CONTAINS PULLOUTS

A WOODLAND HISTORY OF NORTH YORKSHIRE

A Multi-Disciplinary Study of Post-Glacial Woodland History

Vol I

Thomas Duncan Gledhill

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Department of Archaeology and Prehistory

Sheffield

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SUMMARY

The post-glacial history of woodland in North Yorkshire has been studied using a wide variety of sources including existing environmental studies, archaeological data, documentary information, and place-names. A critical approach has been adopted involving comparative studies of the different sources.

The environmental and archaeological data available for the prehistoric period are thought to indicate that until the end of the Atlantic climatic period the vegetation of North Yorkshire was primarily environmentally determined, though mesolithic woodland burning may have created open spaces and encouraged the growth of hazel in the uplands. During the Neolithic and Bronze Age a gradual spread of dense agrarian settlement and intensive clearance across areas with calcareous soils, and into some drift covered lowlands, is thought to have occurred. This was probably accompanied by pastoral exploitation of the more acidic uplands causing a structural change in some upland woodland reflected by the decline of *Tilia*. The Iron Age and early Roman period appear to have been a time of widespread clearance, affecting even areas such as the clay lowlands of the Vale of York. Woodland appears to have become restricted to slope and bog refugia at this time. Evidence for a

post-Roman woodland recovery is patchy. Secondary woodland appears to have formed principally on steep slopes such as the moorland scarp and gill sides, and around lowland bogs.

At the beginning of the medieval period there appears to have been a marked contrast between the largely woodless areas of the Vale of Mowbray and the Wolds, and the remaining areas which were relatively well wooded. With the exception of the eastern fringe of the Pennines, woodpasture appears to have been the dominant form of exploitation in most of the more wooded areas in the early Middle Ages. The expansion of coppice management appears to have been slow, accounting for only a small proportion of documentary references to woodland until the 14th century. After this coppicing appears to have become widespread while many common woodpastures were enclosed or lost their trees. By the mid-nineteenth century common woodpastures were rare, occurring mainly in the Pennine uplands, and plantation accounted for a significant proportion of woodland, particularly in areas with landscape parks.

The evidence for distribution and management of woodland over a long time period has facilitated the construction of interpretive models for the influence of environment, economics, and social structure on woodland history. Whilst the interaction between the environment and economic considerations offers a good model for the broad trends in clearance, and woodland distribution, the chronology of the adoption of coppice management requires a more subtle explanation. The expansion of coppice is thought to have been delayed until after the Black Death as a result of a concerted defence of common by the tenantry, which may to a large extent have consisted of freeholders.

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Chapter 1

Introduction;

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Section 1.1

Defining Objectives

In recent years there has been a steadily increasing interest in 'ancient woodland'. The reason for this is twofold. Firstly it has been realised that such woodland is one of the most ecologically important habitats in Britain. Arguably it provides the range of ecological communities most representative of the character and composition of late Holocene woodland. Secondly, with increasing concern about man's environmental impact and the certainty that non-renewable sources of energy and materials will one day run out, interest has been generated in a return to traditional methods of woodland management, particularly coppicing. An historical study of woodland is perhaps of little value to the industrialist or idealist wishing to re-establish commercial coppicing, present conditions being so different from those of the Middle Ages. For the ecologist, though, such a study may help create an understanding of the ways in which man may have affected woodland ecology over the centuries (and by extension how present management might affect the remaining woods of the future). But in any case such a study is valid historically. The importance of woodland to settlement patterns and society is easily underestimated, and has perhaps received less academic attention than other aspects of landscape.

Since the pioneering studies of the English landscape by Hoskins in the 1950s, his view of England as a predominantly wooded country until the medieval period has been overturned. The discovery that much of the country may have been cleared of woodland by late prehistory has considerable implications for understanding the role which woodland has played in landscape formation. In particular there has been a shift in emphasis from clearance to exploitation. The work of Oliver Rackham in the 1970s and 80s has been particularly influential in encouraging a view of woodland as a resource which was managed as far back as prehistory. Woodland can thus be considered an active part of the cultural landscape, as much a forum for the interplay of social and economic forces as field systems or settlement.

Rackham's work, though of considerable relevance to the whole of the British Isles, is mainly concerned with his own studies of eastern England. Since the publication of <u>Trees and Woodland in the British Landscape</u> in 1976, and <u>Ancient Woodland</u> in 1980, work by Whitney in Kent (1990), Redmonds in West Yorkshire (1983), and Jones in South Yorkshire (1985, 1987), amongst others, has to some extent redressed the balance. As more information becomes available, the possibility of differing regional woodland histories is becoming apparent. The existence of this regional variation was acknowledged by Rackham when contrasting the different woodland histories of Ancient and Planned landscapes (1986). The theme of differing regional woodland histories has been further developed by the work of Whitney (1990) in Kent, in which she shows that the Weald had a quite different history from the northern and eastern parts of the county during the period prior to the Black Death. The possibility of regional variation, and a paucity of regional studies with the scope, both in terms of area and timescale, which would allow the study of that variation are two of the main motives in undertaking this research.

Section 1.2

The Choice of Area

The motives outlined above have implications for the approach which was adopted for this study. The choice of area is, for instance, strongly influenced by a desire to produce a counterpoint to the well studied south east. For this reason it was regarded as important to study a northern county with upland districts. The choice of area was further influenced by a desire to illustrate regional difference within the area. Thus an area of study was chosen which itself offered a number of differing regional environments, thus facilitating discussion of the factors which have led to different woodland histories. North Yorkshire was chosen because in addition to providing an almost uniquely diverse range of environments, including chalk wolds, acidic and calcareous uplands, and a number of different lowland environments, which have quite different woodland histories, it also offers a number of additional advantages as a study area. The rich mineral resources in some areas have led to a long history of woodland exploitation for lead and iron industries. Due to the activities of the Yorkshire Archaeological Society and the Surtees Society it has a particularly large volume of published documentary material; and it is the only North Pennine county to be mentioned in Domesday Book. Although for historical reasons, and for the ease of retrieving documentary information, it might have been thought more appropriate to have taken the North Riding as a study area, there are a number of reasons why this has not been done. Most important among these is that the modern county of North Yorkshire provides a great deal more variety in regional landscapes. Choosing the North Riding as a study area would have excluded the Wolds and a large part of the Vale of York, both of which are important in providing regional contrast. For similar reasons there has been little respect for the county boundaries of North Yorkshire; in particular it has been found convenient to include a large part of the present county of Cleveland within the study area.

Section 1.3

The Choice of Period

The need to illustrate the process of change has had a direct bearing on the choice of time period to be addressed by this study. The rate of change of woodland is often slow and the evidence is frequently scarce. It is therefore helpful to consider long periods of time. It is, as we shall see, both more useful, and a great deal easier to define the progress of change than to illustrate the state of woodland at any particular point of time.

There are additional reasons for considering a long time period. One implication of Rackham's studies is that woodland is a very long term feature of the landscape. Consequently at any particular time period it is the product of a long period of woodland history. Some aspects of the disposition and nature of woodland in, say, the 13th century might therefore be the product of events which took place in the prehistoric period. It is certainly the case that, as Rackham has shown, our present woodland is to a great extent the product of its medieval past. Again on the basis of Rackham's studies there appear to be periods, such as the destruction of wildwood in the Iron Age and Roman period, which were periods of particularly rapid change. The identification of such historical watersheds is facilitated by consideration of a long time period. In response to these arguments the period considered here covers most of the history and prehistory of settlement in North Yorkshire from the end of the last ice age to the mid nineteenth century.

In spite of the strong arguments in favour of consideration both of a long time period, and an area as large as North Yorkshire, there are disadvantages. The most severe of these is that this results in a loss of detail. Given the time limits imposed by a Ph.D. it is impossible to consider all the possible documentary material available for the county. It is even more difficult to provide a thorough survey of all woodland in the area. Whilst these problems might be solved by considering a much smaller area or time period, this would mean that the aims of considering regional contrast and the process of change would be compromised. It would also be very difficult to determine the wider significance of such a study as it would be impossible to decide whether it constituted an exception to the rule, or an illustration of general trends. What constitutes a representative sample of individual studies can only be determined once the general framework is in place. A study which ignores this runs the risk of becoming a disconnected collection of local studies.

Section 1.4

Sources of Information

As the one of the main aims of the present study has been to identify regional variations in woodland history within the study area, an approach has been adopted which as far as possible allows comparisons across the county. For this reason much of the information is presented in map form. Rackham's (1990: 107) advice that as many complementary sources of evidence as possible should be used has been been followed as far as possible. This work brings together information from documentary, philological, archaeological and palynological sources, to produce as balanced an account as possible. Where these sources have been used to determine regional contrasts, they have tended where possible to be of a kind available over a large area.

The investigation of regional variation and temporal change has led to an inquiry into the factors which influence woodland history. This is a topic which has not yet received the attention which it deserves. Many authors have used such variables as soil quality, the price of wood, or the independence of commoners to explain aspects of woodland history. There has however been no concerted attempt to question what factors might be important in producing woodland change and diversity, or what the effects of these might be. Even Rackham, though devoting some space to a discussion of the formative processes, does so primarily to suggest that these are complex, and that it is not sufficient to regard economic trends as the main influence. In order to address these questions a range of more detailed local studies have been carried out to assess particular factors in determining woodland history.

Section 1.5

The Use of Documentary Sources

Where documentary sources are concerned, the long time period and wide area under consideration has encouraged the use of published transcriptions and translations. The body of this material for the medieval period in North Yorkshire is fairly large, thanks to the industry of the Yorkshire Archaeological Society and the Surtees Society. This use of published sources has a number of associated difficulties. Some of these apply to any documentary investigation. It must always be borne in mind when conducting documentary research that documents were intended for purposes other than those for which we are using them. Some sources are inherently less reliable in recording woodland than others. If for instance we consider a fine dated 1390 relating to the sale of a number of woods in Aislaby (Clay 1940: 1), we may reasonably assume that the woods existed at that time, and that the conditions of sale were not considered completely unreasonable (whether they were adhered to or not is a different matter). On the other hand the statement by Leland in the 16th century that there was no woodland in Swaledale (Smith 1909: 32) must be regarded with extreme suspicion. Leland had no particular interest in accurately recording the landscape, nor is there any clear distinction between what he has himself observed, and information gained from others. Besides we have no idea of the criteria used by Leland to decide what was woodland, what was scrub, or say pasture with trees, nor do we know what was meant by 'little' or 'plentiful' woodland. Similarly the evidence of the foundation myths of Cistercian monasteries has not been used as the rules of this order encouraged isolation. Features of the landscape such as woodland which suggest wilderness tend therefore to be greatly exaggerated. In general we are on safer ground when considering documents which transfer land, record disputes, or value assets, where the intent of the document is clear, and the woodland described not generally fictitious.

Another area which requires a great deal of care is when comparisons are made, either between periods, or between different areas. In this study both types of comparison are important to illustrate both regional variation, and change with time. It has been easier to illustrate regional variation, as in general similar types of document are used for each area. It is, however, necessary to consider the possibility of a distributional bias. A clear example of this occurs in the case of post medieval woodland surveys. These relate solely to crown property, often that acquired from the late monasteries. They therefore have an inherent distributional bias and strictly speaking only inform us of the state of woodland on crown estates in those areas at that particular time (though in some cases they may strongly reflect their earlier monastic management). Comparison between periods is much more complicated. Often it is necessary to use different types of document which may differ in the degree of emphasis placed on woodland or differing woodland types. This is particularly well illustrated by the difficulties in making a comparison between the evidence for medieval wood, and the woodland surveys of the sixteenth century. Even after detailed consideration of the manner and purpose for which woodland is recorded in each type of document, the degree to which bias is compensated must be largely a matter of judgement.

The use of transcriptions and particularly translations creates its own problems. Authors of such publications have not on the whole had any great interest in, or knowledge of, woodland issues. The main problem relates to the translation of woodland terms from Latin. Silva, nemus and boscus are the most common terms used to refer to woodland in medieval documents. Although the management implications of these terms are far from clear, words with clear management implications such as 'coppice' are often used in translation. In consequence it is best to assume that there is no management implication unless either a precise Latin term such as virgultum is quoted or a certain type of management is suggested by the text. Both translation and transcription will of course involve a degree of error; fortunately however most of the terms are reasonably common and therefore likely to have been rendered predictably. The final difficulty associated with the use of documentary evidence is its availability. There is very little useful documentary evidence for North Yorkshire earlier than the late 11th century. While documentation is relatively plentiful in the form of charters, fines, and court proceedings for the following period until the Black Death, little documentation has been found for the late 14th and the 15th centuries. For the post medieval period, on the other hand, material is plentiful. It tends however to be of a very localised and often detailed kind which makes comparison between regions difficult. This difficulty is compounded by the fact that very little of this material has been transcribed, with the result that study can be extremely time consuming. These problems have been overcome by illustrating the development of selected areas in detail by comparison with the medieval evidence.

Section 1.6

The Use of Place-Names

Anglo-Scandinavian place-names are now routinely used to provide an illustration of regional variation in woodland density in the early medieval period (see for instance Rackham 1979 & 1980 for a national treatment) for which there is little documentary evidence. Certain problems encountered in using place-names in this way are specific to this study; there is a very marked mismatch between the distribution of woodland and clearance place-names, and the distribution of woodland suggested by medieval documentation. This is discussed in detail in chapter 6, but may be related to topography, and the disposition of woodland in the landscape. Other limitations are common to any use of place-names in this way. The study of place-names relies on the assumption that names when designated have a specific and well known meaning; this is subsequently lost due to changes in language. The place-name becomes fossilised, possibly undergoing a process of alteration with the passage of time. Interpretation of the place-name record is thus dependant on patterns of designation and survival, and our ability to understand the languages in which place-names were coined, and retrace the subsequent changes. The study of individual place-names thus involves the application of specialist linguistic knowledge to the documentary record. Ideally therefore only names which have firm derivations should be used to construct a map of those which are woodland related. Such an approach is not suitable for North Yorkshire. This is in part because the area as a whole was relatively poorly wooded at the outset of the medieval period, and also because the arrangement of many upland hamlets into very large composite townships has led to an extremely uneven distribution of place-names with good documentation. The strategy adopted has therefore been to select a limited range of place-name elements thought to have predictable derivations. An unknown proportion of the names containing these elements will have other derivations, but it is thought that these will be small in number and randomly distributed. Using place-names in this way has the advantage that coverage of the county is very even, and that a large proportion of minor place-names can be employed. It is thus possible to include landscape features as well as settlements whose names have been influenced by the presence of woodland.

Place-names, particularly those of woods, are also used to indicate woodland management. A number of terms (see chapters 6 and 7) carry implications of woodland management. These have been used both to assess differences in management history between areas, and to help illustrate the development of management with time by studying the changes in the occurrence of such terms in the documentary record. The meaning of terms such as hag is complicated by multiple meanings and by regional variations in the chronology of their use. This is addressed by attention to the context in which these terms are used. Hag for instance, as discussed in chapter 6, has several distinct meanings in North Yorkshire, referring to peat cuttings, intakes, and coppice-woodland. Clearly if we can be sure that a woodland is referred to, then it is reasonable to conclude that this was coppice managed when the name was given.

Section 1.7

Archaeological Evidence

Archaeological evidence is used in two ways in this study. Published artefactual and field evidence is used to illustrate patterns of settlement and land use. This indirectly reflects the distribution of woodland and the pressures upon it. As discussed in greater detail in chapter 4 the distributions of material remains is not determined solely by their disposal or construction, but also by factors affecting their survival and retrieval. The problem of relating archaeology to woodland is further complicated by the fact that the relationship between them may be indirect. It is for the prehistoric period that we rely most heavily on this kind of evidence. Without further environmental evidence it is difficult to know whether a distribution of finds represents a distribution of wealth, population, or a particular culture which used, say, pottery in preference to more perishable materials such as wood. Inferences may sometimes be made on the basis of the presumed purpose of an artifact or feature. In the case of neolithic arrow heads for instance we assume that these were used either for hunting or for warfare. It seems reasonable to infer therefore that the frequent occurrence of such artifacts on the North York Moors indicates activities likely to be marginal to the main settlement areas. In other words this is likely to be an area used for hunting and perhaps the focus of territorial disputes, rather than agriculture and settlement. We may thus guess that changes in woodland were related to activities peripheral to the main area of settlement, such as the creation of temporary clearings for game, or changes in woodland structure associated with pasture. Little is however learned of the scale of this activity. One might argue that some types of archaeological feature provide definite evidence of cleared landscapes. Evidence such as field systems, however, only informs us of where woodland was not rather than where it was. It is not true to say that a landscape which was largely enclosed was necessarily less wooded than one which has little evidence of enclosure. Such evidence in any case only accounts for a small area, even in areas such as Craven where prehistoric field systems are abundant and well preserved. Prehistoric field systems are a good illustration of a further problem with this form of evidence; that of dating. Whilst the dating of many artifacts is reasonably accurate and secure, field evidence, and in particular field systems, are often very difficult to date. In consequence it is often difficult to determine whether a particular field system originated in the Bronze Age or the Roman period. With these problems in mind archaeological evidence has been used to give an indication of the variation in population density from place to place at different times, and to indicate patterns of land use. It is assumed that in agricultural societies, areas with high population density are likely to have less surviving woodland. This assumption is likely to be most valid during the early periods of agricultural settlement; in later periods, due to the effects of grazing, transhumance, and earlier clearance, there is likely to be a less direct relationship between woodland and population. General patterns of land use may have implications for woodland exploitation and clearance. A predominantly pastoral society may manage its woodland resources in a very different way from a society based on arable farming.

The second context in which archaeological information has been employed is in detailed surveys of specific woodland. In favourable circumstances an archaeological study, such as that of Ivelet Wood in Swaledale (see appendix 2), may be very productive.

Unfortunately in North Yorkshire the number of woods with this kind of potential is small and of restricted type. As we shall see, very few North Yorkshire woodlands have discernible features such as woodbanks which offer opportunities for archaeological study. The study of Ivelet Wood makes use of the considerable potential of charcoal platforms, providing evidence of the composition and management of the woodland, and the probable date of industrial exploitation. The limitation to the use of charcoal platforms is that they tend to be confined to woods which were exploited by industry, and thus only representative of a very small part of the woodland history of the county. It has already been pointed out that a decision to study an area as large as North Yorkshire restricts the amount of detailed local study which can be undertaken. In consequence it has been necessary only to undertake detailed archaeological studies of woodland which had a reasonable chance of providing a positive contribution to the overview of North Yorkshire woodland history.

Section 1.8

Environmental Evidence

Environmental evidence, particularly that gained from the fossil pollen record, complements archaeology in the study of prehistoric woodland. For the historic period the pollen record can supply a narrative account of woodland change in a way not yielded by any other form of evidence. Although the pollen record is more directly related to the landscape than is the archaeological record, it is not a direct measure of the vegetation surrounding the pollen site. Interpretation of the pollen record involves two stages of interpretation. The first involves moving from the raw pollen data to some concept of vegetation cover. This process is complicated by the very different pollen outputs of different plants (see for instance Andersen 1970, 1972), and the same plants under different conditions. This problem is to some extent overcome by considering suites of plants indicative of certain habitats, rather than attempting to determine vegetation cover in detail. This is for instance the approach adopted by Turner (1964) in determining an arable/pastoral landuse index. The second stage of interpretation involves the inference of cultural and ecological landscape and change from the postulated vegetational sequence. The problems associated with this have been discussed much more extensively by Edwards (1979) than is appropriate here. He focusses particularly on the inference of clearance activity from pollen data, pointing out the interpretational problems generated by uncertainties regarding pollen catchment area, and the location of the pollen site relative to the perceived activity. In addition to these problems inherent in pollen data, interpretation has also tended to be limited by a lack of formal models for human activity, to which changes in pollen profiles might be related. In particular there has been a distinct lack of models for the effects of prehistoric pastoralism, in spite of an increasing awareness among archaeologists that domestic animals may have made a greater contribution to the late prehistoric economy and land use than arable crops.

If we go beyond the individual pollen study to consider a whole county we find an additional limitation. Pollen studies of peat profiles, which are our main concern here, are restricted by the necessity of finding sufficient depths of undisturbed peat deposit. This is considerably more difficult in some areas than others, with the result that the pollen record may be representative only of particular situations, or of certain areas of the county. This point is illustrated by the map of pollen sites studied in North Yorkshire (fig. A). Pollen data is virtually non existent for large areas of the lowlands, and for the areas with calcareous soils (see fig. C). Although in other parts of the country such as Wessex the lack of paleobotanical data in areas with calcareous geology has to some extent been addressed by the study of alternative forms of environmental evidence such as snail shells, such information is not easily compared with paleobotanical evidence, nor have such studies yet been undertaken in North Yorkshire. We must therefore be content with a very incomplete picture of the paleoecology of the county, and beware of transposing the conclusions based on the pollen records of the acidic uplands onto the lowlands and chalk Wolds, which may have had very different woodland histories.

As we have seen each form of evidence has its own limitations and strengths. It is therefore by bringing together the information from these various sources that we have the best chance of producing a balanced woodland history. Documentary and philological information are very useful in providing details of woodland distribution and management for particular periods. Archaeology and palynology on the other hand provide a more general view of woodland clearance over a longer time. The different sources also complement each other spatially as palynological and philological information is available in upland areas where the documentary record is less good. For the prehistoric period archaeology helps to provide an account of the areas which have a poor pollen record, such as the lowlands and the chalk Wolds.

Section 1.9

Arrangement of the Text

Earlier in this chapter two aims were set out; to investigate regional variation in woodland history within North Yorkshire, and to investigate the formative processes which may have been responsible for creating change and diversity. In pursuit of these aims the text is divided into three parts. The first considers the national background to the present study. The text is written in approximately chronological order, beginning with early post-glacial woodland, and ending with the decline in coppice management and the rise of timber plantation in the last three hundred years. Where appropriate, other aspects of the landscape are discussed, particularly where medieval patterns of settlement and field systems are concerned, as some authors claim that woodland may have played a critical role in the regional differentiation of these.

Part 2 is concerned with the evidence for woodland management and distribution in North Yorkshire. Again a chronological approach has been adopted, beginning with a discussion of palynological and archaeological evidence for the prehistoric period. For the medieval period evidence from place-names and the documentary record is also used. The information from these sources is presented in map form in order to facilitate discussion of regional variation and to identify areas which may have had distinctive woodland histories. The documentary data has also been analysed on a more chronological basis in order to give an account of changes of management with time. Due to the massive volume of information from some sources and the uneven coverage of others, study of the post-medieval period is concentrated on the study of specific areas within the different woodland landscape zones defined by the evidence for the medieval period. A more complete coverage of the county is achieved with a discussion of the information from early O.S. maps as analysed by the Nature Conservancy Council Provisional Inventory of Ancient Woodland (Carter 1987).

Part 3 is a discussion of the factors which may combine to produce woodland history. Models are suggested for the way these environmental, economic, and social factors may have acted on woodland and interacted. Where possible arguments are illustrated by specific examples. While it is not possible to arrive at an 'explanation' for the history of North Yorkshire woodland (indeed there is some difficulty in determining the precise nature of that history), the discussion in this part of the thesis attempts to illustrate the means by which diversity and change in woodland history have been generated, and the relationship of that history to both the wider landscape and society.

PART 1. STUDIES IN ENGLISH WOODLAND

Chapter 2

Prehistory

Section 2.1

Mid-Holocene Vegetation

It is generally accepted that after the period of rapid warming at the beginning of the present interglacial approximately 10,000 years bp trees and shrubs began to recolonise the British Isles. Some such as birch may have been able to spread from sheltered refugia, but most spread from what is now continental Europe, which at this time was still connected to Britain by dry land. The progress of this recolonisation is now well established, and is described by a number of authors (Godwin 1975, Pennington 1969, Simmons & Tooley 1981). Trees and shrubs continued to spread across from the continent until about 7800 bp (Simmons & Tooley 1981: 88), by which time the melting ice caps had caused sea level to rise sufficiently to cut Britain off from the rest of Europe. Birch, juniper and aspen were among the first trees to spread across the post glacial land surface. These were followed by pine, then hazel, then oak, elm and alder, lime, beech and hornbeam being amongst the last (Bennett 1986, Huntley & Birks 1983). The isolation of Britain from the rest of Europe at about 7800 bp coincides with the beginning of a period during which the climate is believed to have been much wetter, which is associated with a marked increase in alder pollen (ibid: 90). During this period of relative climatic stability conditions were suitable for the establishment of what were once considered to be 'climax' plant communities, consisting for the most part of dense tree cover or wildwood (eg. Godwin 1975: 465). This model of the vegetation of the mid-Holocene period as climax is now increasingly regarded as inappropriate as more evidence of human impact on the ecosystem comes to light (eg. Simmons & Tooley 1981: 102-106, see also below). The wildwood extended over most of the British Isles except the far north of Scotland. Trees may also have been less dense or absent at high altitude, as in Snowdonia (Walker 1978); though the work of Pennington (1964) in the Lake District shows that wooded conditions were prevalent at much higher elevations than the present day tree-line. The abundant archaeological evidence for early neolithic settlement in areas of chalk and limestone geology has led to the suggestion that these have always supported a lower density of woodland cover (Wooldridge & Linton 1933). Although this is apparently supported by pollen studies which appear to show that the mid-Holocene wildwood was less dense than the norm on the sugar limestones of Teesdale (Turner et al.1973), pollen and molluscan analysis on the chalk lands of southern England (Evans 1971, 1972, Waton 1982) and pollen studies on the Irish Burren (Crabtree 1982) suggest that calcareous soils supported dense wildwood.

In some upland areas such as the southern Pennines (Jacobi et al. 1976) and the North York Moors (Simmons et al. 1982, Spratt & Simmons 1976), the presence of charcoal horizons in peat profiles has been used to infer that in some places broken woodland cover may have been created and maintained by periodic burning by mesolithic peoples. It has however been pointed out that there are other potential explanations for the presence of charcoal in peat profiles (Edwards & Ralston 1985,

Edwards 1988). In particular it is usually not possible to ascertain the spatial extent of charcoal horizons, thus the distinction between charcoal derived from local domestic hearths and more large scale burning is unclear. There is a body of evidence for woodland burning being used by historic hunter gatherer societies. The advantages of clearance by fire in increasing the quantity and quality of vegetation available to browsing animals are discussed by Mellars (1976). Clearance by fire may be advantageous not only in increasing the productivity of ungulate populations, and endowing the movement of herds with some predictability, but may also facilitate hunting and increase the available vegetable resources. Rackham (1990: 33-4), however, points out that on the whole the deciduous woodland likely to have dominated the English flora during the later Mesolithic is extremely resistant to fire, whereas the ethnographic data comes from areas where the woodland is relatively combustible. It is perhaps significant that the evidence for woodland burning during the Mesolithic comes from what are now upland moors and lowland heaths. It is suggested by Mellars (1976) that exposure to wind and dry sandy soils may have rendered these woodlands more flammable. The beneficial effects of fire may also have lasted longer due to slow regeneration on relatively poor soils.

Before describing the possible changes brought about by the introduction of agriculture, and a more settled existence by neolithic people, it is useful to clarify as far as possible what the wildwood was like at the end of the mid-Holocene period. In a study using multivariate analysis of a large number of pollen samples from sites spread throughout the British isles, Birks et al (1975) have been able to give a rough idea of the relative distributions of the main tree components of the wildwood at about 6500 bp. Birch and pine dominated the north east of Scotland and western Ireland. Elm and hazel were predominant in central and eastern Ireland. Alder and hazel were abundant in central England and lowland Wales, with oak most important in the north and west, and lime in the south and east. It is important to note that this study only reflects variation at a fairly coarse regional level, and that as much as 50% of the variance in the data may be accounted for by small scale variation at a local level. The wildwood is likely to have been affected by rainfall, drainage, geology, exposure, and temperature on a local scale, and to have consisted of a mosaic of different woodland types of which some were broadly dominant in different regions. A map based on this study and work done since then was published by Oliver Rackham (1990: 29). This divides the British Isles into a number of provinces, with a good deal of variation of woodland type within each province depending on local soil type etc.

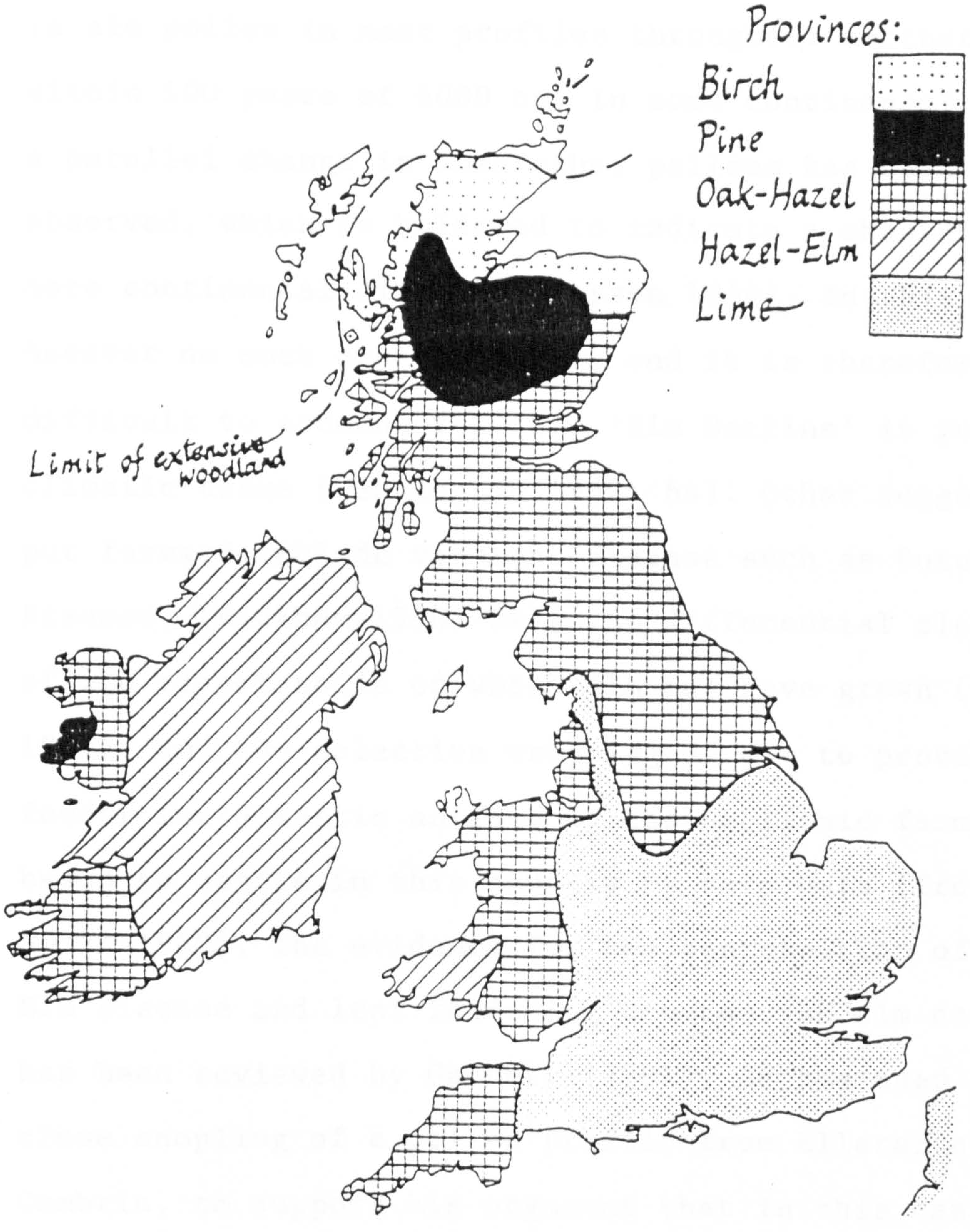


Fig.1 Wildwood provinces in 6500 bp.
From Rackham 1990: 29

Section 2.2

Neolithic Activity

The end of the Atlantic is marked by a synchronous fall in elm pollen in most profiles throughout northern Europe within 100 years of 6000 bp. In some continental profiles a parallel change in some other pollens has been observed, which is believed to indicate a change to a more continental climate (Iversen 1944). In this country however no such changes occur, and it is therefore difficult to account for this 'Elm Decline' in purely climatic terms (Pennington 1969: 64). Other suggestions put forward include virulent disease such as Dutch Elm Disease, (Rackham 1990: 34), the differential clearance of the richer soils on which elm may have grown (Mitchell 1965), and the selective cropping of elm to provide fodder for domestic animals by the neolithic farmers who began to settle in this country by this date (Troels-Smith 1960). The evidence for the contribution of Dutch Elm Disease and leaf foddering towards the elm decline has been reviewed by Garbett (1981). He has used very close sampling of a pollen profile from Ellerside Moss, Cumbria, to support his argument that in this case over-exploitation of leaf fodder was the major factor in causing the fall in levels of elm pollen.

The agriculture practiced by neolithic farmers in Denmark has been equated by Iversen (1941) with the practice of landnam, involving the creation of small temporary clearings, cultivated briefly, then used as pasture before being deserted and left to regenerate. This model was adopted by archaeologists and palynologists to explain short lived clearance phases observed in many British pollen profiles (eg. Pennington 1969: 70). The *landnam* model of neolithic agriculture has since had to be considerably modified in the light of more recent palynological and archaeological evidence. It is for instance questionable to what extent 'small temporary clearances' is a good description of the clearance which Simms (1973) finds at Hockham Mere in East Anglia, where the main cultivation and pasturage phase is estimated to have lasted c.100 years and to have occupied an area of at least $36km^2$. Increasingly, alternative models for neolithic subsistence strategies are emerging, such as the infield/outfield model proposed by Smith (1984) for the Avebury area. Whilst in parts of Lowland Zone the problem with *landnam* as a model for neolithic activity is the long duration of clearance phases, in much of Highland Zone clearance in many pollen profiles appears to occur without accompanying evidence of cultivation. This is sometimes explained by the relatively long time lapse represented by the distance between samples taken from the peat column (Bradley 1978). At Ellerside Moss (Garbett 1981), however, the distance between samples was very small, but the evidence is consistent with clearance which was purely pastoral.

In some other areas there is evidence that clearance was sustained, as at Barfield Tarn on the Cumbrian coast (Pennington 1970). More recent models for neolithic land use include a rotation of arable with 'coppice' woodland suggested by Goranson (1986), discussed by Edwards (1993). Further doubts as to the appropriateness of a landnam model for the British Neolithic are raised by the increasingly popular view that a process of acculturation was at least as important as immigration for the diffusion of neolithic agricultural practice (Zvelebil & Rowley-Conwy 1986). This would suggest that considerable variation in the mode of neolithic land use is probable. Thus there may have been regional variants in neolithic subsistence patterns, some of which may have been intermediate between the mixed agriculture usually associated with the Neolithic, and mesolithic hunter-gathering. In particular the evidence for clearance without convincing evidence of settlement or cultivation in much of upland Britain may indicate that mesolithic patterns of transhumance were continued. Such a pattern of transhumance has recently been proposed for the early Neolithic by Thomas (1991: 7-28). He argues that a lack of evidence for year round occupation sites, a high proportion of wild species in carbonised seed assemblages, the efficient use of flint, and a small, adaptable range of tools, is consistent with small scale fixed plot cultivation combined with cattle herding involving seasonal transhumance. Later neolithic changes such as a tendency towards more diffuse spreads of a wider range of more specialised lithic material may, he suggests, be explained by shifting cultivation based on the use of the plough, whilst perhaps involving less seasonal movement. Such a change to a more localised, though shifting, pattern of land use may also be supported by a change in faunal remains. Cattle dominate the faunal record of the earlier Neolithic, whereas in the late neolithic period remains of pig are more common. Grigson (1982) believes that, in spite of the fact that this evidence comes from ritual contexts, it reflects a genuine change in the neolithic husbanding economy. Although she relates this change from cattle to pigs to the exploitation of bracken rich secondary woodland (which might be unsuitable for cattle), a movement away from long distance seasonal transhumance may also be implied as pigs are not well suited for this type of management (Ibid).

The fact that comparatively little palynological evidence is available from the areas of calcareous geology, such as the Yorkshire Wolds (see chapter 2) or Wessex, which appear from the archaeology to have been the most important for settlement, contributes to the uncertainty regarding the nature of neolithic land use. The study of snail shell assemblages, particularly from buried soils under long barrows (Dimbleby & Evans 1971, Evans 1971, Evans 1972), has to some extent illuminated this darkness. This has provided evidence of the clearance of closed canopy woodland on calcareous soils during the Neolithic. Clearance of chalk downlands at this time is also supported by pollen diagrams close to the North Downs in Kent (Evans 1971). Similarly, pollen analysis of well preserved turf below Silbury Hill (Wilts) provides evidence of a predominantly open landscape at the time of its construction in the mid to late Neolithic (Dimbleby 1984). A series of pollen studies on and around the southern chalklands by Waton (1982) show substantial clearance on the chalk in the early Neolithic, followed by some regeneration and the resumption of clearance in the late Neolithic. In some other areas too, such as the East Anglian Breckland (Godwin 1944) and the Cumbrian coast (Pennington 1970), pollen analyses seem to indicate long term and extensive clearance.

Section 2.3

The Bronze Age

Turner (1965) has demonstrated that small temporary clearances continued to be widespread in northern and western England throughout the Bronze age. Woodland rapidly regenerated after these temporary clearances were deserted. On light soils, and in upland districts, clearance was followed by rapid deterioration of the soil which prevented the regeneration of trees and led to the establishment of heath (Dimbleby 1962). In the chalk lands of central and southern England, Lincolnshire, and the Yorkshire Wolds pollen evidence is poor, but the tree cover here appears to have been extensively cleared. Much of this clearance may already have taken place by the end of the neolithic period, allowing the construction of the ritual landscapes of the Wessex barrow cemeteries within which complex relationships between monuments presuppose a cleared landscape (Fowler 1981: 28). In northern England the positioning of round barrows and carved rocks in positions which command wide views may also imply an increasingly open landscape (Spratt 1982, Bradley 1978).

It is during the Bronze Age that the first definite signs of extensive field systems in England. The extensive planned field systems of Dartmoor (Fleming 1988) or Wessex (Bowen 1978), and the more irregular types of for instance the North York Moors (Spratt 1982, Spratt 1993) all represent an investment in the future. An intention, at least, to remain in one place for a significant amount of time is implied. Similar inferences can be made from evidence for the manuring of fields in Wiltshire and on the Cornish coast (Ashbee et al. 1979, Fowler & Evans 1967). It has been argued (Fowler 1983: 218) that this division of the landscape into fields, and the adoption of settled agriculture, as opposed to the shifting type believed to have taken place during the

Neolithic, indicates a measure of land pressure. If so the trend towards this more settled way of life may have received an extra impetus in the later Bronze Age from the disuse of some field systems, such as those on Dartmoor, on more fragile soils, particularly in upland situations. The cause of this may have been a climatic deterioration believed to have occurred during the late Bronze Age between about 3100-2500bp (the evidence for this is far from conclusive as many of the changes observed in the palinological record could be interpreted as the result of sustained or increased human exploitation; discussed by Turner in Simmons & Tooley 1981: 250-261). In addition to the adoption of settled agriculture, it has also been argued (Fowler 1983: 218) that the building of fortified settlements and lake villages in the late Bronze Age was linked to an increasing need to define and defend territory. However, a glance at the distribution of hill forts (Hogg 1975: 37-46) shows that the fortification of settlement is governed by more complex criteria than merely land pressure.

In spite of the apparent pressure on land, at the end of the Bronze Age the area affected by agriculture is believed to have been still fairly limited, the chalk lands and some lowland river terraces being the most densely settled (Fowler 1983: 60). In many areas, especially those with heavier soils, and in much of highland Britain disturbance of the vegetation appears from pollen records to have been still relatively minor. Small 'interference phases' in more marginal locations, often without cereal pollen, are generally seen to indicate that less intensive pastoral farming was practised on what are now moors and lowland heaths (Evans 1975: 134-138). Here the inception of peat growth in many areas (ibid: 139-142), and expansion of Calluna pollen probably followed podzolisation resulting from the removal of tree cover (Dimbleby 1962, Moore 1993).

Section 2.4
The Iron Age and Roman Period

In a review of the archaeological evidence for farming in later prehistory Fowler (1983: 78) concludes that during the 1st millenium BC, although there is a much greater volume of evidence for settlement and agricultural activity than for the preceding periods, this activity had become concentrated towards the lowland south east of the country. In contrast in northern and western England (Fox's Highland Zone, Fox 1938) there was an increasing emphasis on pastoralism (Ibid: 196). In common with most generalisations, this statement must be qualified. Firstly the archaeological evidence for prehistoric agricultural activity in northern and western parts comes mainly from upland areas. It owes its preservation to a lack of subsequent agricultural activity, and is therefore unlikely to be properly representative of the area as a whole. Secondly, even on the basis of the known archaeology it is certain that south eastern England was not solely occupied in arable farming, nor was the north and west exclusively pastoral. Pollen studies also show that despite the apparent retreat of agriculture from higher ground in the north and west during the 1st millenium BC, there was a period of clearance throughout the Highland Zone on a scale not previously encountered, usually commencing in the Iron Age (eg Turner 1965, Fenton-Thomas 1992, see also chapter 5).

