

The Mesolithic-Neolithic Transition in the Lower Tyne Valley: a Landscape Approach

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Introduction

The establishment, by the end of the sixth millennium RCY BP (Radiocarbon Years Before Present), of a mainly sedentary settlement pattern based on the production of an increasing proportion of the necessities of life through crop and animal husbandry has for long been regarded as one of the major developments of British prehistory. The initial stages of this development have customarily been attributed to the Neolithic and in most works of synthesis dealing with the prehistory of the British Isles the Neolithic is regarded as synonymous with the establishment of farming. During the preceding phases of the Stone Age, the Palaeolithic and Mesolithic, human communities survived by hunting and gathering. The mechanism by which the practices of food production became adopted throughout the British Isles is a subject of some controversy. Although an indigenous development of farming can be ruled out on the grounds that the wild progenitors of the domestic staples wheat and barley were absent from the native flora, whether the practices of crop and animal husbandry were introduced by farming immigrants or adopted by hunter-gatherers in contact with farming communities in neighbouring areas is yet to be established. By whatever mechanism, a transition between the two ways of life is believed to have occurred in many parts of Britain during the course of the sixth millennium RCY BP. However, in most areas this transition is not documented by the survival in the archaeological record of domesticated crops or the remains of domesticated animals, a rare event requiring special circumstances of preservation, but rather by a substitution of one technology for another. While both the Mesolithic and Neolithic periods are part of the Stone Age, they are each represented by distinctive suites of artefacts. Study of the occurrence of these artefacts in the landscape provides an opportunity of monitoring changes that occurred between these two periods, changes usually regarded as concomitant with shifts in modes of subsistence and patterns of settlement.

Indirect evidence for the transition to food producing can also be obtained from a number of non-archaeological sources. Although the activities of hunter-gatherers may have had far reaching effects on the landscape, it is generally considered that the farmers of

the Neolithic and later prehistoric periods had a greater influence on landscape development through their disruption of the natural vegetational succession. The early farmers had to clear the wildwood in order to create plots of land in which to sow their crops and evidence of this can sometimes be recognised in pollen profiles where a sudden drop in values for the pollen of woodland species is matched by an increase in the evidence for weeds of cultivation and grasses such as cereals. The disturbance of the topsoil caused by ploughing and increased rates of runoff due to the removal of the canopy can lead to an increase in soil erosion, the evidence for which may be accelerated rates of alluviation on the valley floor. Unfortunately, indirect evidence of this kind is mainly lacking for the lower Tyne Valley. Accordingly, of necessity, this paper is based on a review of archaeological evidence.

I intend to review the evidence from the lower part of the Tyne Valley, defined as an area extending from the confluence of the Rivers North and South Tyne just west of Hexham, eastwards to the outskirts of the Newcastle conurbation at Newburn (National Grid Reference 10 km squares NY96, NZ06 and NZ16). With the exception of a single field monument of dubious status and no longer extant, the evidence available consists of casual finds or assemblages collected during the course of systematic fieldwalking and excavations on sites of later periods. These data can be divided into those collected since 1985 by members of the Department of Archaeology at Newcastle University and earlier data. I have been closely involved with the former data set for the past decade but in order to make a preliminary assessment of its implications in relation to the issue of the Mesolithic-Neolithic transition in the lower Tyne Valley it is first necessary to review work undertaken previously.

The archaeological record of the Mesolithic and Neolithic in the lower Tyne Valley prior to 1985

The only field monument belonging to either period recorded in the lower Tyne Valley is the putative Neolithic

