ART. III – *The environs of the Castlerigg stone circle: an analysis of the landscape of the Naddle Valley near Keswick*

By T. CLARE

ALTHOUGH Castlerigg stone circle is one of the best known and visited prehistoric monuments in Britain there has been no previous archaeological survey of its environs. In that context the author began a survey of the area in 1994 and this paper presents the results of one piece of fieldwork. In particular it has two objectives: to describe individual features and to discuss how they relate to the evolution of the landscape.

Britain's landscape has sometimes been described as a palimpsest. The point of this analogy is that features from an earlier landscape, such as a stone circle, might exist in a later period in the same way that words of an earlier text might be discernible below and between the principal text. However, this analogy is too simplistic and a better model is that used by Roberts to explain village landscapes (Roberts, 1987, Fig. 1.4). The essential feature of Robert's model is that the earlier landscape (or text) is rarely removed *in toto* but individual features may survive to influence or to be used in later periods. For example, many "late twentieth century" field boundaries were originally built more than two hundred years ago and were part of a somewhat different socio-economic system to that now operating.

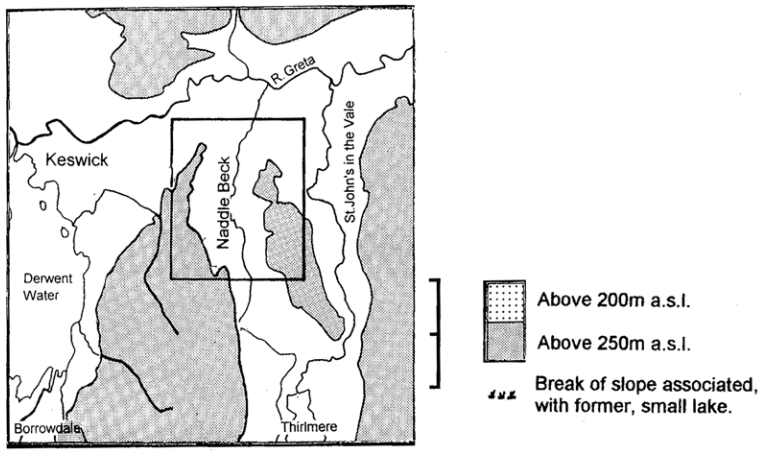
Implicit in this model are two implications for traditional archaeological approaches. Firstly, the need to recognise that period dates, such as "neolithic" or "Tudor", attached to features, usually refer to when the structure was erected or used for its primary purpose. They do not indicate how long the site may have survived or been used (Barrett, 1994, 117-118, Clare, 1994, 170). Secondly, that some earthworks or relict features such as lynchets, meticulously surveyed and recorded for the Sites and Monuments Record and management purposes, may be contemporary with field boundaries which are still serving farms and are not usually included in archaeological inventories.

Landscape archaeology has developed in recognition of these issues and four concepts are relevant to this paper *viz*: that the landscape is a continuum in both space and time; that some areas have greater "time depth" than others; that there is a relationship between biodiversity and the archaeological/historical record; and that all of the above have combined to form discrete "landscape historical zones" (McNab and Lambrick, 1996). In this paper, therefore, the archaeology of the Naddle valley will be described in terms of individual features – some relict, some functioning – and historic landscape zones and their relationship to topography and biodiversity.

The Topography of the Study Area

A former tarn

A prominent feature of the valley floor and one visible from the stone circle is a



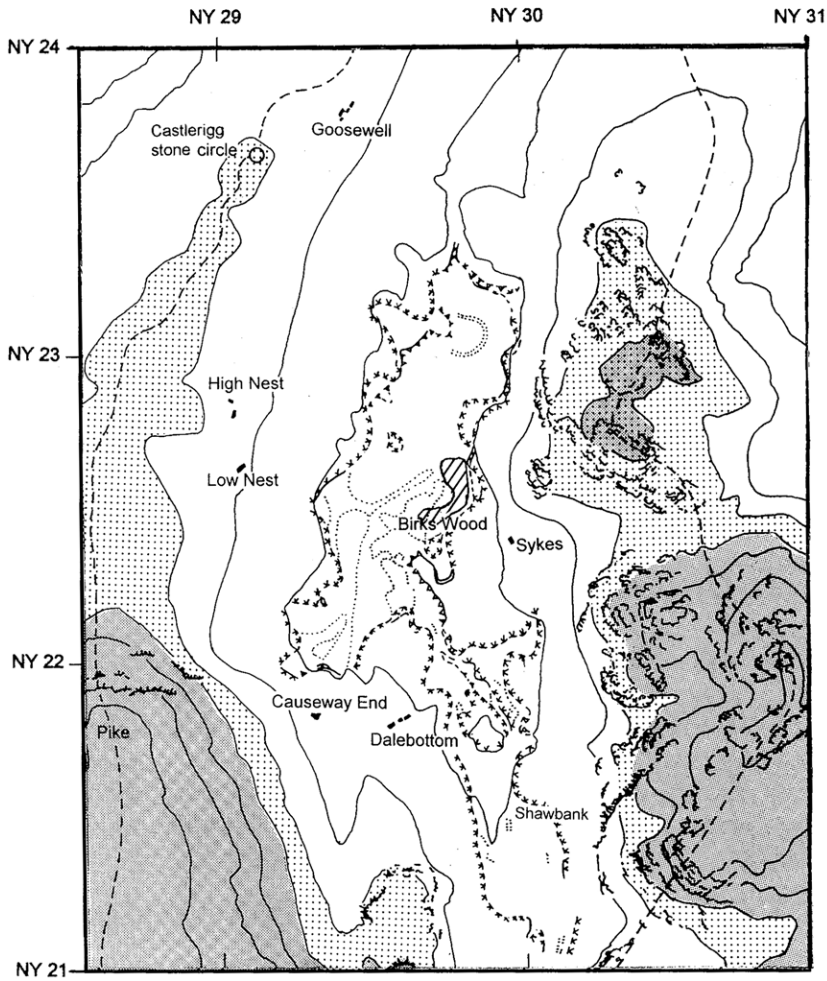


FIG. 1a. The general location of the study area.
FIG. 1b. The topography of the area showing the extent of the former tarn and associated sediments.

former tarn. Geomorphological observation and mapping of the feature (Fig. 1b) suggests much of the southern half was infilled by sediment in the early Holocene. By medieval times the tarn would have ceased to exist as such. Any areas of standing water would have been very small and localised and the main topographical feature (as now) would have been extensive areas of mire formation in basins north of those sediments or between them and the valley sides: a situation consistent with the absence of a name for the tarn (but see below).

One such basin is that beneath Birks Wood (NY 298226). Here there is more than 5 m of peat, and pollen analysis reveals that for much of the Holocene this part of the valley was occupied by alder carr (Wilkinson, Clare and Corkish, *submitted*). By the time of the first Ordnance Survey map in 1865, however, this woodland had gone and the area was more open but supporting a small area of scrub/woodland which, on the evidence of the present name, was predominantly birch.

The disappearance of the alder carr in the vicinity of Birks Wood and its subsequent replacement with birch, a tree characteristic of drier ground, may be linked to the draining of the northern part and main basin of the tarn. When this occurred is not clear but former oxbows, such as that at NY 298230, show that, prior to this event, the main stream was sufficiently powerful to maintain its own meandering channel through the areas of bog. The canalisation of the channel was, therefore, an attempt to lower the water table of the bog both by creating a more efficient channel and by physically lowering the point at which it exited from the main basin.