By the late Iron Age areas away from the fertile lowlands of S.E. England, such as the Scottish Borders, Wales, and the South West, were sufficiently well settled to have major concentrations of hill forts (Hogg 1975: 37-46) (The distribution of hill forts should not however be taken to represent the distribution of settlement). Population expansion, invasion, increasing trade and industrialisation had led to a much wider distribution of settlement and land exploitation. Society was both sophisticated and diverse, and sufficiently successful not only to support a population which may have been comparable with that at Domesday (Fowler 1983: 32-6), but also to have produced a surplus for export.

The clearance seen in pollen profiles during the Iron Age if anything increased in intensity during the Romano-British period. The Romans developed an organised industrial economy with towns, villas, pottery kilns, forts, roads and even canals (Salway 1965, Frere 1967, see Swan 1984 for pottery kilns). Although the material evidence for Roman settlement is much more widespread than for preceeding periods, this is probably largely due to increased consumption of items such as pottery which survive to form the archaeological record. However agricultural expansion would have been necessary to supply the Roman army and feed the inhabitants of the new towns (Manning 1975). Drainage of the fens was initiated (Salway 1965); there is evidence that the clay lands began to be extensively settled by this period at the latest. Pollen evidence suggests that cereal cultivation was increased in the Highland Zone (Pennington 1969: 93).

Section 2.5

Prehistoric Woodland Management

Given the evidence for a progression towards nucleated and permanent settlement, and increasingly intensive use of land in response to growing population and deteriorating environment, there are two possibilities for the fate of woodland in prehistory. Either, as a result of agricultural clearance, tree felling, and unrestricted grazing, woodland was continually destroyed so that communities had to travel increasing distances to procure basic raw materials, or a proportion of woodland was consciously managed to guarantee future supplies of woodland products. In view of the abundant evidence to suggest efficient management of other aspects of the agricultural system it seems likely that woodland was no exception. Woodland management may also have been essential in order to provide specific products which could not easily have been procured from the wildwood, however distant. However, the material evidence for such management is scarce. This is partly because the results of this management, the wooden products, are only preserved in exceptional circumstances, and partly because this issue has only recently begun to be addressed in modern excavation.

Growth ring studies, and the presence of heels at the stem bases of wood from neolithic and bronze age trackways in the Somerset Levels suggest that these are likely to have been constructed from coppice wood (Rackham 1977, Morgan 1982). Many poles used in the later neolithic hurdle tracks of the Levels such as Rowland's track had their tops cut off during summer some years previous to felling, perhaps indicating that one purpose of the management was the production of fodder (Coles et al. 1978, Rackham 1977). Similar opportunities to find preserved wood have been exploited in the Cambridgeshire Fens where at Etton, Cambs. bronze age coppice stools and large quantities of woodworking debris have been found preserved in the peat. This is believed to have resulted from the manufacture of wattle hurdles from wood taken from coppices and pollards local to the site (Taylor 1988). Bronze age and iron age building techniques necessitated large numbers of long straight poles and flexible rods which would most easily have been supplied by coppice. Even where timber was used, as at the wooden bronze age island at Flag Fen, Cambs., the small size and rapid growth rate of the oak timbers implies managed woodland (Pryor et al. 1986). In part this evidence depends on a conception that the natural state of the wildwood was one in which slow grown mature trees predominated. This was not necessarily the case; in North America where areas of temperate wildwood still survive they are typically full of saplings which could quite easily have provided most of the materials necessary for prehistoric building. Rackham (1990: 32-33) however points out that America has more shade tolerant species than our native wildwood would have done.

The evidence presented above encourages the view that woodland management techniques such as coppicing and pollarding played an important part in prehistoric woodland exploitation. It should however be pointed out that this evidence relates to a relatively small number of structures which required wood and timber with special properties. There would have been many other purposes for which wood and timber from unadulterated wildwood would have been just as suitable. There were some products, such as dugout boats, which required very large straight timbers only available in the wildwood. An analysis of prehistoric woodland management which only addresses the artefactual evidence also runs the risk of ignoring what must have been an important form of woodland exploitation, namely woodpasture. Although this cannot easily be detected, there can be little doubt that it played at least as important a part in the prehistoric woodland economy as it was later to do in the early historic period.

It is to be doubted whether the English wildwood can be regarded ever to have been entirely free of human interference. The possibility of a park-like upland landscape dominated by hazel, created by the burning activities of mesolithic peoples, has already been mentioned. With the introduction of pastoralism in the Neolithic this landscape would have provided an attractive semi-open pasture for summer grazing, and for continued hunting activity. Troels-Smith (1960) has shown by pollen analysis of settlement sites that leaves may have been used as fodder, so perhaps pollarding was practiced. There may even have been leaf meadows similar to the '<u>lovang</u>' still occasionally preserved in Sweden (Emanuelsson 1987). Similar arguments apply to the Bronze Age; although wood may nowhere have been in such short supply to have necessitated management, the procurement of specific products such as leaf hay or flexible hazel rods, or merely the convenience of a reliable source of woodland products, may have encouraged the practices of both coppicing and pollarding.

At some point during the Iron Age or Roman period a point is likely to have been reached where woodland was so scarce in some areas that management became essential. Rackham cites documentary evidence to show that the Romans were familiar with coppice management in Italy in the first century. He believes that it is possible that chestnut was introduced into England by them for that purpose (Rackham 1990: 41). The Romans also had a number of institutions which used large quantities of wood; hypocausts, heated baths, and a dynamic iron industry to mention but a few. Charcoal identifications from iron smelting sites imply that the Romans may have operated mixed coppices similar to the medieval coppices of East Anglia. (Ibid: 40-1).

Chapter 3

Post Roman Woodland

Section 3.1

Anglian, Saxon and Norse Settlement

The collapse of the Roman empire and economy is believed to have been followed by a decline in population. The palynological record for this time is very varied. In some areas, as in parts of North Yorkshire (see section 5.6), pollen profiles record a significant regeneration of woodland. In others there appears to have been stasis, or even clearance (see for instance Fenton-Thomas 1992). In spite of the emphasis placed on the continuing use of some features of the late Roman landscape in some recent studies (Rackham 1990: 41-2, Gelling 1978: 191-214), the social dislocation at this time must have been severe. This is perhaps most strikingly demonstrated by the almost complete re-naming of all features of the landscape which took place during the period of Germanic & Scandinavian settlement. This re-naming provides a rich source of evidence for the character of the country inherited by the new settlers. Many of the place-names given by these settlers described features of the landscape of the time (see for instance Gelling 1984). Authors such as Rackham (1980 & 1990) have used this to illustrate contrasts in the post Roman landscape. One such contrast, apparent when Saxon and Norse place-names indicating clearance are mapped, is between a strip of

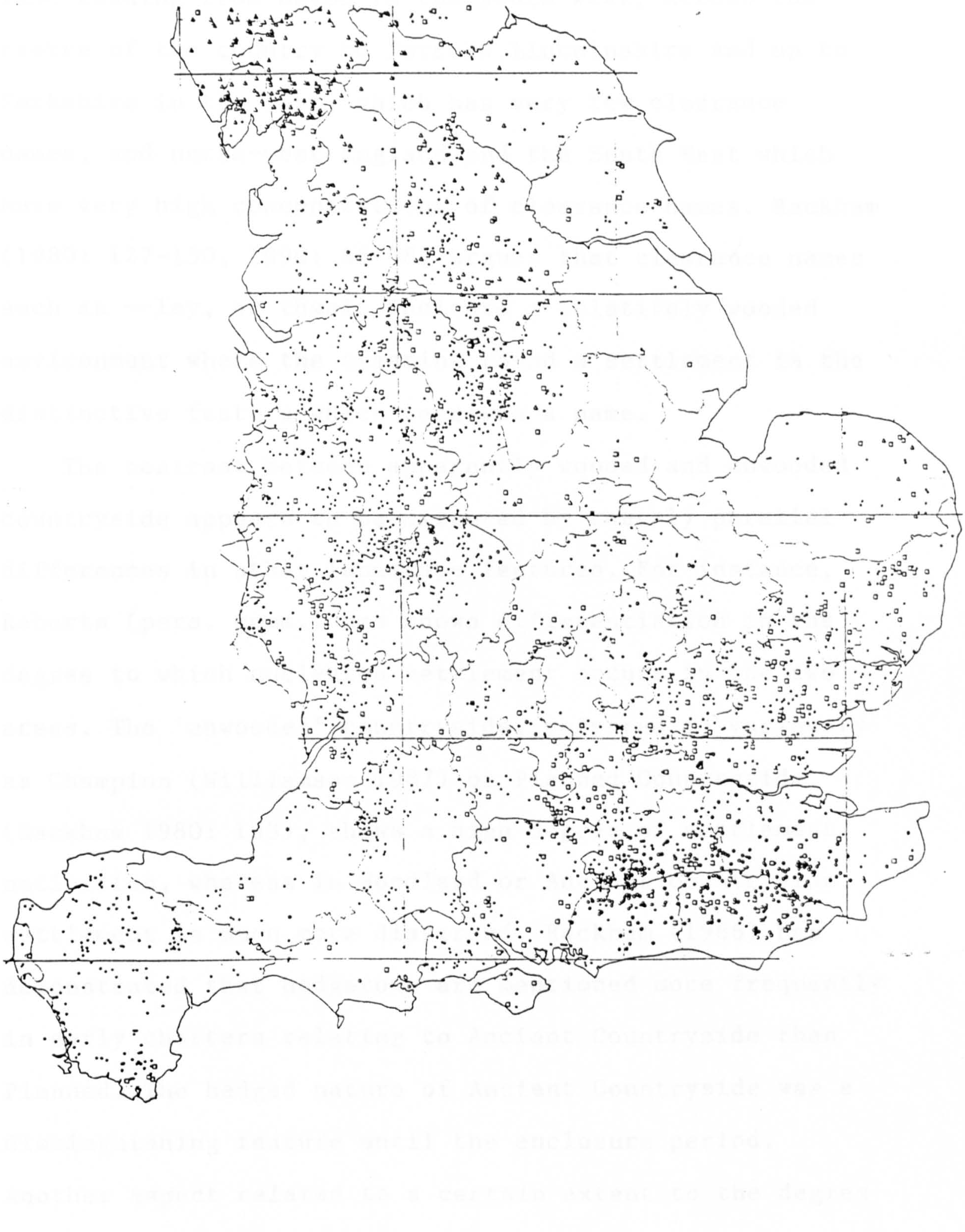


Fig.2. Distribution of towns, villages and hamlets involving 'ley' (●), 'hurst' (o), or 'thwait' (Δ), and of towns and villages involving 'feld' (□). From Rackham 1980: 129.

land running from Devon in the south west, across the centre of the country to Norfolk,Lincolnshire and up to Yorkshire in the east, which has very few clearance names, and north-west England and the South East which have very high concentrations of clearance names. Rackham (1980: 127-130, 1990: 46-48) argues that clearance names such as --ley, or thwait indicate a relatively wooded environment where the clearing round a settlement is the distinctive feature which receives a name.

The contrast between apparently wooded and unwooded countryside appears to be mirrored by roughly parallel differences in other landscape features. For instance, Roberts (pers. comm.) has shown differentiation in the degree to which nucleated settlement occurs in the two areas. The 'unwooded' countryside, referred to variously as Champion (Williamson 1987) or Planned Countryside (Rackham 1980: 133), shows a high degree of settlement nucleation, whereas in Woodland or Ancient countryside settlement is much more dispersed. Rackham (1986) has demonstrated that hedgerows are mentioned more frequently in early charters relating to Ancient Countryside than Planned. The hedged nature of Ancient Countryside was a distinguishing feature until the enclosure period. Another aspect related to a certain extent to the degree of nucleation is the strength of the open-field tradition. Rackham (1980: 133) illustrates that parliamentary enclosure involving open-field is primarily associated with Planned Countryside.

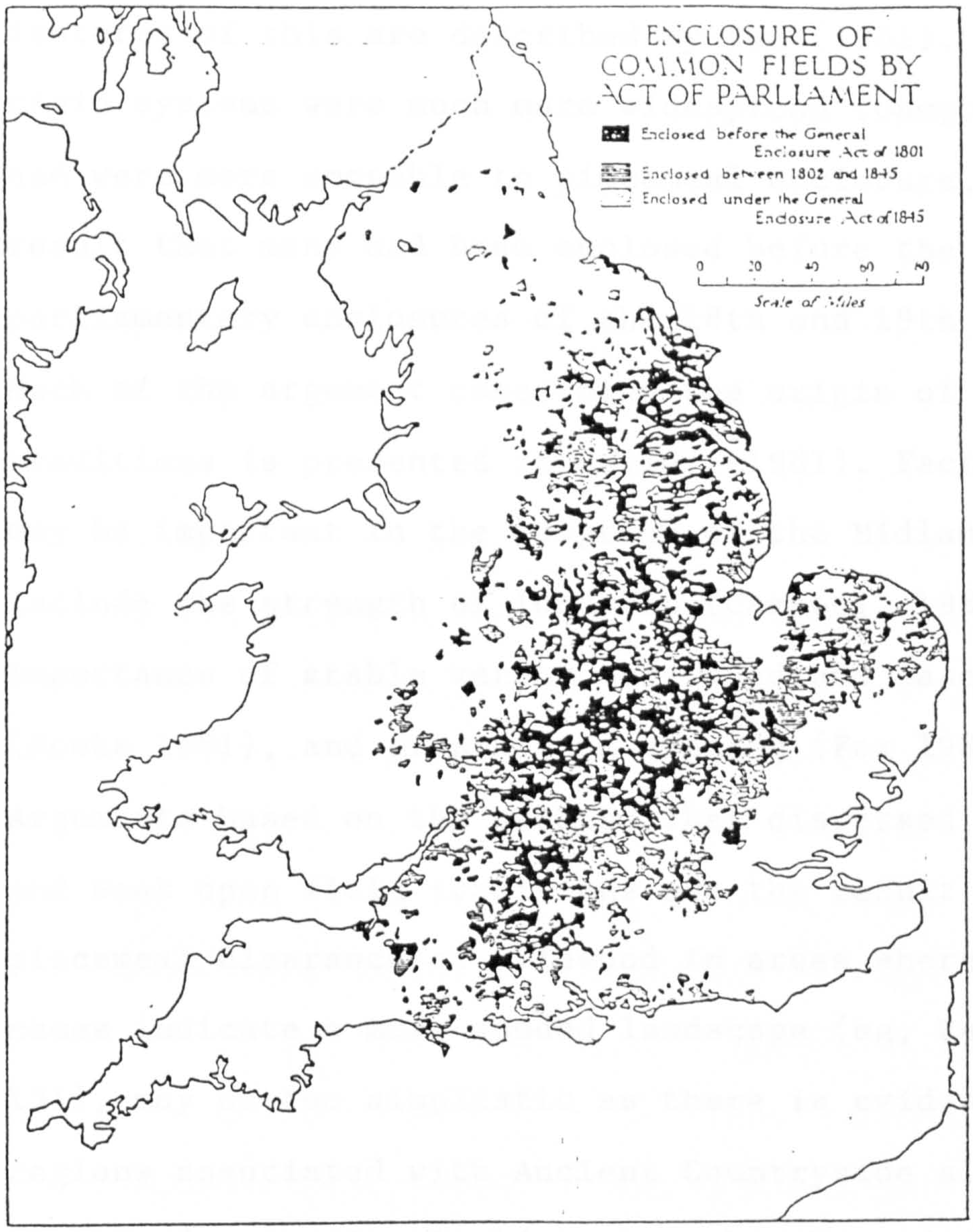


Fig.3 From Slater 1907: 73

There is some debate as to how these contrasts came about, and why so many fundamental aspects of the English landscape are involved. The pattern of open-field enclosure appears to reflect the distribution of a particular variant of subdivided arable farming often referred to as the 'Midland System'. The essential features of this are described by Fox (1981). Other less rigid systems were much more widespread (Campbell 1981) and were more amenable to piecemeal enclosure, with the result that many had been enclosed before the parliamentary enclosures of the 18th and 19th centuries. Much of the argument concerning the origin of open field traditions is presented in Rowley (1981). Factors which may be important in the adoption of the Midland System include the strength of lordship (Campbell 1981), the importance of arable versus more woodland based economy (Hooke 1981), and pressure on grazing (Fox 1981). Arguments based on the premise that dispersed settlement and weak open field traditions are the result of piecemeal clearance of wildwood in areas where clearance names indicate a more wooded landscape (eg, Rackham 1980: 131), may be too simplistic as there is evidence that the regions associated with Ancient Countryside already contained extensive field systems by the end of the Roman period (Williamson 1987). The argument presented by Fox (1981) that the Midland System was adopted to solve problems created by a lack of pasture is attractive because it has the advantage of explaining the tendency for woodland areas to be associated with weak open field traditions, whilst not making the presence of woodland a prerequisite. It does however seem likely that, as pointed out by Campbell (1981), the presence of strong unified lordship would be an advantage in bringing about the redistribution of land and settlement, and the changes in tenurial practice, necessary for the adoption of the Midland System. Williamson (1987) speculates that differences in the way in which the Planned Countryside and the area of Ancient Countryside of the South East were settled by the Anglo-Saxons may be an important factor in determining the contrasts observed in the landscape. He postulates that in the South East Anglo-Saxon settlement proceeded relatively peacefully and continued a pattern of settlement which was in essence Romano-British. In Planned Countryside he envisages much greater social upheaval and the break-up of kin groups, with the result that Romano-British patterns of settlement were abandoned and society became organised on the basis of neighbourhood groups resulting in a much greater communalisation of arable agriculture.

The above discussion serves to highlight the difficulty experienced in defining the causes for even a single, well studied, aspect of the Ancient / Planned landscape dichotomy. What is also clear is that this single aspect, the organisation of field systems, is related to many other facets of land use and society, which may have arisen at widely differing times. We should, perhaps, therefore regard the differing characters of the two landscapes as the product of divergent historical trajectories, accumulating difference with the passage of time as one distinctive feature predisposes the acquisition of another.

Section 3.2

Domesday

Whatever the cause of the differentiation of Ancient and Planned landscapes, the place-name evidence presented by Rackham certainly indicates that differential distribution of woodland is one of the distinctive features of the contrast. The general division of England into wooded and unwooded regions is on the whole also illustrated by the information in Domesday Book. The woodland mentioned by Domesday has been discussed by Darby & Maxwell (1962), and more recently by Rackham (1980: 111-126). Rackham has determined that about 50% of settlements are stated to possess woodland (Rackham 1980: 112). The 50% of 'woodless' settlements are concentrated in particular areas such as the Midlands, the Fens, the Breckland, and east and north west Yorkshire. Although questions have been raised concerning the accuracy of the picture of woodland distribution which Domesday gives at a local level (Hooke 1989: 117, Witney 1990: 23), at a national level these discrepancies are not likely to be serious. Similarly the rough calculations of the area of woodland at Domesday which indicate that as little as 15%

of the land surface was wooded (Rackham 1980: 126) are important in illustrating the order of magnitude involved.

Fig.4 Woodland recorded in Domesday Book. White areas: no recorded woodland. Hatched areas: some settlements have recorded woodland. Black areas: all settlements have recorded woodland. After Rackham 1990: 49

Section 3.3

Woodland Management, Domesday and After

The view of medieval techniques of woodland management presented by Rackham in Trees and Woodland in the British Landscape in 1976 has not since been seriously challenged. Indeed, although his research was primarily conducted in eastern England, the general trend of his conclusions has been confirmed in local studies in many other parts of the country. Rackham showed that the capacity of most indigenous trees to re-grow after cutting was exploited by coppicing and pollarding in a way which was much more efficient and widely practiced than previously recognised. It is convenient for the purposes of discussion to regard coppice and woodpasture as separate management traditions. In reality this division is a simplification as the two traditions represent opposite ends of a spectrum of widely varying practice. There was, however, a tendency towards differentiation between the two traditions as a result of their relative suitability to differing social, and practical situations (discussed below, see also part 3 for consideration of North Yorkshire). Thus an interpretation based on these extremes may provide a useful measure of the relative importance of the two traditions of management, but should not be seen as a true reflection of the diversity of woodland exploitation.

Coppicing consists of cutting near the ground, and subsequently enclosing to protect the new growth from damage by grazing animals. Regrowth from the stools provides a regular crop of poles, the thickness of these depending on the length of the coppice cycle, and the situation of the wood. Animals are excluded either completely, or until the new growth or 'spring' is of sufficient size to withstand grazing. Seven years was frequently regarded as of suitable length of time for this. Timber could be produced in coppice woods in two ways; either by allowing naturally occurring seedlings to grow on over several coppice cycles, or by deliberately leaving one pole of a coppice stool to grow on. A wood which combines timber and wood production in this way is called coppice with standards.

Woodpasture is a compromise between grazing and woodland management. The term woodpasture as used by Rackham (1980,1990) covers a wide variety of such compromises, from situations where management as such is virtually absent, to those where the trees are as efficiently managed as is possible within the limitations of the system. The shading of pasture by trees reduces the quality of grazing in all types of woodpasture (Rackham 1990). The presence of trees may however be advantageous in providing shelter for stock, particularly in exposed areas such as the Pennines. Of the techniques which can be employed to manage trees within woodpasture

Rackham (Ibid) considers pollarding to be the most important, though woodpastures consisting purely of timber trees, or involving coppice compartments only enclosed for short periods after cutting also existed. The inclusion of coppice compartments in woodpasture illustrates the diversity of past woodland management practices. In some contexts coppice cycles are very long, thus allowing considerable periods of time when pasturing can take place (for instance in 18th century Swaledale where a 25 year rotation was used, Gledhill 1992). When considering indirect evidence for woodland management it is tempting to interpret the evidence too simplistically, in terms of the most readily identifiable management practices.

Section 3.4

Medieval Management in Context

The distinction between coppice and woodpasture lies in a difference in the relative priority given to the grazing. Coppice can be seen as intensive management for wood, with grazing as a minor by-product if it occurs at all. Whereas with woodpasture the grazing is of prime importance, and the harvesting of wood or timber must be arranged as best it can. Coppicing therefore is most commonly associated with demesne woodland exploited for the market by the individual. As a result coppice is associated with lords who had greater opportunities to exploit woodland in this way. Private ownership and the need to enclose led to the creation of characteristic boundaries. Rackham records that many coppice woods were compact in shape, and had a large surrounding ditch and bank. These features not only reflect the need to protect the new growth from stock, but also the desire to protect a valuable piece of private property.

Woodpasture is associated with a number of situations in which pasture takes precedence over wood production. An instance of this is common woodpasture where rights to pasture are exercised by a whole community. In this situation the exclusion of animals required by coppice is difficult. In addition, common rights to wood were often exercised over common woodpastures, with the result that coppice may have been difficult to organise and pollarding probably represented the preferable solution. Rackham notes that many wooded commons have irregular 'concave' outlines, the boundaries being those of the surrounding fields. Being in a sense communal property, wooded commons were not marked in any distinctive way, except perhaps where disputes arose between neighbouring communities.

Compromise between pasture and woodland is one of the most important aspects of wooded forests. Rackham is careful to distinguish between legal and physical forest, in other words between the area over which Forest Law operated, and the area in which the deer were actually kept. He also highlights the fact that even the physical forest was not necessarily tree covered, distinguishing between wooded forests and others. Although forests and forest law have been the subject of many books and publications, Rackham is the only author to address the subject of woodland management in wooded forests adequately on a national basis (several local studies of forests do address this topic eg. the books of C. Hart on the Forest of Dean). Rackham points out that most forests were also wooded commons in which villages within the legal forest exercised rights to pasture and sometimes wood. The limitations on management in forests were therefore similar to those on other common woodpasture. Pollarding was common, though few pollarded forests now survive in a recognisable form. forests with coppice compartments also occurred, Hatfield Forest being a classic surviving example (Rackham 1990: 180-183). Where woodland was held within a forest by a private landowner the laws for the protection of the vert required, in principle at least, a Royal licence for any felling or the clearance of land. Until relatively recently it was held that this must have had a strong restraining effect on woodland clearance (eg. Raistrick 1972: 84, 88). Authors who have held this view have seldom considered the issue of management, but the implication must be that coppicing was also strongly discouraged. Rackham (1990: 170) opposes this view, expressing the opinion that in practice a licence was only required for exceptional fellings. This is generally supported by Young's (1979) study of Royal forests in which he points out that the main use of Forest Law in the 12th and 13th centuries when the system was at its height was the raising of income for the Crown. Similar arguments are applied to assarting by both authors who point out that the vast majority of assarts were allowed to remain on payment of a fine. Rackham (1990: 171) suggests that fines were often used as a convenient method of collecting grazing rents or casual wood-sales. One clear conclusion from the importance of forest revenue to the Crown must be that the Crown had no interest in actually preventing trespasses against Forest Law. Young's study also raises doubts as to the efficiency of the forest system. He notes for instance that forest eyres were often held at very infrequent intervals, with the result that many defendants could not be tried as they had died long before. This was particularly true in the 14th century and later, when the importance of forests in raising income had waned. Given the above arguments, there must be some doubt as to the effectiveness of Forest Law in preventing either management, or clearance of woodland for much of the medieval period, and it is probable that the private woodlands within forests were managed in much the same way as if the forest had not existed. This topic is explored further with reference to North Yorkshire in

chapter 12.

The third situation of which Rackham (1990: 151-163) holds woodpasture to be typical is deer parks. Here again there is a need to reconcile the need to provide the deer (or occasionally other beasts of the chase) with both shelter and sufficient pasture, resulting once again in the compromises typical of woodpasture. When, as sometimes occurred, parks were carved out of commons, common rights were usually denied, or bought out (Neave 1991: 11-12). Rackham (1980: 191) notes only one or two very large parks with common rights. The fact that parks were thus generally demesne allowed the owner much greater flexibility in woodland management, which may have encouraged compartmentation. Neave (1991: 7-10) certainly regards this as normal though not universal practice. Efficient management would have been necessary to prevent damage to trees by deer biting young shoots and stripping bark. Concerning the management of timber, Rackham (1990: 157) notes that timber trees coming from the open portions of parks tend to be older than trees from [coppice] woodland. This may, he suggests, be a reflection of the difficulty in replacing trees because of grazing, which may have resulted in trees in this type of situation being used mainly for special purposes or as a kind of contingency fund, usually only exploited in times of crisis. This may have applied to timber trees in open woodpasture of all types so that large or rotten timber trees were characteristic feature of this type of management.

Section 3.5

The Development of Medieval Woodland Management

Rackham (1980: 134) suggests that late medieval forms of woodland management were already well established in the Anglo-Saxon period. In particular he quotes a charter of 866 relating to Wolverley (Worcs) which grants:

"pasture for 70 pigs in that wooded common .... which the country folk call Wulfferdinleh and 5 waggons full of good rods and every year one oak for building ... and wood ... for the fire as necessary...."

This he interprets as indicating the presence of compartmented woodpasture. This argument is presumably based on the assumption that five waggon loads of rods can only have come from coppice woodland. This assumption is not sustainable; there is no reason why these should not have come from pollards. Thus the validity of his contention that

"The importance of woodmanship is eloquently illustrated by the fact that such a highly-organised variant should have reached this backward place by the ninth century" is questionable. This example illustrates the problems of interpreting such evidence. References such as this to annual supplies of rods strongly imply management of some sort, but do not indicate what kind of management was involved. At the very least pollarded woodpasture is implied.

Other, rather vague, evidence for pre-Conquest management comes from place-names. Gelling (1984: 189-192) suggests that the Old English words graf and bearu may have referred to woodlands which were coppiced. In addition Rackham (1990: 45) notes that the words wyrtruma and wyrtwala are found in contexts which would imply that woodbanks are meant. It seems clear that whatever the actual management of woodland at this time the distinction between demesne and common woodland was already well developed, and that pollarded wood pasture, and probably coppice, existed.

Firmer evidence comes from Domesday Book. For some counties the Domesday surveyors made a distinction between silva pastilis and silva minuta. Rackham argues that these refer to the two major forms of management observable from medieval documents, woodpasture and coppice (Rackham 1990: 54). Unfortunately this distinction is only made for a small part of the survey and few conclusions can be reached about the relative importance, or distribution, of the two types of woodland nationally. For the counties of Derbyshire, Lincolnshire and Nottinghamshire where this distinction is made Rackham finds that silva minuta woodland tends to be smaller, and associated with areas in which there is relatively little woodland. The measurement in Domesday of woodland in terms of pannage in eastern England implies that the Domesday commissioners expected this to be the main source of profit, and strongly suggests that woodpasture was the dominant form of management. It is probable therefore that Rackham (1980: 135) is correct in asserting that pasture and pannage were the predominant uses of woodland in the eleventh century. This is arguable not just on the basis of the evidence presented above, but would also be expected from a consideration of the development of medieval agriculture. The communal use of pasture, wooded or otherwise, can be seen as a natural and efficient response to a sparsely populated environment. This does not imply the existence of an egalitarian society, but is merely an acknowledgement of the fact that in a situation where pasture is plentiful its enclosure is a waste of valuable labour. With the possible exception of subdivided arable fields the majority of historians would agree that late medieval common rights are firmly rooted in Anglo-Saxon practice (Lefevre 1894: 7-10, Stamp & Hoskins 1963: 3-13). On this basis, woodland in Anglo-Saxon England must have been managed almost universally as woodpasture, except for a few small areas of coppice which supplied materials for specific purposes, and perhaps in some areas where woodland was particularly scarce. As a result the creation of demesne coppice must usually have involved encroachment on common woodpasture. One would not have expected this process to have proceeded far in any but the most densely populated areas by Domesday as population was still fairly sparse.

Section 3.6

The Expansion of Coppice

Rackham has estimated that as a result of population increases and the expansion of agriculture the rate of conversion in the 160 years following Domesday was at least 20 acres a day (Rackham 1990: 55). As a result woodland had become a relatively small constituent of the landscape in terms of surface area by the mid 13th century. Rackham (1990: 76-82) is able to demonstrate that a great many woods recorded in 13th century surveys in eastern England still survive today with comparable acreages. Increases in demand as a consequence of increased population, and the radical decline in woodland area would be expected to have led to a major increase in the efficiency of woodland management. Although Rackham finds little explicit reference to coppice he infers from references to the enclosure of woodland, and statements of annual value, that coppicing was extremely common. Indeed one of the earliest explicit statements of coppice management is contained in an instruction to the constable of St.Briavels in 1237 (Rackham 1980: 183) concerning the Forest of Dean. Rackham argues that it is a reflection of the ubiquity of coppice that it had reached this wooded part of the country. Although the force of this argument is somewhat undermined by the presence of a particular demand for coppice woodland in Dean in the shape of an active iron industry, Rackham's contention that coppice was widespread by the mid thirteenth century is supported by evidence for coppicing from Kent (Witney 1990), Cornwall (Rackham 1990: 63), and, in the light of the evidence presented here (Chapter 6), North Yorkshire.

The reduction in woodland area in the period up to 1250 had also encouraged a precise definition of woodland rights. These were enforced by the manorial courts, and their exact terms varied from place to place. Tenants usually had rights to wood for fire, for enclosure, and for repair. Timber was normally only available for repair by delivery of the lord. These rights could be exercised over particular woods, particularly those on commons, over hedgerows, or over the whole manor (Rackham 1980: 174). By the 13th century not only is the acreage of woodpasture likely to have decreased massively as a result of all kinds of encroachment, but there may also have been a considerable loss of trees due to the effects of grazing. Rackham (1990: 143-145) points out the vulnerability of pollarded woodpasture resulting from the difficulty in replacing trees. This is not to say that regeneration could not occur in periods of slack grazing, indeed Rackham gives several examples of previously treeless commons which turned into woodpasture (1990: 147 & 149-50). It is to be doubted whether such regeneration was common in the period of increasing population up to the 14th century. Wood on commons which were compartmented probably had a greater chance of survival as the periodic exclusion of animals will have allowed some regeneration. Rackham for instance records that most of the woods on the compartmented common of Michinhampton were able to survive until the 17th century (1990: 145-147). However, he also observes that this type of management was unusual on commons. The general trend therefore throughout the period from Domesday (until the expansion of agriculture was checked by bad harvests, cattle plagues, famine, and eventually the Black Death, in the late 13th and early 14th centuries) must have been the expansion of coppice in response to a growing wood market, while woodpasture progressively disappeared as a result of enclosure and grazing.

One would expect that the massive and sustained drop in population in the 14th century would lead to the collapse of the wood market and a relaxation in grazing pressure. The result ought to have been that coppicing was discouraged, and trees were able to regenerate on commons. The desertion of agricultural land might even have increased the amount of common grazing. In short one would expect a recovery in woodpasture. (There is in fact a late medieval recovery in arboreal pollen in upland North Yorkshire; this is discussed in chapter 8). Rackham suggests that the rapid clearance of woodland came to an end with the Black Death, and that in some areas, such as the east Midlands, regeneration took place. There is however no indication that coppicing was any less important in the 14th and 15th centuries than it had been in the 13th. Indeed, though explicit evidence of coppice is scarce for the latter period, there is little difficulty in finding such material for the late medieval period. Nor is there much evidence of a contraction of the wood market in Rackham's figures for the prices of underwood and timber in Eastern England when compared with an index of the general price of consumables (Rackham 1980: 171). The impression gained of the late medieval period is that whilst there may have been little clearance of woodland for agriculture, at least till the later 15th century, and possibly even some regeneration, coppice almost certainly continued to expand at the expense of woodpasture.

During the late 15th century population may have begun to recover, and by the mid 16th century it was expanding rapidly (Hatcher 1977: 63-67). Rackham (1980: 170) notes the period 1550-1650 as a time of major woodland clearance. Wood and timber prices rose relative to the general price of consumables during this period in eastern England. Probably this was a response to rising demand combined with a declining area of woodland (Rackham 1990: 83 cites rising population, chimney building, and colder winters as particular factors). In many areas this was a time of active enclosure and the remaining woodpasture commons are likely to have suffered along with other types of common. Post medieval political changes may have had a profound effect on woodland management, as they had on all aspects of English life. The Dissolution of the Monasteries marked the beginning of a period when land ownership was extremely unstable, particularly in the north of England. Not only did monastic lands change hands, but also those of Recusants, and later Jacobites, and Royalists. Lands forfeited to the Crown or State typically changed hand several times within a short space of time. Rackham (190: 76) records that timber was often felled by people in need of money to pay off debts or fines. Speculators who bought estates cheaply from the crown before selling them, and wished to make a quick profit from newly acquired estates, may also have found the sale of timber lucrative. New owners also often felt less sympathetic towards the rights of their tenants, and the period provides many examples of law suits concerning terms of tenure and common rights (eg. Hoyle 1984, Fieldhouse & Jennings 1978: 115-117). A particular factor in fuelling these conflicts was the vastly reduced value of fixed copyhold rents and other manorial dues in a time of high inflation. Society, or at least those with power, was increasingly impatient of the multiple land uses which characterised the medieval period (see for instance Thompson 1991: 106-7). During the two centuries following the Dissolution of the Monasteries therefore, a host of factors threatened the survival of woodpasture. Although there is as yet little published evidence to suggest the degree of destruction, or indeed how many woodpastures had been able to hang on till this time, it seems highly probable that such destruction took place.

Coppice woods were much better placed in the post medieval period than woodpasture. Being specialised for wood and timber production, they would have appealed to the mentality of agricultural improvers and the emerging capitalists. The interest in woodland is reflected in a plethora of woodland surveys, more detailed than in the preceding era. Among the earliest of these are the surveys of the properties of the late monasteries made for the Crown immediately following the Dissolution. These purport to itemise every timber tree, their approximate ages and value, often also giving the main species of underwood, as well as their age and value at 20 years growth (see for instance chapter 5). The relatively high price of wood combined with these factors gave coppice woodland a much better chance of survival than woodpasture, and although Rackham records the destruction of woodland during this period, this may in some areas have been offset by the encoppicement of woodpasture.

Section 3.7

Woodland in the 18th and 19th Centuries

The trend towards enclosure and agricultural improvement was maintained, culminating in parliamentary enclosure, which must have spelled the end for many of the remaining medieval wooded commons. Coppice woodland fared rather better due to the growth of a wide variety of wood-using industries. The dependence of these industries, particularly the charcoal iron industry, on large local supplies of wood led to the encouragement of coppicing in many of the more wooded areas of Britain (see for instance Hammersley 1973). Timber using industries such as ship building also expanded considerably, and Rackham (1980: 164) suggests that this may account for the high price of oak trees in the early 19th century (the massive amounts of oak bark used by the leather industry may, he suggests, also have been a contributory factor). From the 17th century onwards there was a contemporary belief in a shortage of oak timber for the navy, illustrated by the exhortations of Evelyn (1729: 271) and others for timber plantation. Rackham believes that this was largely unfounded, the difficulties experienced by the navy in acquiring sufficient wood being more a result of its own inefficiency and the low prices offered than a genuine shortage.

The ideology of industrialisation and agricultural reform began to influence coppice woods. Rackham (1990: 82) notes that 18th century surveys of woodland show that it was now normal to fell a certain proportion of the timber at each cutting of underwood, and on big estates the coppice rotation might be arranged for the estate as a whole. A physical manifestation of the tendency to more 'organised' woodland regimes may be the straight woodland rides of the period, though Rackham (1980: 83) links these with the sixteenth century introduction of sporting guns. A movement towards plantation management can be seen as expression of the same ideology, though Rackham points out that the relative value of oak timber exceeded that of wood for the period 1790-1860 (Rackham 1980: 170). The ideological aspect of plantation is illustrated by the existence of fashions in trees which, as Rackham points out, has been a feature of plantation management which still continues (Rackham 1990: 93). As coppice management started to go out of fashion, to be replaced by plantation, fuel-using industries one by one gradually found alternative fuels to wood and charcoal which were both cheaper and less limiting in terms of supply and transport. In spite of this trend the changeover was slow and at least one charcoal fired blast furnace was still in operation at the beginning of this century at Backbarrow in Cumbria (Fell 1968). In many areas as transport improved coal replaced wood as a domestic fuel, a trend which had begun in some cities such as London by the 17th century (Nef 1932). As a result of these trends coppice management went into a steady decline. The actual replacement of coppice by plantation was probably rare till the 19th century. The earliest example recorded by Rackham is 1759 (Rackham 1990: 101). But Rackham suggests that during the 19th century a point was reached when plantations rivalled 'natural' woodlands in area, and significant areas of existing woodland were replaced by plantation.

Section 3.8

Forests; their Development and Decline

As stated above in medieval England forest meant an area under Forest Law, which was designed to preserve game. A good discussion of the history of royal forests is provided by Young (1979). Forests in this medieval sense are considered to be an introduction of the Normans, the 'Constitutions' of Cnut being a 12th century forgery (ibid: 12). Several forests had already been created by the time of Domesday Book. Those referred to in Domesday are illustrated by Young (1979: 9), and are predominantly situated in the south and west of England. The area subject to Forest Law continued to grow under successive kings. During the anarchy of Stephen's reign the enforcement of Forest Law may well not have been rigorous. There may also have been some considered concessions in area in order to win political favour. Henry II not only restored the earlier boundaries of the forests, but also extended them. Young (1979:19) considers that the extent of the royal forests reached a maximum during his reign. The subsequent history of forest boundaries consisted of a series of recessions and expansions depending on the political fortunes of the monarch.

During the 12th and 13th centuries forests were used as a means of raising money. Large sums could be raised from bought exemptions from Forest Law, such as the £100 paid for the disafforestation of Ainsty in Yorkshire in 1190 (Ibid: 21). Forest eyres (Itinerant forest courts) could also be extremely lucrative. In 1175 Henry II was able to raise as much as £12,305 from his forests, Young compares this with the £21,000 total revenue of the crown in a year when there was no forest eyre (Ibid: 40). Although 1175 was a year in which the income from forests was quite exceptional, being the result of an eyre of unparalleled severity, Forests continued to be of major financial importance to the Crown until the 14th century.

Young takes the date 1327 as the point which marked the beginning of the decline of the royal forests. In fact he demonstrates that the seeds of decay were sown long before this. Rackham (1980: 180) takes the Magna Carta, which Young (1979: 64) regards in turn partly as a response to the particularly severe eyre of 1212, as the beginning of the decline.