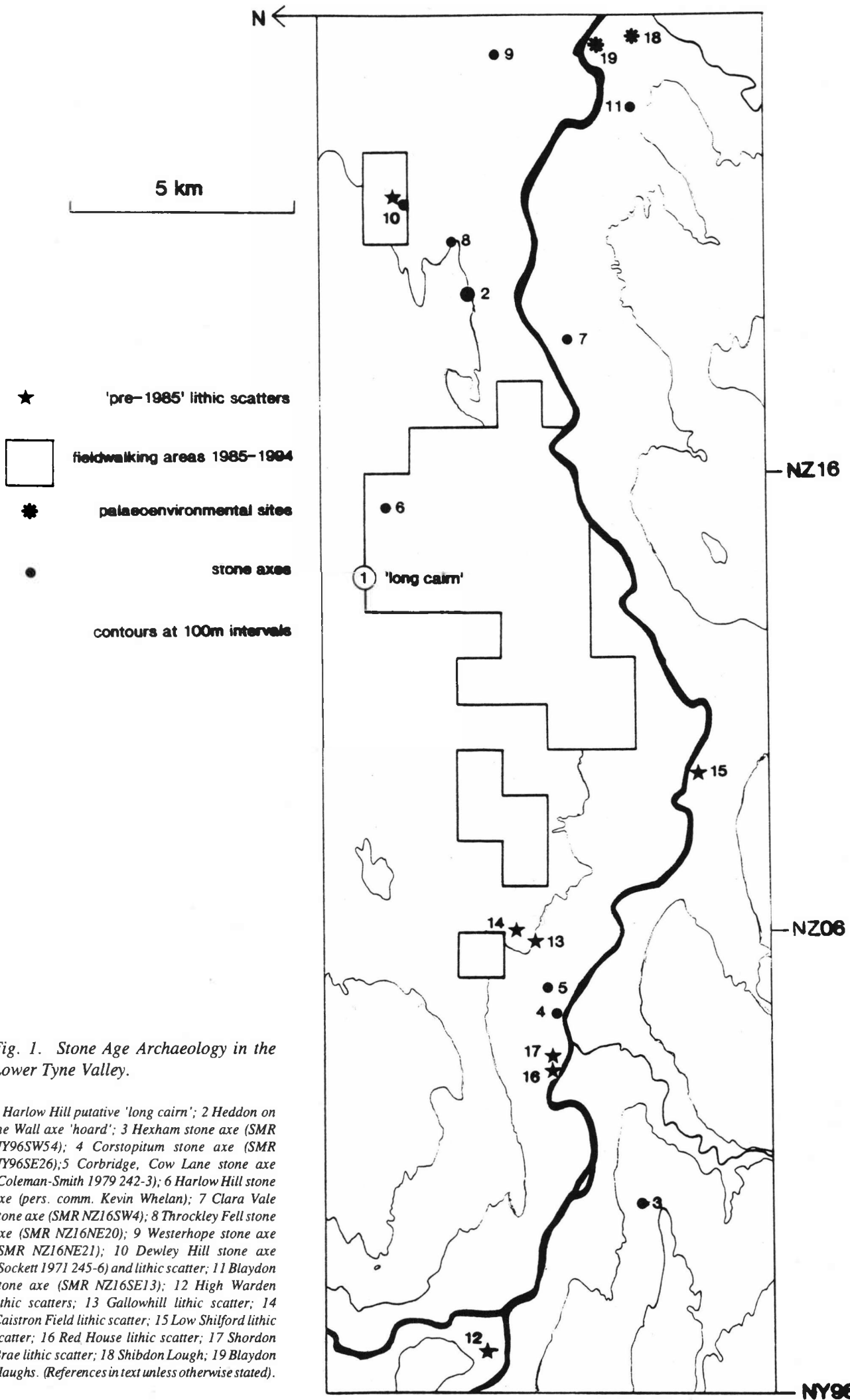


Fig. 1. Stone Age Archaeology in the Lower Tyne Valley.

1 Harlow Hill putative 'long cairn'; 2 Heddon on the Wall axe 'hoard'; 3 Hexham stone axe (SMR NY96SW54); 4 Corstopitum stone axe (SMR NY96SE26); 5 Corbridge, Cow Lane stone axe (Coleman-Smith 1979 242-3); 6 Harlow Hill stone axe (pers. comm. Kevin Whelan); 7 Clara Vale stone axe (SMR NZ16SW4); 8 Throckley Fell stone axe (SMR NZ16NE20); 9 Westerhope stone axe (SMR NZ16NE21); 10 Dewley Hill stone axe (Sockett 1971 245-6) and lithic scatter; 11 Blaydon stone axe (SMR NZ16SE13); 12 High Warden lithic scatters; 13 Gallowhill lithic scatter; 14 Caistron Field lithic scatter; 15 Low Shilford lithic scatter; 16 Red House lithic scatter; 17 Shordon Brae lithic scatter; 18 Shibdon Lough; 19 Blaydon Haughs. (References in text unless otherwise stated).

long cairn at Harlow Hill described by Masters (1984, 66) and MacLauchlan (1858, 19). This monument is no longer extant, having been destroyed by quarrying or agricultural improvements, and its status must remain in some doubt. It was described by MacLauchlan as being '... about 6 feet high, 12 feet broad and 60 yards in length' and found to be '... full of bones highly decayed' when dug into by a local farmer. As Masters comments, the length to breadth ratio is exceptional for a long cairn, but it does fall within the range of a class of monuments known as bank barrows, hitherto not recorded outside the south of England. The precise location of this monument cannot now be established (Myra Tolan-Smith pers. comm.; *pace* Masters 1984, 66) but it appears to have been situated within 500m to the north of the summit of Harlow Hill (fig. 1, 1). Similarly, its dating remains a matter of conjecture, and Masters, discussing the long cairns of both Cumbria and Northumberland, suggested 'a long time span in the fourth and third millennia B.C.' (Masters 1984, 72). It is virtually impossible to interpret the significance of a single, no longer extant, monument, except that it probably implies the presence in the vicinity of a relatively sedentary population and may have been the focus for important ritual and ideological aspects in the life of the community.