The significance of this is that it suggests the valley floor had been very wet and that, at times of flood, the whole valley floor would have been a single sheet of swirling water. This apparently still occurs in the area of southern sediments (MacMeeking, pers. comm.), but the real significance of this observation is that the valley might be described as one of "flowing wetness": a possible origin for the name Naddle (Appendix).

From an archaeological point of view the fact that the valley floor is in reality a series of discrete basins means that pollen evidence is likely to be localised (Jacobsen and Bradshaw 1981, for the relationship of basin size to catchment area). The vegetation sequence at Birks Wood, for example, must relate to that area and not to the wider valley. Certainly the evidence from a small basin east of Dalebottom Farm is different. There, the record still contains a high proportion of alder but there is also hazel, oak, and ribwort plantain amongst other species (Corkish, 1994) so that the "picture" is of a landscape being farmed from somewhere in the vicinity (see below).

Overall, this picture is not inconsistent with that of Pennington (1970) who, working further south at Thirlmere, demonstrated that after the establishment of secondary forest in neolithic times, there was little woodland clearance until the tenth century A.D. However, the hillfort high above Shoulthwaite Gill, the principal tributary of Naddle Beck, suggests that by late prehistoric times the ridge tops were being exploited, albeit perhaps only for summer grazing. Evidence for the latter in the medieval period is demonstrated by the existence of shieling huts in the area but palynological evidence from Launchy Tarn, 4 km to the south of the hillfort shows that some trees were present at that time, possibly in the gullies and hanging valleys (Leigh, 1995).

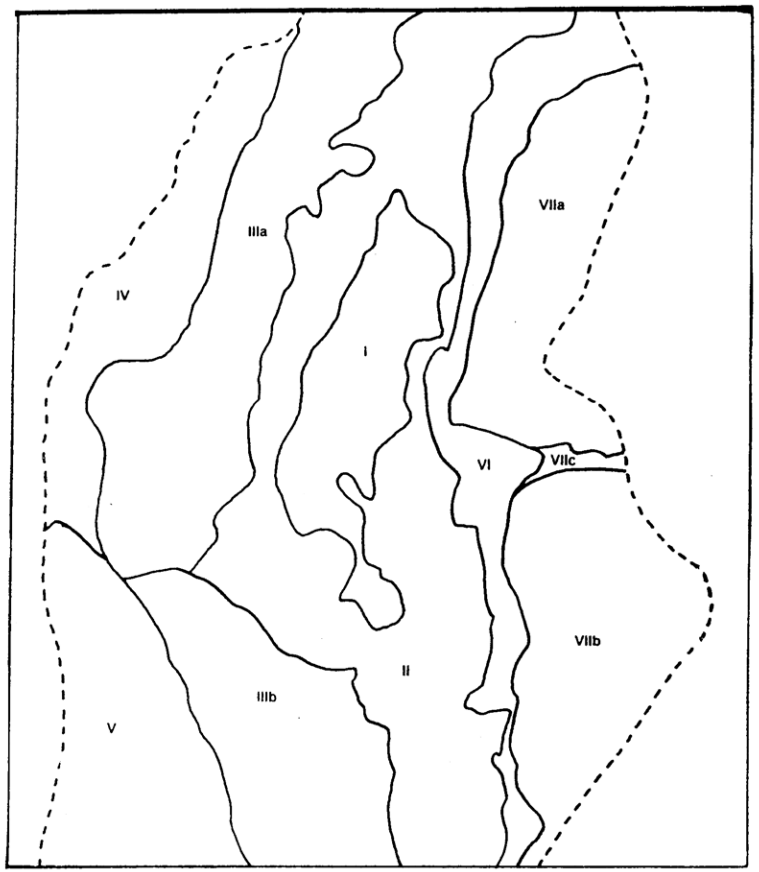


FIG. 2a. The topographical units.

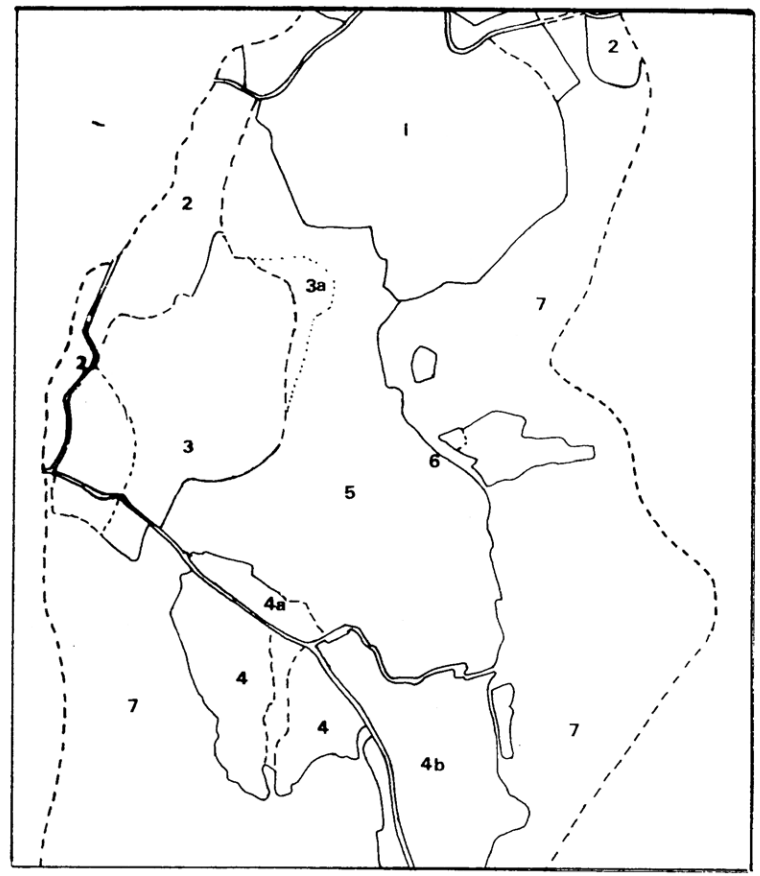


FIG. 2b. The historic landscape zones.

Other topographical units

In addition to the former tarn (I in Fig. 2a), six other topographical units can be recognised based on height above sea level, slope, aspect and drainage. These factors would have influenced the character of the Flandrian soils and vegetation prior to the latter being changed by humans and climate. For that reason the topographical units have an ecological meaning which can be compared with historical data and the six units other than the tarn are:

II: an area of relatively flat valley floor, including that north of the tarn's overflow channel, defined largely by the 160 m contour and with a relatively high density of water courses at its south end;

IIIa: the east facing valley side between for the most part 160 and 200 m above sea level where the water courses are primarily "drains";

IIIb: an extension of the previous area but distinguished by its slopes merging into those of unit V, by the existence of a tributary valley and its network of streams and by the existence of rock outcrops on the associated spur of Snipes How;

IV: the relatively flat interfluve on which the stone circle is situated; its boundaries being the 200 m and 240 m contours;

V: the western ridge above 240 m; this rises in steep slopes to a relatively flat ridge 360 m above sea level.

VI: gently sloping valley side, west facing and approximating to the 160 m and 190 m contours;

VII: the ridge which forms the eastern side of the valley, characterised by rock outcrop, crags and scree; with an area predominantly below 240 m (VIIa) and one predominantly above 240 m (VIIb), separated by a col (VIIIc).

