are remarkable for their breadth, although there is no excavated evidence from mainland Scotland for emphasis on their importance in the form of terminal deposits. It is possible that the misshapen north west terminal at Cairnpapple represents a secondary narrowing of this entrance to its present 9m width, rather than being the effect of uneven rock subsoil as suggested by Piggott (1948); the cropmark ditch at Balwaistie (III:h) has a similar appearance. Such activity could relate to a clearing out of ditches. Grooved ware deposits were found in pits at the entrance to the possible henge at Hillend, and there are cropmark pits outside the entrance to Balwaistie, and inside the entrance to Curriestanes cursus (VI:d). These latter are symmetrically placed, perhaps having held uprights, as with the standing stones within the Balfarg ditch entrance, echoing the massive timber pair at Ring A (Mercer 1981(a)). There are also single stone holes, or post holes, within each Cairnpapple entrance.

Such emphasis on entrances can be read as a means of enforcing the significance of the transition from outside to inside, and the broad causeways should not be assumed to represent easy accessibility. The off-centre placement of the 'Cove' at Cairnpapple,
similar to that at Arbor Low (Burl 1988(b)), shows that views of the interior were not intended to be unrestricted. The act of enclosure itself served as a means of definition of an area of special importance.

11:4:4 The agrios

Structurally important to Hodder's identification of the Neolithic with the principle of the domus, is its opposition the agrios, the wild, or unknown. This is a duality fundamental to human psychology, which has seemed to many to be of particular relevance in relation to the domesticating Neolithic, engaged in a struggle to bring the natural world under control. Chris Scarre, for example (1983, 277), comments on the appearance of chambered tombs as an aspect of neolithic expansion into western France: 'The building of monumental tombs was a way of creating a cultural landscape'; it expressed 'a new distinction' between the cultivated and the wild. Again, however, care must be taken over the attribution of ethnocentric concepts to past societies.

An opposition between man and nature forms a long-lived and recurrent theme in traditions of western philosophy, whether from the rationalist humanitarian stance that holds man to be the proper study of mankind, or from the Rousseauesque and Romantic view of the pleasing natural world in which only man is vile. A perspective which has become deeply ingrained in an
over-artificial society may not, however, be fully appropriate in relation to the Neolithic, living and working within the natural world.

From its very beginning, the Neolithic in Scotland is concerned with the transformation of raw materials. Clays are mixed, tempered and formed into pots; stone is extracted, shaped into axes, and polished; wild cattle are tamed and controlled; seeds are planted, tended and harvested; timber is felled, split and used in construction. These transformations act out the binary oppositions between the raw and the cooked that form the basis of Lévi-Strauss' structuralist interpretation of primitive society, extended by Hodder to the symbolic structure of the Neolithic. The symmetry of such systems, however, concerns a duality that need not be presented in oppositional terms. The domesticating role of the Neolithic involves a culturing of the wild that is a reproductive, nurturing process, not a destructive one, and it may be better represented by a consensual, female model than by a conflictual, masculine approach.

The oppositional view of the adoption of agriculture as a revolution posits a reversal or realignment of every aspect of economic and social life (Meillassoux 1973). As already discussed, the transition to the Neolithic in Britain can be seen as a cultural and cognitive development, accompanied by a
piecemeal process of agricultural change, very probably achieved on a small scale family basis (Bogucki 1993). Sherratt's (1991) view of the increased scale of social endeavour required by agriculture can, on this basis, be postponed to the Developed, if not the Late phases of the Neolithic. The Early Neolithic need for ritual and for monument construction satisfied small social units, celebrating achievement of a new status within the limits of local resources.

The transformations of death, however, represented a very present unknown, an agrios to be manipulated by the formalisation of procedures associated with its treatment. Early chambers, mortuary structures and enclosures, and, perhaps, exposure platforms, are very directly concerned with the processes of death and decay. These areas of control are then, however, mounded over and incorporated into the monumental forms of cairns, which themselves become a central symbolic focus, expressing the exercise of power over the agrios.