The discovery, in the back garden of 44 Antonine Walk, Heddon on the Wall (fig. 1, 2) of four Neolithic polished stone axes, and fragments of at least two others, (Sockett 1971) has been described by Burgess as 'one of the largest and most important hoards of stone axes ever found in Britain' (Burgess 1984, 149). According to Burgess the axes were found in the fill of a ditch, or 'less probably' a pit, and the possibility of a major Neolithic site at Heddon on the Wall should not be excluded. However, very little of the feature in question was available for examination and its significance remains in doubt. The status of this hoard is unclear. All four axes were damaged and only one (Sockett's no.5) remained serviceable. The inclusion of fragments in addition to broken axes suggests that it was the raw material that was important, and although petrological identification has not been undertaken, a Lake District (Group VI) source is considered likely. Whatever the status of the hoard, it is worth noting that the axes were found at a prominent location on the north side of the valley close to the tidal limit and within a kilometre of Stannerford, a crossing of the Tyne the antiquity of which is implied by the former presence at its northern end of two standing stones (OS Record Card NZ16NW25).

There are also records of a number of casual finds of Stone Age material from the study area but as most are undiagnostic and found out of context they have little contribution to make to the present study. They do, however, include nine isolated finds of Neolithic polished stone axes, in addition to the Heddon on the Wall hoard, and their locations are indicated in fig. 1 (3-11).

Before 1985 fieldwalking had been undertaken in the lower Tyne Valley by a number of individuals foremost of whom has been Dr Joan Weyman, who has summarized most of this earlier work (Weyman 1984).

Apart from casual finds and diffuse collections made over large areas, several assemblages are of particular interest. At High Warden, two of what Weyman calls 'chipping places' were located on a terrace of glacial gravels about 370m north of the present course of the River South Tyne (fig. 1, 12) and about a kilometre west of its confluence with the River North Tyne. Of particular interest is Weyman's reference to, and illustration of, an obliquely blunted point (Weyman 1984 47, 48 fig. 3.4 (10)), one of a few pieces of evidence for a potentially early Mesolithic phase of activity in Tynedale. Similar 'working sites' are reported from Gallowhill Farm and Castron Field, Corbridge (fig. 1, 13 and 14) (Weyman 1984, 1975). The latter assemblage also included post-Mesolithic finds as did an assemblage collected at Low Shilford (Weyman 1984, 1980) (fig. 1, 15). Two assemblages of Mesolithic material were recovered during excavations on Roman remains at Red House and Shordon Brae, Corbridge (fig. 1, 16 and 1, 17) and Weyman's report refers to the recovery of three obliquely blunted points, two from Shordon Brae and one from Red House, although only one is illustrated (Weyman 1984, 198; 1979, 70-4, fig. 23e).

Two further groups of finds from lower down the Tyne Valley, but still within the study area, are also mentioned in Weyman's summary. One of these, the Cocks Collection, comes from the south side of the valley at Ryton. Stone artefacts were collected from over a wide area and it is inappropriate to refer to this collection as an assemblage. According to Weyman (1984, 47) the Cocks Collection, which has not been published, 'is mostly of Neolithic and later appearance but does contain some material of Mesolithic aspect'. The other group of finds from the lower part of the valley were collected by Dr Weyman in the vicinity of Dewley Hill, a putative glacial kaim and findspot of one of the stone axes referred to above (fig. 1, 10). This assemblage includes both Mesolithic and later material of a predominantly industrial character (Weyman 1984, 47), a finding confirmed by more recent (unpublished) fieldwork at the site.

These pre-1985 data provide a very limited picture of the Stone Age in the lower Tyne Valley. The obliquely blunted points from High Warden and the Corbridge excavations might indicate a human presence in the area during the early Mesolithic but such finds also occur in later Mesolithic assemblages and it is to the period after 8500 RCY BP that most of the evidence for Stone Age activity in the lower Tyne Valley belongs. Weyman identified a number of locations (High Warden, Gallowhill Farm, Castron Field and Dewley Hill) where evidence was found for industrial activity during the Mesolithic, her 'chipping' or 'working' sites. Each were situated some way from, and above, the river on terraces of glacial gravel, a possible source of raw material for flint working. Other assemblages such as Red House, Shordon Brae and Low Shilford, were situated at lower elevations and closer to the river.