Field Patterns

Fig. 3 shows the extent of enclosed land now and in 1840, and the changes in field boundaries which have occurred between those dates. The most noticeable feature of the changes is the enclosure of common land which, by 1840, was predominantly high ground.

A comparison of the field patterns in 1840 with the ownership recorded at that time (Fig. 4) suggests, however, that there had been other areas of common land. In particular the relatively flat top of the ridge on which the stone circle stands (topographical unit IV) was in numerous ownerships and this fact, together with the rectangular shape of the fields suggests that it had been common land. It has not, however, been possible to find documentary evidence for the enclosure of this land but the mid-eighteenth century descriptions refer to the circle being within an (arable) enclosure. In that context a date *c.* 1702 for the enclosure may be postulated, based on the datestone of the farmhouse just outside the study area at NY 283229. Significantly this farm is called 'Moor', a name usually used of common land, and it is probably the latter to which the name recorded in 1569 (Dickins, 1943) applies. A concomitant is, however, that many of the other enclosures recorded in 1840 (including those still in use) were in existence by 1700 and could/should therefore be regarded as archaeological features. Equally, they provide clues as to where the early settlement might have been *viz.* Nest; Causeway Head-Dalebottom; Syke and Shaw Bank.

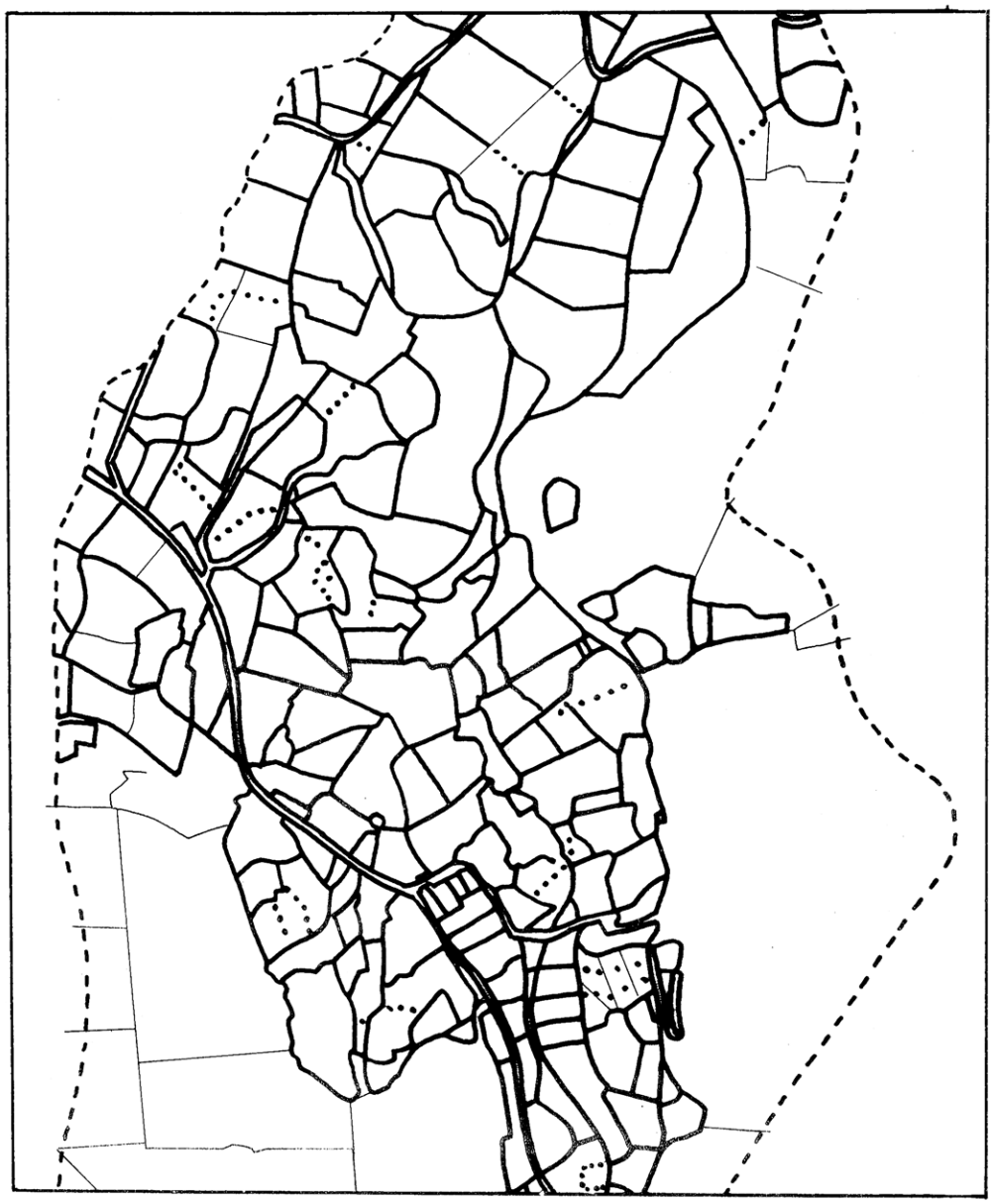


FIG. 3. The field pattern.
Heavy lines = boundaries present now and in 1840.
Thin lines = boundaries since 1840.
Dotted lines = boundaries lost since 1840.

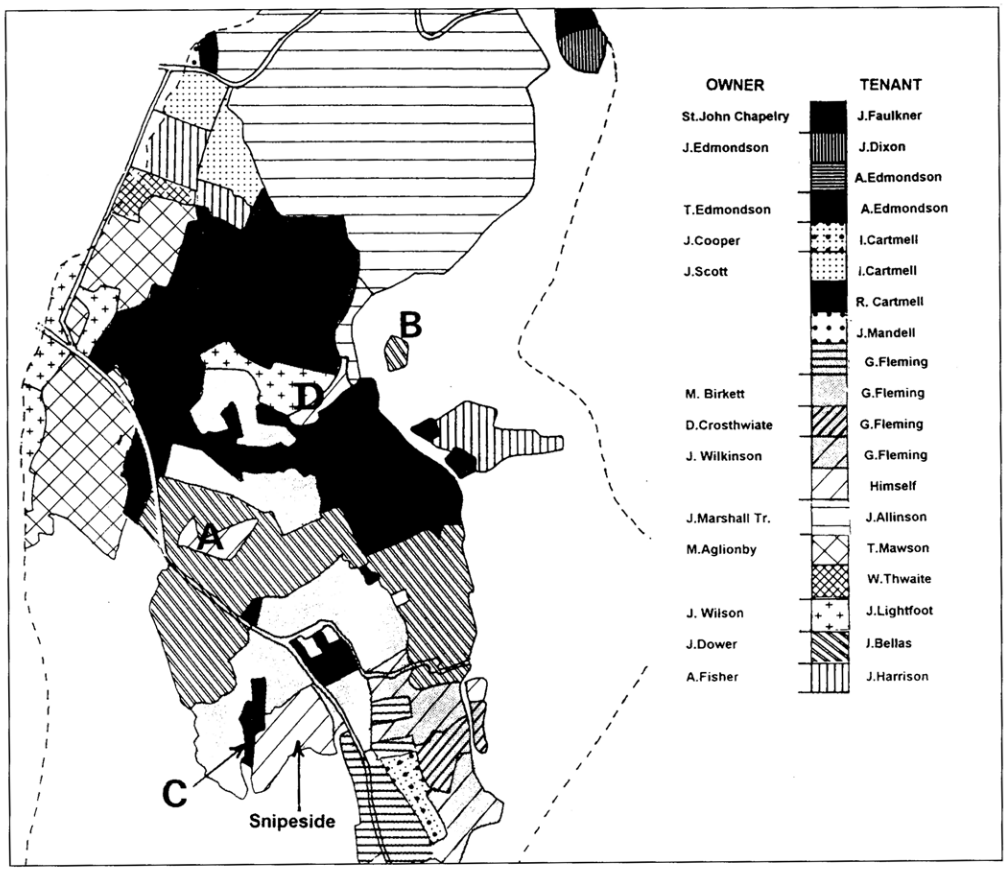


FIG 4. Land ownership in 1840.