It is hardly surprising that the barons resented the forests. Not only did Forest Law restrict the use they could make of their own lands, it also diverted to the Crown many of the profits which would otherwise have have been theirs through the manorial courts. The abuse of their position by forest officials was also a matter of resentment and is specifically curtailed by Magna Carta. Although the agreement of Magna Carta was not respected by either side it provided the basis for a series of subsequent charters. Particularly important was the Forest Charter of 1217 which amongst other things provided that all the forests created by Henry II, John, and Richard, excepting their demesne woods, should be disafforested. A summary of the provisions of this charter is given by Young (1979: 68). Subsequent fluctuations in forest area revolved around the interpretation of this charter and disagreement over the new bounds. The Hundred Years War also marked an important downturn in the fortunes of the forest as successive Kings were forced to make concessions in order to persuade parliament to authorise taxes. Although these were frequently recanted by the King, the general trend was towards a restriction of forest area. The fiscal importance of forests also declined as taxes granted by parliament assumed greater importance in financing the war in France. The date 1327 taken by Young as the turning point marks the confirmation of perambulations taken under duress in 1300 during a low point in the fortunes of Edward I.

As the potential income from forests declined, and the attitude towards them hardened, forest eyres became less and less frequent, being replaced by inquests into the state of the forests. Young points out that the eyre made final judgement on all but the most minor transgressions, and that therefore the discontinuance of the eyre meant a decline of the forest administration. He also illustrates this decline with the increasing infrequency of the regard. Young (1979: 159) claims that as the efficiency of the forest administration was reduced forest offices became viewed as a source of income and prestige rather than carrying a responsibility to administer the law effectively.

The post-medieval history of forests is one of continued decay. The use of forests as a means of raising income was revived by Elizabeth I, who attempted to profit by exploiting wood and timber resources. Charles I attempted to resurrect Forest Law for similar reasons (Rackham 1990: 172). Charles' reign was also particularly important in beginning the process of disafforestation and enclosure for several forests such as the High Peak and Galtres (Cox 1905: 178-180, Cowling). Other forests experienced a slow decline in their significance and in the efficacy of the Forest Law and administration. Thus by 1661 the only significant stocks of deer in the Forest of Pickering were in Blandsby Park. The most enduring feature of forests has been the exercise of common rights. In spite of the fact that in some forests such as Needwood, Staffs. (Cox 1905) these were ended by the nineteenth century enclosures, in others such as the New Forest they still continue (Rackham 1990: 173)

Section 3.9

Private Forests

Private forests have not been subject to the detailed study which has been undertaken for the royal forests. This is at least in part due to poor or non existent documentation. The Forest of Weardale is one of the few private forests with extensive documentation, and its history has been studied by Drury (1978); but it can hardly be considered typical given the near-regal powers of the Bishops of Durham. Although the intended function of royal and private forests was the same, owners of private forests (with the exception of the Bishop) cannot have had an equivalent of Forest Law, which until the 13th century at least was outside the Common Law. Thus the establishment of a private forest could only be effected by reserving certain rights to woodland, hunting, and often minerals, prior to sub-infeodation and was subject to Common Law. Besides the legal distinction between royal and private forest, private forests cannot have been involved in the process of constitutional reform in quite the same way. Their history is more likely to reflect changes in the relationship between owner, tenant and peasant, and the value of a forest as a status symbol. In some forests such as those of Swaledale and Weardale the exploitation of minerals became of prime importance during the late medieval period.

Section 3.10

The History of Parks

Medieval deer parks were areas of enclosed land in which deer were farmed. The boundary often consisted of a bank with an internal ditch, and surmounted by a cleft oak pale. After the Norman Conquest parks were usually stocked with imported fallow deer, but parks for red deer and even wild boar also existed. Unlike forests, parks appear to have existed before the conquest. Rackham (1990: 153-5) gives the park of Ongar as a rare example. He also points out that there are a number of parks around which parish boundaries deviate, possibly indicating an early date. It must, however, be pointed out that as parish boundaries frequently deviate round woodlands this is not unequivocal evidence of a pre-conquest park. Rackham considers that parks did not become numerous until after the conquest. However it is not until the 13th century that there is a systematic record of parks, in the form of licences to empark. By about 1300 Rackham estimates that there were about 3200 parks in England covering nearly 2% of the country (Rackham 1990: 152). This estimate is based on the known medieval parks for eight eastern counties which themselves show considerable variation in the density of parks, ranging from one every seven square miles in Hertfordshire to one every fifty four square miles in Cambridgeshire (Rackham 1980: 191). Rackham shows that, unlike that of forests, the distribution of parks appears to have approximately followed that of Domesday woodland as is illustrated by fig 5.

The main function of a park, and the motivation for their creation was similar to that of a forest. Both were involved with the farming of deer which not only provided meat for the table, but were also, as venison could not be bought or sold, a gift of major social significance. One way in which gifts of venison served as an outward expression of the social order is illustrated by the 18th century venison lists which Neave (1991: 7-8) finds for the East Riding. The social significance of parks is also illustrated by the role which trespass could play in lordly disputes. Neave (1991: 12) notes examples of this for a number of parks in the East Riding. To throw down a park pale or to poach the deer was not an act of minor vandalism or simplè theft; it was in effect an attack on the owner's social status.

Parks appear to have retained their popularity a great deal longer than forests, and were available to a much wider range of people. The opportunities for the creation of parks were also greater as much less land was required, and their existence was not so intimately connected with the feudal system of landholding as was the case with forests. In the late medieval period parks declined: few new parks were created and parks already established were often leased as pasture. This decline has been explained largely in economic terms. Stamper (1988: 146) relates the decline of parks to the wage rises of the period after the Black Death, and the resultant increase in the cost of employing a park keeper. There may also have been a downturn in the social significance of hunting.

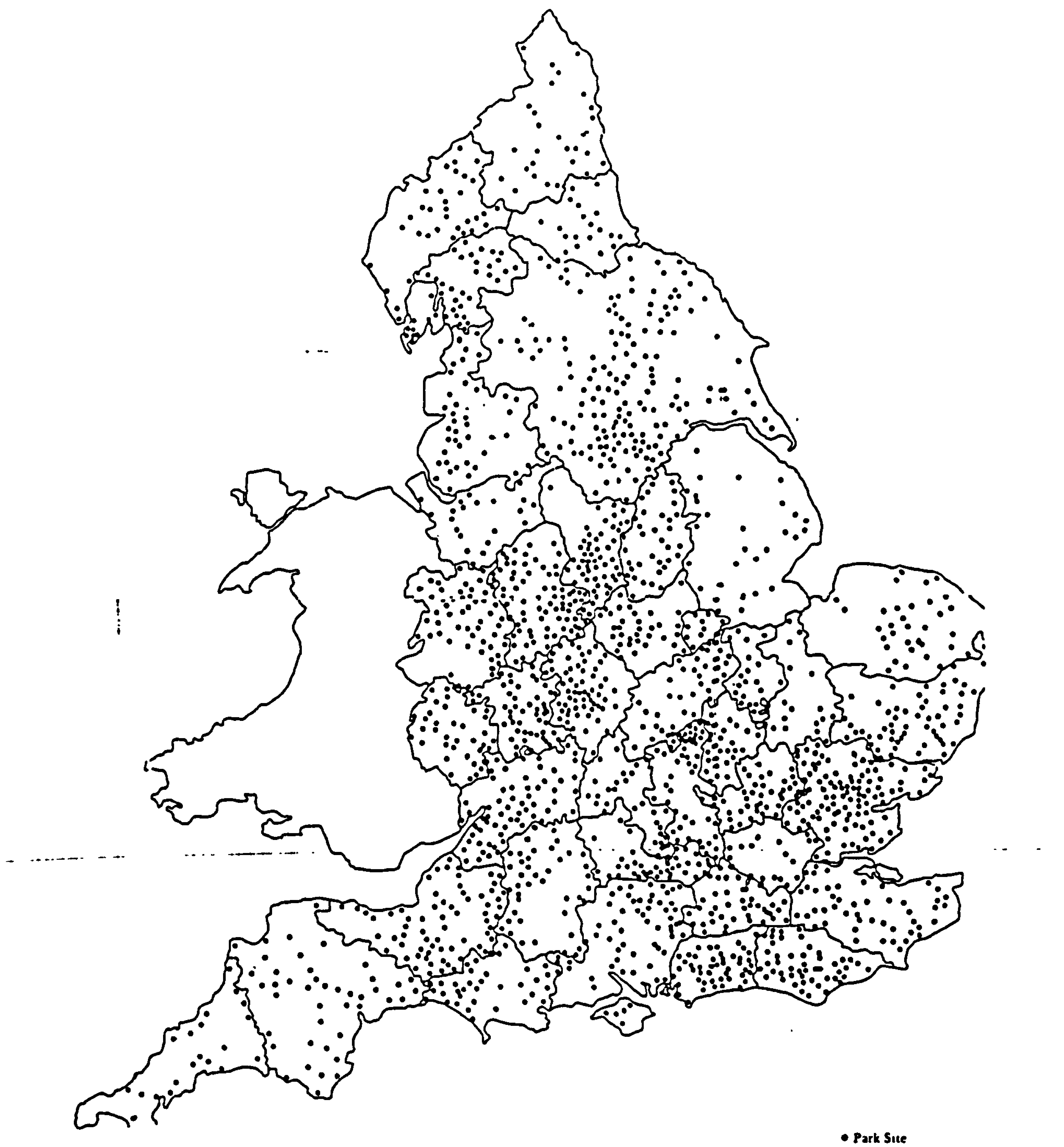


Fig. 5 The medieval parks of England. From Cantor 1983: 4

Deer farming, though ostensibly the main purpose of a park, was by no means the only use to which they were put. Timber and wood in parks have already been mentioned. The pannage of pigs, and the pasturing of cattle were also common. Usually these were permitted by the owner at a price, but occasionally common rights to pasture or wood could remain from the time before emparkation. This was the case in Riccal park in the East Riding (Neave 1991: 46). These profits served to offset the sometimes considerable expense of maintaining the park boundaries which often consisted of a ditch and bank with surmounting oak pale. In the later medieval period these forms of exploitation tended to become more significant as the importance attached to deer farming declined. Many parks were leased as pasture, examples being the Bishop of Durham's parks in Weardale (Drury 1978). Other parks appear to have become specialised for wood and timber production, an example being Downholme Park in Swaledale in the 17th and 18th centuries (Gledhill 1992).

Most medieval parks were remote from the residences of their owners. This and the lack of evidence for ornamental planting has led some authors to conclude that aesthetic considerations played no part in their creation (Cantor 1982: 75). This seems unlikely to be true. Harvey (1981) argues strongly that aesthetic considerations could be important, and there are examples such as

Woodstock where there is evidence of interest in the appearance of a park. The late medieval and Tudor periods saw the rise of what Lasdun (1991) refers to as the 'Country House Park'. These typically surrounded large and comfortable country houses and combined deer farming, hunting and landscape features. Early examples of this include the park created by Henry VII at Richmond in 1499 as a setting for his new palace (Lasdun 1991: 22). Parks as settings for palaces and country houses were increasingly important during the Tudor period. A great many parks of this type were constructed by Henry VIII. The increasing popularity of this type of park was linked to a renaissance in the importance of hunting. Royal hunting had by this time become a an event of great symbolism and ceremony, the final dispatch of the deer often taking place at a preordained place in view of a 'standing'.

The country house park continued to develop during the sixteenth century so that by Elizabethan times the park had become once again an indispensable demonstration of social rank. Increasingly the creation of these parks involved a moulding of the landscape and the planting of trees, as Lasdun (1991: 31) shows to be the case at Holdenby in the late sixteenth century. These developments foreshadowed the evolution of the landscape park which developed after the Civil War. Landscape parks were created in the 18th and 19th centuries, and involved the manipulation of the landscape around a country house in such a way as to emphasise the importance and wealth of the owner (Lasdun 1991: 51-76). The fashions, trends and practitioners of this type of park are well documented and have been the subject of much study. The importance of landscape parks to the study of woodland management lies in their reflection of a changed attitude to the countryside. An important transition had taken place. No longer was it necessary to take what nature provided and make the best use possible; it was now thought possible to improve on this by manipulating the natural environment. On the land this new attitude was reflected by the agricultural improvements, and in woodland by the growing popularity of timber plantation, increasingly involving exotic trees.

Part 2

NORTH YORKSHIRE WOODLAND DISTRIBUTION AND MANAGEMENT

Chapter 4.

Pre-Agricultural Woodland

Section 4.1

Sources of Evidence

For the whole of the prehistoric period the archaeological remains left by prehistoric cultures and the pollen record are the only sources of evidence. The study of palynological material gives information on the environment of the sites considered, but interpretation is complicated by factors such as differing pollen production by different plants and under different conditions, and by uncertainties over the pollen catchment area. Pollen data generally come either from buried soils or from peat profiles. As Bradley (1978) points out, these tend to provide different types of information. Pollen analysis of buried soils is very good at detecting local soil disturbance (eg. by ploughing) but is time averaged. Peat profiles on the other hand may provide long sequences of vegetational change, but even relatively small vertical distances may represent a relatively long timespan, enough for instance for a short-lived clearance phase to be missed between samples. Another problem can be the physical location of good pollen sites. Such sites tend to be situated in places with large peat build-up and a lack of human disturbance; thus the acidic and badly drained moorlands of the North York Moors are particularly well represented, whereas the pollen record is very poor for the well drained calcareous uplands of the Wolds and the Tabular Hills. The Vales of York and Mowbray are also very poorly represented because of the difficulty of finding sampling sites in these densely settled and drained agricultural areas. The degree to which this limits discussion of the paleoenvironment is illustrated by the distribution of pollen sites on figure A.

Archaeological material may provide a broad indication of settlement patterns, and perhaps relative population densities for various past time periods. This has its own problems. Distribution maps of archaeological finds or monuments may be misleading as their inclusion in the archaeological record involves a complex sequence of processes governing deposition survival and retrieval. These have been discussed by a number of authors in the past (eg. Young 1987, Stevenson 1975). In North Yorkshire settlement sites, or field systems might be expected to survive well in areas such as the Pennines or the North York Moors, which have long histories of pastoral land use, and less well in areas such as the Wolds, or the Vales of York and Mowbray, which have seen intensive agriculture. Conversely artifacts are more likely to be found where land has been turned by the plough and might be expected to show the reverse bias. In the Vales of York and Pickering burial of occupation deposits by peat or alluvium may limit the opportunities for artifact retrieval or detection of settlement sites. Urban expansion probably represents the most important process by which archaeological material becomes available for study in these areas, particularly if as at York substantial interest is taken in the history of the town. Uneven distribution of archaeological interest has probably operated in favour of the Wolds, the North York Moors, and the city of York, and against the Yorkshire Dales and the Vale of Mowbray (except perhaps where Roman military remains are concerned).

In the following discussion it is hoped that an understanding of prehistoric land use will be possible by consideration of both palynological and archaeological information. Although conflicts between the two types of record may be revealing, this has its own pitfalls. In particular when few independently dated pollen profiles are available there is a danger of constructing circular arguments such as 'the Bronze Age is the period with greatest activity, therefore clearance seen in the pollen profile must be Bronze Age....'.

Section 4.2

The Effect of Mesolithic Peoples on Postglacial Woodland

The development of woodland after the rapid warming into the present interglacial about 10,000 years ago was essentially similar in North Yorkshire to that in the rest of England. The pollen evidence for the area of the North York Moors is summarised by R.L. Jones (Simmons et al 1982: 36-49). A succession from open communities is portrayed, through birch and pine woodland, with mixed, mainly deciduous, woodland becoming dominant over the whole area by the early part of the mid-Holocene in the 7th millenium bp. This is essentially similar to the picture conveyed by Bartley's study of a lake deposit near Tadcaster in the Vale of York (Bartley 1962), and by R.T.Smith in a summary of pollen evidence for Craven, though in some of the upland profiles in this area (eg. Great Close Pasture) pine remains more important than is typical for the rest of North Yorkshire (Smith 1987).

Mesolithic people were present in North Yorkshire soon after the retreat of the ice, and might be expected to have exercised some influence on the development of the wildwood. Changes in the post-glacial woodland which have been attributed to man range from major ecological events visible throughout England, such as the rise in hazel pollen during the early-Holocene (dated to c.8160 bp by Honeyman 1985 at Whirley Gill in Wensleydale) and the fall in pine pollen dated to about 7-6000 bp at various sites in Craven (Smith 1987), to minor local recessions in woodland cover, sometimes associated with charcoal layers as at Fountains Earth (Tinsley 1975 / 1972). In north east Yorkshire where the mesolithic period has received more attention Spratt (1982) has found that flint sites belonging to the earlier Mesolithic cluster along the southern watershed of the North York Moors and at lowland locations around the post-glacial lakes in the Vale of Pickering. Investigation of the lithic material at these sites has demonstrated that the upland watershed sites differ from lowland sites such as Star Carr in having mainly tools and waste associated with hunting activity, whereas the latter have a predominance of tools used for bone and antler working. Spratt (1982) concluded that there is a difference in function between the two site types, with upland seasonal hunting camps exploiting more open conditions reflected in pollen diagrams (see below), and lowland bases. This pattern of seasonal upland camps and lowland bases has become a standard model for the interpretation of earlier mesolithic material (Darvill 1987: 41-3), and similar contrasts between upland and lowland lithic assemblages have been observed elsewhere in northern England (Jacobi 1978). Recent re-interpretation of the Star Carr site and the discovery of a wide range of additional sites around Lake Pickering by Schadla-Hall (pers. comm. & Spratt 1993) suggests that more complex models are needed for a detailed understanding of mesolithic subsistence patterns, though some form of seasonal movement is still probable. In north east Yorkshire there is also evidence suggesting woodland clearance by mesolithic peoples using fire, both at the lowland site of Star Carr (Cloutman & Smith 1988) and at upland watershed locations such as Ewe Crag Slack (Jones, in Simmons et al 1982: 43-9). At Star Carr a layer containing charcoal and mesolithic material was found; it is however not clear to what extent this represents woodland burning, or some more localised activity. At Ewe Crag Slack (Jones in Simmons et al 1982: 43-9) a layer of silt and charcoal coincides with an expansion of herb pollen, indicating clearance.

Simmons and Innes (Simmons et al 1982: 50-67) postulate that later mesolithic peoples responded to the increasingly dense tree cover of the mid-Holocene by preferentially exploiting areas which naturally retained vegetational diversity. This they speculate may have led to seasonal exploitation of woodland edge, riverine and foreshore environments. In addition mesolithic populations may have encouraged this diversity by artificial means where possible, especially by using fire to clear woodland. Palynological support for this kind of activity is quoted from a number of sources; Dimbleby (1962) detected a large reduction in the proportion of arboreal pollen immediately above a charcoal layer and associated flint scatter at White Gill on Westerdale Moor. Further evidence for clearance by fire comes from the spring head site at North Gill, and from Bonfield Gill Head where rotational burning of the same site is suggested (Simmons et al 1982: 50-67). As has already been discussed in chapter 2, the gains from this type of clearance activity may have been considerable, not only in terms of attracting prey and facilitating hunting but also by encouraging the growth of plants and shrubs, such as hazel and the Rosaceae, which would have provided useful vegetable resources (Mellars 1976). The pollen evidence suggests that the central watershed of the Moors was composed of shrub and open communities during the mid-Holocene. Simmons and Innes (Simmons et al. 1982: 50-67) believe that, since in other areas the tree line appears to have been considerably higher, this situation may have been the result of sustained mesolithic activity. The use of fire and heavy grazing by ungulates attracted by mesolithic clearance may have caused the tree line to move down hill, or even have prevented the formation of wildwood. At lower altitudes regeneration of the wildwood may have been more rapid. However, the presence of charcoal at the base of peat profiles at sites where peat accumulation commenced during the mid-Holocene suggests that clearance activity may have encouraged the inception of peat formation at these sites. In a discussion of the origin of blanket mire

Moore (1993) argues that although the date of inception of peat growth may vary according to local environmental conditions, the disturbance of woodland by human activity may be critical in beginning the process. Simmons and Innes suggest that the use of fire may have resulted in a landscape which was to a considerable extent determined by man, consisting of a mosaic in which mature woodland existed alongside regenerating woodland and semi-permanent open areas of bog and heath.

In other parts of North Yorkshire, charcoal layers similar to those observed by Simmons and Innes on the North York Moors also occur, such as the *Calluna* charcoal in profiles at Malham Tarn Moss (Piggot & Piggot 1963). Charcoal is also present at the base of the peat at Great Close Pasture (Smith 1987) and in the profiles at Stump Cross near Grassington (Walker 1956), and Fountains Earth, Nidderdale (Tinsley 1975). In general, upland sites on the North York Moors, and in Craven and the Dales, tend to show more evidence of mesolithic interference than sites in lowland situations, such as those at Eshton Tarn (Bartley et al 1990) or Seamer Carr, near Stokesley (Jones, R.L. 1976), where charcoal layers tend to be absent and evidence for woodland clearance is less direct.

Section 4.3

Mid-Holocene Woodland

Mid-Holocene woodland immediately prior to the Elm Decline is the starting point for agricultural clearance. There are a number of methods of spatial presentation of palynological information. Here the most suitable is to map the information from each site as a pie chart, as the sites are too unevenly distributed to create a meaningful series of isopollen diagrams. As different trees have widely differing pollen productivities, expressing the information purely in terms of the proportion of each pollen type greatly underestimates the importance of low pollen producers such as _Tilia_. Andersen (1970) has suggested multiplying the pollen counts by the following coefficients

Pine, oak, alder, birch	x1
Elm	x2
Lime, ash, maple	x8

to accommodate the differing pollen productivities of different trees. The remaining tree pollen important in North Yorkshire diagrams is _Corylus_; Rackham suggests using a coefficient of 1 for this (Rackham 1980: 101). Although this method of presentation does not take into account factors such as the reduction in pollen output by shrubs such as hazel when shaded by other trees, or that some trees might have reduced pollen output in exposed situations or overcrowding, it does help to highlight differences in the importance of low pollen producers when comparing different pollen spectra. The resultant figures plotted as pie charts allow easy comparison between sites (fig.B) (see also fig.A for site names and references).

The angle θ of the segment representing the pollen value y of a particular tree is given by:

$$\theta = \frac{y \times c}{\sum(y \times c)} \times \frac{360}{1}$$

Where c is the appropriate coefficient and $\sum(y \times c)$ represents the sum of all the dry land arboreal pollen values when multiplied by their coefficients.

The North York Moors

As can be seen from fig.B the pollen sites from the North York Moors are divisible into 3 distinct associations.

1. This is at its most characteristic at Glaisdale Moor, White Gill and Loose Howe, and is characterised by very high values for Corylus and very low values for Ulmus, Quercus, and Betula; Tilia is typically the tree with the second highest values.

2. The second association, represented by Moss Swang and Lady Bridge Slack, has high Quercus values and values for Betula which are high relative to those from other diagrams.

3. The third association is represented by one pollen diagram only but may be significant when considering North Yorkshire as a whole (see below); this occurs at the West House Moss site and has comparable values for *Corylus*, *Quercus* and *Ulmus*.

There is also a tendency for pollen sites in the south of this area to have high *Ulmus* values for their type. Thus North Gill and perhaps May Moss are association 1 sites with expanded *Ulmus* and Fen Bogs corresponds most closely to association 2 with expanded *Ulmus*. The sites at Collier Gill and Ewe Crag Slack appear to lie between 1 and 2.

The Yorkshire Dales

The Yorkshire Dales divide into two main areas, Craven to the south and west which is dominated by limestone pavement, and the area to the north and east comprising Swaledale, Wensleydale and Nidderdale where the uplands are dominated by Namurian shales and sandstones, and the valley sides by the Yoredale series of limestones shales and sandstones. In the latter area four sites have been considered; Fountains Earth in Nidderdale, Fleet Moss and Thornton Mire to the south of Wensleydale, and Whirley Gill between Wensleydale and Swaledale. The very high value for *Alnus* at Fountains Earth and relatively high values for *Betula* and *Salix* suggest a very extensive wetland environment around this upland site while the remaining woodland, which Tinsley (1975) regards as probably situated on the valley sides, is mainly composed of hazel and oak. All three Wensleydale sites have very high Corylus values. Ulmus the tree with the next highest values is most abundant at Thornton Mire.

Craven wildwood is represented by 5 sites. Eshton Tarn is a lowland site in Airedale near Gargrave; Gordale Beck and Great Cow Close are both upland sites surrounded by limestone pavement; Malham Tarn Moss lies close to Malham Tarn; Stump Cross lies on the uplands to the east of Grassington. The limestone pavement sites are dominated by Ulmus, with Pinus and Betula playing a surprisingly major role. There is no sign of the Fraxinus woodland which dominates this type of scenery at the present day. At Malham Tarn Moss Corylus plays a major role, with Ulmus as the next most common tree. Corylus also dominates at the Stump Cross site with Betula, Ulmus, Quercus, and Tilia making similar contributions. The sites of Eshton Tarn and Linton Mires have roughly equal values for Corylus, Ulmus and Quercus and are very similar to the site at West House Moss in the North York Moors.

Yorkshire Wildwood

The North Yorkshire pollen record strongly supports the concept of a mosaic of woodland types in mid-Holocene woodland. This variation in woodland type is likely to have been created by a combination of environmental and anthropogenic factors. As has already been discussed the human activity most likely to have affected wildwood composition at this time is the burning of upland woodland. One of the effects which this activity is believed to have had on the composition of mid-Holocene woodland was to encourage hazel (see chapter 2). It is possible therefore that the predominance of Corylus in upland pollen profiles is anthropogenically rather than environmentally determined. This seems especially likely as several of the sites in question, such as Stump Cross (Walker 1956), are close to mesolithic flint scatters, and do not correlate well with variations in surface geology.

The occurrence of certain other pollen types appears to be better explained by environmental variation and is consistent with modern woodland ecology. Most descriptions of woodland ecological communities are too complex for comparison with the paleo-ecological record as they are based on minor components of the woodland flora. The rather simpler scheme employed by Rackham (1980) is based on associations between the dominant tree species, and is therefore more suitable for this comparison. Several of the pollen associations observed in the Atlantic pollen spectra have parallels in the associations observed by Rackham in modern ecological contexts.

The *Alnus-Betula* association observed in the pollen profile from Fountains Earth on the Nidd-Skell interfluve occupied a poorly drained upland plateau. This has a strong parallel in contemporary plateau alder-woodland which Rackham (1980: 305-310) believes to have been much more widespread in prehistory than the present day. Similarly the apparent connection between high *Ulmus* values and areas of calcareous geology is consistent with the behaviour of wych elm noted by Rackham (1980: 277-8), and observed in modern North Yorkshire. The oak woodland thought to be typical of Highland Zone is barely represented in the pre Elm Decline pollen record, though high *Quercus* values for some of the diagrams from the lower altitudes of the North York Moors may reflect the occurrence of this woodland type.

The distribution of pollen sites at which *Tilia* was an important component of the pre Elm Decline woodland is more consistent with the behaviour of lime observed by Rackham (1980: 237-254) in eastern England than its distribution in present day North Yorkshire. In eastern England Rackham observes that large stands of lime are particularly associated with fine textured, gleyed soils over boulder clay. The soils of the uplands of the North York Moors, where mid-Holocene records of *Tilia* are high, may well have been of this kind prior to podzolisation. In present day North Yorkshire lime occurs as a rare tree in ancient woodland on steep limestone scree. It is probable that this distribution is the result of the destruction of lime woodland by man, rather than the ecological preferences of lime.

A pollen association which is most strikingly evident in the pre Elm Decline pollen spectra is an Ulmus-Betula-Pinus association. This occurs at sites close to limestone geology, and is particularly apparent at the sites of Goredale Beck and Great Cow Close, close to large areas of limestone pavement. It is reasonable to conclude that this association was environmentally determined, particularly since the ash woodland, which predominates in this type of scenery at the present day, is widely thought to be the result of secondary regeneration.

The impression gained from the above discussion is of a pattern of woodland cover whose arboreal constituents were mainly environmentally determined. This may, however, have been substantially modified by mesolithic burning in many upland locations. The effect of this modification is likely to have been to encourage the growth of hazel.

Chapter 5

Later Prehistoric Woodland

Section 5.1

The Neolithic

Neolithic Pollen

In common with pollen diagrams for the rest of northern Europe, most of those for North Yorkshire exhibit a marked decline in elm pollen at circa 5000 bp. Some possible causes for this have already been suggested in a wider context. These arguments are discussed in the context of Craven pollen diagrams in Smith 1987 and for the North York Moors in Simmons et al 1982. It is unfortunate that the Elm Decline has not been independantly dated in the majority of North Yorkshire pollen studies. Out of a total of 20 profiles covering the period only three have radio-carbon dates at or close to this horizon. This severely limits the value of the published pollen record in an investigation of the nature of the Elm Decline. Some discussion of the topic may however be worthwhile. Of the various suggestions for the causes of the Elm Decline (see chapter 2) the two most plausible are climatic change, and disease, the latter probably assisted by human acivity such as the creation of clearings (Edwards 1985). The three radio-carbon dates for North Yorkshire relate to Eshton Tarn in lowland Craven (Smith 1987) and the two upland sites of Fleet Moss and Thornton Mire in Wensleydale (Honeyman 1985).

The rather late dates for the two Wensleydale sites (4680 +/- 50 bp and 4550 +/- 50 bp respectively) compared with the earlier, and more typical, date at Eshton Tarn (5010 +/- 110 bp) encourage the view that the Elm Decline was not primarily the result of climatic change, which would be expected to have affected the upland sites first. The intensity of the event does not vary greatly from area to area in spite of considerable variations in environment, and in the contribution of elm to the pollen rain. Again this would tend to argue against a climatic cause as this might have been expected to affect the areas where elm was already under most stress (and therefore less common) more than areas where it was a dominant component of the woodland.

On the whole there is relatively little evidence from pollen diagrams for the effect of neolithic activity on the North Yorkshire wildwood. This is particularly true of the North York Moors where signs typical of mesolithic burning of the upland woodland appear to cease at about the time of the Elm Decline. There is however a gradual decline in tree pollen on most upland sites on the North York Moors observed by Simmons and Innes (Simmons et al 1982). Within this a number of minor 'clearance phases' may be discerned. An example of this is a late neolithic woodland recession dated 3,886 +/- 79 bp at Collier Gill (Jones et al 1979). Atherden (1972) regards clearances visible soon after the elm decline at Fen Bogs to have been primarily for hunting purposes as there are few pollen types typical of arablè or pastoral agriculture present. In addition to the minor woodland recessions noted above, a number of other features are detectable which may indicate neolithic interference with the post-Atlantic wildwood. One of these is a decline in _Tilia_ pollen, a phenomenon observed elsewhere in England (Simmons & Cundill 1974a). On the North York Moors a _Tilia_ decline is visible at all sites except Moss Swang and Lady Bridge Slack (Atherden 1972, Simmons & Cundill 1974a, Jones et al 1979, Jones 1976,1977,1978, Simmons 1969). This _Tilia_ decline is normally explained in terms of the preferential clearance of soils on which _Tilia_ grew (Turner 1962). Implicit in this is an assumption that these soils were more suitable for neolithic agriculture. When applied to the North York Moors this interpretation is seriously flawed. Firstly, on the basis of the pre Elm Decline pollen spectra discussed in chapter 3, _Tilia_ is unlikely to have been associated with soils which were especially fertile. Secondly the selective clearance of lime stands implies local opening of the woodland canopy. Lime is not a copious producer of pollen, nor is that pollen widely disseminated (Iversen 1967). Any hypothetical clearance of lime recorded in pollen profiles must therefore either have taken place close to the site, or have involved large tracts of woodland. In either case one would expect a marked increase in herb pollen.

An alternative explanation for the *Tilia* decline on the North York Moors is that it was a product of extensive exploitation of upland woodpasture, the effect of which was to change the nature of the woodland rather than cause its removal. This is consistent with both the widespread nature of the *Tilia* decline, and with a lack of other evidence for clearance. Furthermore there is evidence to suggest that lime is sensitive to woodpasture exploitation. Rackham (1980: 241-2) notes that lime growing on infertile sands and gravels in the Forests of Epping and Fontainbleau has been replaced by a succession of oak, then beech. He considers that this may have been due exploitation as woodpasture. At Coniston in the Lake District Pigott has suggested that the association between lime and the grass *Festuca altissima* results from a common intolerance of grazing (Pigott 1993). In a study of woodland in the area of the Avon Gorge Rackham (1982) finds that lime survives best in coppice woodland and on cliff edges where it has been protected from grazing. In areas of wood pasture lime has been replaced by oak. If we accept that the *Tilia* decline is mainly the result of woodpasture exploitation, then we may interpret the gradual fall in arboreal pollen noted above as a gradual thinning of the woodland under grazing pressure. Slight expansions in *Plantago* (plantain) and *Gramineae* (grasses) are consistent with grazing activity, and increases in Pteridium (bracken) and Calluna (heather) at some sites may reflect a more open canopy. Cereal pollen has only been observed at one, lowland, site (West House Moss)(Jones 1977).

In upland Craven the decline in Tilia, though present at Stump Cross (Walker 1956) and Malham Tarn Moss (Pigott & Pigott 1963), is not as common as in the North York Moors diagrams. Several sites exhibit a decline in Pinus pollen, as has been noted by Bartley et al at Eshton Tarn (Bartley et al 1990). At Gordale Beck (Smith 1987) a fall in overall tree cover commencing at the elm decline is in contrast to the declines in Tilia pollen noted on the North York Moors. Here Ulmus, Betula and Pinus decline in concert accompanied by expansions in herb pollen. Given that a characteristic Ulmus-Betula-Pinus community may have existed on limestone pavement (see chapter 4), this is likely to represent genuine clearance of this habitat. It can not however be determined whether this was simply the result of heavy grazing, or the deliberate creation of open pasture by felling. With the exceptions of the sites of Gordale Beck and Stump Cross, most sites in Craven show declines in the proportion of tree pollen relative to total pollen which are small and temporary. At the majority of sites increases in herb pollen (Plantago and Gramineae) seem to indicate the expansion of grassland. Heath (Ericaceae) expands at Stump Cross where clearance had already been taking place during the mesolithic period, and is seen to indicate a deterioration of the soil rather than neolithic activity (Walker 1956). Weeds associated with cultivation increase only at Great Cow Close (Smith 1987), where Compositae and Chenopodiacae expand slightly. In contrast to the situation on the upland sites, cereal pollen is recorded from about 4500 bp in two cores taken from Eshton Tarn. This is accompanied by a series of woodland recessions and recoveries, which are interpreted as landnam type agriculture around the edges of the tarn (Bartley et al 1990).

In the Yorkshire Dales evidence of neolithic agriculture is on the whole much better. The pollen diagram for Fountains Earth, Nidderdale (Tinsley 1972), shows a marked trough in total tree pollen sometime after the Elm Decline. This is mainly due to a dramatic and permanent fall in Alnus pollen. Tinsley (1975) interprets this as upland clearance, possibly close to the pollen site. The subsequent partial recovery in tree pollen is due to expansions in Betula, Ulmus, Quercus, Fraxinus, and Corylus. Herb pollens which peak in this clearance episode are those associated with grassland, such as Rumex Acetosella (Sheep's Sorrel), Plantago Lanceolata, (Ribwort Plantain) the Gramineae (Grasses), the Cyperaceae (Sedges), and heath (the Ericaceae). This has led Tinsley (1975) to conclude that neolithic activity here was of a pastoral nature. In the light of the magnitude of the decline in *Alnus* pollen, and major increases in pollen associated with grassland and heath, there can be little doubt that this represents wholesale clearance of the plateau alder woodland surrounding the site. The two pollen diagrams for Wensleydale (Honeyman 1985) both show temporary clearances. At Fleet Moss clearance takes place soon after the Elm Decline; this is relatively small, and is associated with declines in *Ulmus*, *Pinus* and *Betula*; *Fraxinus* expands, presumably forming secondary woodland. During this episode, *Plantago lanceolata* and the *Gramineae* enjoy a peak; cereal pollen is also present. At Thornton Mire a massive trough in tree pollen, the beginning of which is dated to 4550 +/- 50 bp, is associated with major peaks in *Gramineae* and *Cyperaceae*. *Plantago* and *Rumex* also expand, and cereal pollen is present in significant amounts. This clearance combines features of almost all the pollen studies so far considered. A major part of the decline in arboreal pollen is due to declines in *Ulmus*, *Pinus* and *Betula* which have parallels at Gordale Beck, and probably represents the clearance of limestone soils. The clearance of alder woodland as at Fountains Earth is also apparent. A decline in *Tilia* pollen occurs. Possibly this is a consequence of the loss of a small proportion of lime present in the calcareous community or alder-woodland. It should, however, be noted that neither the clearance of alder-woodland at Fountains Earth, nor the clearance of *Ulmus*-*Betula*-*Pinus* woodland at Gordale Beck, was accompanied by a decline in *Tilia*. Alternatively the *Tilia* decline here may be the result of woodpasture exploitation on soils less affected by clearance. The existence of such areas is supported by the persistence of *Quercus* pollen, which is relatively unaffected by clearance. The re-expansion of woodland after this episode is almost complete, with *Fraxinus* and *Betula* playing the major part. *Tilia*, *Ulmus* and *Pinus* never recover.

If we consider that the only significant effect of neolithic land use was clearance, then the pollen record for North Yorkshire indicates a very limited effect on the post-Elm Decline woodland by neolithic settlers. When interpreted in these terms, declines in *Tilia* pollen and small increases in grassland and heath vegetation on the North York Moors seem to suggest small scale, and mostly temporary, clearance for pastoral or hunting purposes, as postulated by Simmons (Simmons et al 1982). Indeed, some writers have suggested that mesolithic peoples continued to inhabit the Moors into the Bronze Age (Simmons et al 1982, Spratt & Simmons 1976), while neolithic farmers inhabited the lower ground and the more fertile soils. The conventional interpretation for the Craven uplands is very similar (Smith 1987). The major clearance at Gordale Beck is seen as an exception to the general pattern of very limited activity. Only on the Craven lowlands at the site of Eshton Tarn and the sites at Fountains Earth and in Wensleydale can be regarded as showing significant levels of neolithic activity. If however we accept that exploitation of woodpasture played an important part in the neolithic economy, then it is possible that the nature of woodland was fundamentally changed without necessarily involving extensive clearance. In this context features such as the Tilia decline assume much greater significance, suggesting a widespread use of upland woodpasture, possibly as part of a pattern involving seasonal transhumance.

Neolithic Archaeology

In assessing the impact of neolithic culture on north east Yorkshire, Spratt (Spratt & Simmons 1982) has used the distribution of monuments and artifacts to demonstrate the areas of densest settlement. Stone axe heads are of particular value for this type of exercise because they are reasonably common (Manby (1979) lists over 2400 for Yorkshire), and because they are believed to have had social and prestige value, and might therefore be expected to be found predominantly near settlement (Spratt & Simmons 1982). Spratt notes that in north east Yorkshire axe finds are concentrated particularly in the Tabular Hills to the south of the North York Moors, with more moderate levels in the Vale of Pickering and in the moorland dales. The Moors on the other hand have particularly low concentrations of axes and other finds associated with neolithic settlement, but these sites which had been important during the Mesolithic are associated with finds such as leaf points suggestive of hunting activities. As with the pollen record, seasonal exploitation of upland woodpasture may be an alternative interpretation of the distribution of this neolithic material. This explanation not only accounts for a limited and light weight assemblage of tools found on the moors, but is also consistent with more recent models of the neolithic economy (see chapter 2) which tend to stress mobility and pastoralism, rather than the more traditional view of shifting agriculture. Both of these interpretations are of course dependant on the assumption that the limited neolithic assemblage recovered from the North York Moors is typical of this area as a whole, and that no major neolithic sites with stone axes are hidden beneath blanket peat. In his review of Yorkshire stone axes Manby (1979) maps their distribution in Yorkshire as a whole. In North Yorkshire the major concentration occurs on the Wolds. The Tabular Hills and the Vale of Pickering are effectively an outlier of this area. Moderate frequencies of axe finds occur in the Vale of York between the Howardian Hills and Ripon, and in Craven. Manby observes that retrieval rates are likely to vary. Conditions for retrieval are good in the Wolds and other areas of arable, though in the Vales of York and Pickering potential finds may be obscured by a significant depth of deposit. Whilst opportunities for artifact retrieval on the North York Moors are provided by peat erosion and forestry ploughing, the permanent pastures and moorlands of the Pennines present few opportunities (Manby 1979). Consideration of monuments such as long barrows does little to help because, as Manby (1970) points out, these are likely to have been robbed out in the Pennines where stone walls are prevalent.