The Neolithic is represented by the presence of diagnostically Neolithic finds in assemblages which also include earlier material, a scattering of polished stone

axes usually unassociated with other finds, a hoard of such axes at Heddon on the Wall and a putative long cairn at Harlow Hill. Although any pattern produced by so few finds may be quite illusory, it is perhaps worth noting that the incidence of stone axe finds declines on an east to west gradient. If axes can be tentatively correlated with the extent of woodland clearance and, indirectly, cultivation (Burgess 1984, 133), Neolithic settlement in the lower Tyne Valley appears to have decreased with distance from the coastal plain. Accumulated temperatures, precipitation and potential soil moisture deficits (PSMDs) are all factors of vital importance to agricultural regimes. Maps published by Lunn (1993, 42 figs 3, 4 and 5) show that the lower Tyne Valley and the coastal plain experience a similar climate and the evidence of the axes suggests that the Neolithic settlement of the valley should be seen as an extension of developments to the south and east. None of the axes have been subject to petrological identification but several are stated as being of 'greenstone' or from a Lake District source; both attributions probably refer to Group VI and the Great Langdale and Scafell axe factories. As such they may be thought to imply westwardly orientated connections but given their often battered state many of the items may have been in circulation for some time and have little to tell us about the affiliations of the Neolithic population of the lower Tyne Valley.

Additions to the archaeological record for the Mesolithic and Neolithic in the Lower Tyne Valley since 1985

In 1985 the Department of Archaeology at Newcastle University began to teach landscape archaeology to undergraduates. Part of the instruction given involved practical exercises in systematic fieldwalking. Also, since 1988 fieldwalking has been undertaken in the area as part of postgraduate programmes of study and has more recently been supplemented by the activities of a group of local amateurs, the Stone Age Tynedale Survey (SATS) founded by Myra Tolan and myself in 1990. Over the past decade a substantial body of fieldwalking data has been accumulated and from the autumn of 1993 this research has been brought within the wider, strategic, perspectives of the Department's 'Tyne-Solway Ancient and Historic Landscapes Research Programme'.

By the end of 1994 fieldwalking data had been systematically collected from an area of 3,523,650 square metres. Coverage varied according to ground conditions and the size and experience of the fieldwalking teams, but was never less than 20% and only rarely exceeded 40%. Finds were collected and recorded within sample blocks which average 2100 square metres but vary in size in accordance with conditions on the ground and the size of the team. Data are at present available from 1671 sample blocks, distributed widely throughout the study area. These variations in field methodology are catered for by a set of standardisation procedures, one of which calculates

a notional density value for the number of finds per 1000 square metres, a statistic which has little meaning in absolute terms but is useful as a basis for comparison.

The majority of stone artefacts found during fieldwalking are not diagnostic of any particular technological phase or chronological period and few items can be ascribed to anything less than very broad time ranges. Until recently all stone artefacts from the area were thought to belong to the Mesolithic or Neolithic, or to the earlier part of the Bronze Age before metal became widely adopted. The recent discovery of a Late Upper Palaeolithic artefact at Eltringham (Cousins and Tolan-Smith in press) has opened up the possibility of a fourth period being represented but it is yet to be demonstrated that this find is anything other than a rare, isolated occurrence. Virtually all finds which can be attributed to the Mesolithic appear to belong to its later phase and are unlikely to be older than 8500 RCY BP. A range of Late Mesolithic artefact types have been collected during fieldwalking and make possible some appraisal of the nature and extent of Mesolithic activity in the area. Unfortunately this is far from being the case with finds attributable to the Neolithic. In the lower Tyne Valley, as in other parts of the British Isles, it has proved very difficult to distinguish Neolithic finds from those belonging to the earlier part of the Bronze Age. In a few cases the distinction is reasonably clear cut such as that between leaf-shaped and barbed points, attributable to the Neolithic and Bronze Age respectively. However, these are not found in sufficient numbers to provide a basis for examining regional patterns and as they probably reflect the same kind of activity, namely hunting, they provide a poor basis for monitoring changes in patterns of landscape use. As a consequence of these uncertainties it has proved necessary in practice to divide the finds made during fieldwalking into three broad categories, Mesolithic (Category A), Neolithic-earlier Bronze Age (Category B) and unclassified (Category C). It follows from this that the patterns of settlement and landscape use identified for the Mesolithic can only be compared and contrasted with what is in effect a composite Neolithic and earlier Bronze Age pattern. Although this makes it difficult to monitor changes which occurred during the course of the transition from the Mesolithic to the Neolithic, it is still possible to contrast the evidence from what is believed to have been a period of high settlement mobility and extensive landscape use, the Mesolithic, with one of decreasing settlement mobility and intensive landscape use, the Neolithic and earlier Bronze Age. While being able to monitor only broad trends inevitably leads to a lack of detail, it does mean that those trends that can be identified are likely to be the result of long term processes.