This interpretation must, however, be qualified by the earthwork and place name evidence (below) and by other evidence from the pattern of landownership. In particular attention is drawn to the following:

(a) Goosewell Farm was an almost circular holding which Winchester, describing settlement patterns in the Lake District in general, says is "comparatively rare" (Winchester 1988, 86);

(b) enclosure A in Fig. 4 is best interpreted as having once been an enclosure made on commonland, much as field B (Fig. 4) was;

(c) the strip of Chapelry-owned land south-west of Causeway Foot which divided two different holdings (C in Fig. 4) appears to have been the remains of an outgang;

(d) in general the boundaries between the main landholdings other than Goosewell were at right angles to the valley floor, suggesting that each unit was seeking to obtain use of both dry ground and the wet valley floor.

This latter pattern is most evident in the area of D, Fig. 4, where there were four separate owners, and even the circular holding of Goosewell encompasses both types of land.

Previously Unrecorded Relict Features

Sources for the stones in the circle

Part of the present monument is the "re-erected" stone in the south-west corner of the field. According to Anderson (1915, 100-101) this was one of several large boulders found from time to time and, in the absence of firm archaeological evidence such as a socket with packing stones, the authenticity of the monolith must be questioned. Certainly there are a number of other large stones built into the base of the walls either side of the lane leading to the A591, some of which also carry plough marks.

These stones are best interpreted as clitter (boulders scattered over the surface of the land by glacial activity) cleared when the common land was enclosed. One area of clitter has, however, survived to the south-east of the stone circle at NY 294234 and there, and on the valley floor near Naddle Bridge, a number of stones are of similar size to the largest members of the stone circle. The stone circle could, therefore, have been constructed from very local materials and the surviving areas of clitter should be managed as part of the environs of the monument, perhaps as a RIGS (Regionally Important Geological and Geomorphological Sites).

An old road to Keswick

The lane which runs south-west from the circle continues south of the A591 as a footpath, first to Rakefoot Farm (NY 284221) and then on to Walla Crag. As such it is reminiscent of a ridgeway and its general line, eventually connecting with Borrowdale and the Langdales (and, therefore the neolithic axe factories), should perhaps be considered part of the setting of the stone circle.

Immediately to the south of the A591 the footpath is located in a hollow-way which had revetted sides. This construction, certainly not prehistoric in origin, can be explained by the fact that an old road, constructed in part as a causeway, exists at NY 289222. This is the old road to Keswick and the revetted hollow-way was the lane which connected it to the stone circle. At the time of writing, however, it has not been possible to find any certain references to this road and the present one was in existence by 1783 (Hodskinson and Donald). However, the engineering involved suggests that it is the turnpike. Equally, it should be seen in context of the letter of Dr Brown quoted by West amongst others:

> The road in some few parts is not completed, yet good country road, through found but narrow and stony lanes, very safe in broad daylight. This is the case about Causeway Foot and among Naddle fells to Langthwaite. (West 1784, Addenda).

Lynchets and field boundary remains

There are no extensive earthwork remains in the valley and some of the lynchets and earthworks are the remains of field boundaries recorded in 1840 (Fig. 3). This explanation is, however, less certain for the bank recorded at NY 294213 for, although it was clearly a head-dyke and it is close to the present wall, it is not certain which of the two is the head-dyke mapped in 1840. In favour of the wall being in

existence by that time is the fact that the later enclosures do not extend beyond it. Interestingly the same extant wall is built up against a tree further north. There, it must be assumed, the wall is built on the line of an earlier boundary which was a hedge: a sequence which may exist elsewhere in the valley (below).

The remaining lynchets and field boundaries recorded in Fig. 5a are concentrated in the vicinity of Nest. There, three main groups can be identified: a group of damaged banks and ditches to the east, which do not appear to form a coherent pattern, a group to the south-west, possibly associated with the old settlement sites there; and, nearer to Nest, lynchets that appear to indicate strip fields.

One other group of earthworks should, however, be noted: three short banks have been formed on the lowest part of the steep valley side at NY 302213 (Plate 1). Their purpose is by no means clear but they are reminiscent of "lazy beds". However, this explanation is unlikely given that they appear to be deliberately located to avoid the flatter ground of the valley floor. "Coney beds" or rabbit warrens are, therefore, a possible alternative.

Former buildings/farm sites

The earthwork remains of two former farmsteads with long rectangular buildings were identified in the survey. The Tithe Map of 1840 shows one of these sites as a group of buildings called Snipeside and although it is recorded as a discrete block of land (Fig. 4), no inhabitant is listed, suggesting that it had ceased to be a farm in the early part of the nineteenth century. The other buildings, of similar morphology, exist at a similar altitude on the other side of the small valley south of Causeway Foot (Fig. 5a and Plate 2). Both farms occupied land either side of the putative outgang in Chapelry ownership and they may, therefore, be regarded as expansions from a core settlement in the vicinity of Causeway Foot-Dalebottom.

Several other earthworks within the valley may be the remains of farmstead sites. The position of these is also shown in Fig. 5a but they differ from the above in having no recognisable, long rectangular buildings. Those at NY 297214 and NY 299224 are, however, reminiscent of "native settlements" and an early medieval date might be possible. Such a date would not be inconsistent with the observation of Pennington that most of the valley was not cleared of forest until the tenth century AD. It is, however, necessary to note the existence of several small circular earthworks (Fig. 5a) which might be earlier – if they are archaeological features at all.

The Present Settlement Pattern

If the latter are excluded, the distribution of earthwork settlement sites echoes the pattern of extant habitation sites: dispersed settlement with the majority of farms being on the western side of the valley within topographical unit III. There they occupy land up to an altitude of 200 m but on the eastern side of the valley, where there are crags, settlement is confined to the lowest slopes of the valley side (topographical unit VI). There can, therefore, be little doubt that the number and distribution of extant farms reflects those parts of the valley which were most suited