On the basis of the archaeological record, the Wolds are the area most likely to have seen major settlement and deforestation during the neolithic Period. On the North York Moors paleo-ecological changes such as the *Tilia* decline may indicate extensive seasonal pasturing of domestic animals. The Tabular Hills, the Vale of Pickering, parts of the Vale of York, and Craven all have reasonable levels of neolithic activity as indicated by stone axe finds, but only Craven has a published pollen record. Here appreciable clearance, with cereal growing, is reflected by the pollen diagrams for Eshton Tarn while the upland diagrams show more limited pastoral activity. This may have involved the selective clearance of limestone pavement. In Wensleydale too there is evidence of selective clearance of limestone at Fleet Moss and Thornton Mire which show appreciable levels of neolithic activity, apparently confirming Manby's (1979) impression that this area is under-represented in the archaeological record. At Thornton Mire and particularly Fountains Earth the pollen record indicates extensive clearance of alder woodland. The lack of evidence for cultivation at Fountains Earth implies that this may have been the result of pastoral exploitation.

Section 5.2

The Bronze Age

Bronze Age Pollen

In the absence of good radiocarbon dates in early work, authors such as Simmons argued that the first significant impact on tree cover on the North York Moors took place during the Bronze Age, as there is an abundance of bronze age remains (Spratt & Simmons 1976). Simmons and Innes (Simmons et al 1982) support this view with radio-carbon dates relating to clearance phases at Wheeldale Gill and Fen Bogs (3210 +/- 90 and 3400 +/- 90 B.P. respectively), and evidence for clearance found by Dimbleby (1961,1962) to have occurred between the building of two barrow mounds at Burton Howes. The evidence from Wheeldale Gill must, however, be regarded with some suspicion as this is an anomalous date of a series taken for that site (Simmons & Cundill 1974a). The predominant land use appears to have been pasture. Neither of the two dated pollen diagrams contains cereal pollen. If the large number of pollen studies which are inadequately dated are taken into account, it seems that some cereal cultivation may have been taking place, particularly on the slightly lower ground. However all sites show a massive preponderance of pastoral activity (Spratt & Simmons 1976). Whatever the nature of bronze age clearance, there is a body of evidence to suggest that it resulted in degradation of the upland environment, particularly by erosion and podzolisation of the fragile soils (Simmons et al 1982, Dimbleby 1962). The overwhelmingly pastoral nature of the exploitation of the Moors (Spratt 1982) may indicate that the bronze age 'clearances' in this area represent an intensification of the woodland pastoralism which may already have been a feature of neolithic land use. Some support for this hypothesis comes from the final disappearance of Tilia pollen from most profiles during this period.

In Craven, as in Nidderdale major clearance has been associated with the early Bronze Age by a number of authors (Smith 1987, Jones 1977). Dating evidence comes from Eshton Tarn (3600 +/- 100 bp) (Bartley et al 1990) and after 3880 +/- 100 bp at Skell Moor on the Nidd-Skell interfluve (Tinsley 1972,1975). Cereal pollen is only present at Eshton Tarn where arable cultivation already appears to have been taking place in the Neolithic. Most diagrams show pastoral activity with expansion of Gramineae playing an important role in the increases in herb pollen at Gordale Beck and Great Cow

Close (Smith 1987). These clearances affect Betula most strongly and it is not possible to associate this with the clearance of a particular habitat. The major clearance noted at Eshton Tarn involves both major increases in Gramineae and Plantago and an expansion of cereal pollen (Bartley et al 1990). Thus the distinction between the pastoral Craven uplands and the mixed economy round Eshton Tarn is maintained.

Clearance in Nidderdale believed by Tinsley to have been associated with pastoral activity from the early Bronze age has already been noted. Within a context of gradually decreasing arboreal pollen values at Fountains Earth there is a second major clearance phase which Tinsley (1972) correlates with the late Bronze Age. This is again overwhelmingly pastoral in nature, though a few grains of cereal pollen are present. In Wensleydale at Thornton Mire a period of intensive clearance, which commenced in the Neolithic and has already been described, continues into the early Bronze Age, ending about 3220 +/- 50 bp. The subsequent woodland regeneration is due to expansions in Betula, Ulmus, Quercus, Fraxinus and Corylus, and may reflect the formation of secondary woodland on the calcareous soils believed to have been cleared during the Neolithic. This is followed by a period of relatively less intensive (or more distant) agriculture. Cereal pollen which was present in the initial clearances continues to be present intermittently, though pastoral indicators are much more important. At Fleet Moss a period of arable and pastoral agriculture lasts from about 3800 bp to 3070 +/- 50 bp, after which arboreal pollen values make a recovery (Honeyman 1985).

In spite of their limitations where dating and distribution are concerned, North Yorkshire pollen diagrams show considerable variations in bronze age activity. On the North York Moors, agriculture seems to have been primarily pastoral, cereal pollen being associated mainly with sites at lower elevations. Radiocarbon dates appear to indicate that the most important period here is likely to have been the middle Bronze Age. In Craven a similar upland/lowland distinction is observed, but here clearance is believed to date from the early Bronze Age, though the evidence for dating is slim for the uplands. In Wensleydale clearance appears to have continued from the Neolithic into the early Bronze Age with cereal cultivation at quite high elevations, the later Bronze Age being characterized by less intensive activity and woodland regeneration. Throughout North Yorkshire, even where there is evidence of arable cultivation, pastoralism appears to have been the dominant land use in the zones where pollen analysis has been undertaken.

A single pollen diagram recording late neolithic and bronze age levels is available from the Yorkshire Wolds at Willow Garth (Bush & Flenley 1987, Bush 1988). The value of this profile is to some extent compromised by a series of discontinuities, and discussion has been restricted to open grassland habitats in the mesolithic. However the study appears to show that woodland had to a large extent been cleared by the late Neolithic. The presence of cereal pollen, and that of arable weeds such as *Centaurea nigra*, indicates that some cultivation was taking place.

Bronze Age Archaeology

The general distribution of settlement indicated by stone axes for the Neolithic is repeated to a large extent by the distribution of bronze age artifacts. The maps of bronze age finds given by Manby (1987) for the western part of the area show that settlement is likely to have been widespread in the Aire Gap, on the Pennine lowland interface and in the vales of York and Mowbray. Radley (1974) gives the distribution for the Vale of York in slightly greater detail, showing that finds are mostly restricted to the slightly higher land. Axe hammers are used by Spratt (1982) to characterise the pattern of bronze age settlement in north east Yorkshire, giving a distribution which is concentrated on the eastern end of the Tabular Hills, but extends into the Moorland Dales.

There is evidence that the expansion of settlement and agriculture into new areas which was observed nationally in chapter 2 is represented in North Yorkshire. This is not particularly well illustrated by artifact distributions, although Manby (1986) appears to show a more widespread distribution of bronzes of the middle Bronze Age in the Vale of Mowbray than is the case for artifacts of earlier periods. The best evidence for bronze age expansion comes from the North York Moors where there are a large number of cairnfields which, though their dating is insecure, are believed to be Bronze Age in date (Fleming 1971, Spratt 1982). These are particularly associated with higher ground on the spurs between the moorland dales, as in upper Ryedale (Spratt 1982). A general lack of evidence for settlement associated with these cairnfields, and the presence of deep hollow ways linking them with the neighbouring valleys, has led Spratt to conclude that they may have been seasonally occupied. It seems possible that their use formed part of a pattern of seasonal, pastoral exploitation of the uplands. It is indeed difficult to account for the long term cultivation of such fragile soils without inferring some additional imperative such as a pre-existing pattern of transhumance. We may thus view these cairn fields as an indication of an intensification of neolithic exploitation patterns, rather than a new departure into upland arable.

It is possible to draw tentative conclusions from a number of other landscape features which emerge during the later Bronze Age. Although the occurrence of ritual and funerary monuments is not necessarily directly related to settlement, the presence of large numbers of carved rocks, round barrows and ring cairns on the North York Moors and in the Pennines (Spratt 1982, Laurie pers. comm., Fleming pers. comm.) must indicate the existence of a population who created these monuments, and for whom they had significance. Spratt notes that in the Snilesworth area of Ryedale on the North York Moors round barrows are predominantly situated along the watershed. He suggests that their relationship with other features of similar date, and with natural boundaries such as streams, may indicate that they performed a function of territorial markers. A similar function has been proposed (Spratt 1982) for a number of long linear banks which are believed to have been created during the Bronze Age in north east Yorkshire. It is tempting to interpret this kind of boundary marking as an indication of increasingly intensive land use, particularly as these features appear to be most common in the eastern Tabular Hills which have greater evidence of settlement in earlier periods. However, a study by Vyner (1994) has linked some of these boundaries (the cross ridge dykes) with the demarkation of ritual areas on moorland spurs. The Yorkshire Dales until recently had very little evidence of Bronze Age activity though a few finds had been made, including a hoard near Reeth in Swaledale. More recent work by a number of researchers (Fleming pers. comm.) has revealed a substantial number of ring cairns in Swaledale and Wensleydale, which may represent a coherent bronze age horizon. There are also a number of un-dated field systems in the area, which are probably prehistoric in date.

Both palynological and archaeological sources appear to show a general increase in agricultural activity for most areas during the Bronze Age. The available evidence appears to indicate that areas with extensive settlement in the preceding era may have seen population increases to a point where it became necessary to mark out territorial boundaries in a permanent way. In some other areas, where evidence of earlier settlement is more sparse, pollen studies and landscape features indicate an expansion of activity. The pattern of bronze age exploitation is particularly clear on the North York Moors. In view of the lack of convincing evidence for settlement associated with moorland cairnfields, it is probable that settlement, and perhaps most of the arable cultivation, was located within the valleys or on the valley sides. The uplands, which probably consisted of a mosaic of woodland and more open landscape, were used as seasonal pasture. This may have consisted of a pattern of seasonal transhumance which also involved the cultivation of some crops on upland cairnfields. The Craven pollen record suggests a similar pattern of lowland cultivation as at Eshton Tarn, and upland pastoralism as at Gordale Beck. In the Yorkshire Dales the evidence appears to point to a decline in agricultural activity. The pollen profiles of both Thornton Mire and Fleet Moss show woodland regeneration during the Bronze Age, and there are very few finds of this date. However there remains the possibility that the lack of finds is due to the problems of retrieval already noted for the neolithic period, and that the pollen evidence indicates a relocation of activity. The continued presence of cereal pollen and pastoral indicators in these pollen profiles rules out a desertion of the area as a whole.

Section 5.3

The Iron Age and Roman Period

Iron Age and Roman Pollen

An excellent synthesis of palynological data for the North York Moors is given for this period by Margaret Atherden (Simmons et al 1982: 81-90 & more recently Simmons et al 1993). This is necessarily based mainly on the well dated diagram at Fen Bogs. She notes that at this site a period of intensive clearance took place, spanning the early Iron Age to the end of the Roman Period. This phenomenon is also observed at the nearby sites of Simon Howe and May Moss, which correlate well with the Fen Bogs diagram. Although pollen reflecting cereal cultivation is present at Fen Bogs, Atherden postulates that arable is likely to have been restricted to the Corallian limestone to the south, while the dominant land use on the acidic uplands of the Moors was pastoral. The intensity of this phase of clearance appears to be reflected elsewhere on the North York Moors in pollen diagrams which can be correlated tentatively with the Fen Bogs diagram by using evidence of a climatic deterioration, believed to have taken place at the beginning of the Iron Age. Atherden concludes that Iron Age and Romano-British peoples had "a significant and widespread impact on the environment of the North Yorkshire Moors."

In the absence of radio-carbon dates for the Craven Iron Age, dating must rely on the identification of climatic zones. This is extremely unreliable in a period when man is increasingly important as a determinant of environmental change, and consequently the conclusions reached must be regarded with suitable reservations. At Malham Tarn and Malham Tarn Moss, intensive clearance, which occurs soon after the Godwin Zone VIIb/VIII boundary, was regarded by Piggot & Piggot (1963) as Iron Age in date, and is associated with the first appearance of cereal pollen. A major change from open alder woodland with hazel to mixed moorland is recorded by Gosden (1968) at Scar Close near Ingleton. This is regarded by her as having occurred at the beginning of Godwin Zone VIII, implying an early iron age date.

Tinsley's studies of the Nidd/Laver interfluve (Tinsley 1975) show major clearance in the late Iron Age and Roman periods which reduced tree pollen to near present levels. Tinsley suggests that after about 250 BC the moorland limits are likely to have been comparable with those of the present day, but that lowland woodland must have been far more extensive than now. Herb pollen associated with this clearance indicates that the interfluve was intensively grazed, causing expansion of grasses at the expense of heather. Indicators of arable occur at fairly low levels and Tinsley concludes that cereal cultivation was largely restricted to the valleys. In Wensleydale too, the Iron Age and Roman period are times of major clearance with arboreal pollen declining to very low values in the Roman Period. The expansion of grasses at the expense of ericaceous pollen also occurs here on upland sites, indicating that grazing pressure was high. Honeyman concludes that a largely pastoral economy was in operation, with cereal cultivation probably taking place on the flat limestone terraces and the lower slopes (Honeyman 1985).

Iron age and Roman clearances are also represented in the lowlands of the Vale of York and on the Yorkshire Wolds. On the Wolds at Willow Garth (Bush 1988) levels of arboreal pollen decline from the already low levels of the Bronze Age. The precise timing of this is unclear because of a discontinuity in the pollen record, but appears to be late Bronze Age or Iron Age. At Askham Bog in the Vale of York (Kenward et al. 1978), the environment of the pollen site appears to have remained fairly wooded until late in the Iron Age. Uncharacteristically for North Yorkshire this woodland still contained appreciable levels of lime. Woodland here was cleared very rapidly in the late Iron Age or early Roman period, leading to the virtual disappearance of lime (see simplified pollen diagram at end of this chapter). The rapid clearance observed at Askham Bog may have a parallel at Gormire, below the western scarp of the Hambleton Hills (Blackham et al. 1981). Although the two pollen cores taken from this lake are undated, both exhibit rapid clearance similar to that at Askham and may be approximately contemporary.

Throughout North Yorkshire the Iron Age and Roman periods are characterised by high levels of woodland clearance. Grazing pressure on the uplands appears to have been intense, causing heather to be replaced by grass on the uplands of the Dales. Cereal pollen is present at virtually all sites, and arable cultivation is thought to have been taking place in the lowlands and in areas of limestone geology such as the limestone terraces of the Dales and the Tabular Hills of the southern North York Moors.

Iron age and Roman archaeology

The nature of iron age and Roman remains in North Yorkshire is very complex, and it is difficult to arrive at a small selection of artifacts or features which might give a good approximation to the settlement/population distribution. The incidence of square barrows, for instance, is concentrated in the area of the Wolds and the Tabular Hills. This distribution may reflect the influence of a particular cultural tradition rather than population, perhaps that of the Iron Age tribe of the Parisi as suggested by Ramm (1978). Hill forts, though widely distributed are not common in North Yorkshire. Ancient field systems and settlements on the other hand are numerous. In most cases the dating of these is tentative or non-existent, though many are thought to be Iron Age or Romano-British in date. A map of such field systems and settlements (White 1988) for the Pennine area shows that these are widely distributed throughout the Pennine Dales, being slightly more common in Craven. Spratt (1982) shows widespread Iron Age and Romano-British settlement for north east Yorkshire. Many of the settlements which have been investigated in greater detail appear to have been abandoned in the 2nd or 3rd centuries AD. Spratt (1982) suggests that this may be due to reorganisation of farms, and the creation of villa estates, many of which date from this time. He does however also point out that abandonment occurs in areas where there is little evidence of villa estates. Thus whereas known villas appear to be concentrated on the Wolds, the Vale of Pickering, and the Tabular Hills, with a few known in the vales of York and Mowbray (Branigan 1980), settlement abandonment is known in Cleveland (Spratt 1982) and possibly in Swaledale (Fleming pers. comm.). The Roman military presence may have had a considerable effect on agricultural practice in the area. Manning (1975) argues that the Roman forts would have taken their supplies from the immediate locality. The creation of forts is therefore likely to have greatly increased the area of land needed for both arable and pasture, as would the founding of Roman towns at York, Catterick, Aldborough, Malton, and Brough on Humber.

It is apparent from both the pollen data and the archaeological material that the landscape of North Yorkshire became very widely settled and farmed in the Iron Age and Roman Period. Indeed the levels of arboreal pollen in many peat profiles such as those on the Nidd-Skell interfluve, or on the North York Moors, are comparable with those of the present day or at the height of the medieval period (see particularly Fountains Earth, Tinsley 1972, and Fen Bogs, Atherden 1976). Many field systems exist in areas which are now used only for rough grazing. It is often claimed that the agricultural economy of Britain at this time was mainly arable in the South and East, and pastoral in the North and West

(Pennington 1969, Fowler 1983). This is almost certainly an over-simplification. The evidence from pollen profiles across the area, and the widespread distribution of querns (Spratt 1982), strongly indicate that cereal cultivation made a significant contribution to the agricultural economy of iron age and Roman North Yorkshire. One would expect on the basis of the archaeology to see an expansion of agriculture in the Roman period in the environmental record. In practice few pollen profiles are sufficiently well dated to be able to investigate this possibility.

Section 5.4
The Location of Roman Woodland

By Roman times the woodland of North Yorkshire had been so reduced that it only formed a small part of a largely open landscape. As a result the problem of determining woodland distribution changes from one of locating clearances to one of determining the location of remnant woodland. Although to achieve this in detail is impossible with the limited information available, it is possible in some instances to determine the type of situation in which woodland is likely to have survived. Evidence for the distribution of surviving woodland comes from consideration of pollen profiles from differing topographical locations. The potential of this approach is severely limited by the uneven distribution of pollen sites in the county, but some comparison between moorland top and moorland scarp / flank on the North York Moors and in parts of the Pennines is possible. On the North York Moors discussion can be based around the palynological studies by Atherden in the Goathland area (Atherden 1972, 1976). These consist of a number of sites in a range of different high moorland and moorland edge situations, and are well correlated with the single well dated profile at Fen Bogs. The two high moorland sites of this collection, May Moss and Simon Howe Moss experience reductions in arboreal pollen to levels comparable with those of the present day. The moorland edge profiles of Moss Slack and Gale Field on the other hand experience very little change in arboreal pollen, which remains at a high level. A tendency for moorland edge profiles to record little trace of clearance, while arboreal pollen values decline to very low values in the high moorland profiles, is also discernible in other less securely dated studies on the North York Moors. At St. Helena in Danby Dale, for instance, woodland persists throughout the Roman Period (Simmons & Cundill 1974b); whereas the moorland sites of Loose Howe, Howedale Hill, and Yarsley Moss all show major clearances (Simmons & Cundill 1974a). The woodland of the moorland edge does not appear to have been ubiquitous, however, as some profiles in this type of location, such as that of Blakey Landslip (Simmons & Cundill 1974b), seem to exhibit major clearance in the

Roman Period. The moorland gill profiles represented by Fen Bogs and Wheeldale Gill (Atherden 1972, 1976, Simmons & Cundill 1974a) are more akin to those of the high moorland sites at this time. Arboreal pollen decreases to very low values in Iron Age and Roman times, though this is somewhat delayed at Wheeldale Gill.

Tinsley's (1972, 1975) study of the Nidd-Laver interfluve offers an opportunity to study woodland distribution at the eastern edge of the Pennines. Here, although sites in a variety of different moorland and gill situations were studied, arboreal pollen values are reduced to low values at all sites relevant to this period. It is noticeable however that clearance is later and more sudden, and the subsequent regeneration more vigorous, at gill sites such as Skell Gill than on the high moorland. It may therefore be that woodland was closer to hand here, even at the height of the Roman clearances. The impression gained from these studies is that the use of moorland pasture was intense in Iron Age and Roman times. Indeed one might argue that the moorlands were created at this time. Clearance seems to have been less intense on the moorland scarp on the North York Moors, and possibly the gills on the eastern edge of the Pennines. Large areas, particularly of lowland North Yorkshire, however, remain unrecorded by palynological study, and the woodland distribution in these can only be guessed at from the archaeological record, and from the documentary record of the medieval period.

Section 5.5

Summary of Prehistoric and Roman Settlement

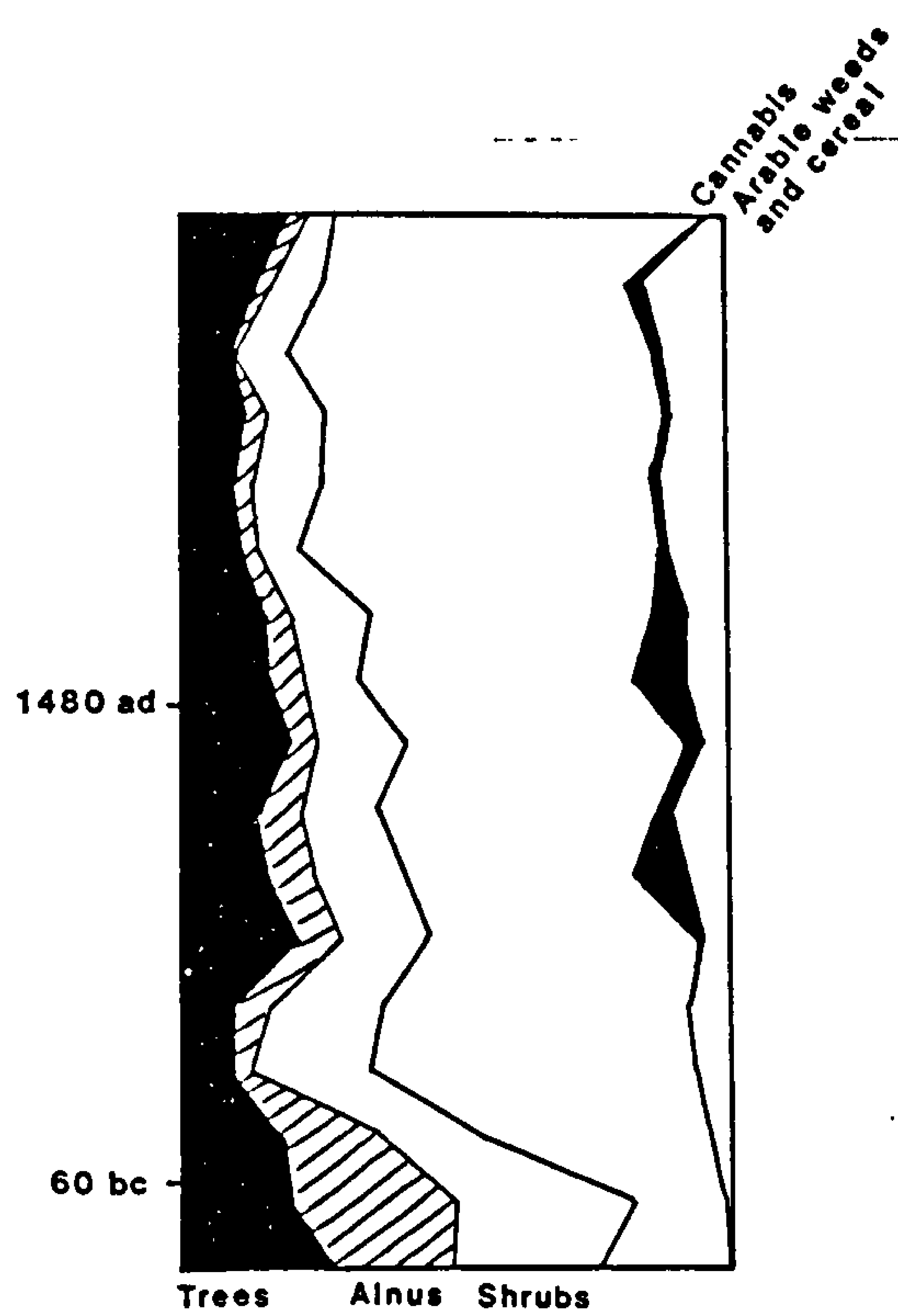
In the preceding pages I have attempted to illustrate the spread of settlement and agriculture across the county as far as is possible from the available evidence on the premise that this is likely to be broadly equivalent to the pattern of woodland clearance. Thus we can see that from the Neolithic onwards there is an expansion of settlement out from the Wolds. At first this outward expansion is mainly onto areas of calcareous geology such as the Tabular Hills, Craven, and the Pennine fringe (Manby 1970,1971). In areas peripheral to these, such as the North York Moors, there is evidence to suggest an extensive use of woodpasture. This may have taken place as part of a system of seasonal transhumance. During the Bronze Age much of the drift covered lowlands was settled, and even some of the poorer soils of the North York Moors were under cultivation. While this expansion was taking place there may have been an intensification of settlement in the areas first occupied, resulting in the construction of boundary banks by the late Bronze Age. By the Iron Age and Roman period almost all suitable land is likely to have been under plough, and most of the rest of the area had been cleared for grazing.

Section 5.6

Woodland Regeneration in the Early Post-Roman Period

As discussed in chapter 2, the immediate post-Roman period was characterised by widespread agricultural decline as a result of the collapse of the Roman Empire. This should have resulted in widespread woodland regeneration. In practice, at a national level the pollen record for this period is very varied. Many profiles do indeed show woodland regeneration; others show stasis, or even agricultural expansion (see for instance Fenton-Thomas 1992). This heterogeneity is also apparent in the pollen record for North Yorkshire. On the North York Moors a wide variety of pollen profiles show a pronounced phase of woodland regeneration. On the uplands of the Yorkshire Dales on the other hand, Fleet Moss and Thornton Mire in Wensleydale (Honeyman 1985) display no such regeneration. On the Nidd - Skell interfluve the high moorland site of Fountains Earth does not show a woodland recovery, whereas at the sites in upper Skell Gill there was a pronounced increase in woodland (Tinsley 1972). In the Craven uplands, Gordale Beck shows no increase in woodland (Smith 1987), whereas at the lowland site of Eshton Tarn woodland appears to have increased (Bartley et al. 1990). At Willow Garth (Bush 1988) on the Wolds too, levels of arboreal pollen remain low. At Askham Bog (Kenward et al. 1978) in the Vale of York they recover slightly. What emerges from this is not a simple pattern of wholesale retreat from marginal uplands or heavy clays. More probably the regeneration seen in a proportion of the profiles represents the expansion of trees into a limited number of specific habitats. This is illustrated by the profiles on the Nidd-Skell interfluve (Tinsley 1972) where regeneration took place in the gills but not on the moor top. The point is also illustrated by a consideration of the pollen profile for Askham Bog in the Vale of York.

Fig.6



Summary of pollen diagram for Askham Bog
(after Kenward et al. 1978)

Here a late iron age and Roman clearance of woodland on and around the bog was followed by post-Roman regeneration. This occurred principally at the expense of the grasses (Gramineae), whereas pollen associated with arable agriculture (including cereal pollen) was barely affected. This implies that agricultural communities continued to be present in the area, but that woodland replaced open pasture, probably immediately around the bog. A similar sequence of rapid, possibly iron age or Roman, clearance followed by regeneration is seen at Gormire, below the scarp of the Hambleton Hills (Blackham et al. 1981). The clearance appears to have included the removal of woodland from the scarp, now the site of ancient woodland (Ibid). As at Askham the subsequent regeneration was accompanied by cereal pollen, indicating continued agricultural activity in the area. This replacement of, probably marginal, pasture with woodland may also fit the case of Skell Gill.

If North Yorkshire continued to be widely exploited in the post-Roman period, then it follows that the Anglo-Saxons must have settled a landscape in which there was an existing, extensive, settlement pattern; either displacing this or fitting into it. This conclusion is not necessarily contradicted by the substantial renaming of the landscape by the new settlers. As pointed out by Gelling (1976) the difference between Anglo-Scandinavian settlement and Norman conquest in this respect can be explained in terms of the dominant social status of the new arrivals, without presupposing an empty landscape in the post-Roman period. More positive evidence for extensive contact between the Anglo-Saxons and the British comes from the survival of some Celtic place-names, especially those of landscape features such as rivers and hills, and documentary evidence for a British element in the population after the Anglo-Saxon conquest (Jones, G.R.J. 1976: 39).

Perhaps the best interpretation of the pollen evidence is therefore that regeneration took place primarily in response to a relaxation of grazing pressure, and that it was the areas least attractive for grazing such as bog edge and steep gill sides which were the primary sites for this regeneration. This suggests that there was no widespread desertion of the landscape in post-Roman times; the moors continued to be grazed, and suitable soils continued to be cultivated.

Chapter 6

Medieval Woodland Distribution: Place-Names, Domesday, and Medieval Charters.

Section 6.1

Sources; Problems and Solutions

Existing studies of the entries concerning woodland in Domesday Book were considered in chapter 3. Whilst Darby & Maxwell (1962) have steered clear of converting the measurements of woodland used in Domesday into modern units, Oliver Rackham and others have argued that such a conversion is possible and worthwhile (Rackham 1980: 113-127). However, when it comes to the area of North Yorkshire there appear to be problems. Rackham (1980: 125) points out that the entry of 16x4 leagues for the manor of Pickering is the largest woodland entry in Domesday; so large in fact that this, when converted to acres and combined with a number of other very large entries for North East Yorkshire, implies that the Tabular Hills and the Moors were largely wooded. This is contradicted by palynological evidence that the tops of the moors were mostly cleared of trees during the Bronze and Iron Ages, and by archaeological evidence of settlement from an early date (see above). While it is admissible in a national context for Rackham (1980: 125) to write off the entries for this area as uninterpretable, this is not appropriate in the present study. In order to overcome this problem and be able to make an assessment of the accuracy of the Domesday entries for the area as a whole, other forms of evidence have been investigated. Medieval documentary evidence up to 1400, and Germanic and Scandinavian place-names, have been used for comparison (Figs, D, E & G)(the method of plotting Domesday references on figure G has been adapted from Darby & Maxwell 1962).

Each source of evidence has inherent problems of interpretation. The medieval charters and inquisitions seldom give the size of the woods concerned so that it is difficult to judge whether an area with sparse references reflects a small number of large woods, or whether an area with many references reflects many small woods. The distribution of references may also reflect the distribution of monastic holdings, as much of the evidence derives from monastic chartularies. This may not be a major problem; monastic holdings covered a large proportion of the county, and the ecclesiastical bias is to some extent balanced by the use of fines, inquisitions and such lay charter material as is available. Forest areas, particularly private forests and the less important royal forests, tend to have very vague references to woodland, rights to timber or wood or pasture often being (on paper at least) exercised over the whole forest rather than a particular woodland. A typical instance of this is a confirmation in 1317 by

John de Mowbray to the Abbot and Convent of Fountains of dead wood for charcoal and pasture in his Forest of Kirkby Malzeard (Lancaster 1915: 414-5).

A wide variety of place-name elements related to woodland are available for mapping; however the number of place-names in North Yorkshire with published derivations involving these is very small. The coverage of the Place-Name Society volumes for Yorkshire is neither complete nor systematic, but represents a collection of names apparently selected because of their philological interest, or because they are perceived to be representative of a type. As a result it has been necessary to use place-names for this study which do not have recognised derivations or ancient spellings. This approach creates both problems and opportunities. The greatest problem is plainly that of insecure derivations. The import of this can to some extent be minimalised by the careful selection of place-name elements to be mapped. Some elements such as <u>bearu</u> have been avoided altogether because of the potential for confusion; or in the case of <u>wudu</u> because a form of this is still in use. In other cases situations where confusion might be expected are avoided where possible. An instance of this concerns place-names involving 'ley' (or ly). Although the majority of these are assumed to be derived from <u>leah</u> (a clearing or wood) a proportion are likely to derive from <u>law</u> (hill). As a result ley names which obviously refer to hills, such as the two Viewly Hills of the Vale of York, are omitted. A similar possibility for confusion arises for names involving 'with', which can be derived from vithr (wood) or wath (ford). Two examples of the name Sandwith are excluded for this reason; in one case Smith (1961: 236) gives a derivation from wath, and in the other such a derivation can be expected from the location. Carr has been avoided because in North Yorkshire this may refer to peat bog rather than the more usual alder woodland. The choice of place-name elements is further affected by the necessity to achieve a reasonable balance between Old English and Old Norse terms in order to avoid highlighting differences in the cultural identity of settlers or the period of settlement rather than contrasts in the appearance of the landscape. In view of the above considerations the following list of place-name elements was chosen for mapping:

Element (meaning)		Equivalent in modern spelling
leah	(clearing or wood)	ley, ly, laugh. (not used where law probable derivation)
thwait	(clearing)	thwait, waite.
weald	(woodland)	wold, wald. (see below)
scaga	(wood)	shaw, saw.
scogr	(wood)	scoe, skew, sque.
vithr	(wood)	with (except where derivation from wath probable)
lundr	(wood)	lund, lunt.
fridd	(wood)	frith

Wold is used with extreme caution in the North Yorkshire Wolds, where, as Gèlling (1984, page) points out, the term is applied to the Chalk Downland.

The writings of Ekwall (1960), Smith (1928, 1937, 1961), and in particular Gelling (1984) have been used to produce the above list and identify possible sources of confusion. Where several place-names appear to refer to a single area of woodland this is only recorded once. This typically occurs in two situations. Where secondary place-names are involved, for instance in the case of Oughtershaw Moss, Burn, and Side, all of which can be assumed to take their name from the settlement Oughtershaw, only the primary name is recorded. Where a group of names occurs in which it is not obvious which, if any, should be considered primary, the name is assigned to a grid square corresponding to the centre of the group. All names have been selected from the 1/25000 O.S. map as this shows more minor place-names than the 1/50000, including most of those marked on larger scale maps.

The greatest advantage of using modern place-names, without requiring a rigorous derivation, is that this allows freedom from the distributional limitations of documents. If for instance we considered only the names included in Domesday Book we would find a lowland distribution of woodland related place-names because very few upland place-names are recorded in this source. The use of all the place-names recorded on a particular scale of map therefore ought to provide a much more representative selection of names, provided of course that the inferred derivations are reasonable, and any errors are randomly distributed. An additional advantage of this approach is that a vastly increased number of names become available for consideration. This includes a great number of minor place-names, with the result that the probable location of the woodland referred to is potentially reflected much more accurately in the distribution of names than when considering mainly the names of major settlements.

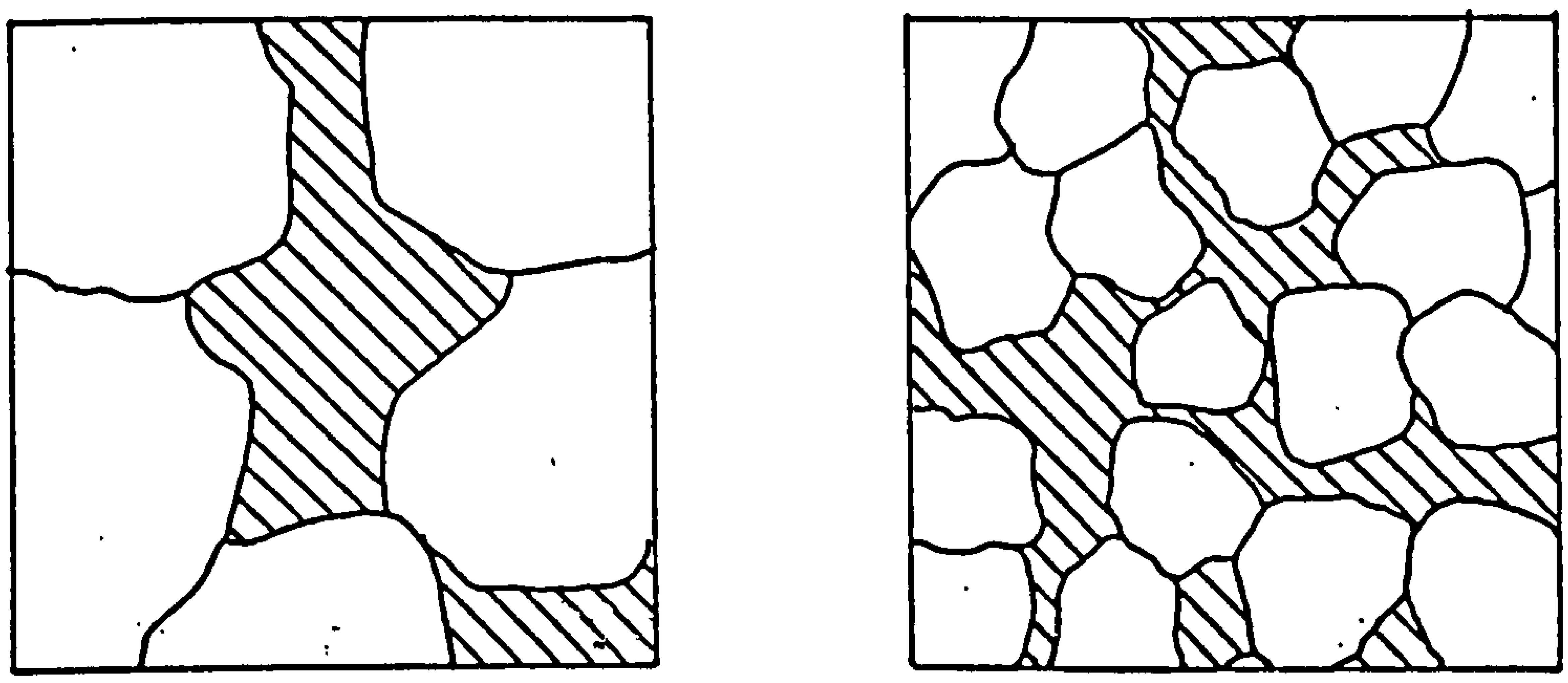
The mapping of woodland/clearing names in fig.D, like the artifact patterns of chapter 5, is subject to processes of formation, survival and retrieval. The process of retrieval involves the appearance of place-names on the O.S. map. This may influence the data set in several ways. Not all place-names are included on the map; field names are for instance absent. In general those names which refer to larger areas or settlements are more likely to be included. There may also be error in the rendering of place-names on the map, or alternative place-names may exist in local usage. As is outlined above, the incorporation of names into the data set involves a process of selection and interpretation. It is inevitable that some names will be missed, and that others will be misinterpreted. It is reasonable to assume that all these factors operate randomly across the area, and should not therefore appreciably affect the distribution.

Survival of names is likely to be subject to settlement desertion (though usually there is at least a farm still carrying the name of the former settlement), or re-naming, particularly of areas of (former) woodland. This might occur when woodland is cleared, or in response to a change of management or ownership. The survival of place-names will for the present purposes be considered to be random, though some possible systematic renaming of (former) woodlands will be considered later in this chapter. This leaves the formation of place-names as the major source of spatial variation.

Although the relationship between clearance place-names and woodland is well established, it is possible to propose additional variables which may have influenced the pattern of clearing and wood elements in place-names. A consideration of these may take our understanding a step further than the simple correlation of clearance names with former woodland. It is particularly important to make an attempt to do this for North Yorkshire as this is a county with relatively few clearance names (see fig.2), yet there are obvious contrasts between different areas of the Domesday map of the county. Patterns of settlement might, for instance, be expected to produce very different patterns of clearance or wood names for the same overall woodland density. This type of contrast is illustrated by the following simple diagrams.

Fig.7

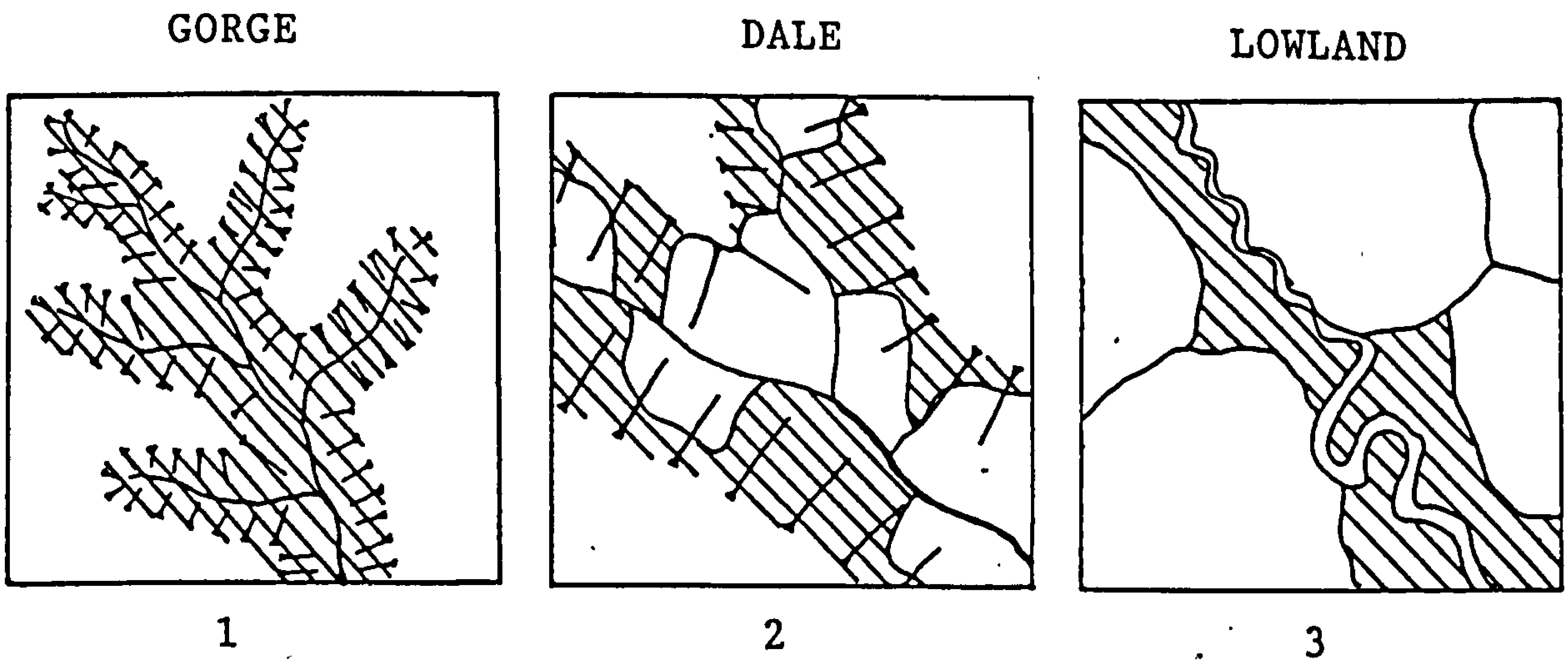
CONSOLIDATED DISPERSED



The woodland is represented by the shaded areas. It can be seen that dispersed clearings will have a greater tendency to generate clearance names, and might also generate a greater density of wood names. Such differences in the arrangement of clearances might be caused by environmental factors such as the relative disposition of good and marginal land, or by the pattern of clearance inherited from the late Roman period. It is also possible that names were lost in the transition from dispersed to nucleated settlement.