The palaeoenvironmental record

The only palaeoenvironmental data available from the study area which span the Mesolithic/Neolithic transition are those collected at Shibdon Pond and Blaydon Haughs during the course of the construction of the Newcastle

Western By-Pass between 1987 and 1991 (Macklin *et al* 1992a and 1992b) (fig. 1, 18 and 19). Sedimentological and palynological studies indicate that during later Mesolithic and early Neolithic times there was considerable alluviation with a flood plain environment dominated by alder. A temporary decline in alder counts and a rise in Gramineae at circa 6300 RCY BP suggests an episode of small scale disturbance, possibly attributable to localised late Mesolithic woodland clearance (Macklin *et al* 1992 48). However, the study of alluvial sequences elsewhere within the Tyne catchment has documented an episode of major incision from the later 4th millennium RCY BP to the mid 1st millennium RCY AD followed by an episode of alluviation (Macklin *et al* 1992). From this it appears that alluvial deposits dating from earlier periods, such as the Mesolithic/Neolithic transition, are unlikely to be widespread.

Palynological data are available from Fozy Moss, situated 7 km west of the study area and 7 km north of the present channel of the River South Tyne. According to Dumayne and Barber (1994, 167) the part of the pollen diagram which spans the period from the Neolithic through to the early Iron Age 'records a largely forested landscape characterised by a series of small temporary clearances, in which pastoral and/or arable agriculture may have been practised'. The resolution of this study is insufficient to monitor specific changes that occurred at the time of the Mesolithic/Neolithic transition and the extent to which this general picture might also be typical of the lower Tyne Valley is matter of conjecture.

Palynological evidence for clearances in the lowlands and Pennine valleys of County Durham, and in north Northumberland, has been taken by Burgess (1984, 132) to imply the establishment of a Neolithic, farming economy in the region by third quarter of the 6th millennium RCY BP. Palaeoenvironmental data of any kind from the study area are limited but the broad picture appears to be one of a very limited anthropogenic impact on the landscape until the later part of the Bronze Age, and in some areas this did not occur until the immediately pre-Roman period.

A landscape approach to the Mesolithic-Neolithic transition in the Lower Tyne Valley

It is a commonly held misconception that the object of a fieldwalking exercise is the discovery of sites, and on many occasions over the past decade I have been asked how many sites have been found by the fieldwalking teams working in the lower Tyne Valley. In recent years there has been a lively debate over the nature of archaeological sites leading to the development of both 'off-site' and 'non-site' approaches in addition to that conventionally focused on the site (Foley 1981; Schofield 1991a and 1991b; Dunnell 1992; Binford 1992). Most people would agree that an archaeological site is a location in the landscape that has been the scene of a concentration

of human activity. The range of possibilities is quite broad and includes, in addition to settlement activity of various kinds, sites of ritual and ceremonial activity and industrial sites where there has been a concentration of raw material extraction and/or processing. However, human activity is not confined to such locations but is distributed, more-or-less, continuously, across the landscape, and simply varies in intensity from one location to another. This emphasis on the spatial continuity of human behaviour, and the concomitant spatial continuity of the archaeological record, has been the principal advance achieved as a result of the debate over the nature of archaeological sites. It is now possible to accommodate the full range of the archaeological record and single finds or small groups need no longer be dismissed as 'background noise' or given inflated importance by arbitrary definitions of 'sites' as N finds within X metres.

Given the above definition, an archaeological site should be represented in the archaeological record by a concentration of evidence for past human activity. Such concentrations are very difficult to identify on the basis of fieldwalking evidence alone and simple correlations between densities of finds and intensity or concentration of past human behaviour can be very misleading. Many factors contribute to the density of finds recovered during a fieldwalking exercise, past human behaviour being only one such factor, and quite possibly not the most influential. The method of fieldwalking employed and variability between fieldwalkers will clearly influence the quantity of finds made and although such factors can, to some extent, be allowed for (Shennan 1985), it is much harder to accommodate the distorting influence of post-depositional processes. These include not only natural agencies such as erosion, colluviation and alluviation, but also landuse practices such as ploughing. The potential effect of these processes on the quantitative results of fieldwalking has led Schofield to suggest that attempts to interpret density values should be abandoned (Schofield 1993). In an area such as the lower Tyne Valley, which is not blessed with abundant sources of workable stone, assemblages of stone tools collected during fieldwalking tend to be small when compared with areas rich in flint, and this further inhibits the interpretation of varying density values.