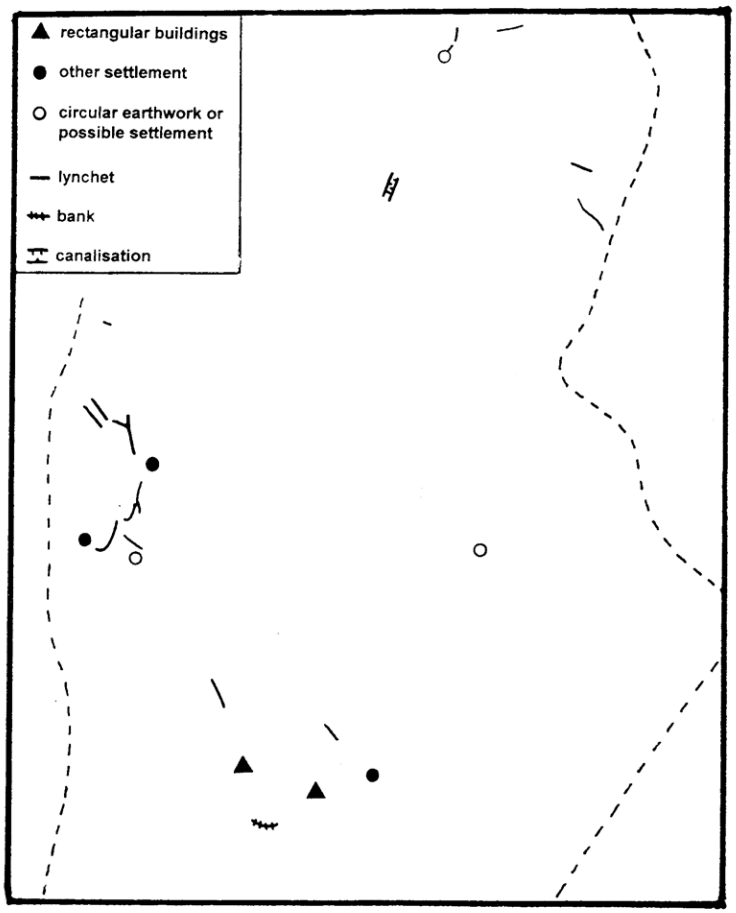


FIG. 5a. The distribution of earthwork sites.

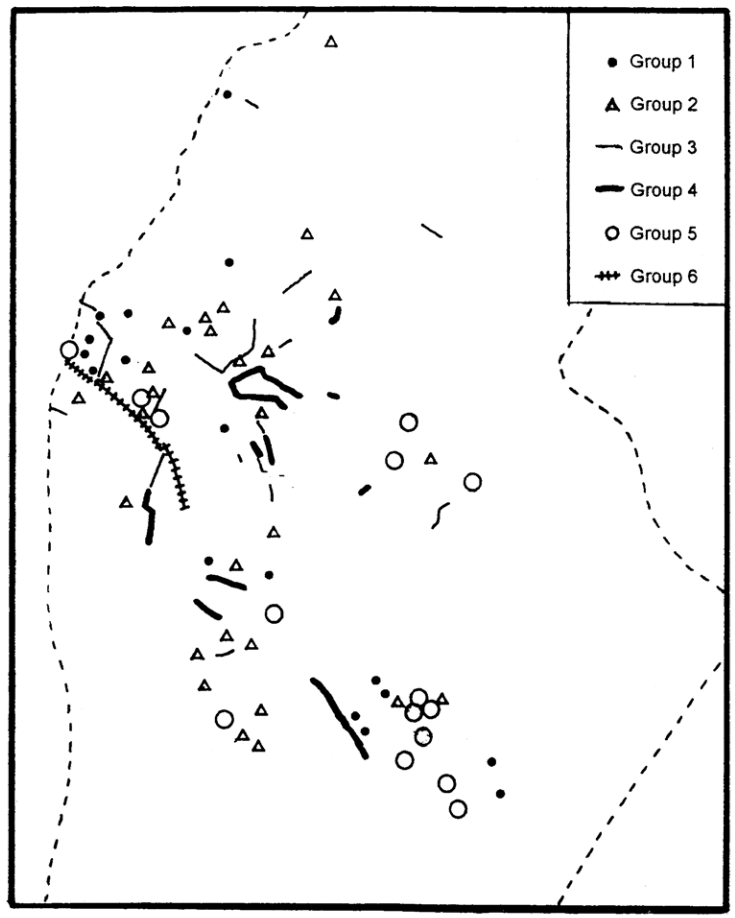


FIG. 5b. The distribution of field boundary types. Group numbers refer to Table 3a.

to agriculture. The fact that all the earthwork settlement sites lie on or near the margins of the land enclosed by 1840 may be taken to indicate that the focus of early farming was also in the vicinity of the extant farms.

There are, however, no clues as to the original dates of these "core" farms, although the three principal owners spoken to "think" or "believe" that their farms go back to the sixteenth century. In large measure this is consistent with the place-name evidence of Dickins (1943, II, 316), and it may be that the latter has influenced the former. The first occurrence of the place-names identified by Dickins are shown in Table 1 and attention is drawn to the relatively late occurrence of the name Nest, and the absence, in pre-eighteenth century documents, of Sykes.

TABLE 1

Earliest occurrence of names (after Dickins 1943)

Causeway Foot	1564
Dalebottom	1605
Goosewell	1567
Rakefoot	1597
Moor	1569
Nest	1792
Shawbank	1702
Snipes How	1665

Historic Landscape Zones

Historic landscape zones are discrete landscape areas which share particular historical characteristics of land use histories (McNab and Lambrick, 1996). Based on the above evidence seven can be suggested:

1. a single valley head farm unit (Goosewell);
2. the former common of Castlerigg ridge;
3. an area around Nest, including former strip fields to the south-west and the remains of small, irregular fields to the north-east and east;
4. an area of small enclosures with an outgang typical of many "valley heads" (the area south, and in particular south-west, of Causeway Foot);
5. an area of former common land (including enclosures A and D in Fig. 4) north of Causeway Foot and south of Goosewell;
6. the land held by the Chapelry at Sykes which may also have been taken from that common;
7. post 1840 enclosures of the remaining common.

The boundary of a number of these zones is, however, difficult to define. It is, for example, not clear whether the slope with clitter at NY 294234 belongs to zone 2 or zone 5. However, both zones appear to have once been commonland beyond the core farmland represented by zones 1 and 3. As such, the only cultural difference between zones 2 and 5 is one of when the enclosures were made and the materials from which the boundaries were constructed.

The zones as indicators of the palaeo environment available to farming

The location and extent of these (Fig. 2b) is similar to that of the topographical

units (Fig. 2a). There is, for example, an obvious correspondence between zone 2 and topographical unit IV; between zone 7 and topographical units V, VIIa and VIIb; and between zone 6 and topographical unit VIIc. Similarly, historic landscape zone 4 coincides with the northern half of topographical units IIIb and the southern end of unit II. Such coincidences indicate that the topographical units can be interpreted in ecological terms and that some historic landscape zones were more attractive to early farming than others. Such an interpretation is consistent with the observations made above about land ownership in 1840 where each land holding seems to have possessed both wet valley floor and drier adjacent ground and, of course, rights on the (as yet) unenclosed high ground.

Somewhat in contrast to the overall size and pattern of most holdings, however, were the four narrow "strips" east of Low Nest (D in Fig. 4). These were in the ownership of J. Wilson, M. Birkett and T. Edmondson but as only two of these individuals had other holdings in the valley it can be concluded that area D in Fig. 4 echoes a deliberate sharing out of resources. Whilst one resource was almost certainly the turf of the valley bottom, the latter formed only 50% of area D. The other 50% was drier ground to the west and below Low Nest and here the resource was probably either species rich woodland or good quality/well drained soils which related to such a woodland.

The Woodland Resource

The present distribution of trees

The relationship between these historic landscape zones and the present arboreal population is discussed elsewhere (Clare and Bunce *submitted*). Here, however, attention is drawn to the fact that the present distribution of trees shows that:

(a) sycamore and beech are located in proximity to farmsteads and reflect the personal preferences of individuals in the past;

(b) trees and hedgerows (Tables 2 and 3) can be used to differentiate the historic landscape zones and as such form biological cultural monuments (Austad, 1994).