Topography would also be expected to exert some influence; the more prominent the woodland in the landscape, the more likely settlement is to be named after it, and the more likely its own name is to survive. Woods hidden away in steep-sided gorges are unlikely to be remembered. It is thus possible to model the probable effect of clearance patterns and topography on different landscape types:

Fig.8



The situation in diagram 1 will give rise to relatively few clearance place-names, and even the woods may be expected to receive the name of the gorges which contain them, as it is this that is the distinctive feature. Diagram 2 represents a situation where both clearance and wood names are likely to be more frequent than the average for a given proportion of woodland. Most of the settlements appear to be clearings, and the woods are prominent features in the landscape.

The consolidated lowland settlement reflected in diagram 3 would produce relatively few clearance names. The woods are prominent features of the landscape, but would probably generate only a few names applicable to a large area.

In making a comparison between the evidence for woodland in medieval documents, place-names, and Domesday, it is necessary to assume that all these represent stages in a more or less continuous process of woodland clearance. Such an assumption is reasonable because of the abundant evidence for agricultural and population expansion during this period, which would have allowed little opportunity for the formation of secondary woodland. If this premise is accepted then it is reasonable to assume that a woodland recorded in, say, 1300 was present in 1086, whether woodland is recorded in Domesday Book or not. Similarly the situation in 1086 was the product of what went before, and although clearance may have occurred in the meantime, major concentrations of woodland reflected in place-name evidence would be expected to survive till Domesday. One consequence of accepting this overall assumption is that it renders less important the fact that neither the medieval documents nor the place-name evidence represent a defined point in time.

If figs. D & G are compared with the map of Domesday entries (fig. E) it can be seen that in some areas the correspondence between the three is good; the areas of the Yorkshire Wolds, the Cleveland Plain and the Vale of Mowbray appear to have little indication of woodland on any of the maps. In other areas, however, the maps differ. In many cases differences are explicable by the insufficiencies of the evidence of the place-names or the medieval documentation. An instance of this is the Vale of York, where a very wooded landscape is recorded by

Domesday and supported by the medieval documents, but is not reflected in the place-name evidence. This underestimate of the amount of woodland in the place-name evidence might be expected for this lowland area with nucleated settlement on the basis of the model put forward above. Many of the dales along the southern edge of the North York Moors may have resembled the situation in diagram 1 (fig.8), with the result that place-names underestimate the degree to which the landscape was wooded. There are, however, other areas where the accuracy of the Domesday record is open to question. In the Pennine Dales, for instance, place-name evidence and the medieval documentation would imply a reasonable amount of woodland, whereas Domesday records very little. Domesday fails to record any woodland whatsoever for Craven, whereas the other forms of evidence imply a moderate amount of woodland though probably a little less than in the Dales.

Section 6.2

The Domesday Record, an Interpretation

The above comparison makes it possible to distinguish between areas in which the Domesday record is reasonably good, and those where it is less satisfactory. This raises the question of why Domesday might misrepresent the distribution of woodland. In the case of Craven an obvious reason arises out of the Domesday text, as details are only given for the value and ownership in 1066; entries for 1086 are entirely lacking, with the result that no woodland is recorded. In other areas some error also arises from the way in which the Domesday entry has been transferred to the map. An instance of this is where the woodland from a large number of manors is combined in a single entry. Examples of this are for the manors in soc to Sherburn, and the bailiwicks of Allerton. In these cases, on the maps presented here, the woodland has been distributed evenly between all the manors to which an entry applies. This is probably fairly satisfactory in the case of Sherburn, as all the manors occupy similar topographical positions, and the medieval documentation would indicate a wide distribution of woodland in this area. The case of Allerton and its bailiwicks is less satisfactory; these occupy two rather different topographical positions and the medieval documents would imply a very uneven distribution of woodland.

A further interpretational problem is found with the manor of Pickering. It is not entirely clear to what area the massive woodland entry of 16 leagues in length and 4 in breadth applies. As this entry immediately follows the description of Pickering and its four bailiwicks it would seem reasonable to distribute it between the these five vills as on fig. E. However, the full entry reads 'But all the wood which belongs to the manor has 16 leagues in length and 4 of breadth' (Farrer 1912), which may refer purely to Pickering itself, or more likely to Pickering, its four bailiwicks and the further 18 vills which belonged to it in soc. Redistributing the woodland in this way would certainly make more sense in the context of the medieval record. It is worth noting that Brompton, the only socage of Pickering to have recorded woodland, is partly held by Berenger De Todeni rather than the King, and it is to this part of the vill that the woodland belongs. Pickering is in fact only one of a number of vills with extensive socages which have very large woodland areas recorded for them and their bailiwicks, other important examples being Whitby and Falsgrave. In both of these cases the Domesday record would be more consistent with the medieval documentation if the woodlands were redistributed to the vills in soc. The logic of this interpretation of the Domesday record is also consistent with the suggestion by G.R.J. Jones (1976) that socages such as that of Pickering were based on multiple estates of British origin.

The explanation for the apparent under-recording of woodland in the Yorkshire Dales may lie in the distribution of 'waste'. If the distribution of waste recorded by Domesday is compared with that of woodland it is apparent that woodland is rare in most of the areas where waste is common. The significance of waste has been the subject of some discussion in the past (Darby &

Maxwell 1962: 59-71, Bishop 1962, Wightman 1970). The distribution of waste has in the past been considered primarily as a reflection of the destruction wrought by William the Conquerer's army during the Harrying of the North (eg. Bishop 1962). The case against this has been convincingly argued by Palliser (1993) who favours the more complex interpretation of Wightman (1970). In general, however, waste seems to indicate a lack of value, and is often associated with a lack of recorded population (a lack of direct value to the lord is indicated by the later medieval use of 'waste' to indicate common land; this is now reflected in place-names such as Thorne Waste, South Yorks.). Wightman (1970) has suggested that Domesday waste may have covered a number of differing situations. He suggests that in the Pennine Dales manors were described as waste because Norman control was not yet strong in these areas, settlement was not yet very advanced, and Scottish raids may have caused some destruction, with the result that rents were difficult to collect and these manors were of little or no value. In view of the fact that one of the main functions of Domesday appears to have been to assess landed revenue it should be no surprise that woodland which was difficult to exploit was often not recorded. In other places Wightman suggests that waste may have been used to describe manors or parts of manors which had ceased to exist on paper because of changes in estate boundaries and amalgamation of manors by Norman lords. If this kind of accounting procedure had in fact taken place the result, where woodland distribution is concerned, would be to clump the woodland from several vills together. Wightman (1970) gives Seamer as an example. The arable potential of Seamer, Killerby, and Thorpfield plus Irton in 1066 is combined in a single entry under Seamer in 1086, and the other two vills are described as waste. Seamer is also the only one of these vills with recorded woodland, leading to the suspicion that this woodland may in reality have been distributed between all three vills. Another instance of this may be on the southern side of the North York Moors where groups of vills with no woodland alternate with vills with very large areas of woodland. Manorial re-organisation may for instance be suspected where the Malet manor of Fadmoor is concerned. Here the entry of "Pasturable wood and land 10 leagues in length and half in breadth" seems impossibly large. In the surrounding vills of Kirkby Malzeard and its bailiwicks of 'Waleton', 'Hovetune', Hutton le Hole, and Gillamoor, held by Hugh Fitz-Baldric, the actual number of ploughs in 1086 (10) exceeds the potential of nine. Fadmoor on the other hand is described as waste. One might conclude that some reorganisation had taken place leaving the Malet manor with most of the woodland, and the Fitz-Baldric manors with most of the arable. The record might not therefore be a good reflection of the actual distribution of woodland. A reorganisation of estates might also be proposed for Spaunton, Lastingham, Appleton le Moors, and 'Baschebi'. All of these were given to the Abbot of York (Farrer, 1912) and their assets in 1086 may have been recorded under the entry for Spaunton which, unusually for Yorkshire, suffered no decline in value between 1066 and 1086. The remaining manors are not given a value, though one (Lastingham) is recorded as possessing a plough. These arguments indicate that at least some redistribution of Domesday woodland should be allowed for when comparing Domesday with other sources, whatever the validity of the reasoning in individual cases.

Section 6.3

Size and Shape of Domesday woodland

Although woodland mentioned at Domesday is grouped at best by vill, a number of tentative conclusions can be reached concerning its detailed geographical location. Where the length given is much greater than the breadth, it would seem reasonable to assume that this is the result of some geographical constraint. Thus the woodlands belonging to Carleton and Scrafton in Coverdale which have very long, narrow entries in Domesday are likely to be located on the valley sides. Similarly the entry for Fadmoor in the Tabular hills may be a composite entry for a number of very long narrow valley side, or gorge woodlands. A gorge location may also be suggested for the long narrow entries to the north of Whitby. In addition to the Domesday dimensions a supplementary line of argument may be called upon. When discussing the probable influences on the density of woodland and clearance names above, it was pointed out that the topographical situation of woodland might influence the frequency of clearance place-names. Taking this argument a stage further, the incidence, or absence, of clearance elements in place-names may allow inferences to be made about the location of Domesday woodland. In the case of Pickering and its dependant manors a very large woodland entry coincides with a virtual blank on the place-name map. There are two possible ways in which this might arise. The area might contain a very extensive woodland tract which was not settled till very late. A similar situation occurs in the case of the Forest of Dean, and Rackham (1980: 128) suggests that this may be the result of a lack of settlement. However if settlement of the Pickering area had been late, one might have expected a local concentration of later forms of clearance place-names such as ridding, which are absent. Alternatively the woodland may have been confined mainly to the gorges which cut through the limestone uplands, as appears to have been the case in the medieval period. This would result in complex shapes whose length and breadth are large compared to their area, and a landscape where, according to the models discussed above, one would expect few clearance names.

Section 6.4

Wooded and Unwooded Landscapes in Medieval North Yorkshire

The result of studying the three sources of evidence is to distinguish several very different landscapes in medieval North Yorkshire, differentiated by distinctive concentrations and dispositions of woodland (see fig. J). The Vale of Mowbray, the Vale of Pickering, and the Wolds appear to have had very little woodland by Domesday. This situation appears to have already been reached before the period when the area received its Germanic and Scandinavian place-names, implying that these areas may have had open landscapes in the late Roman and early post-Roman periods. It is of course possible that English names referring to clearance or woodland in these areas were replaced by Scandinavian names which may have had less tendency to record topographic features, or failed to record woodland already cleared by the English. Such a process is however unlikely as it is precisely these areas in which Old English place-names predominate. In those areas with more woodland and clearing names Old Norse place-names are more common, and it is in these areas that we might expect English wood and clearing names to have been replaced in the process of a

Scandinavian renaming of the landscape. In contrast to the 'woodless' areas is the Vale of York (including the lower Wharfe valley) in which extensive areas of woodland were attached to most vills. The eastern fringe of the Pennines appears to have been an area in which most vills had some woodland; but many of these woods may have been relatively small. In the Dales the woodland was probably mainly confined to the steep valley sides, but may have been widespread in these locations. Craven probably had rather less woodland than the Dales but it may have been in similar locations. A similar pattern might be proposed for Eskdale and the upper portions of other moorland dales where they broaden out to the north of the Tabular Hills. The western scarp of the North York Moors was well wooded, as was the northern side of the Howardian Hills. Along the northern edge of the Vale of Pickering the lack of woodland and clearance elements in place-names and the narrowness of certain Domesday entries leads us to conclude that the woodland recorded by Domesday may have been mainly confined to the steep-sided gorges, and the southern scarp of the Tabular Hills.

Section 6.5

4 Case Studies

The foregoing discussion is based partly on untested hypotheses, particularly where place names are concerned. After distinguishing a number of landscape types it seems appropriate to choose a number of small areas within these for closer study, to test the ideas concerning place-names, and if possible to gain a better insight into the different landscapes distinguished above. A portion of upper Wensleydale (area A on the place names map) was chosen as representative of the Dales; this is depicted on fig.9. All place-names relating to woodland have been mapped, along with the major settlements and a simplified representation of the steeper slopes. It is immediately apparent that wood names are exclusively situated on the valley side: leah and thwait names are situated in the valley bottom or the valley side (the exception being Carpley Green).

Fig.9 Evidence for Medieval Woodland; Area A, Upper Wensleydale

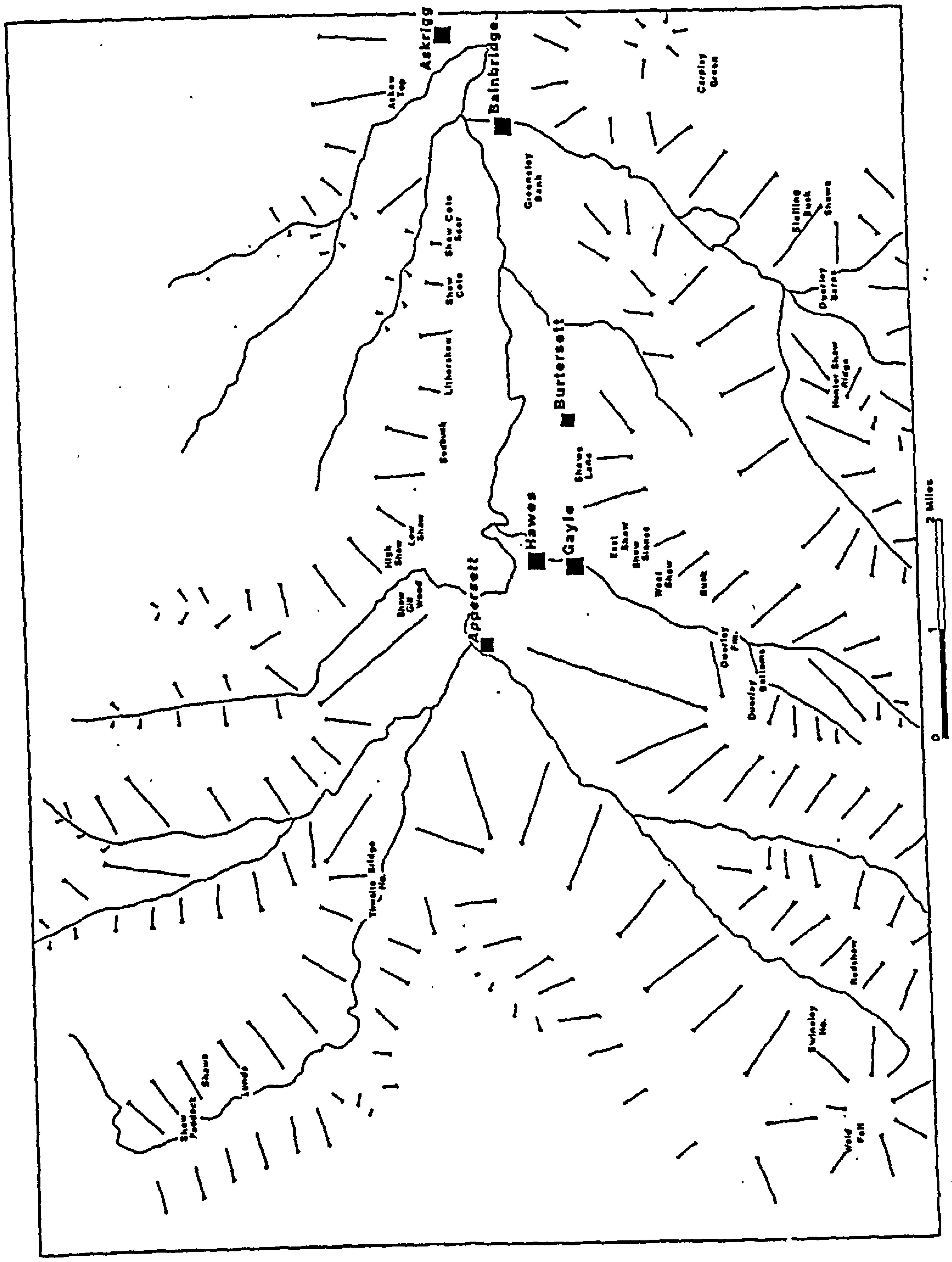


Fig.10 Evidence for Medieval Woodland; Area B, Part of the Forest of Pickering

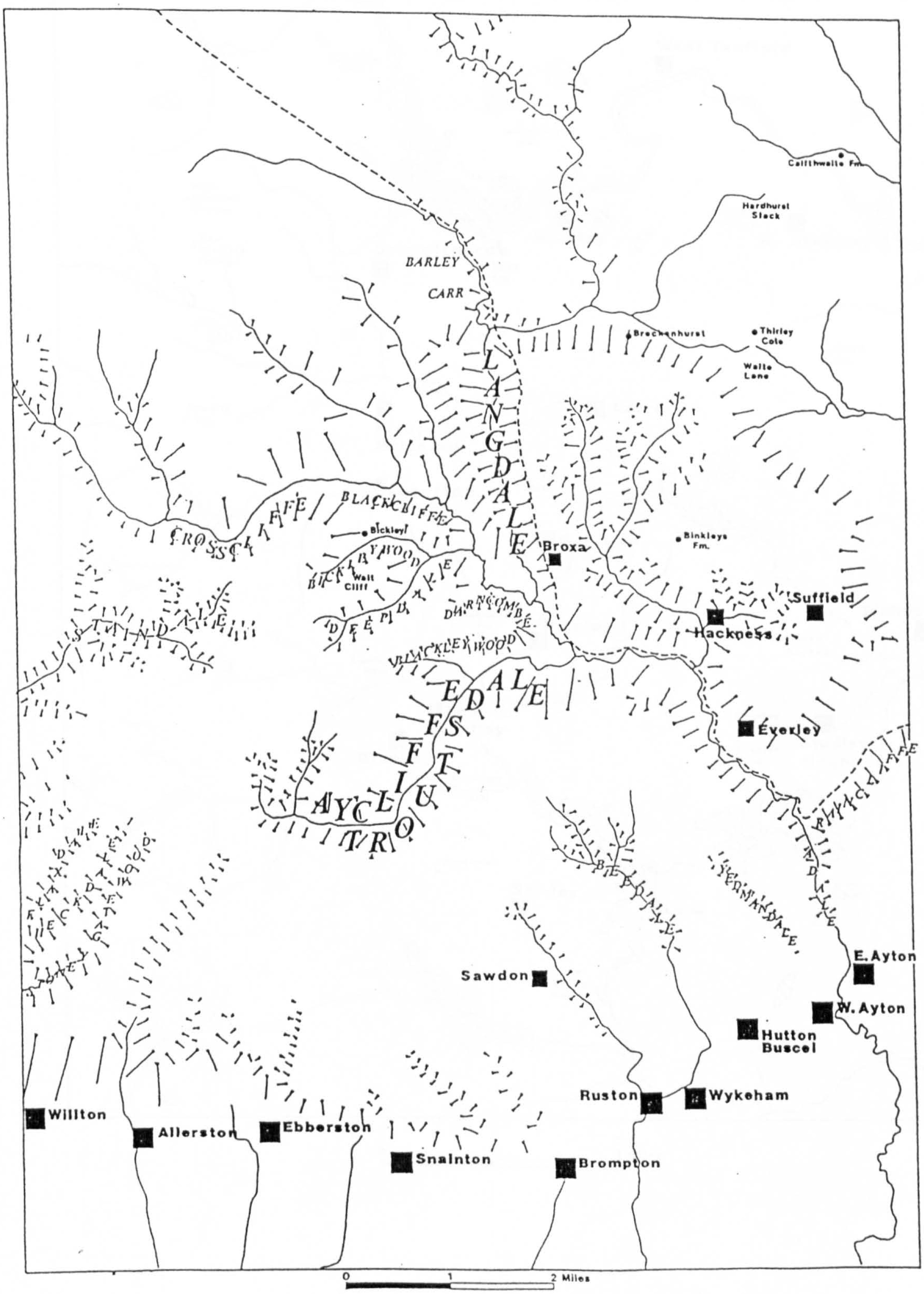


Fig.11 Evidence for Medieval Woodland; Area C, The Pennine Fringe

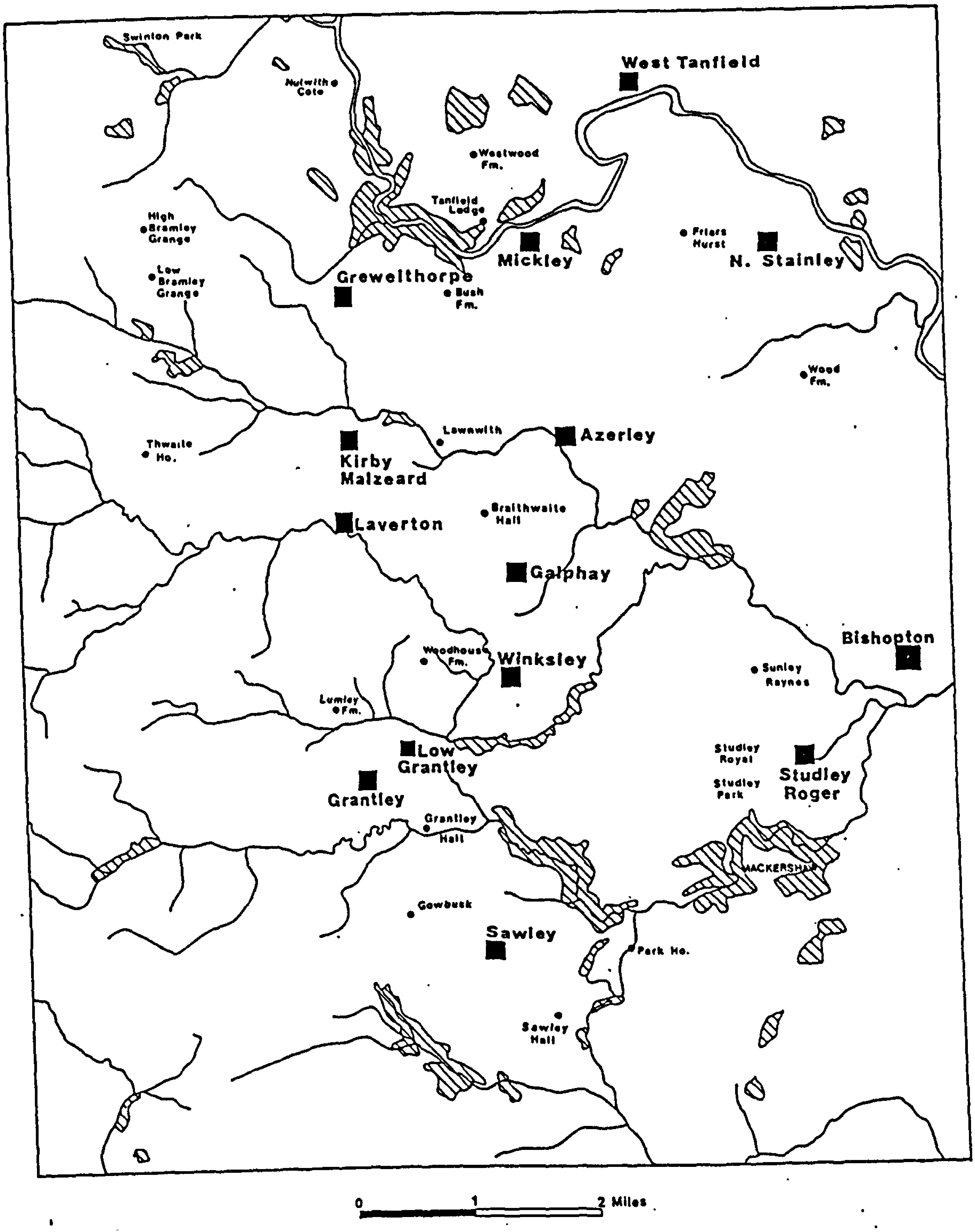


Fig.12 Evidence for Medieval Woodland; Area D, Selby and Surroundings

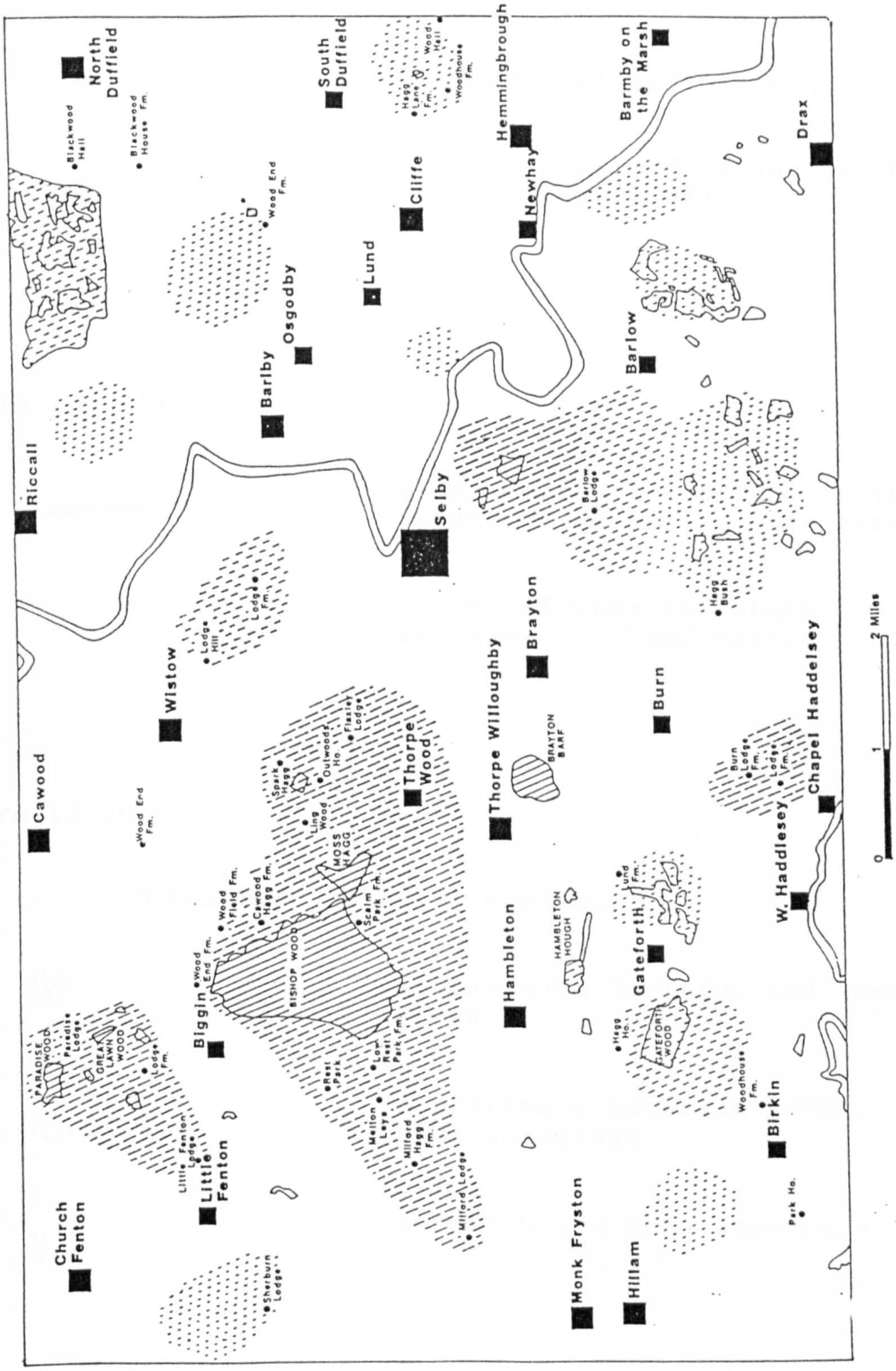


Fig.13

Key to figures 9-12

Broxa	Settlement
Askew	Woodland related place-name
	Wood mapped as ancient by Carter (1987)

Figure 10 only

DARNCOMBE	Named medieval woodland in the Forest of Pickering (see text)
	Extent of area for which medieval woodland mapped

Figure 12 only

Documented medieval woodland:

	Approximate location and area known
	Approximate location known, area uncertain
	Location and area uncertain

Area B is a portion of the Forest of Pickering; the western portion of this area is a gorge landscape with very few wood or clearance names (fig.10). Towards the north and east the landscape becomes more rolling and settlement is more often located in valleys. Due to the lack of suitable place-names other sources of information have been consulted. Wightman (1968), in a detailed study of medieval documentary material for the Vale of Pickering, mapped a large number of medieval woods for the area. These are recorded on fig.10 in italics. The boundary of the area covered by Wightman is marked by a dashed line; no attempt has been made to represent the medieval woodland beyond this line as there is a mismatch in the detail available. The western part of the resultant map corresponds very well with the situation in diagram 1 above, with medieval woodland occupying the gorges. As the model predicts clearance names are absent from this part of the map, and in virtually every case the name of the wood reflects its location with names such as Dale, Cliffe and Combe. It is also clear from the medieval documentation that few of these woods had names, being referred to by the name of the valley in which they were situated. Towards the north and west of the area, settlement is increasingly located in valleys (examples being Everley and Bickley), and gorges become less marked. This coincides with a sharp increase in clearing and wood names.

Area C, situated on the fringe of the Pennines to the west of Ripon, is a rolling landscape with a particularly high concentration of clearance names. Place-names associated with woodland are mapped on fig.11 (this includes names with wood, park and lodge), as are ancient woodlands (from the N.C.C. inventory, Carter 1987), and the place-names included in fig.D. It can be seen that the dominant location for ancient woodland recorded in the inventory is the stream valleys. Yet the valleys here are not gorges as in the Tabular Hills. The few woodland-related names also tend to be in this kind of location. If we postulate that woodland was once much more extensive along the stream sides it becomes easy to comprehend why so many settlements in this area have names in <u>leah</u> and <u>thwait</u>. It requires relatively little extra woodland to make, for instance, Sawley appear to be a clearing. It is also interesting to note the lack of woodland names in this area; names in <u>lundr</u>, <u>scaga</u> and <u>scogh</u> are remarkable by their absence. It may be that the disposition of woodland along the stream sides here caused woodland to be defined by its location, as with the gorge woodland of the Tabular Hills. However, the medieval evidence points to the loss of old wood-names as names such as 'Hereleshow' and 'Makershae' (Walbran 1878: 1, Lancaster 1915: 565) are recorded in the documents.

Fig.12 represents an attempt to reconstruct the Medieval woodland of area D, located in the southern Vale of York, from a combination of the documentary record, place-names, and the location of ancient woodland. The result is a landscape where woodland is distributed in large but discrete areas in an otherwise cleared landscape. There is thus a ready explanation for the coincidence of large Domesday entries with a lack of clearing place-names. It is worth noting that, of the two place-names in <u>leah</u> one (Flaxley) represents and intrusion into Selby Outwood, and the other, Barlow, is exceptional in being virtually surrounded by areas of woodland. Place-names with woodland elements such as <u>hyrst</u>, <u>vithr</u>, and <u>lundr</u> are slightly more common, but are still not particularly frequent. It is noticeable that none of the surviving or medieval woodlands bears this type of name. This might arise from the extensive use of the Old English <u>wudu</u>; alternatively there may have been a period when previously shared woodland was divided between townships, with a consequent renaming. The result of this might have been that the portion belonging to a vill X became known as X wood, or similar. Any previous designation would then be lost. Some such renaming process would seem the only satisfactory explanation considering the presence of settlements with names in <u>lundr</u>, <u>vithr</u> and <u>hyrst</u>.

The studies of these four areas serve to emphasise the differences between the landscapes distinguished in fig.J. They also bring together in greater detail the available information on medieval woodland distribution and location, allowing a better visualisation of the kind of landscapes concerned. They emphasise the importance of detailed local study and corroborative evidence when interpreting place-name information, particularly in the case of counties such as North Yorkshire where the large tracts of woodland of areas such as the Kentish Weald appear to have been lacking. The major reward of this type of approach is a greater appreciation of the subtleties of landscape differentiation.

Chapter 7

Medieval Woodland Management

Section 7.1

Woodland Management at Domesday

Yorkshire is one of only a few counties for which Domesday Book distinguishes between different types of woodland. The main categories used are silva pastilis and silva minuta. The first of these, silva pastilis, is of fairly obvious economic importance, being translated as pasturable woodland (Farrer 1912), or woodpasture (Rackham 1980: 118). The meaning of silva minuta however is less clear. This is translated as 'underwood' by Darby & Maxwell (1962: 131-5) and Farrer, which may imply a connection with coppicing as suggested by Rackham (1980: 118) or some kind of scrub. Entries described just as silva are also fairly frequent. Domesday Book occasionally further qualifies the entry, as in silva pastilis per loca (eg. the sokelands of Easingwold). To assume, as Rackham does, that this refers to a wood which is partly wood pasture and partly coppice would seem to be stretching the evidence a little too far. The rendering by Farrer (1912) 'pasturable wood in places' is more satisfactory. Similarly the translation of silva modica as coppice by Darby & Maxwell (1962: 131-5) must be incorrect as this would make nonsense of the entry for Crayke: 'Silva pastilis modica'. It is therefore probable that Farrer is correct in giving 'Small pasturable wood' as the translation. It is clear from fig. F that pastured woodland was by far the most important woodland utilisation in terms both of area and distribution, especially when it is considered that this would be a major use of the woodland which for various reasons failed to be recorded by Domesday. The evidence for coppice woodland is much less clear. It is tempting to concur with Rackham in his assessment of the significance of *silva minuta* woods, particularly in view of their predominance in the Ripon area which had dense settlement and many small woods.

Section 7.2

Medieval woodland management

Before attempting to map medieval woodland management it is necessary to formulate a procedure for the interpretation of the medieval documentation. In order to attempt this it has been necessary to assume that medieval woodland practice divided neatly into woodpasture and coppice. It is recognised that this is unlikely to represent the real medieval situation (see chapter 3); however it is thought that the resultant map may be of some benefit in illustrating regional variation. The application of defined criteria for interpretation makes possible not only the mapping of evidence for management, but also an appraisal of that evidence and the accuracy with which it is likely to portray the management of North Yorkshire's medieval woods.

In the material studied, only 6 unambiguous references to coppicing for the period up to 1400 were found. 'Unambiguous' in this context means that the process of cutting, and subsequently enclosing the wood against animals is explicitly mentioned. One of the earliest datable references of this kind is a sale by Ranulf de Nevill to the Abbot of St Mary's in 1294 relating to a wood called the Lund at Sutton-in-Galtres. This allows the Abbot to cut wood and make faggots and charcoal for a period of 4 years, with pasture for his carriage beasts. It goes on to state that the wood where he makes his faggots in one year shall not be pastured the next. The underwood and branches by which the Lund can be enclosed with hedges and 'hay' by the officers of Ranulf are excluded from the sale (Harrison). Of the remaining 5 references, 2 more are sales with similar conditions to the above. These are from Aislaby near Whitby and Heck near Selby (dated 1390 and 1399 respectively)(Walbran 1878: 1, Price 1953: 94). The rarity of records of this type is unlikely to be a reflection of the unimportance of coppicing; it must have been very unusual for this kind of transaction to find its way into permanent records of property such as chartularies (as at Sutton), or to be recorded by fines (as at Aislaby), as these were normally used for genuine litigation, or as a means of recording changes of ownership of property. At Kilburn (1251-2) (Parker 1932: 57) and Newton-under-Roseberry (1318) (Atkinson 1878: 361) agreements regulate the pasturing of woodland to allow coppicing to take place.

A variety of indirect forms of evidence for coppicing are available. One of the features which distinguishes coppice from woodpasture is the enclosure of woodland. A total of 43 references which refer to woodland enclosure were found in the material studied. The quality of these references varies considerably. At best, as in the 6 references mentioned above, enclosure is expressedly to protect coppice. A second set of 17 references imply distinctive enclosure of the whole wood. A proportion of these imply the exclusion of animals, as when the phrase 'in defence' is used. This is for instance used of a wood at Liverton (Cleveland) '<u>In bosco autem meo qui est in defensa non accipient maremium vel pannagium nisi per me</u>' (1165-1175)(Farrer 1915: 237). One problem with this type of reference is that a proportion may refer to parks rather than coppice woods. This is almost certainly the case at Priors Cliff, Guisborough, (1239)(Brown 1889: 116) and Est Wood and Stainer, Selby (Fowler 1890: 168-171), as in both cases there are later references to parks.

Two further categories of reference to enclosure are found; references where it is not clear whether the intention is to enclose land from the wood or visa versa (in many of these the former is implied), and references where the primary function of boundary features appears to be the demarcation of property. This last is the case in a number of references which refer to the partition of commons, and a number mentioned in lengthy disputes over ownership and rights. On fig. H references which explicitly refer to coppice have been mapped, and those which imply the distinctive enclosure of the whole wood and / or the exclusion of pasturing animals, with the exception of the two cases which can be shown to refer to parks.

Wood names can also be used to infer coppice management; The term hag(g) appears to have been used to describe a coppice compartment (Rackham 1990: 108). The connection of hagg with coppicing in North Yorkshire is supported by references such as 'et de Vs de firma unius copicii sive le Hagge ' which occurs in the dissolution ministers accounts for Rievaulx (Atkinson 1889: 316). Although there are a number of such references, some caution must be exercised in the use of hagg as an indicator of management as it appears in a number of other contexts. The most important of these are peat cuttings, often referred to as peat hags, and intakes (a large number of instances of this use can be observed in surveys and maps of Bilsdale, Ashcroft & Hill 1980, Ashcroft 1983). It does not however seem likely that these will form a high proportion of wood-names. A potentially more important use of hag is its use in South Yorkshire for holly woods used for winter fodder for stock (Spray & Smith 1977). However this meaning has not been found in the references to this practice in North Yorkshire (see section 12.6), and is not thought to account for a significant number of hag wood-names. Another wood name which may be linked to coppicing is Fall; the link with coppicing is demonstrated by contexts such as the following from West Yorkshire in 1545 'Haltemprice coppies devidid in 7 hagg.........and in the same be growinge 300 okkis of 60 yeres growith croppid and loppid at the fallynge of the underwood..' (LCAS Fo 1). Similarly in South Yorkshire in 1684 fall occurs in the following context: 'such parcell of woodes ..... as were reserved att the last fall or spring of the same' (Redmonds 1983). Fall is probably the northern equivalent of Fell which Rackham (1980: 137) notes as a term for a coppice compartment. The occurrence of hagg and fall names in the medieval documentary record for North Yorkshire is not common, a total of only 17 dating before 1400 having been located in the material studied. It is however interesting to note that only one of the six unambiguous references to coppice includes a name of this type (namely Heck Falls).

Consideration of wood-names and enclosure may also take the history of coppicing back some years earlier than the more explicit evidence. There was for instance a road called Haggesgata adjacent to a wood in 1175-89 at Ingleby Greenhow on the northern edge of the North York Moors (Farrer 1915: 144). A reference to woodland enclosure at Liverton, specifically excluding animals, is mentioned above, and is dated to 1165-75. There may also be other earlier names for coppice woods. The names of Ris woods at Kirkhammerton and Litton (1226 and 1251 respectively)(Parker 1921: 86, Lancaster 1915: 321) for instance, are probably derived from the Anglo-Saxon _hris_ meaning underwood. At Dishforth and Skipton on Swale _hris_ is combined with the old Norse / Middle English _scogh_ to form Riscough (Martin 1909: 170, Lancaster 1915: 639), and at Asmunderby _hris_ is combined with the Old English _scaga_ to form Rishaw (Fowler 1881: 206). Only those woods which contain the elements _Hag(g)_ and _Fall_ are mapped on fig H.