In point of fact fieldwalking is a rather poor way of identify archaeological sites; what it is effective at is establishing a human presence and monitoring changes in the nature of activities undertaken in different parts of the landscape. This assessment of fieldwalking data in terms of the extent and nature of past human activity is what I term the landscape approach. In common with both the 'non-site' and 'off-site' approaches referred to above it views human behaviour in the landscape as a continuous phenomenon of varying intensity. Its level of focus is that of the landscape as a whole and there is no attempt to identify or interpret sites as such.

The Mesolithic-Neolithic transition in the Lower Tyne Valley: a preliminary assessment of the results of fieldwalking between 1985-1994

A quantitative assessment of the data from each period can be undertaken by adopting a simple 'presence-absence' approach which is not density dependent. I have discussed this approach in a supra-regional regional context in previous publications (Smith and Openshaw 1990; Smith 1992) and many of the issues raised also apply at the smaller scale of analysis undertaken here. This approach proceeds from the assumption that the recovery of a Category A find from within a sample block is indicative of Mesolithic activity within the area of that block, and likewise for Category B finds and Neolithic-earlier Bronze Age activity. At this level of analysis additional finds of either category would not add to our knowledge of the extent of activity within the block and in this sense such finds can be considered redundant. This analysis also proceeds on the assumption that the methodological and post-depositional biases which can influence absolute density values will not have been specifically selective of one category of material at the expense of the other. Thus by summing the sample blocks in which finds of each category have been made a quantitative assessment of the extent of activity in each period can be arrived at.

Discarded stone artefacts have been recovered from 573 blocks or 34% of the area covered by fieldwalking. As a methodological check 7% of the area examined has been searched for finds during more than one fieldwalking season, and finds were also made in 33% of the blocks fieldwalked. Although a crude measure, this figure does provide an index of the extent of evidence for Stone Age activity in the area.

Of the 573 blocks from which evidence for Stone Age activity was recovered during the main fieldwalking programme Category A finds occurred in 167 blocks (29%) and Category B finds in 62 blocks (11%). In only eight cases did finds of both Categories occur in the same block, suggesting only a small degree of overlap. The finds from the remaining 352 blocks are undiagnostic and have been recorded as Category C. This undiagnostic material can play no further role in this analysis, but it should not be forgotten, and if it becomes possible in future to assign more Category C finds to Categories A or B the patterns tentatively identified in this preliminary assessment might be subject to modification.

Of the 221 blocks within which diagnostic finds have been made 75% have produced finds indicating activity during the Mesolithic and 29% finds indicating Neolithic-earlier Bronze Age activity. The greater extent of evidence for Mesolithic activity may arise from a number of factors.

The first to consider is whether the greater extent of Mesolithic activity, as represented by discarded stone tools, is simply a reflection of the greater duration of that period. On present evidence the Mesolithic in the lower Tyne Valley lasted for about 3000 years, beginning

around 8500 RCY BP, while the Neolithic and the earlier part of the Bronze Age spanned the period from 5500 RCY BP to 3500 RCY BP, two millennia in total. These are only very broad date ranges and will be subject to modification. They are also an oversimplification as some overlap is likely to have occurred between the Mesolithic and the Neolithic, and this may have spanned several centuries or indeed longer. However, they do provide a means of applying a temporal correction factor to the fieldwalking data. The simplest way to do this is to divide the number of blocks with diagnostic finds by the duration of the period, in millennia in order to keep the figures manageable. On this basis the adjusted values for Category A finds are 55.2 blocks per millennium and for Category B finds 31 blocks per millennium. I feel this gives a more realistic indication of the extent of activity in each of the periods. On the basis of this preliminary analysis of fieldwalking data it appears that Mesolithic activity in the lower Tyne Valley, even allowing for the greater duration of the period, was significantly more extensive than activity attributable to the Neolithic-earlier Bronze Age.

The greater extent of evidence for activity in the Mesolithic can be attributed either to the fact that the population was larger than in subsequent periods or that Mesolithic activity was of a genuinely more extensive nature than activity during the Neolithic and earlier Bronze Age. At the supra-regional scale, and in the context of the Late Upper Palaeolithic and Mesolithic settlement of the British Isles, I have suggested that the extent of the landscape occupied during successive millennia can provide a relative indication of the size of the population (Smith 1992). However, it is doubtful whether this simple correlation between area occupied and population can be held to apply at smaller scales of analysis and a behavioural explanation seems more likely.