(c) in particular, historic landscape zones 3 and 4 occupy the most species rich area of the valley suggesting that this was a factor in the location of early settlement.

The association of trees within the groups in Table 2a is derived from a multivariate classification based on data gathered in 100 m squares. There it can be seen that Group 6 contains the largest number of species and is the only one to possess hazel (Corylus). Significantly, with the exception of Goosewell land, this group occupies between 20 and 40% of each landholding which existed in 1840 (Table 2b) regardless of whether that holding was in a single block, as at Nest or Causeway Foot, or in scattered blocks.

Whilst it must be concluded that this grouping of trees was regarded as a farm resource its origins are not certain. It is possible that each landholder planted similar trees on their land but it is also possible that each holding was located in such a way as to utilise the pattern of trees found in the valley, i.e. that the groups relate to the composition of the "wildwood".

TABLE 2a

Tree species with over 60% frequency within TWINSPAN classification of 100m grid squares.

	Groups											
	1	2	3	4	5	6	7	8	9	10	11	12
Salix	X					X						
Crataegus	X		X	X	X	X	X		X			
Corylus						X						
Prunus					X							
Quercus		X	X				X					X
Fraxinus	X					X	X					
Betula						X						
Acer											X	
Fagus												X
Ilex										X		
Sorbus									X	X		
Pinus								X				

TABLE 2b

Proportion of landholdings in 1840 covered by group 6 trees.

Land held in 1840 by	% cover by group 6 trees
Aglionby	31%
Birkett	44%
Chapelry	21%
Dower	29%
Marshall (Goosewell)	8%
Scot	26%
Wilkinson	20%
Wilson	27%
average without Goosewell	30%
average with Goosewell	27.50%

The wildwood contemporary with the building of the stone circle

As noted above, the palynological studies of Pennington (1970) provide the basis of our understanding of the original forest cover or wildwood. However, the pollen evidence relates to the broad landscape and, when the data are derived from only one core, cannot reflect the more localised composition of the forest. That there should have been localised patterns within the original forest cover of the study area is, however, a reasonable supposition given the variations in topography. Indeed, even in areas of less dramatic topographical changes such as the Somerset Levels (e.g. Coles and Orme, 1985, 18) and Church Stretton (Osborne, 1972) it has been possible to demonstrate that the wildwood could be a mosaic of differing stands, some of which, like elm, would have provided early farmers with clues about soil fertility.

In this context, palynology and the present distribution of trees within the study area can be used to suggest that at the time when the stone circle was built, and until the tenth century A.D., the wildwood of the valley consisted of: alder and birch carr

along the fringes and on the surface of the former tarn and associated basins; birch and more open woodland on the high slopes; and oak-ash-elm woodland in-between to a height of at least 200 m above sea level (although within this area would have been stands of alder, willow and perhaps birch along stream courses). Perhaps not surprisingly, the only evidence for early farming identified in this study lies within this latter area i.e. the coincidence of farming and group 6 trees reflects something of the original ecological resource and explains why the farms are where they are.

The present upper limit of 200 m above sea level for elm (above) is, however, almost certainly a product of the upper limit of the head dyke in existence by 1840. The fact that it was possible to establish plantations of oak and beech above that height shows that a species rich woodland such as that represented by group 6 trees could have existed on the Castlerigg interfluve in the past and at a time contemporary with the building of the stone circle. This may also explain why some of the few earthwork remains of former cultivation occur near to the 200 m contour along the southern edge of the Castlerigg ridge.

It may therefore be that the position of the head-dyke of 1840 represents a contraction of farming at some point in the past and the climatic deterioration which started in the late thirteenth century could have been a possible factor. On the limestone in the upper Eden valley, for example, it had been possible for cultivation to occur up to 300 m above sea level (admittedly on southern facing slopes) although at Troutbeck the common arable land described by Parsons (1993) occurred below 200 m above sea level.

The character of the present woods

To some extent some of the differences in the character of the present woodlands echo the earlier mosaic described above but the main influence was past land use. The replacement of alder carr with birch woodland (the present Birks Wood) can, for example, be attributed to the improved drainage of the former tarn sometime in the last few hundred years, and the alder trees flanking the stream south of Causeway Foot form another "seminatural" woodland area. In contrast, however, are the oak plantations at NY 300210 and NY 303224; the beech plantation at NY 305224 and the former 'pine' plantations at NY 286220 and NY 290234. These woodlands are or were predominantly of a single species and single age and are clearly human rather than ecological artefacts. Less certain, however, are woodlands like that at NY 297213. There the oak, ash and hazel composition may reflect a selective management of the wildwood which existed in this area.

The largest "mix" of tree species, and one which is closest to the wildwood of the pollen diagrams, occurs however around the rocky outcrops north-west of Causeway Foot where, presumably, grazing is difficult. However, this explanation must be qualified by noting that most crags in the valley are devoid of trees, so again the impression is given that the best woodland survived (or was maintained) longest in the Causeway Foot-Nest area.

Overall, this situation is similar to the Coniston area where a study of present woodland composition showed that gullies or crags had a species diversity (including small leaved lime) closer to the palynological record than the main woodlands

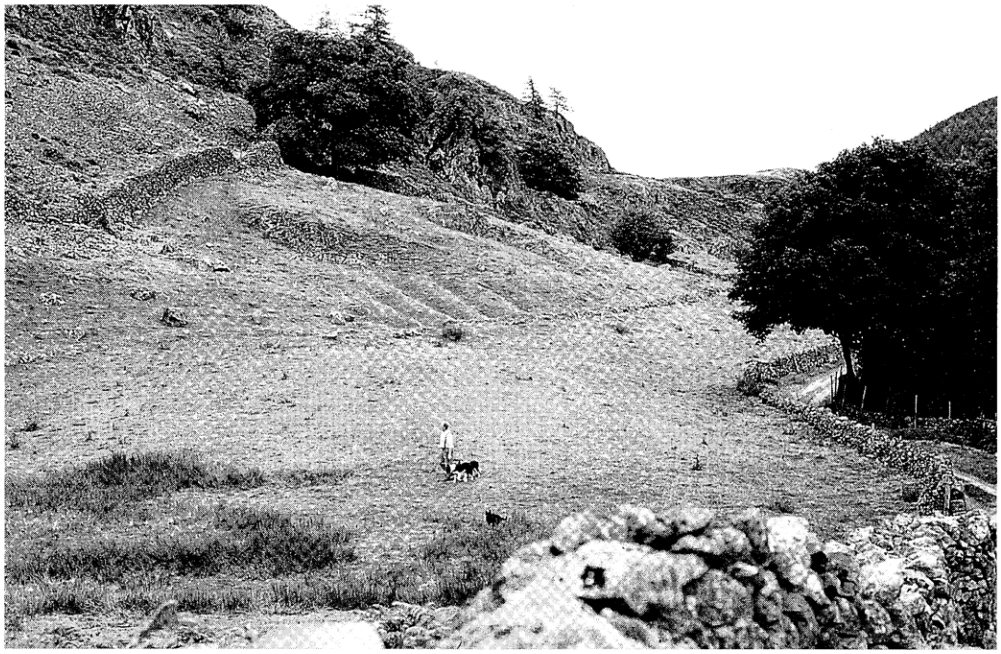


PLATE 1. The earthworks at NY 302213.