A final category of evidence which might be used to indicate coppice are references to underwood, _subboscum_ or _virgultum_. It seems likely, however, that these terms can as easily refer to wood produced by pollards as from coppice, and for this reason they have not been mapped. An exception to this is when _virgultum_ is used to describe a wood rather than its product. In this context it is thought that _virgultum_ specifically refers to coppice. This use is illustrated by the Allerton Receivers Accounts of the Bishop of Durham of 1518-19

(Durham University: CC Box 84 189509), in which English receipts are appended to a Latin document. The context in which virgultum is used, and the English rendering 'copy' leave little doubt that a coppice wood is meant. The inclusion of references in which _virgultum_ is used in this way adds only a single reference to the map. This refers to a wood at Haddenham near York (Farrer 1914: 186)and has been regarded as unambiguous. Valuations of woodland such as those in _inquisitiones_ _post_ _mortem_ often give an annual value for woodland, which certainly implies management, though pollarding is as likely as coppice.

Quite apart from the problems of interpreting the evidence, there is a major problem in the definition of different forms of management. This was discussed in detail in chapter 3. The examples of Newton under Roseberry, and Kilburn, mentioned above, are cases in point; can woods where grazing animals are only excluded from newly cut woodland for only a year really be considered to be coppice, or would they be better classified as compartmented woodpasture?

The burden of evidence for woodpasture is a good deal lighter than for coppice, mostly consisting of references to the pasturing of animals. Given that coppice often involves some pasture at some time in the cycle there is bound to be some confusion here, particularly in view of the problems of definition mentioned above. Woods where such a conflict occurs where there is definite evidence for enclosure for cutting are mapped as coppice woods on fig. H. In the case of Dalby Hagg (Turton 1894) both forms of evidence have been mapped as neither is considered conclusive.

Having determined the criteria for regarding woodland as coppice or woodpasture it becomes possible to assess the significance of the documentary evidence. To do so we must look again at the contexts in which references interpreted as woodpasture or coppice occur. As outlined above, woodland can be referred to in a number of documentary contexts. Perhaps the largest category are woodlands mentioned in perambulations. On the face of it these, in so far as the edges of manors etc. are recorded, might be expected to over-record woodpasture, which is typically located outside the core of the village land. In practice if anything the opposite is the case. The pasturing of woodland is unlikely to be mentioned. On the other hand wood-names, and features enclosing woods such as ditches are quite likely to be recorded, and these are two of the means used to interpret coppice management. Woodland rights appurtenant to grants of land, and grants of pasture are two further important categories of reference. Here there is almost certainly a real bias towards woodland interpreted as woodpasture. Even this type of record, however, presents opportunities to detect coppice where areas of wood are excluded from pasture, as is the case with the wood at Liverton (see above) described as in defence and deliberately excluded from a grant of pasture. The relatively minor category of woodland mentioned in references to the partition of lands common to several landlords, or vills, is the only one where references to coppice can be expected to be completely excluded. This consideration of the circumstances in which one form of management might be over or under recorded indicates that there may be a slight tendency for woodpasture to be relatively over-recorded. This, however, is not likely to be so great as to render fig.H invalid.

Figure H represents the management of woodland recorded in medieval documents, interpreted according to the criteria discussed above. Out of a total of about 400 woodlands, in over 900 separate references, it is possible to interpret only 121 as either coppice or woodpasture. Of these, 38 are interpreted as coppice, the remainder as woodpasture. The fact that such a high proportion of the woodland cannot be assigned a form of management leaves large gaps in the map and limits its value. Areas which were in royal or private forests are particularly blank. This is because grants of pasture or wood are usually expressed in such general terms in these areas that it is impossible to know whether woodland pasture is meant or not. In fact, as discussed in chapter 3, woodpasture is likely to have been an important feature of wooded forests. Bearing all this in mind, fig.H would seem to indicate that both coppice and woodpasture were widespread in the more wooded parts of North Yorkshire. References interpreted as coppice are however absent from the uplands (a pattern repeated in later periods). Another, more striking, feature of the map is the concentration of hag(g) and fall names on the Pennine fringe. It is possible that this is an artifact of the record and interpretation, although wood-names are commonly recorded in the documentation for other areas. This group of hag(g) /fall names also coincides with a concentration of *silva minuta* woodlands on the Domesday map, adding a little extra credence to Rackham's suggestion that *silva minuta* refers to coppice, and leading one to the conclusion that coppicing was particularly important in this area of North Yorkshire from a very early date.

Section 7.3

Trends in Woodland Economy

Woodland utilisation not only varies spatially, but also through time. In order to gain an idea of the intensity with which woodland is managed, and how this changes with time, a study was made of the frequency with which pannage, woodpasture, and coppice are referred to at different dates. Interpretation of the coppice references is on the same basis as the map on figure H (see above for details). On figure 14 the totals of the references over successive twenty year periods are plotted for each category of woodland exploitation. Figure 15 presents the same information expressed in terms of percentages of the total number of sufficiently well-dated references.

Fig.14

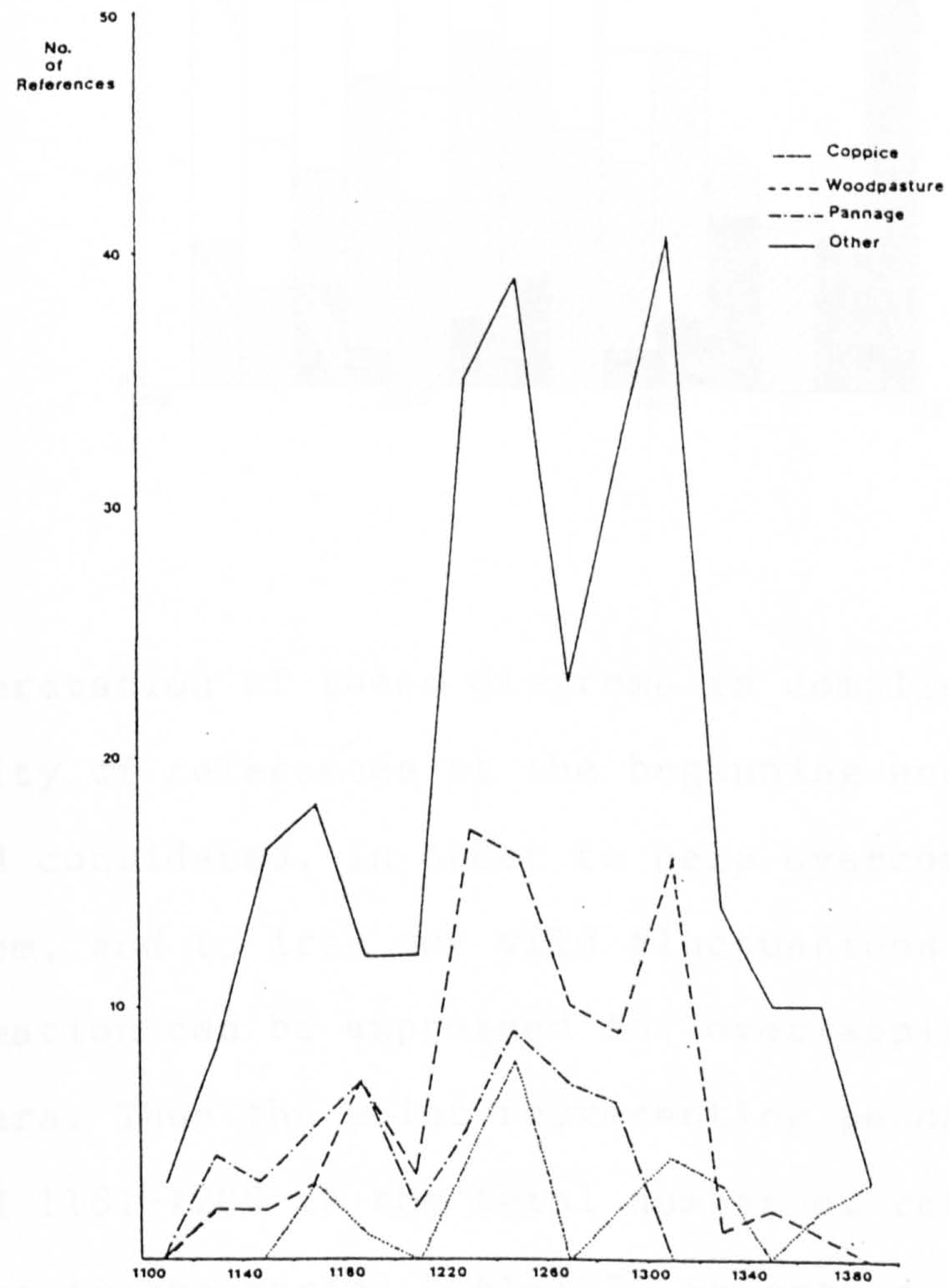
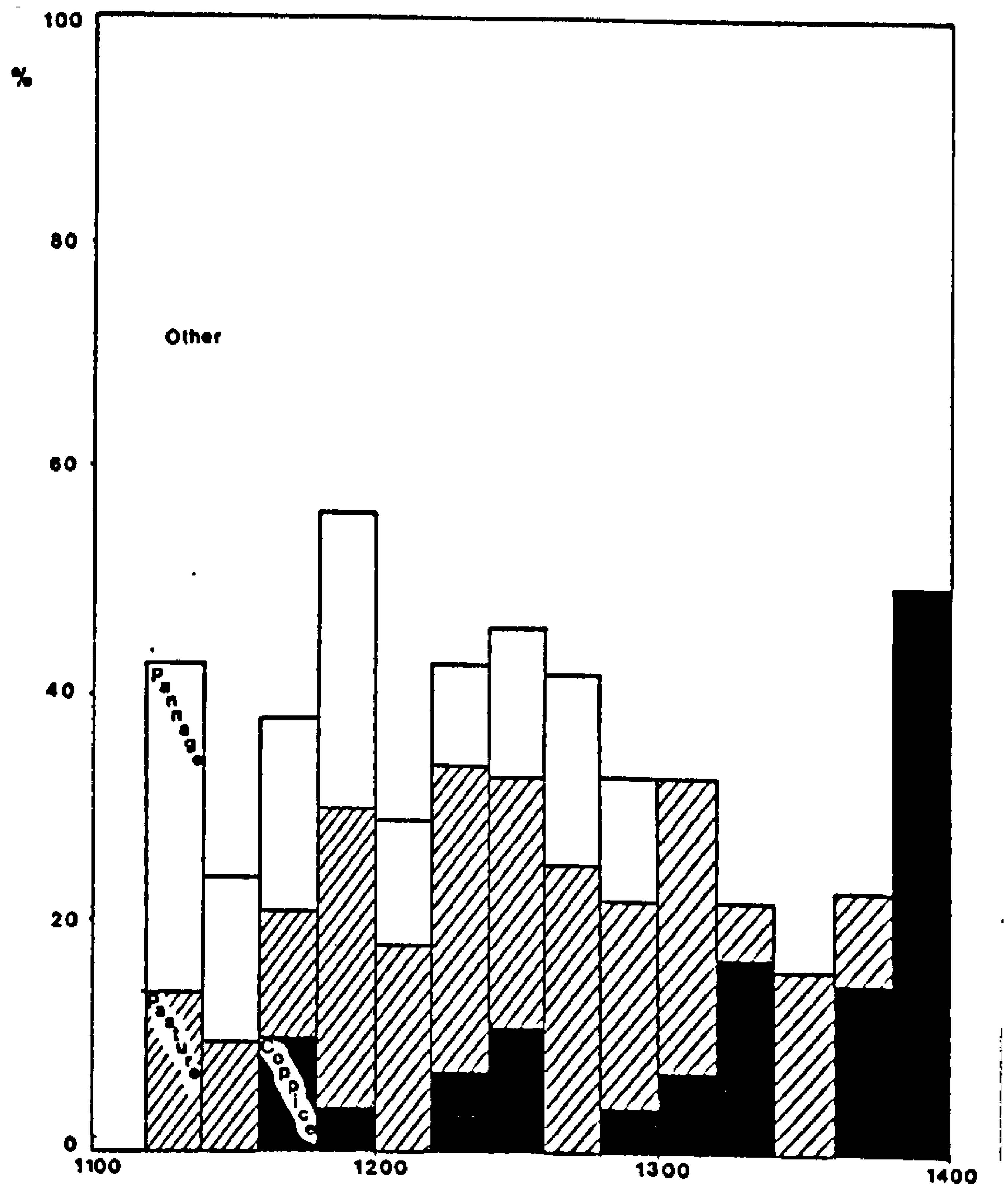


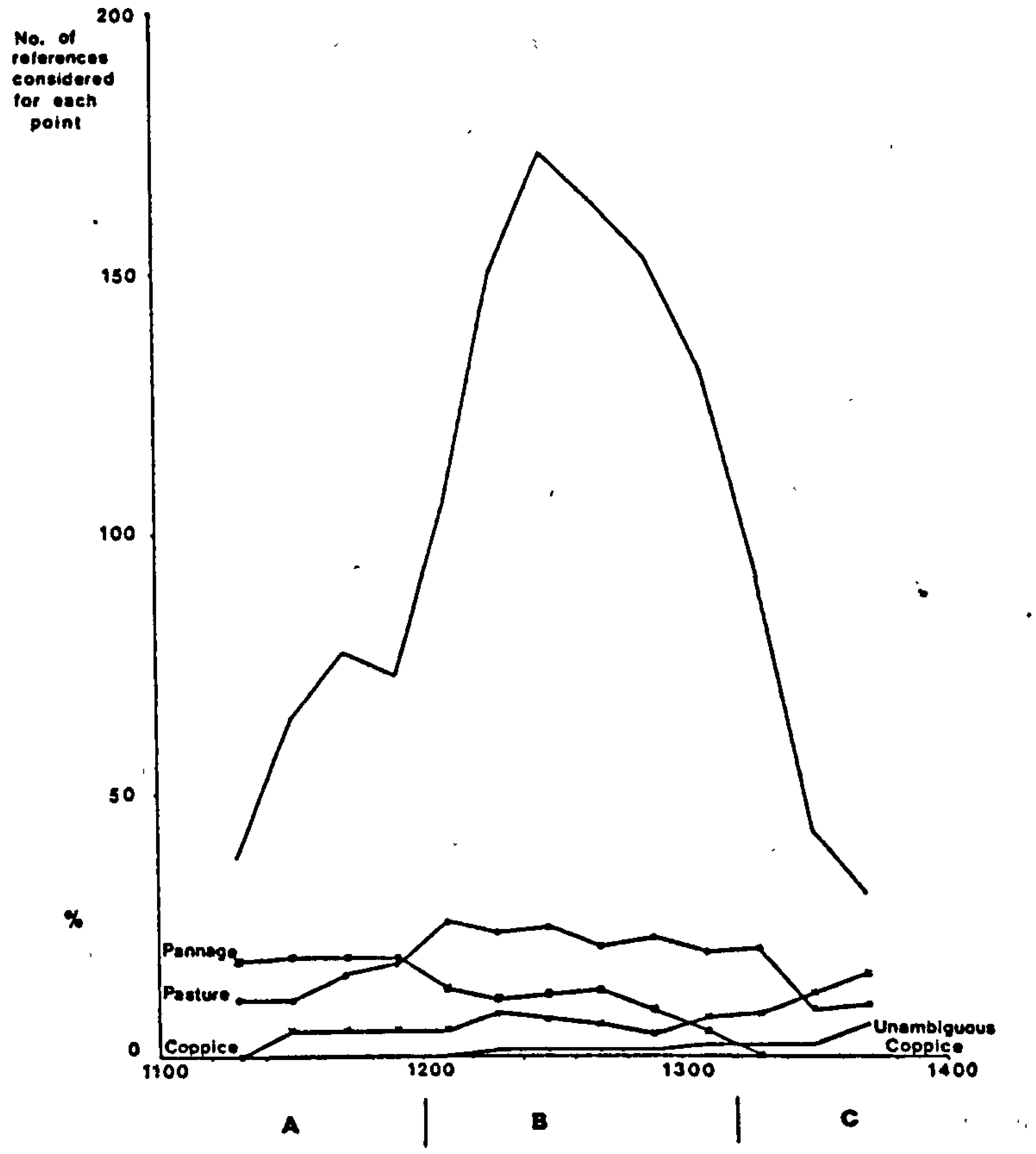
Fig.15



Interpretation of these diagrams is complicated by the scarcity of references at the beginning and end of the period considered. In order to help overcome this problem, and to iron out wild fluctuations the same information can be expressed for overlapping periods of 60 years. Thus the point representing pannage for the period 1181-1200 is the total number of references to pannage in the period 1161-1220 expressed as a percentage of the total number of sufficiently datable references for the latter period. This ensures that each point represents a proportion of a minimum of 31 references.

This is not by any means ideal but it is a great deal better than 3!

Fig.16



All three diagrams can be divided into three time periods labelled A, B, and C, but figure 16 is the clearest. During period A references to pannage are most frequent, during B pasture, and during C coppice. It should not be thought that this is a direct reflection of the degree to which pannage etc. were practiced, but rather the importance placed on them by the landlord, whose priorities the documentary record generally reflects. The relative importance of pannage during period A can be interpreted as indicating a low level of management, that mature mast-bearing trees were frequent, and coppiced and pollarded woods rare. A relative lack of records of pasture at this time may indicate that on the whole the level of pasturing was not so intense as to require extensive regulation or for pasture rights to be precisely defined. During period B the importance of pannage declined. A decline in the number of references to pannage as a proportion of total woodland references cannot be caused directly by a decline in the area of woodland, but must represent a change of priorities, if not management. Pasture is the most frequently recorded woodland use in period B, probably reflecting an increasing need to manage and control woodland pasture. In this context the best interpretation of the decline in pannage is that tree management, particularly pollarding and compartmentation of woodpasture were increasing with the result that there were fewer mature oak or beech trees. Interpretation of the final phase C is complicated by the scarcity of references. However, there appears to be both an increasing interest in coppice, and a marked decline in the frequency with which woodpasture is mentioned. This decline is contemporary with the early 14th century agricultural decline culminating in the Black Death. These events almost certainly led to a slump in the demand for pasture of all kinds which here is reflected in a decline in the records of woodpasture. The tendency for references to coppice to increase may commence in the preceding period, as is certainly implied by figure 15. This increase is accompanied by the appearance of references which were defined above as unambiguous. Of the 6 unambiguous references to coppice mentioned in section 7.2 all are after 1250 in date, and four of the six are after 1300. Even taking just these into account figure 15 records a gradual increase in the importance of coppice. The documentary record thus appears to show a gradual shift from relatively inefficient and casual exploitation of woodland to progressively more intensive forms of management. Similarly if we look again at the spatial distribution of this information as depicted on figure H it can be seen that the pannage references are concentrated in the areas which have the greatest density of Domesday woodland, particularly the Vale of York, and the western and southern edges of the North York Moors. The evidence for coppice on the other hand is concentrated in an area of the Pennine fringe in which Domesday shows a relatively smaller density of woodland, and which appears to be mutually exclusive with pannage. Possible interpretations for these observations are discussed in Part 3.

Chapter 8.

Woodland after 1400.

Section 8.1

Woodland at the Dissolution

During the 16th century a wealth of documentary material becomes available, of which perhaps the most important is a series of Crown surveys of woods belonging to dissolved monasteries (for instance those appended to the published chartularies of Rievaulx and Selby) (Atkinson 1889, Fowler 1890, 1892). It is apparent from these surveys that the same basic set of woodland management techniques were in use as in the medieval period. Thus in the manor of Selby in 1540 (Fowler 1892: 353-4) the common woodpasture or Outwood still existed, containing 1300 'scrude' (pollard?) oaks and 4 coppices of which 2 lay in the common pasture while the others were 'springed' (coppiced). The manor also contained a number of other coppices, not in the common pasture.

The detailed information contained within the surveys allows a much more confident interpretation of management practices than the bulk of the medieval material. Extensive use of terms such as spring, hagg and coppice, descriptions of common rights, and of woodland structure allow a much more subtle reconstruction of woodland management than was possible for the earlier period. It is, however, not possible to construct a dissolution map of woodland for comparison with the medieval information of the charters, both because of the very different ways in which the woodland was recorded, and also because the dissolution surveys give a much less even coverage of the county than Domesday and the Charters. The approach adopted has therefore been to study a selection of small areas. These have been chosen with three main criteria in mind. Firstly there must be a detailed sixteenth century survey; secondly the areas chosen must together illustrate the range of woodland landscapes defined in chapter 5; finally there should ideally be enough medieval documentation available to make a valid comparison. In practice it is virtually impossible to meet all these criteria satisfactorily, and a series of compromises have had to be reached.

In the Vale of York, Selby and Hambleton (see figure 12) are suitable subjects for study. Here a reasonable medieval record of woodland belonging to Selby Abbey coincides with two detailed dissolution surveys in 1540 and 1543 (Fowler 1892:350-362). The survey records four woods in Hambleton. These included the Outwood or woodpasture in which the king's tenants still had common pasture and hedgebote, and Hambleton Haugh, an oak coppice apparently without timber. Of the two remaining woods Est Hagge (sic) is described as having very fair holly underwood of various ages in addition to 'many old runted oaks', and was used by the king's tenants there as common. The combination of common rights, a coppice related name, and the structure consisting of holly under old or pollarded oak, suggest that this was a coppice compartment within a woodpasture (probably the Outwood). King Spring on the other hand is a small coppice with both timber trees and a mixed underwood. At Selby the Outwood with its oak pollards and four haggs have already been mentioned above; in addition a medieval park called Stainer Park had three springs or haggs called Mawdlen Spring, Elyston Hagg, and Robert Crofte. There was also one small hagg called the Carr. All of these appear to have been conventional mixed coppices with oak timber.

When the sixteenth century survey is compared with the information gained from medieval documents we find a reasonable correlation between the two. In Hambleton a wood subject to common rights is referred to as The Wood of Hambleton and The Abbot of Selby's Wood of Hambleton. Locational clues indicate that this was part of the larger woodland area north of Hambleton, illustrated on figure 10. This is almost certainly the same wood as Hambleton Outwood. An undated medieval document records a wood called Hoga de Hambleton which appears to have been used as woodpasture, though possibly not in common. This is Hambleton Haugh. East Hagg and King Spring are not recorded before the sixteenth century (King Spring is unlikely to have been so called before the dissolution). In the case of Selby a medieval common wood likely to be Selby Outwood is documented in various contexts (eg.

Fowler 1890: 171). Stainer Park appears to have been enclosed towards the end of the thirteenth century, then forming part of a larger area of woodland named Est Wood (Fowler 1890: 168-171) (The medieval references imply that the woodland outside the park was divided among the remaining freeholders in lieu of common).

In conclusion therefore with the exception of Est Wood all the documented woods of both Selby and Hambleton survived into the sixteenth century. In the case of Est Wood clearance is most likely to have taken place in the late thirteenth or early fourteenth centuries. Where management is concerned there appears to have been a shift away from woodpasture towards coppice. Hambleton Haugh for instance appears to have been woodpasture in the earlier period but by the sixteenth century it was oak coppice. Similarly Stainer to the south of Selby made the transition from common wood pasture to park to coppice between the late 13th century and the sixteenth century. The case of the outwoods is more complex. In the sixteenth century both outwoods still performed their medieval function as common pastures; both appear to have become compartmented by the sixteenth century. It is impossible to be certain that this was not already the case before 1400. However, it is improbable that Selby Outwood was compartmented before 1237 when the common was partitioned between the Abbot of Selby and Robert de Willoughby. In the case of East Hagg the large number of pollard or rotten oaks and underwood dominated by holly might suggest that compartmentation was fairly recent, and that much of the earlier structure survived.

Woodland in the Pennine Dales is represented by Marrick in Swaledale. Here the medieval documentary material is far from detailed. It is however sufficient to provide a general impression of the nature of the landscape in the earlier medieval period. The foundation charter of Marrick Priory (c.1156)(Clay 1936: 76) mentions woods, and assarts in woods, conveying an impression of a wooded environment. By the sixteenth century the woods were islands in cleared land, very much as they are today. Seven woods are mentioned in a survey of 1545 (T.S. 1835), and an additional four in a lease to John Uvedale in 1542. Of these eleven woods ten were coppices. The remaining wood, Oxe Close, was of rather uncertain status. It was only recorded as a close in 1542 (ibid), and was described as 'thin set with underwood' in 1545. Again we may question the extent to which any loss of woodland can be attributed to the later medieval period. Indeed it is probable that most clearance took place soon after the establishment of the priory. However, where management is concerned some of the wood names in the sixteenth century survey, such as Colte Parke, Oxe Close, Fedynge Close, and Shepe Bank, suggest an earlier phase of woodpasture exploitation.

The extent to which Marrick is typical of Swaledale, let alone the Dales as a whole is questionable. Marrick appears to lie at a transition point in the landscape of the dale. Below Marrick to the east, the steeper slopes appear to have been extensively wooded in the medieval period. These were almost all encoppiced by the second half of the seventeenth century at the latest (Gledhill 1992) and probably well before this. Above Marrick to the west, the continuing survival of common woodpastures suggests a rather different woodland history. Archaeological examination of one such woodpasture, Ivelet Wood, indicates that this may have been reduced to a few refugia during the medieval period, then re-expanding probably in the late Middle Ages. This may be more typical of the woods in the upper dale. The history of Ivelet Wood is discussed in more detail in Chapter 11 & Appendix 2.

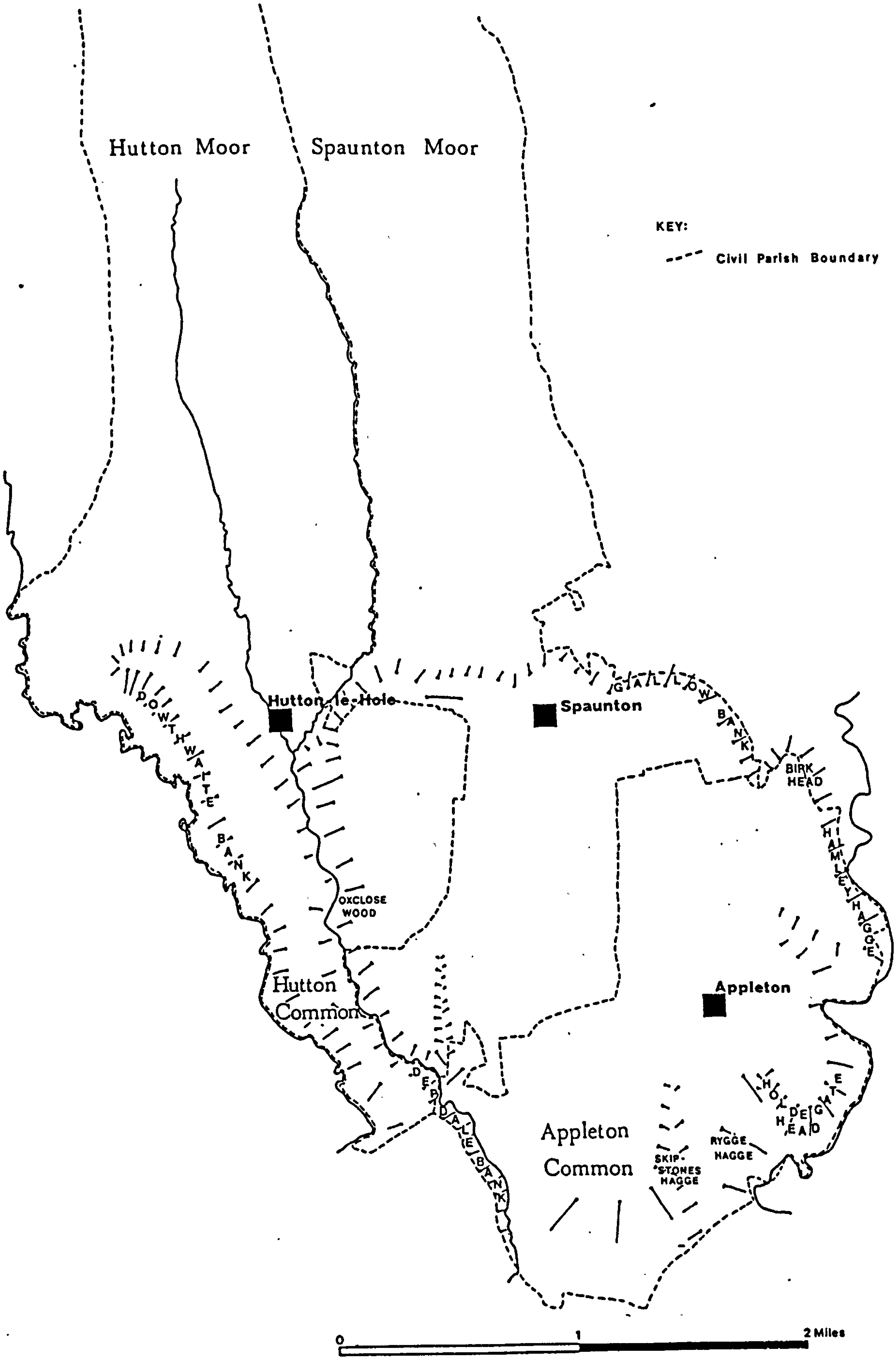
North east Yorkshire is illustrated by the area surrounding the village of Spaunton (already mentioned in the context of Domesday woodland). Here medieval references mentioning common rights to wood and pasture would suggest that wood pasture was the dominant form of woodland exploitation during the earlier Middle Ages. A survey of 1545 (LCAS GC. Fo 1) describes a large number of woods, many of which can be identified and mapped (see fig.17) In most cases the method of woodland management can be deduced.

Table of Woods in Spaunton in 1545

Coppice	Woodpasture	Other
Birk Head	Spyres Wood	Stokynt Closes
Hamley Hagge	Gallow Bank	Dowthwaite Bank
Holdegate Head	Ampsters Wood (common)	Hutton Lytell Wood
Rygge Hagge	Hutton Oxclose	
Skypstones Hagge	Depdale & Littledale End	
Hutton Hagge	Hutton Yaus	

Stokynt Closes are best interpreted as woodpasture which has been enclosed as they were reported to contain two hundred 'pollyd okes'.

Fig.17 Spaunton Woods in the Sixteenth Century



In contrast to Marrick the majority of coppice woods have names in hagg, suggesting that coppicing was not a recent development. Several of the coppices appear to have suffered from recent neglect. In most cases the underwood is old. Holdegate Head wood was said to be partly destroyed, and in the case of Hamley Hagge a note in the margin of the document claims that the wood had been destroyed by cattle through lack of fencing. This neglect may well have been a consequence of the dissolution. In general place-names such as Waite, Ridding and Lund where no sixteenth century woodland is recorded, and a large woodland entry in Domesday Book point to a loss of woodland during the medieval period. As with Marrick it is perhaps most realistic to suggest that this took place during the period of agrarian expansion before 1300. Where management is concerned it is perhaps most likely that the coppice woods developed mainly in the later middle ages, as the emphasis in medieval documents is on common rights to wood, pasture, and pannage.

The best opportunity for study in the Pennine fringe is presented by the properties of the late Fountains Abbey. These were subject to a series of surveys during the sixteenth century (Walbran 1863). Although these record woodland on a large number of disparate properties rather than in a discrete area, a general idea of the woodland management can be gained. Of 23 woods mentioned in these surveys 17 were coppices, five of the remainder being woodpasture closes, and one a wooded meadow. It would therefore seem that coppicing was by far the most important method of woodland management in this area at the time. The importance of coppicing in this area may also be of greater antiquity than elsewhere as it is this area which is notable for the number of woods with coppice related names in medieval documents, and for a particular concentration of <u>silva</u> <u>minuta</u> woods in Domesday Book. The long history of coppice management in this area may also be reflected in the variety of coppice related wood names (<u>hagg</u>, <u>fall</u> and <u>spring</u> are all represented in the sixteenth century surveys), and in the tautological combination Abbot Fall Spring.

In most areas, except perhaps the upper reaches of the Yorkshire Dales, there appears to have been a definite shift towards coppicing between the fourteenth and the mid sixteenth centuries. In some areas as at Marrick this may have been a relatively late development. In other areas such as Spaunton, and especially the Pennine fringe coppicing appears to be long established. Woodpasture on the other hand was in decline. Both at Marrick and on the Fountains Abbey estates common woodpasture appears to have almost disappeared, leaving a handful of woodpasture closes. At Spaunton, Ampsters Wood was still a common woodpasture but Stokynt Closes containing two hundred pollard oaks points to the recent enclosure of woodpasture here too. It is in the Vale of York where the tradition of common woodpastures appears to have been strongest, represented by the pollarded and compartmented outwoods of Hambleton and Selby.

The apparent increase in the importance of coppice woods evident in the detailed studies discussed above is mirrored by a more general consideration of the sixteenth century evidence. The most convenient way of illustrating this is by considering wood names. Seventy coppice names occur in the documentation consulted out of a total of approximately 350 references (ie.20%), compared with a mere 17 in the pre-1400 literature out of a total of approximately 900 references (0.02%). A similar impression is gained from the use of the word 'spring' as a wood-name. It has been suggested that this word was initially used to describe the young shoots after coppicing (Redmonds 1983), and the first use found by the author in North Yorkshire is at Aislaby in 1390 where the coppice is referred to as 'le spring', though this is not its name. As a wood name spring does not occur in any of the pre 1400 references, but accounts for 34 of the 70 coppice related wood-names after this date. Similarly the tautology Abbot Fall Spring mentioned above implies that fall may have been an outmoded term by this time, and that spring was more recent. If we assume that only spring names were given to new coppice woods after 1400 this implies that the number of coppices approximately doubled between 1400 and 1600. In fact, figure L shows, there is a marked concentration of spring wood-names in the Pennines, indicating that the term spring may not have been adopted evenly across the area. The sixteenth century documentation also shows that hagg was still a term in current usage at that time, particularly in the eastern part of the county. It is therefore probable that the increase in coppicing was very much greater even than that indicated by the number of spring wood-names.

Section 8.2

The Late Middle Ages and Early Tudor Period

The period after 1400 to the dissolution is a time for which there is a dearth of information. This is particularly unfortunate because it coincides with the major changes which appear to have taken place in North Yorkshire woodland management. This gap is only partly filled by a few monastic accounts, leases, and contracts. Of these, the records for Fountains Abbey are the most informative. The bursar's accounts for the years 1546-9 (Fowler 1918) record moneys paid for custody of springs, for making hedges and ditches round springs, and installing gates. Costs for making faggots, cutting firewood and other woodland activities are recorded, as well as sales of wood and timber. Similarly, lease agreements of the abbey from the late 15th and early 16th

(Michelmore 1981) century give the impression that the abbey had a well developed system of coppice woods. A typical example of one of these leases is that for Fellbeck House in 1520. This states that "The abbot and convent have the right to take and carry away wood, with free entry and exit.......and if in the future they cause any of the woods to be felled and layd in sprynges R. and R. (the lessees) agree to keep the springs during the fence time." Similarly a lease of Kilnsey in 1507 requires the lessee to "maintain and repair all houses, hedges, walls, ditches and other defences around the woods and springs".

Information is also forthcoming concerning woods on the Bishop of Durham's properties in Northallertonshire. Here the receiver's accounts (Durham University: CC Boxes 84-90) and the records of the forestmote courts (NYCRO ZBD) have survived, allowing an unusually balanced account of the management of woodland on this estate to be made. Woods mentioned in the accounts (which start in 1492-3) are the two demesne woods at Clack near Osmotherly, and Cotcliffe to the south of Northallerton. Both of these appear to have been managed as coppice with standards in the late medieval period. Both produced large numbers of faggots, as well as oak timber, bark and lopp and topp. In most of the accounts there is a heading for pannage but no moneys were ever received for this. The accounts also record frequent payments for making and repairing hedges and gates, and in 1520-1 (Durham University Box 84 189363) for ditching. Thus in 1518-19 (Ibid Box 84 189509), 14s 6d was received from the sale of 1460 faggots made in Cotcliffe woods, while 20d was spent on a new gate for Clack, as well as 20s 6d for 76 rodd of new hedge round the wood of Clack ...to have a coppice (virgulto) there to save the young wood growing in it where a sale of wood had been made by Thomas Strangwisse... Apart from faggots other coppice products mentioned include garthsell (material for hedging) and firewood. Timber was seldom sold, but used for repairs and improvements to the Bishop's property, as in 1514-15 (Ibid Box 84 189274A) when bark was sold for 20(d) from 5 oaks felled for the repair of tenements. Also itemised in the accounts is a payment of 31s by the Bishop's tenants in Allertonshire called wodlade, paid at the rate of 1½d per bovate. It is probable that this was a payment for the right to collect fuel and other wood. Occasionally receipts are appended to the accounts in which certain items are recorded in greater detail.

The rolls of the Forestmote courts add to the picture. In 1509 (NYCRO ZBD 53/7) William Sympson custodian of the wood of Cotcliffe accused Radius Emeryson of Landmoth and Henry Caynton Knt. of not keeping the hedges and defences in the lords wood so that the cattle of Landmoth and others there entered and trampled the herbage and the young wood to the great damage of the lord. When the forestmote rolls are considered it becomes clear that the Bishop held other woods in Allertonshire which are not mentioned in the accounts. Most important of these is Aykdale (now Oakdale near Thimbleby). At least part of this wood also appears to have been coppiced as the Forestmote of 1435-6 (NYCRO ZBD 51/2) records (cattle?) captured in the hagge of Aykedale, and that of 1446-7 (ibid 51/5) that John Wonfford had twenty cattle captured in the spryng of Aykedale (note that hagg and spring are used interchangeably here). The most frequently recorded offence is cutting of green wood without licence. In 1509 (ibid 53/7) some 39 persons from Osmotherly, 11 from Ellerbeck, and 13 from Thimbleby were fined for this, normally about 2d. Fines for this offence are so commonplace as to suggest that this was more a charge than a punishment. Genuine offences are generally listed separately. It is possible that the reason Aykedale does not occur in the accounts is that this is held in common, so that while able to use the wood for purposes within the manor the Bishop was not able to exploit these woods commercially. Perhaps it is here that the tenants who paid wodlade were able to gather their wood. The case for wodlade being payment for the right to collect wood is strengthened by the fact that tenants from the manors that pay this do not normally appear in the forestmote rolls for taking green wood. The overall impression is one of intensively managed demesne coppice woodland at Clack and Cotcliffe, with perhaps a woodpasture with compartments at Aykedale. In general the documentary material from the 15th and early 16th centuries generates a picture of widespread coppicing, with common woodpasture surviving in an intensively managed form. It is however impossible to chart any rise in coppicing during this period because of a lack of a sufficient volume of evidence from which generalisations could be made.

Section 8.3

19th Century Woodland: Tithe and O.S. Maps

The most recent sources used in this study are tithe maps, enclosure maps, and the early editions of the Ordnance Survey. The analysis of the latter by Carter (1987) to produce the North Yorkshire edition of the Provisional Inventory of Ancient Woodland is thought to be an adequate reflection of the overall distribution of the woodland which survived from the sixteenth century into the nineteenth. The woods listed in the inventory are illustrated on figure K. In accordance with national trends (see chapter 3) the period between circa 1550 and 1850 saw the plantation of many new woods. This is illustrated by many tithe apportionments which make the distinction between 'woodland' and 'plantation', and by the number of named plantations on the O.S. and tithe maps. It is as a result relatively easy to determine some of the changes which had taken place since the sixteenth century. Figures 18-21 depict the tithe information from Swaledale in the Yorkshire Dales, Spaunton in north east Yorkshire, and Kirby Malzeard on the Pennine fringe. The Selby area unfortunately has a dearth of tithe information because of the density of ex-monastic holdings, so a conflation of the 1858 edition of the Ordnance Survey 6" map (Sheet 221) and the enclosure map for Cawood and Wistow has had to suffice.

Although certain general trends, such as the spread of plantation, the enclosure of commons, and the loss of woodland on commons are shared by most of the areas, it is also apparent that the intensity of these trends varied. The area under plantation appears to be most closely associated with landscape parks. These appear to have been particularly popular in the gently rolling landscape of the Pennine fringe. Other rolling landscapes such as the Howardian Hills were similarly affected. Plantation also appears to have been popular in lower Swaledale, This is only partly associated with landscaping, and may have been more the result of the locally high value of woodland (see section 11.3).