With the growing impressiveness of monumental form the monuments, as symbols of local community, may have come to assume a territorial role. In the Developed Neolithic environmental evidence for agriculture becomes more convincing, and theories of social change which have usually been applied to the onset of the Neolithic (e.g. Meillassoux 1973; Sherratt 1991) may
become of relevance. Christopher Evans (1988, 93-4) discusses this delayed transition to a man-managed landscape in relation to the construction of causewayed enclosures by Middle Neolithic communities in southern England, an event which he links to Sherratt's (1981) Secondary Products Revolution. The elongated monuments of the study area, cairns, barrows and cursus enclosures, seem, like the causewayed enclosures of the south, to have been concerned with control over access to land, an increasingly valued asset in a more committedly agricultural society. Some long cairns are sited at peripheries, as if making territorial statements. They sit in secluded areas, sometimes in natural 'precincts' defined by rocks or streams, or on confined areas of hilltop ridge or terrace, occasionally marked by an attendant standing stone. The cursus enclosures, at estuaries, provide neutral ground for reception of travellers. Monuments were thus both sealing an agrios within and expressing control over an external wild. Relationships of power erupted in the south in episodes of warfare at causewayed enclosures (Mercer 1988), and the more aggressive, masculine attitudes of the time may be perceived in the northern situation also.

In surrounding the mounded monument at Balfarg Riding School by a ditch, control over the ritual area within was made explicit. By this Middle Neolithic
phase, however, long cairns had ceased to be built, and when enclosures begin to feature in the Late Neolithic a different emphasis is apparent. Timber uprights define enclosed areas, perhaps reproducing the effect of a clearing in the forest. Participants are now within a boundary, looking out at an external agrios. The ambivalence of earlier symbolic systems, perhaps the cause of their failure, was now replaced by a clear cut expression of difference from the uncultivated wild. Henges conform to a uniform morphological pattern, as do flat based grooved ware and new, standardised lithic forms. Cup-and-ring marked symbols, again a widely recognised device, are carved onto rocks, demonstrating power over natural features. In some areas order is expressed through localised monument forms, Clava and Bargrennan cairns, and certain types of stone circle, again prescriptive in their conformity to set pattern, and often also incorporating wider systems of geometric or astronomical knowledge. Control over disorder is demonstrated, with a rigidity that proved to be short lived.
The ceremony of the monuments

If 'meaning is a function of social practice' (Thomas 1991, 38), consideration of the nature of that practice must be essential to any understanding of the role of the monuments. As Boast and Evans (1986) point out, prehistoric sites are not static architectural artefacts but constitute defined spaces for public action. Barrett (1994, 9-39) has demonstrated this precept in an exploration of the 'practical engagement' of participants in the architectural landscape of the Avebury complex, where ceremonial practice is clearly structured by the setting. Monuments of the study area do not provide such extended definition of ritual movement, but, nonetheless, modes of use of the structures constitute an important aspect of their role.

Attention was paid during fieldwork to subjective aspects of the landscape around the monuments, and comments have been incorporated into the Catalogue entries. In particular, assessments were made of the extent of the surrounding area from which a monument appeared silhouetted on a skyline, or, alternatively, was completely hidden from view, and visually impressive lines of approach were considered (10:5). Such judgements must, however, be seen in the context of subsequent landscape change, which may have included erosion of slopes, movement of watercourses and
standing water, peat encroachment and vegetative change.

The extent of tree cover has obviously altered considerably, some sites now lying in dense forestry, while trees have vanished from other areas of moorland and grassland. The use of timber uprights for avenues, alignments, cursus monuments, ring sites and enclosures may represent earlier tree lined features. Monuments are entirely likely to have gained emphasis from being encircled by trees, or set at the apex of a long clearing; outward views may have been formed by the forest.

Perhaps still more important in appreciation of the ceremonial landscape would have been awareness of ritual meaning, taboos, and features of special significance. The appropriate sense of occasion would be induced by the ceremony itself, by moonlight or by firelight, with gatherings of people, dancing, feasting and potations. To analyse residual architectural features with the cold logic of the twentieth century, cinema trained eye, noting assymetries, irregularities and an absence of cre*ndic grandeur, is to miss most of the original significance of these sites.

It does not seem that Early Neolithic monuments were designed principally as settings for large gatherings of people. Rather, they provide a focus for an 'event'. There may have been a funeral pyre, a feast with the
deposition of the residues in pits, disposal of bodies or partial remains of bodies. Where spaces are defined on a larger scale, as at Inchtuthil, by timbers, or at Slewcairn, by boulders, the intention seems to have been exclusion rather than creation of a ceremonial arena. At Slewcairn a basal layer of cairn material infilled the setting; at Inchtuthil, as at Lochhill with its timber facade, the timbers were used to spectacular effect as they were burnt down, creating an event. The role of such monuments was the structuring of occasion, as each participant assumed a part as actor or spectator.