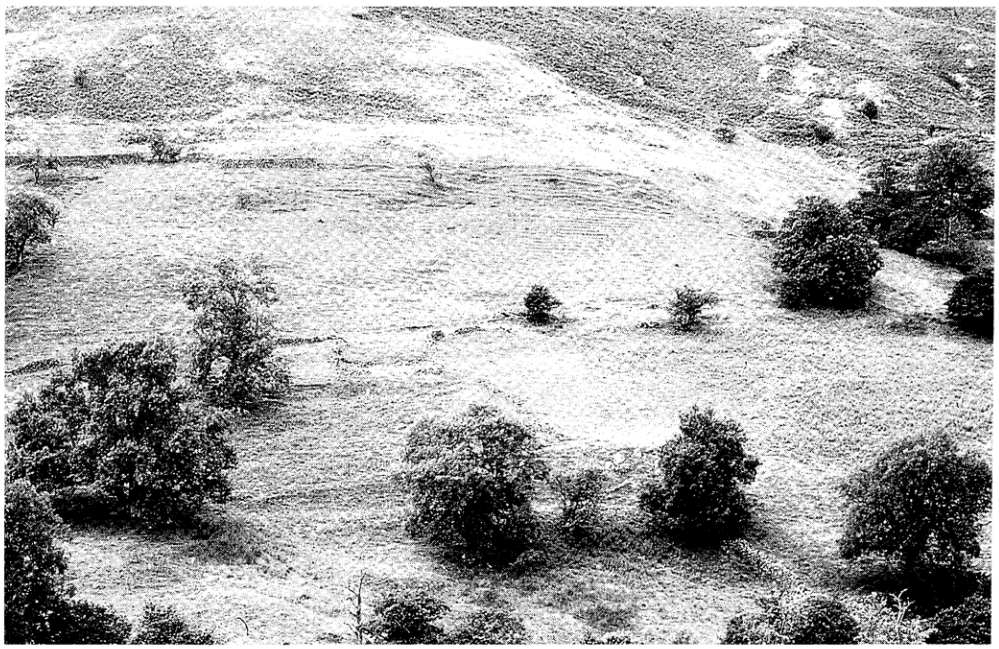


PLATE 2. The earthwork remains of a farmstead at NY 293214.

(Barker, 1985). One explanation for the species richness of the gullies is that they contained enriched soils, but this can hardly be said of the crags. The alternative explanation is that both crags and gullies are refuges from grazing and management, with the widespread oak-ash woods of the Coniston basin reflecting the exigencies of humans rather than "native" – albeit secondary – woodland.

Hedges, Walls and "Hooper's Rule"

The relative numbers of hedgerows help differentiate one historic landscape zone from another and for that reason might themselves be regarded as biological cultural monuments. However, it is generally accepted that the species composition of a hedge may reflect its origins and, perhaps, its date (Rackham, 1993), and for both reasons the woody species composition of the hedges within the study area were analysed by two different methods. However, as the fieldwork showed that a number of trees and shrubs were associated with walls, these field boundaries were also included in the analyses.

The first analysis was the identification of recurrent associations of species in each full length of boundary using the TWINSPAN program of multi-variate analysis (for TWINSPAN see Hill, 1979). This shows that within the study area six groupings of species (Table 3a) exist within the field boundaries and that these have a spatial correlation with the seven historic landscape zones (Table 3b and Fig. 5b). Particular attention is drawn to the fact that the distribution of group 1 hedges along Castlerigg ridge corresponds to the boundary between cultural areas 2 and 3, supporting the idea that the latter may also be a major chronological divide within the landscape.

TABLE 3a

Tree species with over 60% within the TWINSPAN classification of hedges.

	Groups					
	1	2	3	4	5	6
Recently planted lengths of *Crataegus*	X					X
Recently planted lengths of *Prunus*	X			X		
Prunus	X					
Corylus		X		X	X	
Crataegus		X	X	X		
Fraxinus		X		X	X	
Rosa can.			X			
Betula				X		
Salix					X	

The second analysis was a count of the number of woody species present in each 30 m length of boundary: a method which, it has been claimed, allows hedgerows to be dated. The basic premise of the methodology is that the older the hedgerow the greater the number of species present. More specifically: the number of species equates with the number of centuries the boundary has been in existence.

This equation is often called "Hooper's Rule" (Rackham, 1993) but it is worth noting that Hooper himself (Hooper, 1970) expressed caution in its application and interpretation. This cautionary note is borne out by some studies (e.g. Cameron and

TABLE 3b

The proportion of specific groups of hedges in historical landscape zones.

	Group no				
Historic landscape zones	1	2	3	4	5
1	0%	6%	5%	0%	0%
2	43%	0%	21%	0%	7%
3	19%	44%	63%	57%	14%
3a	0%	3%	0%	7%	0%
4	0%	23%	5%	21%	14%
4a	9%	3%	0%	0%	0%
4b	28%	6%	0%	0%	47%
5	0%	0%	0%	14%	0%
6	0%	3%	5%	0%	20%

Pannett, 1980), which show that it does not always work and that the number of species present may reflect selective planting schemes by individual landowners. For example, a notable feature of the distribution of holly within the study area here is the number occurring on Nest land, suggesting that someone there liked the tree, perhaps as a source of winter fodder (for the latter see Rollinson, 1981). On the other hand, without such human interventions, the number of species available for colonisation in northern and upland England are less than in southern England so that the oldest hedges would appear to be younger than they actually are. This might explain why the hedge alongside the old road through Goosewell and in existence by 1700 AD only scores two using Hooper's Rule.

Nevertheless, it is possible to interpret the distribution of species numbers per 30 m length of hedge (Fig. 6) in such as way as to provide an insight into the history of the valley landscape:

1. the paucity of trees in the hedge alongside the road through Goosewell and in existence by 1700 AD (an average of two per 30 m length) may be explained either by an absence of trees on the nearby commonland or by the preferences of a past owner of that farm.
2. whilst the relative abundance of species on the crown of the ridge west of Nest (and within historic landscape zone 2) – some 3-5 species per 30 m length – is almost certainly the result of personal preferences/design rather than the age of enclosure at this point.
3. the hedge with the highest number of species and part of the enclosure at D in Fig. 4 also belonged to the same owner in 1840 (J. Lightfoot).
4. but there is a general concentration of high numbers around Nest suggesting that this is an area of land which has been either enclosed for upwards of four hundred years or one carved from species rich woodland.
5. as at point D in Fig. 4, the species rich hedges in the vicinity of Nest, the area centred on Causeway Foot and around A in Fig. 4 correspond to what were ownership boundaries in 1840.

However it is necessary to note that not all hedges have survived to be analysed. For example the boundaries of the former farm units south of Causeway Foot, such as Snipeside, are almost devoid of trees although the earthwork remains show this area did originally have some hedges.