Fig.18 Spaunton Woods c.1850

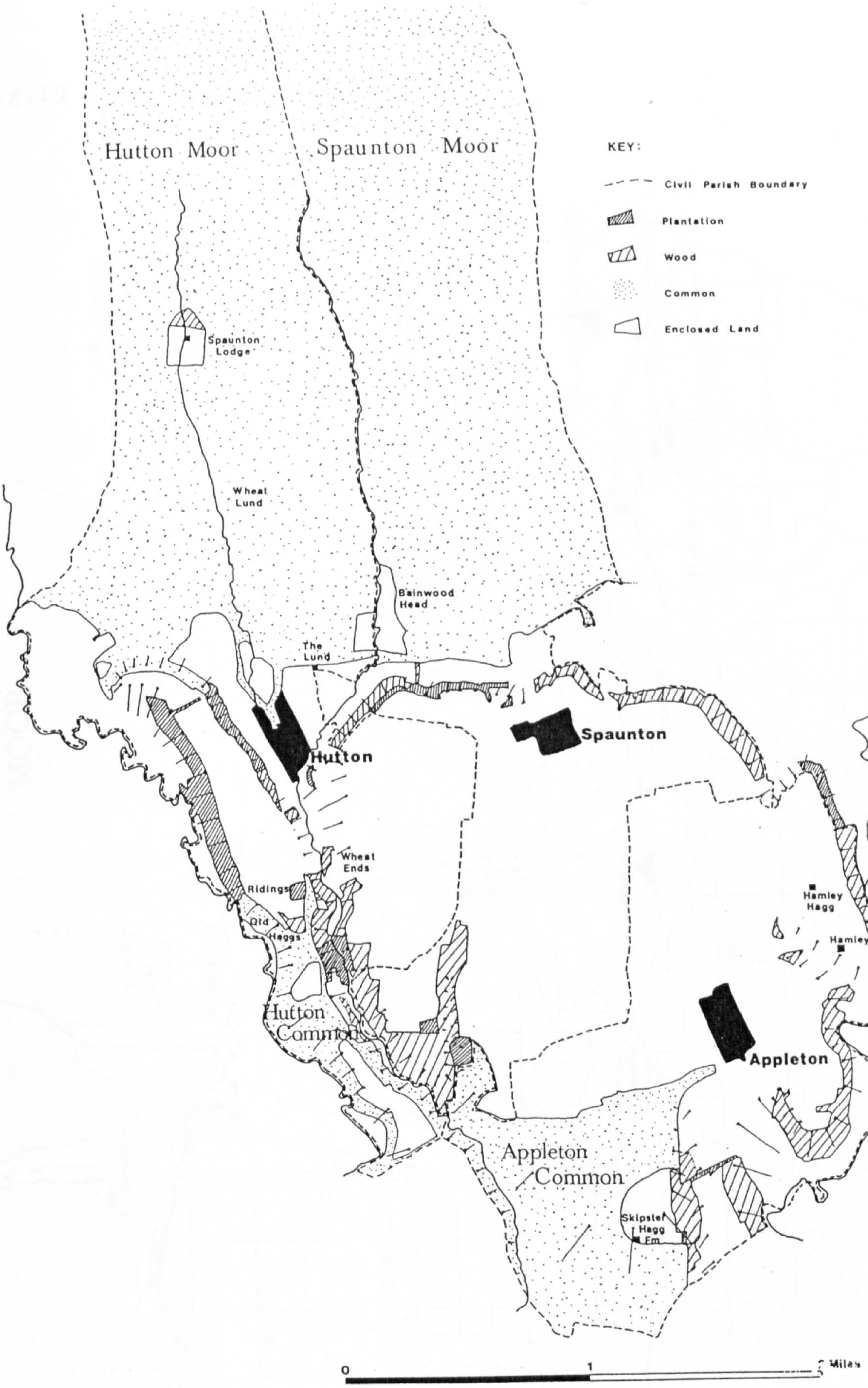


Fig.19 Upper Swaledale c.1850

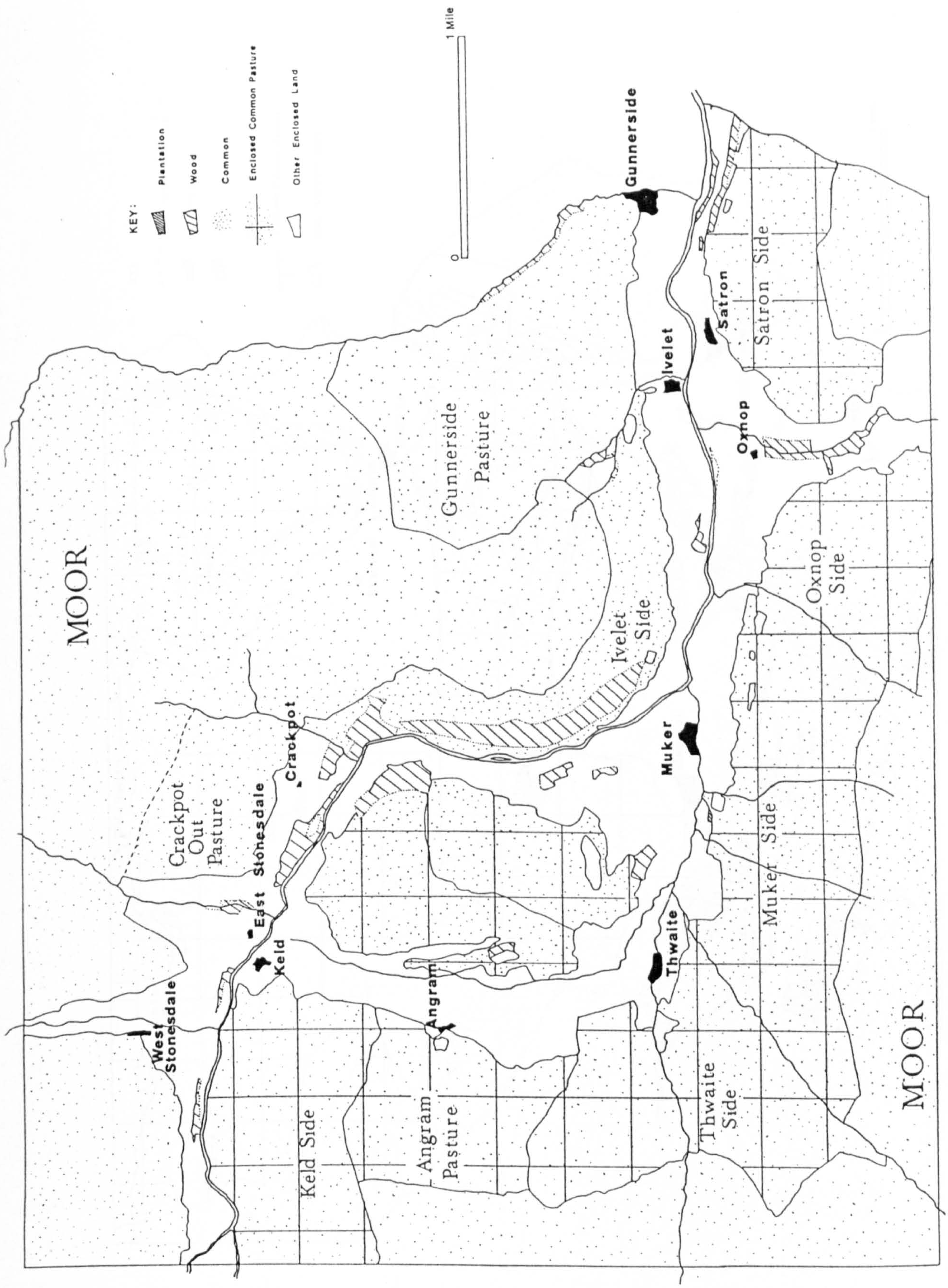


Fig.20 Lower Swaledale c.1850

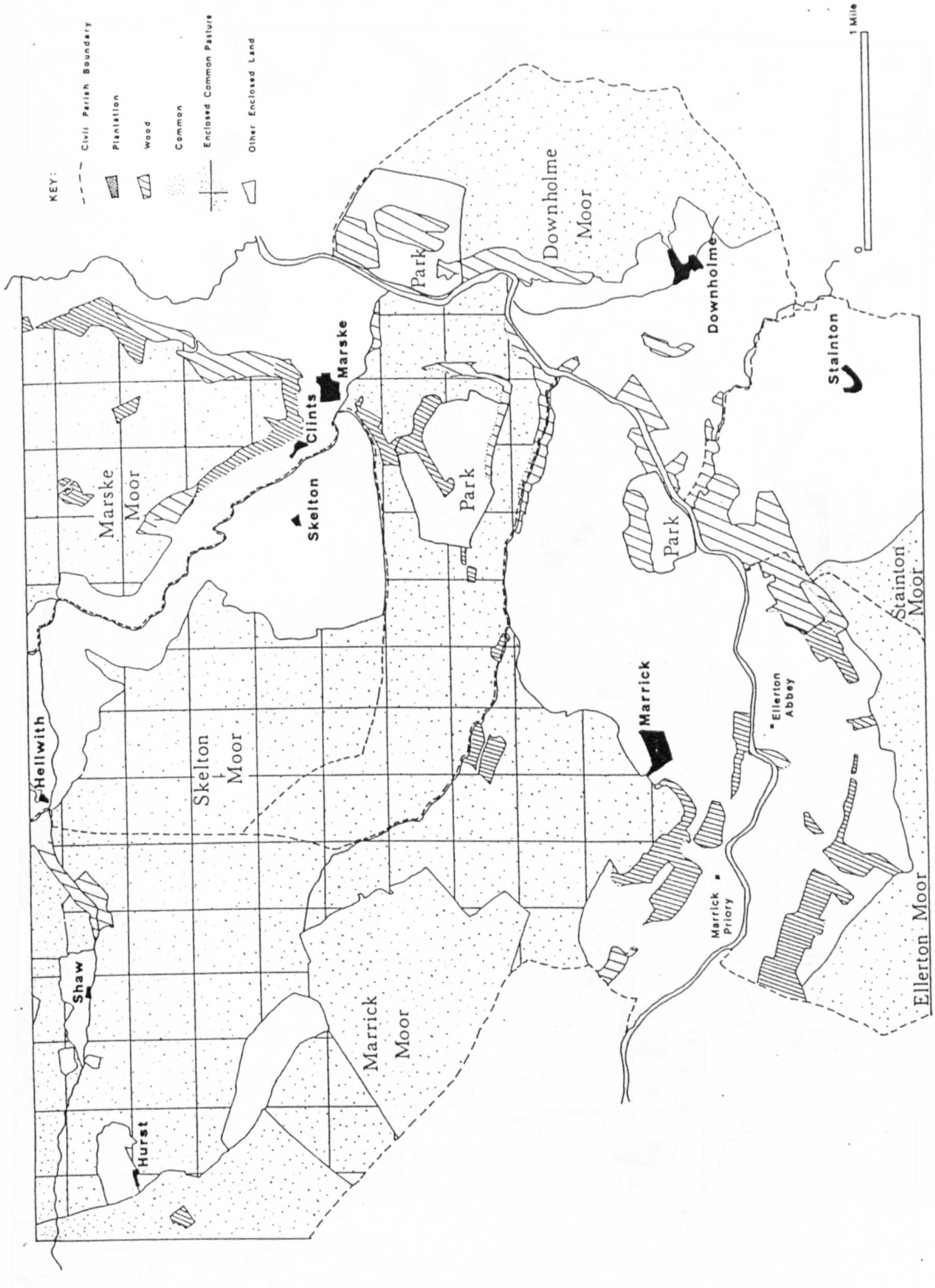


Fig.21 Kirby Malzeard & Grewelthorpe c.1850

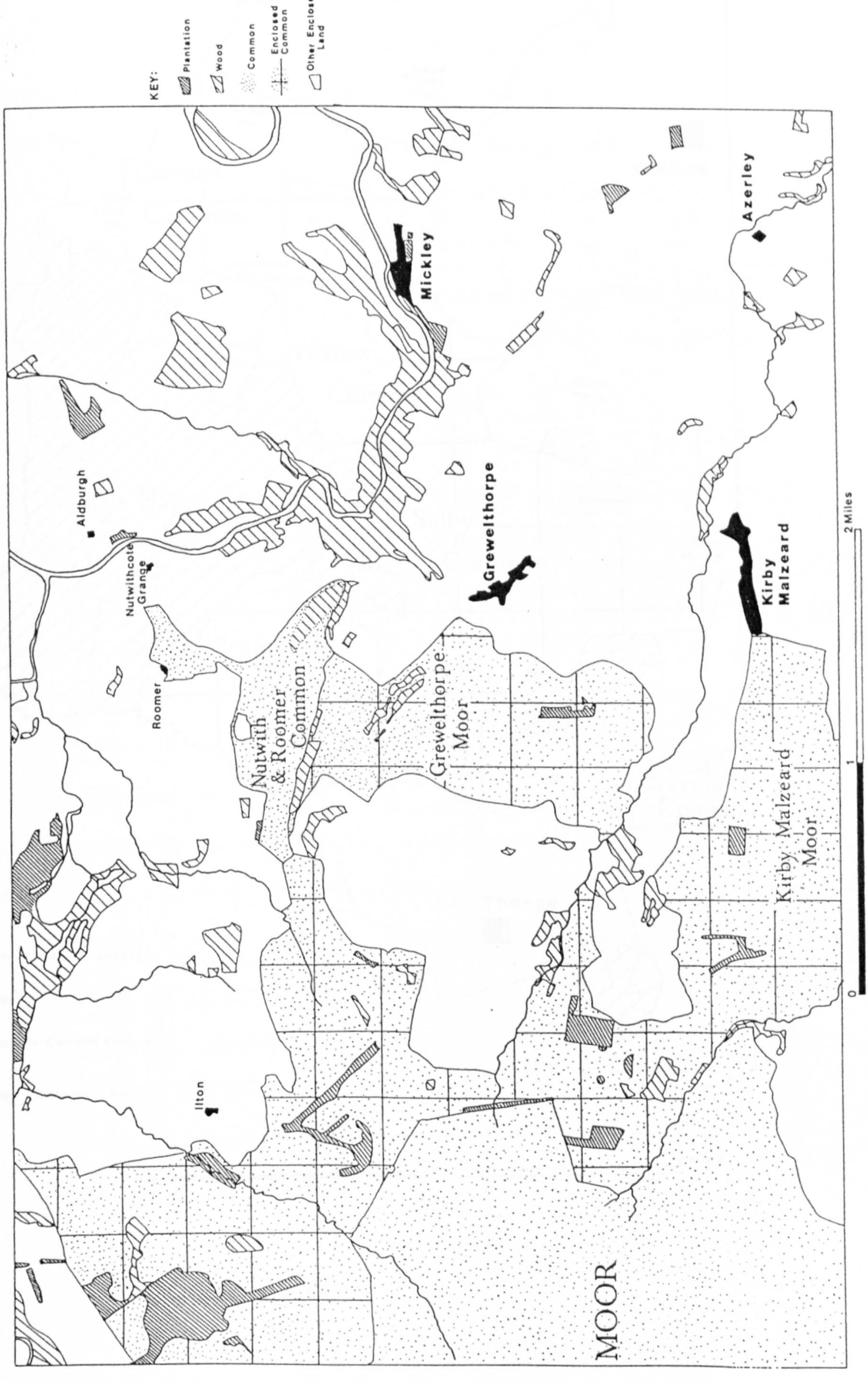
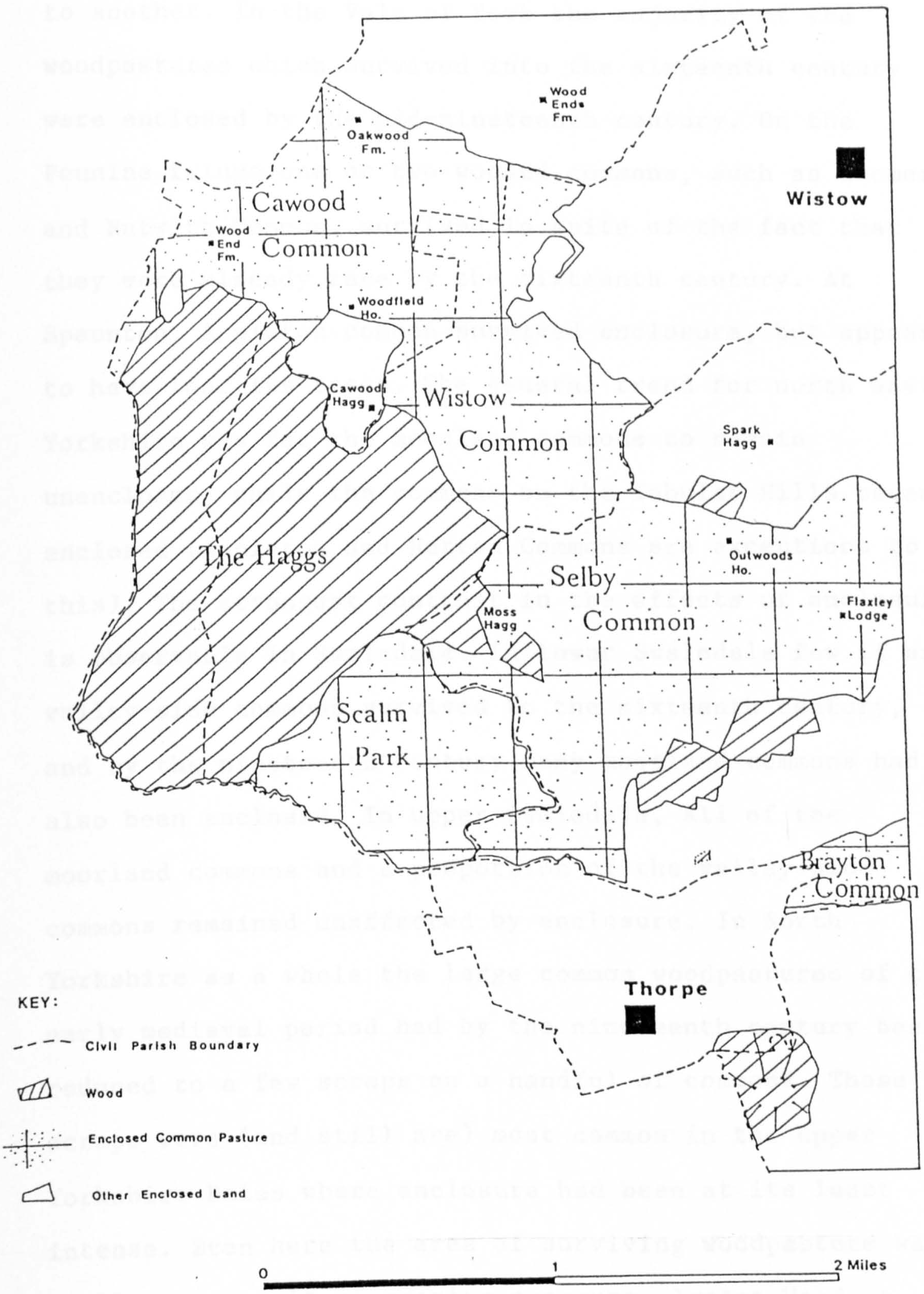


Fig.22 Selby Area c.1850



The intensity of enclosure also varied from one area to another. In the Vale of York the majority of the woodpastures which survived into the sixteenth century were enclosed by the mid-nineteenth century. On the Pennine fringe one or two wooded commons, such as Roomer and Nutwith Common, survived in spite of the fact that they were already rare by the sixteenth century. At Spaunton, Appleton common survived enclosure, but appears to have lost its trees. The general trend for north east Yorkshire was for the moorland commons to remain unenclosed, while the commons on the Tabular Hills became enclosed (Appleton and Hutton Commons are exceptions to this). The strongest contrast in the effects of enclosure is observable in Swaledale. In lower Swaledale few if any valley-side commons survived to the sixteenth century, and by the nineteenth century many moorland commons had also been enclosed. In upper Swaledale, all of the moorland commons and a proportion of the valley-side commons remained unaffected by enclosure. In North Yorkshire as a whole the large common woodpastures of the early medieval period had by the nineteenth century been reduced to a few scraps on a handful of commons. These scraps were (and still are) most common in the upper Yorkshire Dales where enclosure had been at its least intense. Even here the area of surviving woodpasture was small as a result of grazing pressure. Ivelet Wood is probably typical in showing a marked decrease in woodland area between the seventeenth and nineteenth centuries (see Appendix 2).

The fate of coppice woodland is less easily established. The frequency of coppice wood-names on the county map (Fig.L) suggests that the area managed as coppice continued to expand after the sixteenth century. It also implies that coppice woodland had a much better chance of surviving into the nineteenth century than did common woodpasture, and that a high proportion of the remaining woodland was, or had been managed as coppice.

Chapter 9.

Additional Scources.

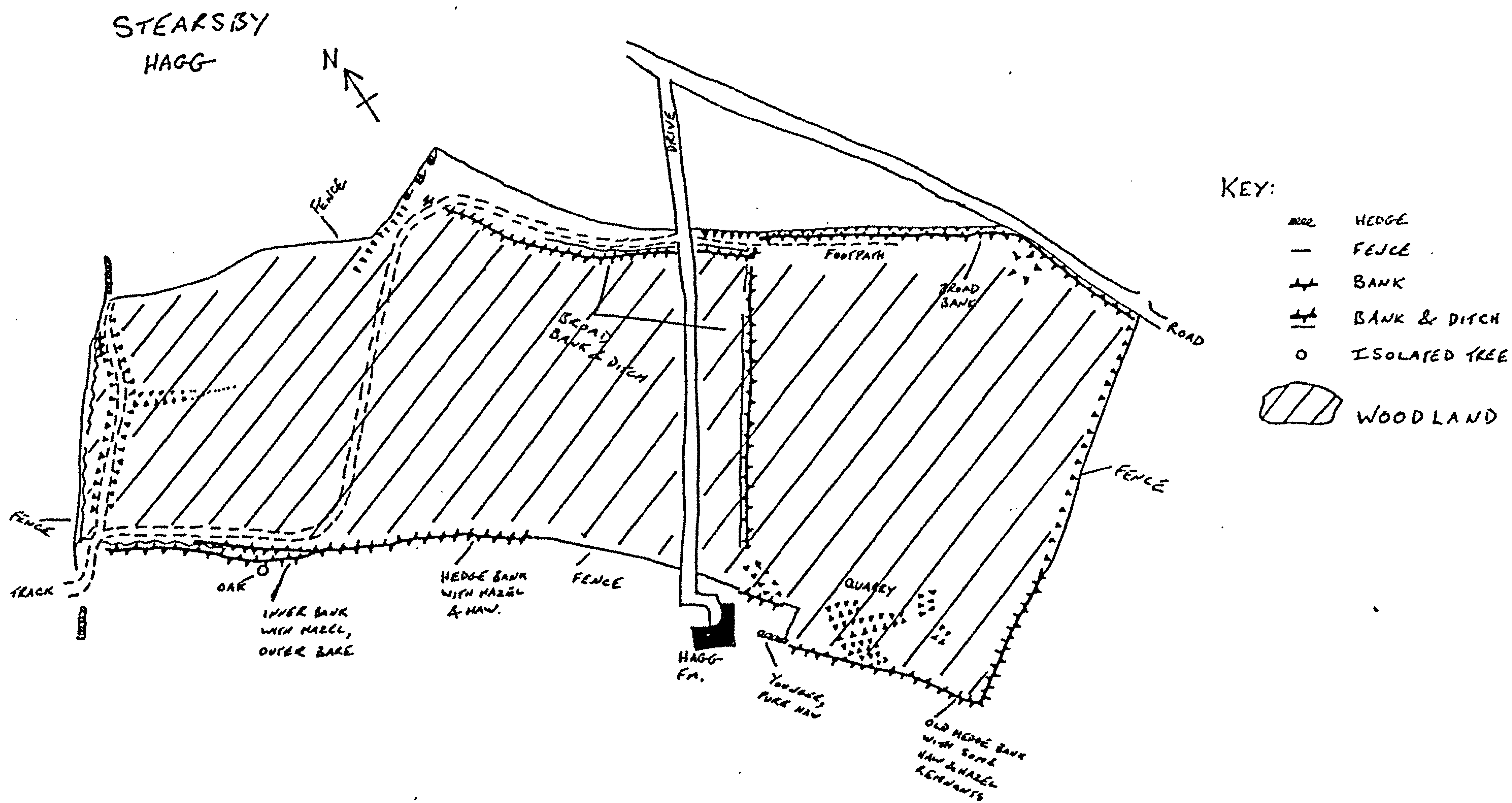
Section 9.1

A Study of Woodland Boundaries

Among the features which Rackham notes as typical of old coppice woodland in the South east of England, 'woodbanks' stand out as a particularly characteristic feature. In view of the abundant evidence for coppice management in North Yorkshire one might expect this type of feature to have been fairly common. Researchers such as Gulliver (1989) have however found such features difficult to locate. This difficulty was confirmed in a survey of 131 North Yorkshire woodlands, selected from the Provisional Inventory of Ancient Woodland (Carter 1987). Only 5 woods were located, which contained, were bounded by, or were close to possible woodbanks. In one of these cases, Stearsby Hagg in the Howardian Hills (see fig.23), the presence of woodbanks appears to be confirmed by documentary references from the 17th century (Nycrop 1988: 111-114.).

In the preceding discussion of medieval documentary evidence, reference was made to woodland enclosure. Boundary features are not uncommonly mentioned in references to medieval woodland, ditch (fossum), and ditch with hedge (sepium) being the most usual, though banks (vallum) (or is this wall?) also occur. It is possible that some of these refer to woodbanks, and in so

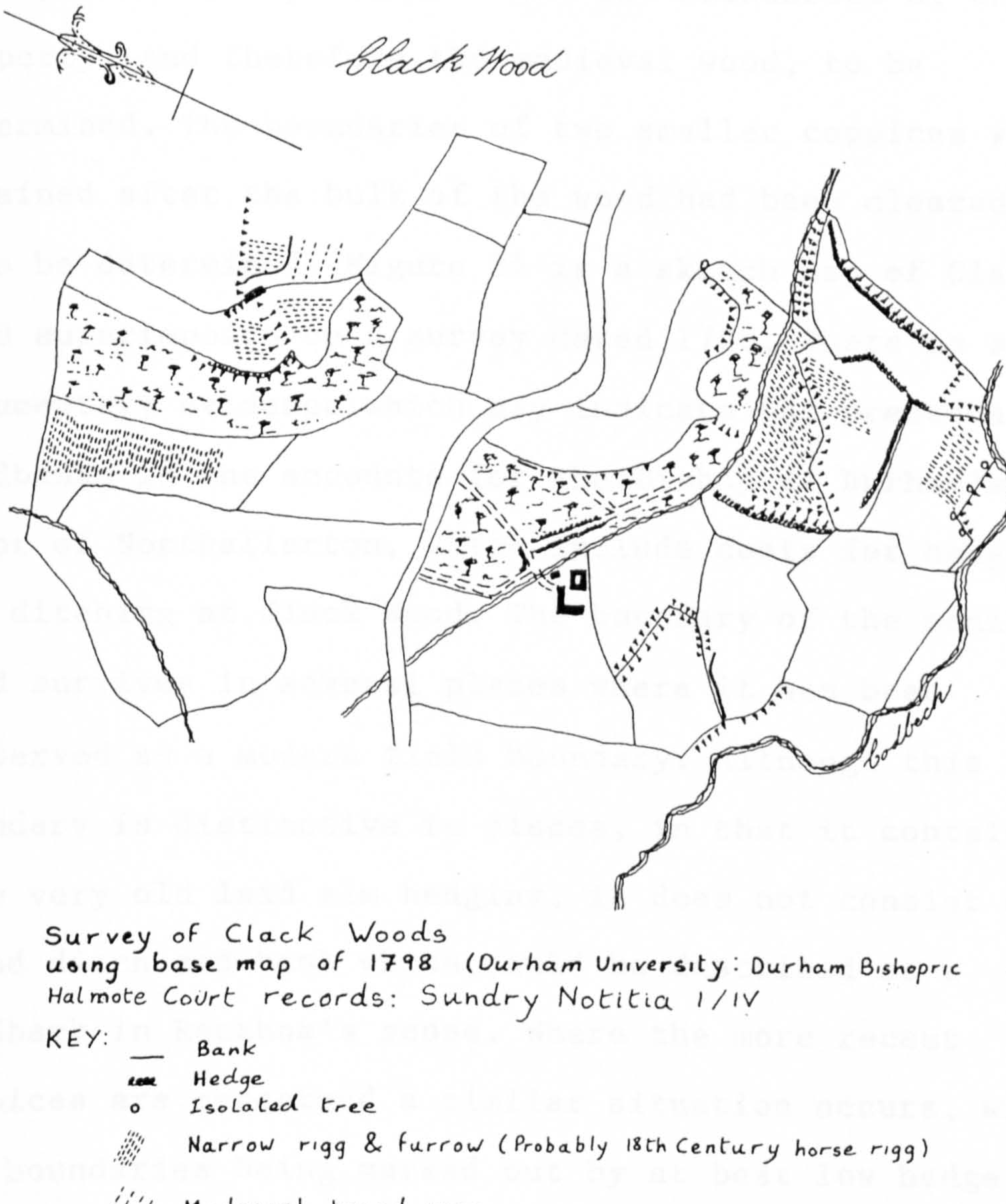
Fig.23


STEARSBY
HAGG
N
FENCE
DRIVE
ROAD
FOOTPATH
BROAD BANK
BROAD BANK & DITCH
FENCE
TRACK
OAK
INNER BANK WITH HAZEL, OUTER BARE
HEDGE BANK WITH HAZEL & HAW.
FENCE
HAGG FM.
QUARRY
YOUNGER, PURE HAW
OLD HEDGE BANK WITH SOME HAW & HAZEL REMNANTS
FENCE
KEY:
HEDGE
FENCE
BANK
BANK & DITCH
ISOLATED TREE
WOODLAND

far as the term woodbank refers to any bank and ditch enclosing a wood they must do. If on the other hand woodbank is defined in the stricter sense of the broad ditch and bank which Rackham observes, there is no reason why these references should necessarily refer to such features. At least a knowledge of such features is, however, implied by a grant of a wood called Bramleifall at Bramley, near Kirkby Misperton, to the abbot of Fountains, which prohibits raising of the enclosure or the creation of a wide ditch so that wild animals are prevented from entering (Lancaster 1915: 141).

In view of the above medieval documentation it was regarded necessary to make an additional enquiry into the existence of medieval woodbanks in North Yorkshire. The major problem involved in identifying and locating woodbanks in the field is a lack of knowledge concerning the position of the medieval woodland edge, which may be at a considerable distance from the present wood. A good example of this is Ivelet Wood in Swaledale, where the distribution of woodland features such as charcoal platforms covers a much greater area than both the present wood or the slightly greater area of woodland which is shown on the 1st edition 6" map. Clack wood near Osmotherley (referred to above) presents a rare opportunity to study a coppice wood where the location of the medieval boundaries can be established with a reasonable degree of confidence. This is possible because

Fig.24



Survey of Clack Woods
using base map of 1798 (Durham University: Durham Bishopric Halmote Court records: Sundry Notitia 1/IV

KEY:
- Bank
- Hedge
- o Isolated tree
- Narrow rigg & furrow (Probably 18th Century horse rigg)
- Medieval broad rigg

the property remained a distinct unit long after most of the woodland had been cleared. This cleared land became Clack Farm and was subject to a series of leases in the 17th and 18th centuries. A few of these leases were accompanied by maps which allow the boundaries of the property, and therefore the medieval wood, to be determined. The boundaries of two smaller coppices which remained after the bulk of the wood had been cleared can also be determined. Figure 24 is a sketch map of Clack Wood superimposed on a survey dated 1798. There is some documentary evidence which may indicate the presence of woodbanks in the accounts for the Bishop of Durham's manor of Northallerton, which include costs for hedging and ditching at Clack Wood. The boundary of the medieval wood survives in several places where it has been preserved as a modern field boundary. Although this boundary is distinctive in places, in that it contains some very old laid elm hedging, it does not consist of a broad ditch and bank which could be described as a woodbank in Rackham's sense. Where the more recent coppices are concerned a similar situation occurs, with the boundaries being marked out by at best low hedge banks.

Fig.25

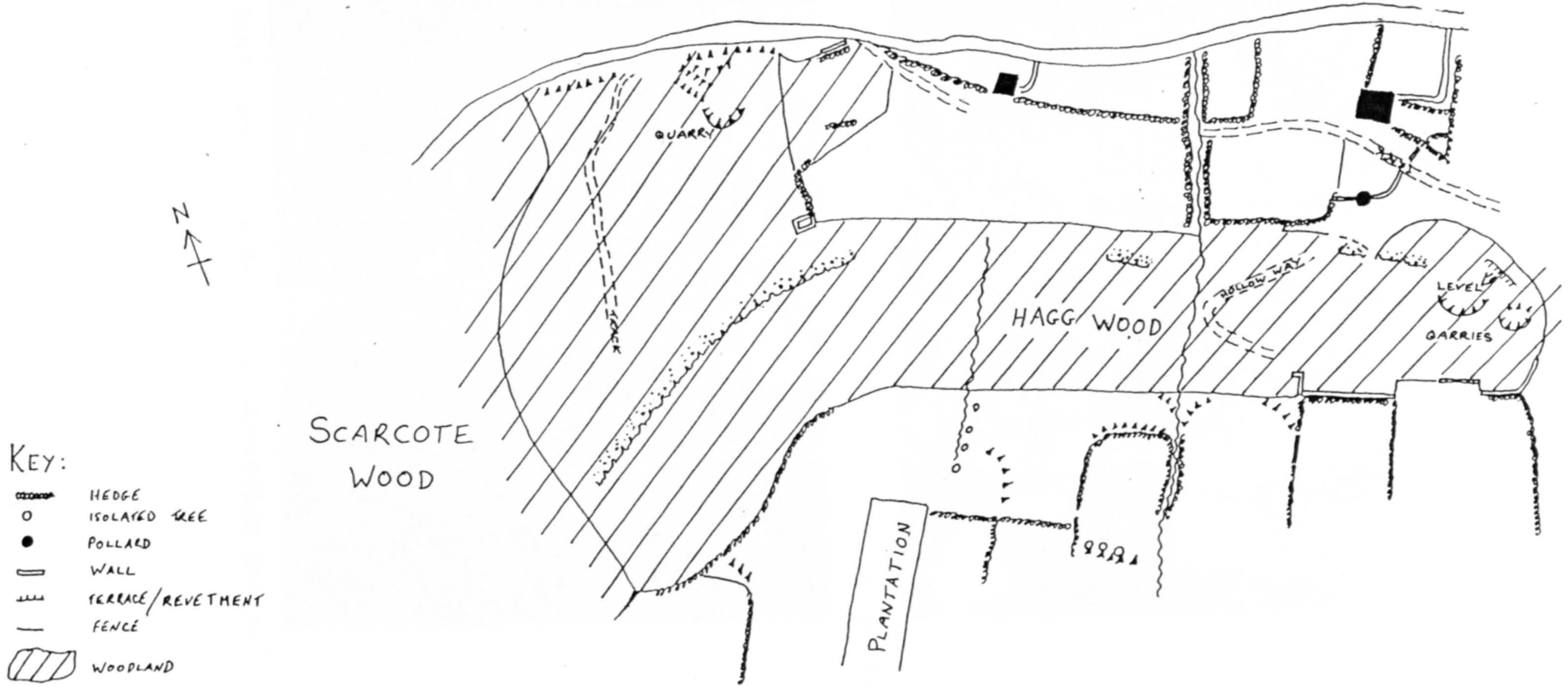

N
QUARRY
TRACK
HAGG WOOD
HOLLOW WAY
LEVEL
QARRIES
SCARCOTE WOOD
PLANTATION
KEY:
HEDGE
ISOLATED TREE
POLLARD
WALL
TERRACE/REVETMENT
FENCE
WOODLAND

Photo.1 Wood bank/ditch, Dicky Wood, lower Wensleydale.

Photo.2 Wood Bank, Stearsby Hagg, Howardian Hills.

The results of the survey of North Yorkshire woodland suggest that on the whole woods have been enclosed in very much the same way as the surrounding landscape. This principle is well illustrated by the example of Hagg Wood in Swaledale (fig.25). There is evidence to suggest that the southern boundary of this wood is of considerable age. This can be inferred from the strong lynchets at the edges of the fields here, which form a pattern of strips typical of medieval agriculture. It will be observed that the wood is not so much enclosed from the fields as the fields from the wood. One would expect this kind of enclosure pattern to be more typical of woodpasture than coppice, as it implies an intention to keep animals out of the fields rather than the wood. Although distinctive woodland boundaries do occur in North Yorkshire the enclosure of Hagg Wood is much more typical. Even in the case of the small number of woods where distinctive enclosure is observed, the characteristic broad banks and ditches which Rackham records in southern England are absent. The rather slighter banks which have been found in a small minority of woods such as Stearsby Hagg may well be of post-medieval date (see photographs on previous page for a number of examples).

It would appear therefore that a marked contrast in the morphology of woodland enclosure exists between North Yorkshire and the Lowland counties of England. This may have important implications for the history of woodland management in the two areas. Woodbanks of the kind observed by Rackham involve, as Rackham points out (1990: 116), a considerable investment in time and labour. It follows that these were expected to perform their function as woodland boundaries for some considerable time. Indeed the remarkable stability of woodland boundaries observed by Rackham in Lowland England can be seen as both the cause and the effect of the creation of these features. This implies that in areas such as North Yorkshire where such enclosure is rare or entirely absent, the stability of woodland management and boundaries which characterises Lowland England was also absent. It seems possible therefore that North Yorkshire has a medieval woodland history which is different from that of the Lowland counties, and may be characterised by a greater fluidity between different forms of management and a greater instability of woodland edges.

The survey evidence for a more fluid relationship between different forms of management appears at first sight to be directly contradicted by the various forms of documentary evidence for medieval coppicing. This is not so problematic as it might at first sight appear. Of the unambiguous references to coppice two of the most explicit (Aislaby and Heck Falls) are very late 14th century, and might therefore be considered to properly belong to a late medieval coppice expansion rather than late examples of high medieval practice. All the remaining references imply some degree of compromise between grazing and coppice, with enclosure after cutting being for as little as one year. References to enclosure are discussed above. Although these references can reasonably be interpreted as indications of coppice, few conclusions can be reached concerning the stability or form of these boundaries. The evidence of wood names is equally ambiguous, Hag(g) is as likely to refer to a compartment within a woodpasture, as a strict coppice wood. The four compartments within Selby Outwood are for instance referred to as haggs (see above).

Section 9.2

Pollen evidence for the Historic Period

Pollen evidence for the historic period has tended to be neglected somewhat by palynologists in the past. There appear to be two main reasons for this; firstly the difficulty in finding peat profiles which extend into this period, and secondly a conception that palynology has little to add to the documentary picture. This attitude is summed up by a comment made by R.T. Smith (1987):

"As we move into the post Roman Period, paleoecological material changes somewhat in status from being the primary evidence of change, and of man's involvement, to being merely corroborative of the extent and intensity from documentary sources."

A consequence of this attitude is that there is a lack of dated pollen diagrams for the period, and that few questions have been posed. Most researchers are content to assign peaks in the arboreal pollen curve to a post-Roman, or post Black Death recovery in woodland, increases in pastoral indicators usually being attributed to monastic activity. Whilst these interpretations are probably quite valid, should the documentary evidence really be accepted without question? Are there no questions which would be better answered using palynological rather than documentary sources? We have already seen that there are difficulties in deducing the distribution and development of woodland in North Yorkshire. Can the rise in coppicing, implied by the documentary evidence and wood-names in the late medieval and after, be detected in pollen diagrams? To what extent can other forms of management, or regional variation be detected? Only through a series of well dated pollen studies can such questions be addressed. The lack of study of historic pollen represents a neglected opportunity, both to add to our knowledge of the development of the medieval and post-medieval landscape, and to work from known landscape situations to the pollen record, helping us to obtain greater insight into the formation of that record. In spite of the dearth of well dated pollen studies for the period it is worth discussing the information available. As with the prehistoric pollen record there is a marked bias towards the acidic uplands where suitable sites are much easier to find.

Medieval Pollen on the North York Moors

The most useful palynological work done in this area is the series of profiles studied by Atherden (1972, 1976) in the Goathland area. These are correlated with a single well dated profile at Fen Bogs. At Fen Bogs, and at the two high moorland sites of May Moss and Simon Howe Moss the late prehistoric and Roman clearances observed in section 5.3 are followed by a recovery of arboreal pollen commencing between 400 and 650 AD cal. (1530 +/- 130 bp), and ending before 780-1160 AD cal. (1060 +/- 160 bp). During the following period of clearance, woodland disappeared from the moorland edge sites of Gale Field and Moss Slack, which had remained wooded until this time. This is followed by a second recovery of arboreal pollen, dated between 1420 and 1640 AD cal. (390 +/- 100 bp) This is more marked at Fen Bogs and the two moorland edge sites, being relatively minor at the high moorland sites of May Moss and Simon Howe Moss. As these latter two sites probably give the most regional picture it is possible that any expansion of woodland at this time was more localised than that in the immediate post Roman period. If these paleoeceological studies are compared with others from the area, similarities can be observed.