Processional progress to the monument is likely to have formed an important part of ceremonial. The cairns of the study area have been observed all to lie within close range of potential settlement locations, and possible sites have been noted to lie only c 100m from some cairns. Account should also be taken, however, of the gathering of people from further distances, especially at the larger monuments of the Developed Neolithic. Attempted identification of probable lines of approach has been an exciting task, ultimately frustrated by the weight of unknown factors. Trapezoidal long cairns, with high proximal ends, and tapering tails would appear to be designed for full frontal approach, their grandeur increased by frequent sitting on the brink of a slope. These very slopes
are, however, in several cases of such steepness as to make access difficult, or at least undignified, and there is often no space for forecourt activity. At Crickley Hill an elongated low mound could only have been approached downslope, from the tail end (Dixon 1988), and such alternative directions should also be considered.

The most common angle for cairns of the study area is of a gentle slope down from head to tail. An uphill approach could thus involve a procession along the length of the cairn to reach the raised head. The Mutiny Stones, unusual in its gentle slope down from tail to head, can be seen from the east, head on, lying on the hillside in full plan, before a descent into a small glen, with a waterfall, and a climb upslope reaches the cairn head. The massive Loanfoot is also only visible from across a stream, in this case side-on, in full profile.

A side-on position, with full length view, also seems an appropriate place for ceremonies at the cairn in many cases, instead of head-on, with most of the length invisible. In several cases there is no space for activity at the head, whereas terraces often lie beside sites, as at the Mutiny Stones. Activity, including several successive fires, took place c 30m from the trapezoidal cairn of Bharpa Carinish, North Uist, downslope, and with a full view of the cairn profile,
at dates beginning at c2540 ± 50 bc - GU 2458 (Crone 1993).

In reconstruction of such areas of activity it must be acknowledged that monuments may have been located for reasons of history and association rather than for landscape effectiveness, as is shown by histories of earlier use below the mound on Biggar Common or the cairn at Port Charlotte, Islay. On the other hand, ambivalence over the most dramatic line of approach may attach to the use of sites by different groups of people, arriving from opposite sides of a ridge. The kilometre of processional space provided by the cursus at Monktonhall could be effectively used by groups converging from the River Esk to the south, and the Firth of Forth to the north, arrivals on the latter shore climbing the ridge of the old beach to the north terminal, from which the length of the cursus could be seen stretching out to the river bank.

Blackshouse Burn, in a hollow among low hills, provides another setting suitable for a confluence of peoples cresting the surrounding ridges. The Meldon Bridge avenue invites approach from the hills, but the site could also be reached up-river, from the Tweed, by way of the Water of Lyne. The avenue gives substance to Hodder's point (1990, 222) that lines of approach to an enclosure perpetuate earlier neolithic concern with linearity. Certainly the henges of the study area,
relatively modest in size, are likely to have incorporated processional approach in the same fashion as has been postulated for earlier elongated monuments. Such approaches must, most commonly, have been uphill, necessarily so to the summit sites of Lindston and Cairnpapple. The Class II format may have been preferred as a means of combining entrances from different directions, which in some cases must have included an uphill and a downhill movement. The enclosed space could, however, have been intended for passing through, from one entrance to the other, after completion of the ceremonial.

There is too little evidence of activity within henges for reconstruction of ceremonial practice here. The absence of the debris of feasts from henge ditches could be the result of later cleaning out, and old ground surfaces had not survived within the excavated sites. The size of the enclosed spaces must, however, be taken to imply a larger scale of participation than at funerary monuments, perhaps both within the ditch, and, as spectators, on the banks. Stone circles tend to be set low in their surroundings, again allowing spectators to view the interior.
Conclusion