Interest in the transition between the Mesolithic and Neolithic periods arises from the view that it marked a major change in modes of subsistence and patterns of settlement. Mesolithic communities, who were hunter-gatherers and lived a mobile existence making extensive use of the landscape in their quest for food and raw materials, are held to have been replaced by Neolithic communities who were sedentary and made intensive use of a relatively small part of the landscape in growing domesticated crops and rearing livestock. There is little doubt that this is indeed what happened although the starkness of the contrast is overstated. Hunter-gatherers, particularly towards the end of the Mesolithic, may have begun to adopt an increasingly more sedentary life style while at the same time intensively exploiting a limited range of resources, some of which they may have submitted to a degree of systematic manipulation (Zvelebil 1994). Similarly, it is unlikely that the early farmers of the Neolithic entirely turned their backs on wild resources and their patterns of settlement may have maintained a degree of mobility.

We have seen from the fieldwalking evidence that Mesolithic use of the landscape seems to have been more extensive than that documented for the Neolithic-earlier

Bronze Age, a conclusion which is in accord with the broad expectations set out in the previous paragraph. Adopting what I have termed a landscape approach to the fieldwalking data analysis of the contrast between these two periods can be taken somewhat further.

People in the remote past, just as much as in recent times, used their landscape in a variety of ways, according to its suitability and their needs. Qualitative variability in stone tool assemblages provides a key to understanding such variable patterns of use. Specialists use a large number of categories to classify stone tools and debitage but in landscape terms these can be combined into broad groups, each reflecting a distinct set of activities. One such group of activities is concerned with the acquisition of the food and raw materials necessary to sustain life. I refer to these as extractive activities. Another group of activities are more concerned with processing the various resources and raw materials acquired during extractive activities; for terminological convenience this group can be referred to as non-extractive activities. The location of extractive activities is determined by the location of the resource, be it a source of raw material, hunted prey or gathered fruits. Even though farmers can choose where to plant their crops they still have to go to the field to harvest them. Domestic animals provide an obvious exception in that they can be moved logistically between locations. The location of non-extractive activities are not determined in this way, and they can be located tactically to suit other human needs.

It is possible to classify stone artefacts collected during fieldwalking according to whether they reflect extractive or non-extractive activities. For example, the acquisition of raw materials, an extractive activity, will have involved the initial testing of flint pebbles or nodules to assess their suitability for further processing. Pieces regarded as unsuitable are likely to have been discarded at the source of the raw material and such tested pieces provide a means of identifying the location of raw material sources. Similarly, arrowheads are most likely to have been lost during hunting episodes, another extractive activity, and large prey are likely to have been butchered at the kill site. Such butchery should also be considered an extractive activity. The gathering of wild plant resources is another extractive activity, as is the harvesting of domestic crops. Activities such as these might be represented in the fieldwalking assemblage by finds of knives, denticulates and sickles. A range of artefact types can also be proposed as representing non-extractive activities. Scrapers and burins, usually associated with hide, wood and bone working, may be cited as typical examples of stone tools used to process other materials, a mainly non-extractive activity. The manufacture of stone tools is also a non-extractive activity and might be represented in an assemblage by cores and knapping debris, though the initial stages in the reduction sequence may have taken place at the source of the raw material.

This approach is, admittedly, somewhat simplistic and an objection that may be raised is that in most cases we have little idea what individual stone artefacts were

used for. However, arrowheads and scrapers were clearly used in different activities and the landscape approach seeks to identify patterns in the spatial distribution of those activities. A further objection might be that in some cases evidence for extractive and non-extractive activities are found at the same place, perhaps belying the existence of any meaningful distinction. On the contrary, such mixing is taken to be evidence for changes in the use of the landscape through time, a phenomenon worthy of attention in its own right.

Because of the difficulty of ascribing industrial discard, the debris of flint knapping, to either Category A or Category B and its uncertain status in landscape terms, this type of material has been omitted from the following analysis. Extractive discard attributable to Category A was found in 29 blocks while the equivalent total recorded for Category B is 27 blocks. When allowance is made for the greater duration of the Mesolithic it appears that extractive activity was rather more widespread in the Neolithic and earlier Bronze Age. The converse is the case with non-extractive discard which in the case of Category A finds is recorded from 95 blocks but only 33 in the case of Category B. This means that, even when allowance is made for the greater length of the Mesolithic, non-extractive activity during that period was significantly more extensive.