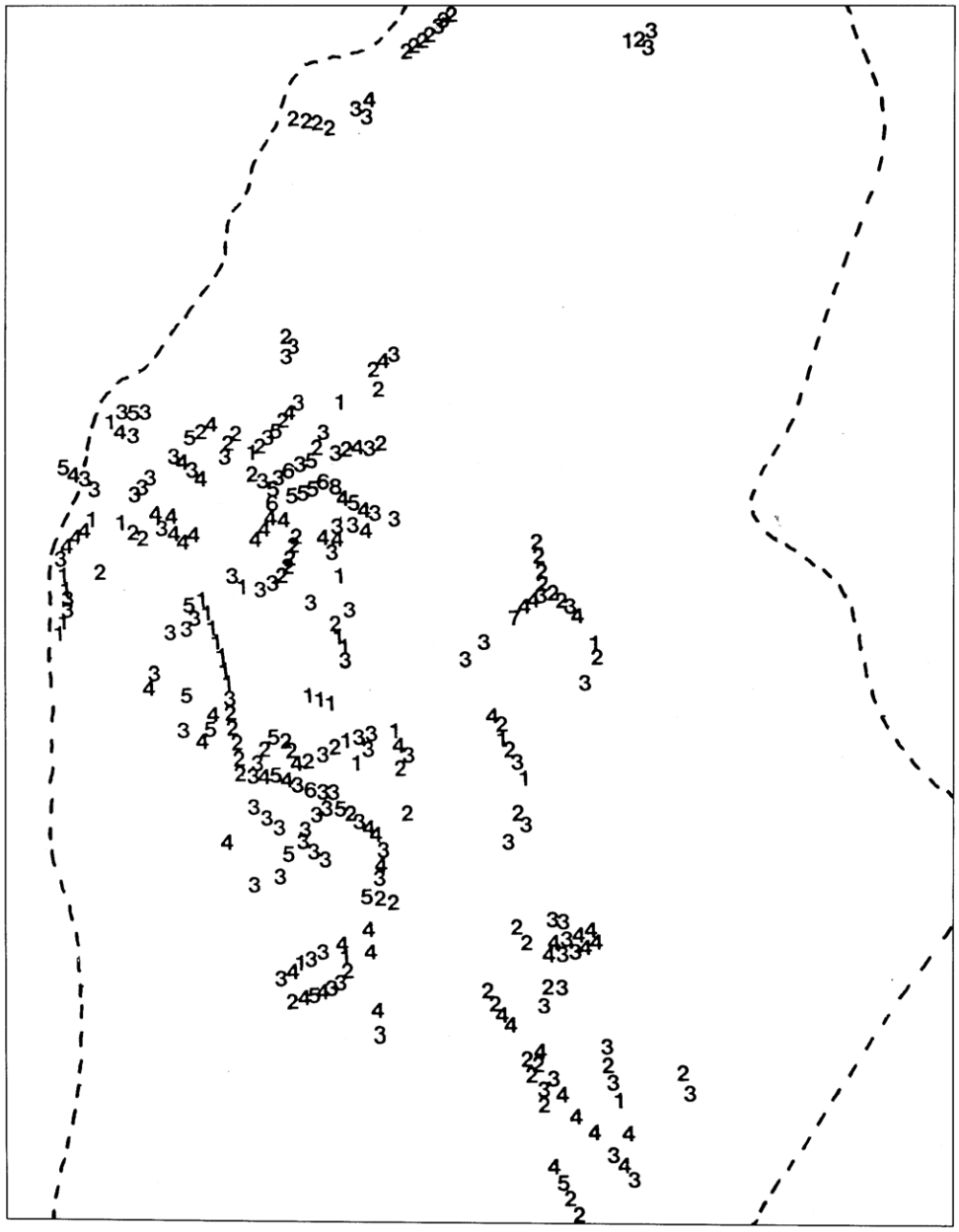


FIG. 6. The number of woody species per 30 m length of field boundary.

The overall distribution of hedges and walls

Interpreting the distribution of hedgerows and walls on the lower slopes and valley floor is, however, difficult. In some places the junctions of fields are constructed as walls, with the lengths in between being hedges. Again, whilst the area of postulated ancient land use around Nest carries 44% of all hedgerows there are relatively few on the ancient farmland south-west of Causeway Foot. Moreover, within the latter area, there is, as already noted, a contrast in the number of hedges either side of what was Chapelry land in 1840. To the west are a few extant hedges and earthwork remains suggestive of others having once existed in the area but to the east of the former Chapelry land there are no hedges and almost no earthwork remains. As there is no significant difference in soil type or quality between the two areas the distribution of trees and hedges in this area must reflect deliberate decisions made in the past.

However, it is also possible that the eastern area was devoid of trees when it was enclosed. If this were the reason, then it follows that hedgerow distribution relates to areas of medieval woodland/tree cover, with the further concomitant that the species composition of those hedgerows also reflects that of the ancient woodland/tree cover. In this context the concentration of the *Betula-Crataegus* group of hedges in the vicinity of Nest can be interpreted as reflecting former woodland fringing the valley floor and growing on the wet slopes to the east-south-east of the farm as postulated above in discussions on the wildwood. Significantly, the main areas of earthworks recorded in the survey (Fig. 5a) lie either side of this putative woodland.

Conclusion

Within the Naddle valley the archaeological and biological evidence combines to form discrete historic landscape zones which are visibly different and which have individual environmental histories and time depth. Nevertheless, the overall impression, which is consistent with the earlier work of Pennington, is that of an area where the valley sides were still predominantly wooded until the early medieval period. However, the composition of the woodland was varied and by the end of the medieval period the tree cover was a scarce and valuable resource: one which was shared out and one which is reflected in the present distribution of trees, hedges and once managed woodlands.

Given that the distribution of trees is also a reflection of ecological factors, such as soils, it is possible to explain the settlement history of the valley as one of exploitation of specific environmental niches. It can, therefore, be concluded that data gathering for catchment area analysis, as applied to archaeological sites, should include the arboreal population of the present landscape and that the latter should be managed with the archaeological features.

The core areas for farming appear to have been primarily in the Nest and Causeway Foot areas with a smaller focus in the vicinity of Sykes. The earthwork remains west of Nest suggest, however, that the extent of farming may have contracted somewhat in the medieval period and the ridge on which the stone circle stands appears to have been commonland devoid of trees by the end of the late medieval period. It has, however, not been possible to demonstrate whether this area

had been farmed at an earlier time or how it was exploited at the time when the stone circle was built.

APPENDIX

The place name *Naddle* by Gordon Roberts

According to Ekwall (1968) the earliest reference to the Naddle valley occurs in 1303 as Naddale.

In a region where Scandinavian names abound, it would be reasonable to assume a Norse origin for this place-name. Thus the Cumberland Place-names Society proposes an original *Ness-dale*, where *nes(s)* would be derived from ON *næss*, "headland", "projecting ridge". Ekwall (*English River Names*. Oxford. Reprinted 1968) also suggests a Scandinavian origin, with *nad(d)* being derived from ON *naddr*, "a point".

However, both definitions (with their common linguistic root) would seem to conflict here with the actual topography, where there does not appear to be any such outstanding feature. Perhaps the proposed ON *nes(s)dair* or *nad(d)dair* has an older provenance.

It is not uncommon for later settlers to retain and assimilate older, existing place-names, especially water names, into their own nomenclatures. In this context, a British *ness* and *nadd* are to be found, for example, in the River Deerness, Durham (Welsh *dwfr* + older Brit. *ness(a)/nass(a)*), the River Ness and Loch Ness, Scotland (Brit. *Nass(a)*) and the Nadder, Yorkshire (Brit. *notr*). Their common liguistic base is an Indo-European **nad, *nat-so*, indicating "flowing (water)", "wetness", as Sanskrit "river" and OE *naet* (and German *nass*), "wet".

Might not, therefore, an earlier British *nass(a)/ness(a)* + ON *dair* be an acceptable, alternative derivation? Is this the origin of the Nest place name in the valley, could this have been the original British name for the locality?

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