The comparative methods employed in this study have inevitably resulted in an emphasis on difference, over space, over time, and sometimes, it would appear, in displays of local individuality. The suggested model for the onset of the Neolithic as a cultural and cognitive process provides a context within which ritual behaviour is adopted, self-consciously, as a means of assuming a neolithic persona. Early morphological variation thus appears to bear little relationship to ethnic grouping, but can be seen as constituting an example of what Sackett (1990) has termed 'isochrestic' choice, different styles of monument being equally valid options in expression of the same purpose. As Bradley observes, however (1993, 48), 'monuments orchestrate human experience', and early forms of ritual practice may have given momentum to the development of regional difference as an expression of group identity. This perception is reinforced by the existence of regions, such as the Tweed Basin, where similar sequence fails to acquire monumental form, and activity is directed rather to artefact related practices, including deposition. Elsewhere, locally set expectations structure developments within a regional idiom, producing elongated monuments in one area, magnified cairns in another, elaborate chambers elsewhere, and, in some
cases, eclectic experimentation with a variety of externally inspired forms. The general theme is of increasing size, formalisation and exclusion as the monuments create their own mythology and project a new self-image of community.

The sequence reaches an apogee, and is discontinued, increasing grandeur failing to answer current needs. In certain areas at least there are, however, indications of continuing tradition, probably in part preserved by the presence of the monuments. With the second 'Agricultural Revolution', perhaps associated with a growing use of Secondary Products, and certainly with more extensive agricultural use of the landscape, new monument forms emerge as arenas for participatory ceremonial. In the south west, in areas formerly concerned with building long and chambered cairns, stone circles may represent a direct evolution from orthostatic forecourts. In the Biggar Gap Region, long cairns are succeeded by henges and timber enclosures, although in Lauderdale such enclosures emerge in an area with no evidence of Early Neolithic structures.

These new monuments are clearly, as Barrett argues (1994, 27-8), produced by existing communities. This reality does not, however, vitiate Bradley's observation that monuments mould social expectations. The work of construction will have served to confirm
community, while ceremonial, acting out social roles, expressed relationships and legitimated power structures, made manifest through knowledge of the prescribed forms of the arcane secrets of the monuments. It is from this basis that the hierarchies of the Bronze Age could emerge, and the monuments of the Neolithic, passing into history, became monuments to the Neolithic.
Fig. 11:1 Distribution of Stone and Flint Axeheads in the South of Scotland

- 1-2 axes per 100 km²
- 3-6
- 7-10
- 11-20
- 21-40
- Luce Sands ('00s)
ABBREVIATIONS
(for three volumes)

Institutions, Museums and other Corporate Bodies

AOC  Archaeological Operations and Conservation (formerly CEU)

APG  Archaeology Projects Glasgow, Department of Archaeology, University of Glasgow (now GUARD)

CBA  Council for British Archaeology

CBAS  Council for British Archaeology in Scotland (now CSA)

CEU  Central Excavation Unit, HBM (now AOC)

CFA  Centre for Field Archaeology, University of Edinburgh

CSA  Council for Scottish Archaeology (formerly CBAS)

CUCAP  Cambridge University Committee for Aerial Photography

Dfs. Mus. Dumfries Museum

FC  Forestry Commission

GAGM  Glasgow Art Galleries and Museums (including Kelvingrove Museum)

GUACFA  Glasgow University Association of Certified Field Archaeologists

GUARD  Glasgow University Archaeological Research Division (formerly APG)

HAKMG  Hawick Museums and Art Galleries

HBM  Historic Buildings and Monuments, SDD (now HS)

HMSO  Her Majesty's Stationary Office

HS  Historic Scotland, SDD (formerly HBM)

Hunt  Hunterian Museum, University of Glasgow

LADAS  Lanark and District Archaeological Society
Bibliographical Abbreviations

BAR British Archaeological Reports, Oxford
Brit Ser British Series
Int Ser International Series

DES Discovery and Excavation in Scotland
Annual Publication of the CSA

Hist Ber Nat Club (HBNC) History of the Berwickshire Naturalists' Club

NSA The New Statistical Account of Scotland, Edinburgh, 1845

ONB Original Name Books of the Ordnance Survey

Proc Ber Nat Club (PBNC) Proceedings of the Berwickshire Naturalists' Club

Proc Prehist Soc (PPS) Proceedings of the Prehistoric Society


RHP Register House Plan

Stat Acct The Statistical Account of Scotland, Edinburgh, 1791-9

Trans Ber Nat Hist Club (TBNHC) Transactions of the Berwickshire Natural History Club
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