The interpretation of these data is far from straightforward but a number of general points, of relevance to the issue of the Mesolithic-Neolithic transition, seem evident. First, there appears to have been a significant increase in the amount of the landscape used for extractive purposes during the Neolithic-earlier Bronze Age. This is especially noteworthy given the generally accepted view that landscape use became increasingly more intensive with the passage of time as farming replaced hunting and gathering. Even though Neolithic-earlier Bronze Age communities probably continued to hunt and extract wild resources it is difficult to avoid concluding that there was an absolute increase in demand for resources of whatever kind compared with the Mesolithic. The most likely explanation for this is an increase in population. Second, the far greater extent of evidence for non-extractive activities in the Mesolithic compared with the Neolithic-earlier Bronze Age is striking and at first sight might seem to run contrary to the evidence for population increase cited above. The reason for this discrepancy probably lies in the nature of the activity involved. Notwithstanding the caveats above about the maintenance of a degree of mobility in Neolithic-earlier Bronze Age settlement patterns it seems likely, given their means of subsistence, that communities at that time were more sedentary than the hunter-gatherers of the Mesolithic. A consequence of greater sedentism is that non-extractive activities will be more concentrated and evidence for them in the archaeological record will be less extensive. The corollary of this is that the greater mobility of communities in the Mesolithic, who made relatively frequent moves, rarely returning to precisely the same location, has led to greater dispersal of non-extractive activities and the evidence for them in the archaeological record.

We may conclude from this stage in the analysis of the fieldwalking data that evidence is provided for an increase in population between the Mesolithic and Neolithic-earlier Bronze Age and a decrease in settlement mobility.

So far these data have been reviewed out of topographical context; the extent of evidence for different kinds of activity has been compared for the two categories of finds, Categories A and B. For the analysis to be taken further the data have to be returned to their topographical context and we need to ask in what ways, other than simply in extent, did the use of the landscape differ between the Mesolithic and Neolithic-earlier Bronze Age periods.

For example, did the topographical focus of extractive and non-extractive activities change between the two periods and if it did was the change abrupt or gradual? The small number of sample blocks with both Category A and Category B finds suggests that there may not have been much overlap between the two periods in terms of landscape use and an abrupt change seems more likely than a gradual transition. But these are complex issues requiring the detailed analysis of the topographical context of the finds discussed here. They lie beyond the scope of this paper and constitute the next stage in the development of both the programme and the landscape oriented approach to fieldwalking that has been applied here. Further fieldwalking is planned in order to ensure that a representative range of topographies have been examined. In the winter of 1994-1995 systematic fieldwalking was begun on the south side of the River Tyne under the direction of Steve Cousins. There are also plans to extend the study area into the valley of the River South Tyne in the autumn of 1995, while the Stone Age Tynedale Survey will continue its programme of fieldwalking in the lower Tyne Valley.

Concluding remarks

In this paper I have addressed two issues. One has been a review of the evidence for the Mesolithic-Neolithic transition and has involved an examination of two data sets. The first consists of finds accumulated over many decades in a variety of circumstances, while the second is comprised of finds made during the course of systematic fieldwalking by members of the Department of Archaeology and the Stone Age Tynedale Survey since 1985. Differing research agendas and methodologies preclude the full integration of these data sets. In the absence of field monuments and a palaeoenvironmental record, the issue of the Mesolithic-Neolithic transition has had to be addressed through an examination of the stone tool assemblages associated with the two periods in question. The preliminary analyses carried out suggest that the transition from the Mesolithic to the Neolithic was marked by (i) an increase in the amount of the landscape exploited and, by inference, an increase in population, and (ii) an increase in sedentism. Both of these conclusions are in accord with predictions that can

be made on the basis of an understanding of the Mesolithic-Neolithic transition elsewhere in north west Europe. The fact that Mesolithic and Neolithic-earlier Bronze Age finds have not often found together provides a hint that the transition may have been more abrupt than gradual, a finding that would probably not have been predicted, and one requiring further investigation. The stone tools themselves provide little indication of a change in patterns of subsistence. On the contrary, several of the artefact categories that can be ascribed to the Neolithic-earlier Bronze Age reflect hunting, a mode of subsistence conventionally associated more with the Mesolithic than later periods. The distribution of stone axes might be taken to imply that Neolithic forest clearance and, by inference, agriculture was more intensive in the lower part of the valley adjoining the coastal plain than it was upstream, but this is a possibility neither supported nor refuted by the fieldwalking evidence.

The second issue I have addressed is the development of a methodology for the study of fieldwalking data which gets away from the largely uninformative hunt for 'sites'. I have called this a 'landscape approach' and I have tried to show how, by looking at the data in broad terms, useful insights can be gained into the relationships between past communities and the landscape in which they lived. Both aspects of this project are still at an early stage of development and much work remains to be done.

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