As discussed in section 5.3 a major woodland recession is recorded at all of the high moorland sites, which is probably of late prehistoric and Roman date. The following recovery in arboreal pollen is appreciably more marked at the sites of Loose Howe and Yarsley Moss, nearer the moorland edge, than at Howedale Hill (Simmons & Cundill 1974a) where the recovery is relatively small. The second (medieval?) clearance phase and subsequent recovery in arboreal pollen observed at Fen Bogs is also recorded at Howedale Hill and Yarsley Moss. Again the effects of any woodland regeneration are felt more strongly nearer the moorland edge.

Pollen diagrams close to the moorland scarp such as Moss Swang, Lady Bridge Slack, St Helena, or Blakey Landslip, (Simmons & Cundill 1974a&b.) tend to be more akin to Atherden's sites of Moss Slack and Gale Field (Atherden 1972, 1976) in the vegetational changes recorded, with woodland generally seeming to persist longer. Where, as at Lady Bridge Slack a probable Roman clearance is recorded this is followed by strong regeneration. Clearance at other sites may be as late as the medieval period. Similarly at Wheeldale Gill clearance appears to be slightly later than the high moorland profiles, and is followed by strong regeneration (Simmons & Cundil 1974a).

The second recovery in arboreal pollen observed in the moorland profiles is very variable in the moorland edge profiles. The two sites at St Helena (Danby Dale), though only a few hundred metres apart, show completely different developments. At St Helena A there is no significant recovery of arboreal pollen after the initial clearance of woodland from the site. At site B however secondary woodland develops close to the site soon after clearance, and is regarded by Simmons et al (1982) to have been removed relatively recently. The situation at Blakey Landslip, showing a moderate recovery in arboreal pollen, lies somewhere between these two extremes.

In general the collection of pollen studies from the North York Moors appear to indicate that a great deal more woodland survived the sustained and intensive use of moorland pasture during the Late Prehistoric and Roman periods as moorland scarp or gill woodland than on the moorland tops. It is also in these areas that post-Roman regeneration of woodland is likely to have been strongest. The second (probably late medieval) woodland expansion is also likely to have been concentrated on the moorland scarp but is more patchy, probably because the woodland here had by this time been severely reduced, or because of differential impact of late medieval agricultural recession.

The Pennine pollen record

On the Pennine fringe a study of the Nidd-Skell interfluve by Tinsley (1972) provides a well dated study. Here the intensive utilisation of upland pasture in the late prehistoric appears to continue a little beyond the end of the Roman period. After this, as on the North York Moors, more wooded conditions returned, the recovery in arboreal pollen being much greater at the sites of North Gill and Upper Skell Gill than on the moorland tops. The former sites appear to record the establishment of secondary woodland in the immediate vicinity. A second, probably medieval, phase of woodland clearance greatly reduced the arboreal pollen at the gill sites. This was followed by a recovery at North Gill, the peak of which is dated to between 1310 and 1420 AD cal. (530 +/- 80 bp) and probably reflects the temporary regeneration of gill woodland. With the exception of Ellerton Moor Swaledale (Fleming pers.comm.) more upland profiles here and elsewhere in the Pennines, as at Thornton Mire (Honeyman 1985) show little sign of post-Roman woodland regeneration. As dating for Craven pollen studies is on the whole very poor for the historic period few conclusions can be reached for this area.

Section 9.3

Investigating the Nature of Woodland Change

Perhaps the greatest difficulty in interpreting variations in arboreal pollen in the record for the historic period is uncertainty whether these reflect genuine clearance, or management techniques such as coppicing or pollarding which might inhibit flowering, particularly if the rotation were short. This concern is voiced by Honeyman (1985) who suggests that declines in arboreal pollen to very low levels in Wensleydale during the medieval period might be due in part to coppicing or pollarding. Re-expansions in arboreal pollen in the late medieval and the recent past might, she suggests, be due to a change of management rather than solely the formation of secondary woodland (Planting of hedgerow trees is also suggested in the latter case) (Ibid). There is as yet no established palynological signature for different forms of woodland management as there is for pasture and arable land use. Indications of what such a signature might have been in the case of coppice woodland come from a study of pollen in Monks Park, Suffolk, (Rackham 1990: 71) where oak and hazel pollen are believed to be over-represented; oak because it is treated as a standard tree rather than coppiced, and hazel because unlike many other trees it is capable of flowering the second year after felling and responds to the increased amount of light available after coppicing. This over representation of hazel in the pollen record is also used by Turner (1965) to infer medieval coppicing in the vicinity of Wixhall Moss, Flintshire. High hazel in the pollen record for coppice woodland may have little value in detecting well established, and continuing management. It would be impossible to distinguish a coppice wood from a wood consisting mainly of hazel. It may however provide a means for investigating the nature of change. It might be possible to distinguish an hiatus in coppicing or pollarding from genuine expansion of secondary woodland. A relaxation of management might thus be expected to result in an increase in pollen associated with trees normally treated as underwood, such as for instance ash, elm, lime and maple, and perhaps declines in oak and hazel pollen (oak because it is often treated as a standard in coppice with standards woodland and hazel because the increased shade would inhibit flowering). Genuine expansions of woodland on the other hand would be recorded as increases in pollen associated with trees typical of secondary woodland, such as hazel, birch and ash. Detailed examination of almost any suitable pollen study in North Yorkshire reveals that where present the rise in arboreal pollen at the end of the Roman period represents the establishment of secondary woodland, expansions of Corylus and Betula pollen as at Fen Bogs being typical (Atherden 1972). Similarly the following medieval drop in arboreal pollen must represent genuine clearance as Corylus and Betula typically suffer the most. In the late medieval period the rise in arboreal pollen is again mainly due to expansions in Betula and Corylus and is thus also probably best interpreted as secondary woodland. This is particularly marked at Tinsley's site of North Gill where a secondary birch wood establishes itself close to the site. In Wensleydale, however, at Thornton Mire _Ulmus_, _Quercus_ and _Fraxinus_ pollen are the most important components of a late Medieval rise in arboreal pollen, and may, as Honeyman (1985) suggests indicate a temporary relaxation of management, though some secondary woodland is indicated by a small rise in _Betula_ pollen and a very small peak in _Corylus_. _Corylus_ pollen only accounts for only a small part of the arboreal pollen in the period of medieval clearances prior to this. It may therefore be that pollarding rather than coppicing was responsible for the very low levels of arboreal pollen, as this ought to have the same effect of preventing flowering of many trees without hazel playing a major part in the pollen spectrum. It is of course also possible that secondary woodland here was different in nature from that recorded by the other diagrams, perhaps because it was confined to limestone scarps, a characteristic location for ash-elm woodland in Wensleydale today.

Summary of the pollen evidence

Even the meagre amount of pollen evidence available serves to fill in the picture of woodland development considerably. On the North York Moors the importance of the moorland scarp as a refuge for woodland during the late Prehistoric and Roman periods, which would be suspected from documentary and place-name evidence, appears to be confirmed. The deductions from documentary and place-name sources concerning a similar role for gill woodland on the Pennine fringe are also confirmed by palynological studies. Pollen studies allow post Roman and late medieval woodland expansions to be identified, and enables us to suggest that scarp woodland on the North York Moors and gill woodland on the Pennine fringe may have been important in these woodland expansions. Where management is concerned little can yet be said as too little is known about the effects of management on the pollen spectrum. The rise in elm and ash pollen in late medieval Wensleydale may for instance be as satisfactorily explained by the formation of secondary woodland at distinctive geological locations, as by a relaxation of management.

PART 3.

THE CREATION OF WOODLAND HISTORY:

Factors affecting the distribution and management of woodland; towards a model for change and diversity.

Chapter 10

The Influence of Environment on Woodland History

Section 10.1

Introduction

The content of this final part is founded on the assumption that change and differentiation of woodland is the result of a limited number of factors which it is possible to describe and illustrate. It is not intended to provide a total explanation of every development in the woodland of North Yorkshire (indeed it is doubtful whether this would be possible), but rather to provide a discussion of the possible variables involved, and to illustrate these using specific examples. The factors affecting woodland history are discussed under three headings as follows: Environment, Economics, and Social Structure, each being the subject of a separate chapter. The order in which these topics are discussed, and the arrangement of discussion within each chapter, proceeds from the relatively simple to the more complex. Chapter 10 which addresses environmental factors is a comparatively straightforward discussion of the observed relationship between a limited number of environmental factors and woodland management and distribution. The chapter on economic variables begins with a simple premise, the validity and implications of which are investigated with reference to increasingly complex contexts. The influence of social structure on woodland history is couched initially in terms of the conflict of interest between landlord and tenant. This is followed by a number of specialised circumstances which may have influenced woodland history. The separation of factors into different chapters in this way is not intended to imply that these are independent of each other. Indeed it is quite clear that the influences on woodland history discussed are very much interdependent

The effect of the environment is perhaps the easiest and most tangible factor to consider, though even here it must be remembered that certain aspects of the environment were not necessarily always as now. A small number of basic environmental variables are considered; soil, geology, elevation and slope. These are not necessarily the only factors involved. However, factors such as rainfall, drainage, etc. are difficult to define for past time periods, and are in any case likely to be influenced to a major extent by the factors chosen for discussion.

Section 10.2

Woodland Distribution

The post-glacial woodland history of North Yorkshire can be divided into two distinct main periods: one spanning most of prehistory to the beginning of the Iron Age, when, in most areas, woodland was the dominant vegetation cover. The second extending from the Iron Age to the present day, during which woodland has formed a relatively minor proportion of the vegetation in most areas of the county. This division has a major influence on the approach needed for a study of the interaction between woodland and environment. In the earlier period woodland distribution is likely to have been dictated by the distribution of most intense human activity. In the later period woodland distribution was probably more closely related to the availability of refugia. One type of refugium is immediately apparent from the evidence of the preceding chapters. The consistency with which woodland has been able to survive on steep slopes in many parts of North Yorkshire, and in many periods, is illustrated by a wide variety of examples. In the area of Spaunton in north east Yorkshire woodland was restricted to the steepest slopes, both in the 16th century, and in the 19th century (see figures 17 & 18). Similar conclusions can be reached from the disposition of early medieval woodland in Wensleydale using the distribution of woodland place-names (fig.9), and from the documentary evidence for woodland in the Forest of Pickering (fig.10). Even in the flat lands of the Vale of York the steep slopes of Hambleton Haugh and Brayton Barf were the sites of medieval woodlands which survive to the present day.

A consideration of the map of ancient woodland, and that of medieval woodland references, suggests that the availability of slope refugia was probably the most important factor in determining woodland distribution. In north east Yorkshire for instance, it was the Tabular Hills with their many gorges which supported most woodland, in spite of their well drained, fertile, limestone soils (see fig.C), and the long history of settlement in this area. Similarly it is evident that in the Northern Vale of York, and the Vale of Mowbray, medieval woodland references are strongly associated with river courses whose banks provided steep slopes (see fig.G). It is only in the Vale of York that the availability of slopes was not the main woodland refugium. Here it would seem most likely that woodland clearance was inhibited by the wide expanses of heavy, wet, soils on the glacial lacustrine clay which dominates the Vale of York. It is thus probable, though difficult to illustrate, that heavy soils and poor drainage may have been a determining factor for woodland distribution in this area. One or two examples appear to support this view; Askham Wood to the south west of York (see section

5.5) is clearly associated with a bog. At Bishop Wood near Selby woodland is located on the heaviest and least well drained soils. It is perhaps also the case that settlement in the Vale of York was inhibited by the clay soils and a tendency towards flooding.

Section 10.3

Pasturing Animals as a Determinant of Woodland Refugia

The mechanism by which woodland becomes restricted to characteristic refugia involves the interaction between man and environment, and therefore the complex issues of motivation discussed in the following chapters. However, one important aspect of the human exploitation of the landscape will be discussed here, namely the eating habits of domestic animals. It is apparent from palynology, archaeology, history, and present land use, that pastoralism has been an important component of the rural economy in North Yorkshire since the Neolithic. It follows that the grazing habits of domestic animals will have been a major determinant of woodland distribution. A consideration of the observed effect of grazing may therefore provide a suitable model for understanding part of the relationship between woodland and environment. In areas such as the Pennines, where the continued use of common pastures allows animals a free choice of grazing, a characteristic distribution of woodland develops. Trees in these situations have a marked tendency to be

Photo.3 Hubberholme& Rais woods, upper Wharfedale.

associated with steeper slopes. This is illustrated particularly well at Hubberholmein upper Wharfedale where the geology of the Yordales Series provides a series of alternating steep and shallow slopes on the valley sides. This stepped-effect has led to differential effects on the woodland, allowing trees to persist much longer on the steeper slopes than on the terraces (see photo).

Section 10.4

Environment and Woodland in Prehistory

In the earlier periods of settlement of North Yorkshire, when woodland is likely to have been the dominant form of vegetation, the distribution of competing land-uses such as open pasture, or arable fields can to an extent be equated with the distribution of settlement. The rather sketchy picture of Neolithic settlement given in chapter 5 appears to show a preference for calcareous soils. The tendency for a bias towards these is sustained to a certain extent during the Bronze Age, though there are expansions into other areas such as the Vale of Mowbray whose fertile soils have made it an important agricultural area ever since. Modern concepts of fertility were not however necessarily the deciding factor where prehistoric clearance is concerned and it must be noted that during the Bronze Age areas such as parts of the North York Moors were brought into cultivation. The pastoral activities of prehistoric peoples on the uplands of the Pennines and the North York Moors may also have had an impact on woodland cover. Here the pollen record shows a gradual decline in tree pollen during the Neolithic and Bronze Age, which may be the combined effect of grazing and the slow growth of trees in these exposed areas.

Section 10.5

Environment and Management

Discussion of the effect of environment on woodland management is complicated by the fact that the two forms of management were dominant at different times, and by a paucity of information on the nature of woodland at the point where woodpasture is enclosed and made into coppice. It is possible to compile a short list of variables which might have influenced the choice of one area over another for encoppicement. Those relevant for discussion here are tree growth rate, and tree density. The first of these is, to a large extent, determined by exposure. Trees in upland locations, and in exposed situations have a much slower growth rate than lowland trees on sheltered sites. The effect of this is both regional and local. The regional effect is best observed on the map of coppice related wood names (fig.L), which shows that woods with coppice names are largely absent from the upper Pennine Dales. The local effect is less obvious but may have led to the encoppicement of woods on the more sheltered southern flanks of the Dales, as in Swaledale, in preference to more exposed northern slopes.

Tree density is likely to have affected the siting of coppice when part of a woodpasture was enclosed. When for instance coppicing was re-established at Clack Woods near Osmotherley it was the steepest slopes, which presumably had the greatest proportion of surviving trees, which were encoppiced, the rest being let as grazing. The map of 16th century woodland in the Spaunton area (fig.17) suggests a similar process, with the wooded common, Ampsters Wood, occupying more gently sloping ground than neighbouring coppices such as Skipstones Hagge, and Rygge Hagge.

Chapter 11

Economic Factors

Section 11.1

Woodland Value

In this chapter the effect of economic factors on woodland distribution and management is discussed. One obvious approach to this topic is to consider the 'value' of woodland versus other land uses. In other words we might suggest that if a piece of wooded land is of greater value when converted to some other use, then it is more likely to be cleared. This statement is based on a number of assumptions. It is for instance assumed that woodland is not removed for any reason other than to use the land for some other purpose. If this were true then it would follow that agriculture was the main agent for woodland clearance, and that at any point in time the woodland distribution would reflect the agricultural preferences of the period, and those which preceded it. One might also wish to consider exactly what is meant by 'value'. Naturally the term must include the concept of financial worth, but how do we measure this when discussing periods in which there was no currency which we can recognise, and what of value of a social or personal kind? As this section is concerned with issues which are economic the concept of value used here will be restricted to one of 'practical worth', leaving social issues to be discussed in the next section. The argument of comparative value used in this sense is not particularly original; it is for instance discussed by Rackham (1980: 170), and is implicit in a number of other studies.

In the previous chapter it was demonstrated that woodland distribution from later prehistory onwards was primarily dictated by the availability of woodland refugia on steep slopes and possibly on heavy wet soils. The economic argument provides a simple mechanism whereby this distribution could come about. One might thus see woodland clearance primarily as a result of the expansion of the agricultural economy in response to rising population. This would affect the most fertile soils first, leading to the progressive clearance of more and more marginal areas. As woodland became less widespread it would acquire scarcity value, eventually reaching a point when the value of the woodland equalled that of any other land-use on the same piece of land.

When applied to a region such as North Yorkshire, which has large areas which have never been cultivated, this model obviously has its limitations. However if this approach is combined with the models for pastoral clearance suggested in the previous chapter it is possible to explain most aspects of woodland distribution. The retreat of woodland to refugia such as steep slopes and heavy wet soils is easily explained in terms of the difficulties these might have presented for agriculture or grazing. Similarly it seems reasonable that prehistoric agriculturalists preferred fertile, well drained, calcareous soils. It may therefore be for this reason that the woodland of the Wolds was probably mainly cleared by the late Neolithic, whereas in the Vale of York major clearance did not take place until some 3000 years later.

The economic model of woodland history also has implications for woodland management. It follows from the model that anything which makes woodland more valuable would tend to have a conserving influence. One way in which this might occur is by converting the woodland to coppice. This will increase the value of the wood both by increasing its the annual yield of wood for a given area, and by providing materials which may be difficult to produce in any other way. Another way in which the value of woodland might be raised is where a particular demand is created. This, by locally increasing the demand for woodland products, should increase their value. The exploitation of woodland by industry presents a number of opportunities to test the validity of this model.

Section 11.2

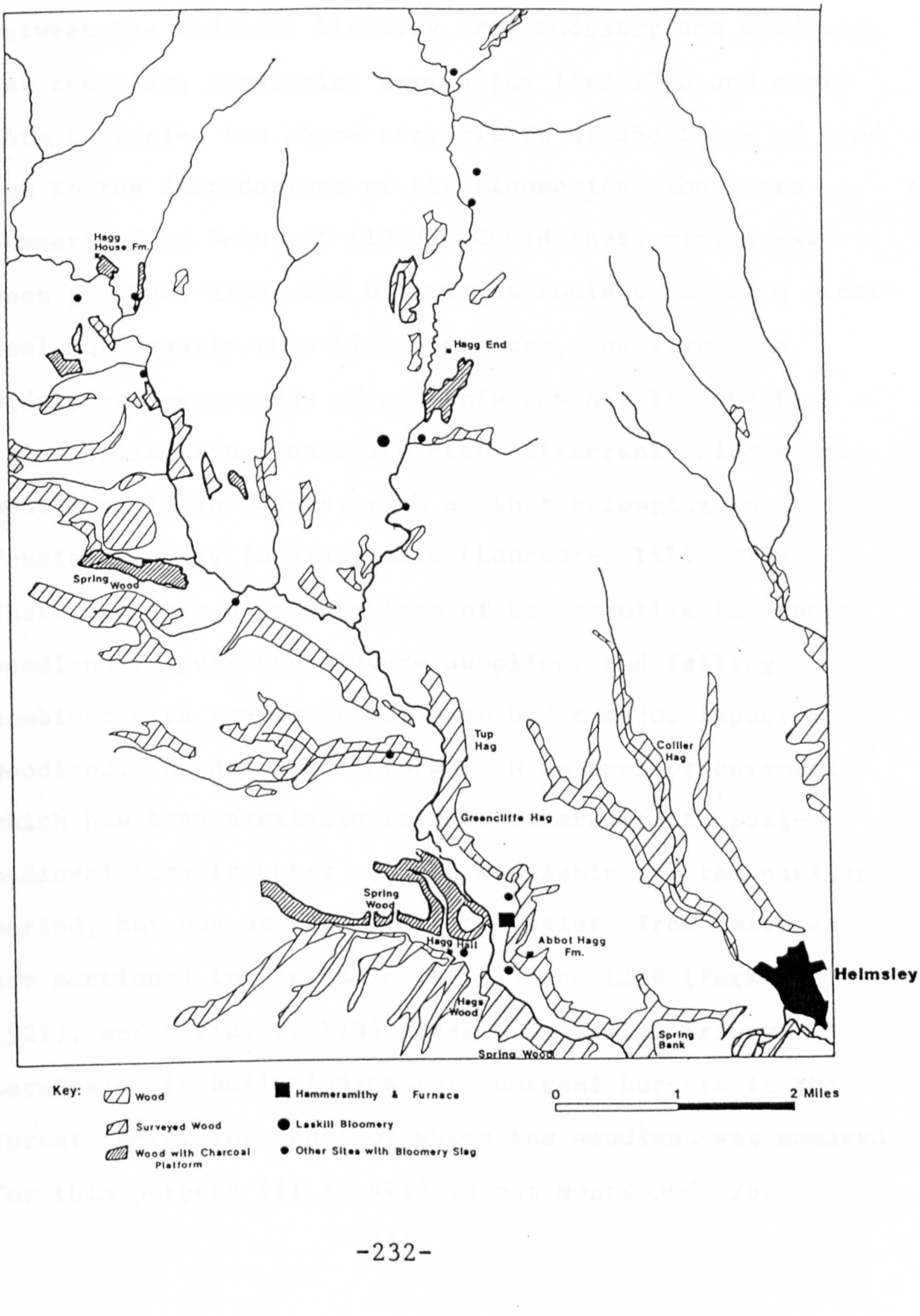
Woodland and Industry

There has been some discussion in recent years on the topic of the relationship between woodland and the iron industry. For some time it was thought by historians that the iron industry of the 16th-18th centuries was responsible for woodland destruction on a massive scale. At this time iron was smelted in a blast furnace using charcoal to produce the necessary heat and a reducing atmosphere. The resulting cast iron was re-melted under oxidising conditions to remove the excess carbon, and finally forged into wrought iron at the hammersmithy (Description in Tylecote 1992). The argument for the destruction of woodland comes partly from the prodigious quantities of charcoal needed for these processes, and from a number of contemporary complaints (Schubert 1957). More recently this interpretation has been questioned. In 1973 Hammersley gave a well reasoned argument that the industry in fact helped to preserve woodland by encouraging coppice management, contemporary comments about woodland destruction probably arising more out of competition for a scarce resource than genuine destruction. This view has on the whole been supported by subsequent work (eg. Cleere and Crossley 1985).

A few charcoal blast furnaces are known in North Yorkshire. One of these is situated at Rievaulx and is one of the earliest blast furnaces outside the Kentish Weald, being built in 1576-7 (McDonnell 1972). The blast furnace replaced an earlier hammersmithy which had forged iron from two bloomeries further up the valley, and possibly from other bloomeries situated in the West Riding and belonging to the abbey (Coppack pers. comm.).

Schubert (1957) presents evidence that in 1541 the exploitation of woodland around Rievaulx was well organised, the woods being divided into 20 coppices, each of which could supply the hammersmithy with enough fuel for a year. It is likely that the area from which charcoal was taken had to be extended dramatically to fulfil the needs of the blast furnace. The impact of the blast furnace on the woodland of the area is testified by the widespread distribution of charcoal platforms in the area (but see below), and by the wood names. Figure 26 shows the woods of the area, their names, and the position of charcoal platforms located in a survey of a sample of ancient woodland in North Yorkshire. Clearly visible on the map is a concentration of both charcoal platforms, and hagg and spring names around the site of the hammersmithy and later furnace, attesting the use of coppice. What can also be observed from the map is a group of platforms near the supposed site of the 16th century bloomeries (McDonnell 1972). The tendency for woodland to be conserved by the increase in financial return resulting from industrial exploitation appears to be eloquently illustrated by the map of surviving ancient woodland (fig.K). In conclusion therefore, although it is impossible to say how far the location of the furnace, and the earlier bloomeries and hammersmithy, was influenced by an existing concentration of woodland, it is probable that the presence of the iron industry

Fig.26 Woodland, Charcoal Platforms and Bloomeries in Upper Ryedale



discouraged the clearance of woodland, and certainly encouraged the adoption of coppice management.

In contrast to the post-medieval iron industry, there has been little or no discussion of the relationship between the medieval bloomery iron industry and woodland. Yet there are parallels; during the late 13th and early 14th centuries too there were claims of shortages of wood due to the depredations of the bloomeries. These are summarised by Schubert (1957). Could these claims have been genuine? After all bloomeries could be moved a great deal more easily than blast furnaces, and given the widespread occurrence of ore this can hardly have been a major limitation. There are even 'itinerant' bloomeries mentioned in documents, such as that belonging to Fountains Abbey in Nidderdale (Lancaster 1915: 213). There may thus have been less of an incentive to manage woodland to guarantee future supplies, and felling combined with grazing could have had a major impact on woodland. The detailed information on fuel procurement which has been available to researchers of the post-medieval iron industry are not available for the earlier period, but one or two references exist. Iron smithies are mentioned in Glaisdale in 1223 and 1228 (Parker 1921), and a fine of 1234 gives Guisborough Priory permission to build lodges for charcoal burners in the forest there. The means by which the woodland was managed for this purpose (if at all) is not mentioned. The

Coucher book for the Forest of Pickering (Turton 1894-7) mentions small numbers of oaks and oak boughs which were made into charcoal in the period 1292-1338, and in 1334 Sir John de Meaux claimed branch-wood (cabilicum)(Turton translates this as browse-wood) and dry wood to sustain his bloomery (forgeam) in his woods of Levisham. In the Forest of Knaresborough in 1195 Fountains Abbey was granted the right to take as much dead wood as they wished in return for 3 score of horseshoes (Schubert 1957). None of these sources refers to coppice, nor do they indicate destructive practices. The nearest the documentary information for the county comes to indicating woodland management for bloomery smelting is in 1294 in Sutton in Galtres when a coppice wood is sold to St. Marys York for making charcoal and faggots (Harrison); there is however no evidence to suggest that this was necessarily used for iron smelting. Further afield, coppicing certainly seems to have been used to supply the bloomeries of the Forest of Dean in 1237 (Schubert 1957). In spite of the paucity of information a number of observations are possible. In the case of the Forest of Pickering large scale destruction of woodland might have been expected to have been recorded by the Forest Eyre, which it is not. Most of the references above probably relate to areas of woodpasture, particularly those referring to branch-wood. It may therefore be that the importance of coppicing is concealed to some extent by a tendency for the fuel supply to be mentioned where there are potentially, or actually, conflicting claims to a common resource. In addition it must be considered, in the light both of references to the right to cut branch-wood and the probably small scale nature of the industry, whether pollarding may have played a major role in supplying the bloomeries with fuel.

Section 11.3

Coppicing and the Lead Industry: The Case of Swaledale

If, as is maintained above, industry preserves woodland by encouraging management and increasing its value, this ought to be true of any industry which requires large amounts of wood, and not just the iron industry. To test this, a detailed study was made of the Swaledale lead industry and its relationship to woodland. Swaledale, in common with many other Pennine Dales, has a very long history of lead mining and smelting which may go as far back as Roman times in some areas (Raistrick & Jennings 1965: 1-22). There is certainly evidence to suggest that lead was being exploited here from the late 12th century onwards (ibid: 25). Very little is known of the mining techniques employed during the medieval period, though it has been suggested (ibid: 66-71) that these were mainly shallow shafts and opencast workings along the vein. Smelting took place in a 'bale' or 'bole'. As yet no bale has been adequately excavated. As a result few conclusions can be reached concerning bale construction or operation. Descriptions of bales in Derbyshire in the 16th century indicate fairly open structures which were often sited on south west facing slopes to exploit the prevailing winds (Kiernan & Noort 1992). These bales appear to have been operated seasonally when the wind was most reliable, using very large amounts of wood for fuel. Of the very large number of possible bale sites now identified in Swaledale by Barker (Barker & White 1992) very few have been dated. The presence of "Priores' Bale" on a map of Marrick dated 1592 (Brotherton) implies late medieval smelting. Charcoal sampled from another site, on Calver, has been dated to 1454 +/- 15 AD cal. (Barker and White 1992). In the later medieval period the slags from bale smelting which were still very rich in lead were often re-smelted at a higher temperature in a blackwork oven using either charcoal or coke for fuel. From the 16th century an expansion of the industry took place, coinciding with changes in smelting and mining technology. By the late 17th century mines were being worked by means of complex systems of shafts and levels, with a consequent need for wood for shoring. In about 1575 what is believed to have been the first ore hearth was built in Swaledale. This smelted lead in a small raised hearth, using a waterwheel to provide the blast. Early ore hearths used wood as the main fuel, a change to peat and coal taking place around the 18th century. Slags were often re-smelted at a similar hearth (called a slag hearth) using coke or possibly charcoal as a fuel (see below)(the above description is based on Raistrick & Jennings 1965: 74-82 and Gill 1988).

Of the various suggestions made for the fuel employed in bale smelting the large quantities of roundwood and brushwood indicated by Kiernan's studies in Derbyshire (Kiernan 1989) are the most believable. That wood was the favoured fuel is confirmed by Leland in 1536-43 who writes of Swaledale that;

"The wood that they burn their lead (with) is brought out of the part of the Shire, and out of Durhamshire." (Smith 1909: 32) There is no direct evidence to show how this was supplied in Swaledale. It does however appear that the practice of coppice management was established in the dale by at least 1542 when a lease of Marrick priory lands to John Uvedale (T.S. 1838) mentions a number of coppices. These are subsequently valued in a survey of woodland belonging to the Crown in 1545 (LCAS GC.Fo.1), which gives their growth as ranging from 2-12 years. It is tempting to connect these coppices with Priores' Bale as both would have been under the same ownership prior to the dissolution of Marrick Priory in 1540. There is however no documentary evidence to suggest a direct link.

Another approach to the problem is to compare the distribution of bale sites with that of woods. Ideally one would use a map of the woodland present at the end of the bale smelting period in the 16th century for this purpose. Unfortunately no such map exists, and it is not possible to construct a satisfactory substitute from the patchy documentary material for the period. Instead the provisional Inventory of Ancient Woodland compiled by the Nature Conservancy Council (Carter 1987) has been used. Although this is based mainly on 19th century sources it compares very well with 16th century documentation for those areas of lower Swaledale such as Marrick where such information exists. In upper Swaledale however physical evidence such as charcoal platforms (see below) appears to indicate that although the rough distribution of woodland was probably similar to that indicated by the inventory, the area was certainly considerably larger. In figure 27 the woods listed in the inventory and those suggested by the presence of charcoal platforms are superimposed on a map of bale sites published by Barker and White (Barker & White 1992). If bale-smelters had indulged in mass destruction of woodland we would expect woods to survive best further away from the bale sites. This is in fact not the case. Indeed given the need to site bales in exposed positions, and the probability that medieval woodland was confined to the valley sides (Chapter 10) the degree to which the distribution of ancient woodland and bale sites coincides is remarkable. The distribution of woods is best explained in terms of the agricultural and grazing potential of the land, with woodland surviving on the steeper slopes, and the rougher ground away from settlement. The correlation between woodland and bales is therefore probably the result of the siting of bales as close as possible to the source of fuel. Thus although it may be wrong to argue that the bale smelting industry encouraged the preservation of woodland, it is unlikely to have occasioned widespread woodland destruction.

Fig.27

Bales and Woodland in Swaledale and Arkengarthdale

As has already been indicated, smelt-mills with ore hearths were built in Swaledale from the late 16th century, and by the late 17th century it is probable that all lead smelting in the dale used this technology. These smelt mills used 'chopwood' as their major fuel. (Chopwood is defined by Raistrick as wood which was barked and dried before use, Raistrick 1982: 54). It is not until the second half of the 17th century, however, that we have any reliable information regarding the sources of chopwood for smelting. The mine accounts of Thomas Swinburne (NYCRO,ZCC), who owned most of the Manor of Marrick (Owen-Tyson 1989), provide valuable information on the price and source of chopwood. The accounts cover the period 1660-63, and include 2 major woodland products; timber for the mines and sacks of chopwood for the mill. The price of these, and the area from which they were taken, both appear to indicate a shortage of wood in Swaledale at the time. In all over 3000 sacks of chopwood were purchased, and although most of these came from within Swaledale nearly 400 came from as far away as Braithwaite to the south of Middleham. In the case of mine timber nearly half came from Braithwaite. When we examine the prices we find that the price paid at the wood (ie excluding transport costs) for chopwood decreased dramatically with distance from the mill; for instance, that bought from Mr Blackburn at Marrick Priory cost between 13 and 14½d per sack, that from Braithwaite less than half that price. In the case of timber, though the price did not decrease so dramatically with distance, we find that it cost nearly twice as much as timber bought by Beldy Hill mines over a century later (NYCRO,ZKU). this is in spite of the fact that elsewhere in England wood and timber prices rose over this period (Rackham 1980: 167).

This apparent shortage of wood does not appear to reflect the destruction of woodland by industry, as many of the areas mentioned are still relatively wooded. On the contrary there is evidence that coppice management was extended to previously less intensively managed woodland. Documentary illustration of this comes from the papers relating to Lord Wharton's manors of Healaugh and Muker (Ashcroft 1984): in 1677 Lord Wharton requested his agent Philip Swale to consider the best way to enclose any woods at Crackpot so that they might be "sprung and preserved from time to time". Wharton also investigated the possibilities of planting new woods, perhaps with the intention of subsequently coppicing them, and encouraged his tenants to spring and fence their woods by paying them more than the going rate for carriage. Coppices are also mentioned in a list of appurtenances of Swale Hall in a marriage settlement dated 1663 (NYCRO: CRONT 1 / HORN), and in an estate survey of Bolton Castle in 1712 the dates when "Downholm Springs" were last cut are given (NYCRO: CRONT 2).

There is documentary evidence of a decline in the importance of wood as a fuel during the 18th century. Already in 1715 an inventory of equipment at Lord Wharton's mills includes only 200 sacks of chopwood, compared with 2000 cart loads of peat (NYCRO: ZLB 5/1). It is likely that this change was related in part to the high price of wood; however, a second factor may have been a change in the siting of smelt-mills. Before this there had been a tendency for smelt mills to be situated in the relatively well wooded areas of the lower dale (Gill 1988). The proximity of these sites to the routes by which lead was taken to the ports may have been an advantage in allowing the mills to take ore from a large number of mines. This may have been important at a time when output of individual mines was not yet very high. Towards the end of the 17th century mills began to be built nearer the mines; this was probably facilitated by an increase in ore output as the mines in the upper valley were developed. The additional transport costs resulting from this move are likely to have increased the cost of smelting with wood, whilst simultaneously placing the mills within easy reach of moorland peat cuttings. The shift towards peat and coal as the major fuels appears to have been complete by the 1790s when the smelt-mill accounts of Beldi hill in Upper Swaledale fail to make any mention of wood whatsoever (NYCRO: ZKU). After this chopwood appears to have only been used as a

Photo. 4 Re-grown oak stump, Side Bank Wood, Swaledale.

Photo.5 Lime coppice, Side Bank Wood, Swaledale.

way of utilising waste wood unfit for any other purpose.

The use of the woods to supply mine timber (or 'grove timber') and brushwood (stoprice), used to line the shafts, continued to be important. Perhaps surprisingly this too was grown on coppice as is shown by the following entry concerning Downholm Springs in a field book for 1765 (NYCRO: ZBO):

"The above springs are generally cut down every 25 years for grove timber. Ingskew, Calf Spring, Side Bank and Swale Island were cut in 1757, Farr Spring in 1765 and High Spring in 1766."

The woods at Downholm must have continued to be of considerable importance during the 19th century too as there exists a preprinted receipt book for the woodyard belonging to AD mines in Fremington dated 1864-67 and entitled "Lord Bolton's Wood"(NYCRO ZLB 2/265) which records considerable quantities of wood coming from this source. Even now it is possible to see the coppice structure of these woods, with standard oaks. Most of the oaks are now stumps struggling to re-grow in the shade of the overgrown coppice, which consists mainly of ash, elm and sycamore. Rarities such as a huge large-leafed lime stool serve as reminders that these woods are what remains of the medieval wood called Staynscough, mentioned in 1321 (T.S. 1838)

The documentary evidence presented above gives the impression of a fairly simple relationship between

Photo.6 Elm stool, Side Bank Wood, Swaledale.

Photo.7 Alder coppice, Hagg Wood, Swaledale.

woodland management and demand for woodland products, such as that created by the lead industry. The industry created a local demand, which raised the value of woodland and encouraged coppice management. However, field evidence from woods in upper Swaledale indicates that the relationship may not always have been so simple. The chopwood used in orehearths often appears to have been dried in small kilns. These kilns, sometimes referred to as elling hearths or Q-holes, have a wide distribution in woodland throughout the lead mining districts of Derbyshire and the Yorkshire Dales. Wood drying kilns and charcoal platforms can therefore both be used to deduce the industrial exploitation of woodland. If the distribution of these is taken into account it becomes clear that several woods in upper Swaledale, which still form part of the common pastures, have evidence of industrial exploitation. The fact that these are still common implies that this did not necessarily involve conventional coppice. This point is reinforced by a detailed study of one of these woods.

Ivelet wood occupies a steep slope in Ivelet common pasture. It now consists mainly of hazel and birch scrub with a small area of more mixed woodland on a section of sandstone scar, and patches of alder carr on the Swale floodplain. The investigation involved a survey of the wood and surrounding common, excavation of one kiln and one charcoal platform in close proximity, and post-

Photo.8 Ivelet Wood, upper Swaledale.

excavational analysis of the species composition and age structure of the charcoal retrieved from the excavation. A full report of this work is available as Appendix 2. The survey results identified some 50 charcoal platforms spread across the common, and six or seven kilns confined to the area of the present wood. These were served by a well developed (if ephemeral) system of pony tracks. The sheer density of these remains encourages the view that the industrial exploitation of the wood was reasonably long term. Evidence from the excavation indicated that both kiln and charcoal platform were last used in the 17th century, coinciding with the period when the industrial demand for wood is thought to have been at its height (see above). Where woodland management is concerned the continued exercise of common rights and a lack of convincing evidence for woodland enclosure supports the view that this was, at best, a compartmented woodpasture. The larger fragments of ash charcoal from the charcoal platform were examined to produce an estimated minimum age distribution. The method by which this was calculated is detailed in Appendix 2; the results are illustrated on figure 42. A number of important conclusions can be made from this data. The age of the wood, most of which was over 50 years old, indicates a long time gap between harvests. It is unlikely to have been worthwhile to keep stock out for this length of time, so that again, any enclosure of cut sections must have been temporary. The slow growth rate of the wood samples, averaging less than 0.8mm in radius a year, may be a result of the exposed situation of the wood. On the other hand, growth may also have been inhibited by damage caused by browsing animals. The minimum age distribution is also not what would be expected if an organised coppice regime had been in place. Coppicing, even in the context of compartmented woodpasture, would be expected to produce a very marked upper age boundary, corresponding to the coppice rotation. This is not the case; the age distribution tails off slowly and irregularly with more than one peak. Some samples may have been well over 100 years old at the time of felling. In conclusion, although the density of archaeological remains implies a considerable investment in the exploitation of this wood, the age structure analysis indicates that this may not even have involved compartmentation of the woodpasture, but a more short sighted or opportunistic approach. In view of evidence for the widespread practice of coppicing elsewhere in Swaledale, it seems reasonable to suppose that in this case encoppicement was actively inhibited, almost certainly by the exercise of common rights.

Section 11.4

Changing woodland economies

The changing role of woodland as clearance progresses, as expressed by the model outlined above may find expression in the value placed on different woodland uses, thus affecting the frequency with which they are recorded in documents (Depending of course to some extent on the type of document concerned). This is implicit in Whitney's study of the medieval woodland economy of Kent. Whitney (1990) employs an essentially economic argument to explain changes in emphasis during the medieval period preceding the Black Death from Domesday records of pannage, through woodpasture, to coppice. The effect of ready markets for wood in encouraging coppice and conserving woodland is seen to divert agricultural expansion into less accessible areas. Although the documentary information for North Yorkshire allows nowhere near as clear a picture of the developments in different areas to be elucidated, some consideration of the issue is worthwhile. Figures 14, 15 & 16 which were discussed in section 7.3 are an attempt to quantify the frequency with which pannage, woodpasture, and coppice are referred to at different dates. It was concluded that the documentary record appears to show a gradual change in interest on the part of lords from relatively casual exploitation of woodland to progressively more intensive forms of management. Similarly from the spatial distribution of this information as depicted on figure H it can be seen that the pannage references are concentrated in the areas which have the greatest density of Domesday woodland, particularly the Vale of York, and the western and southern edges of the North York Moors. The evidence for coppice on the other hand is concentrated in the area of the Pennine fringe in which Domesday shows a relatively smaller density of woodland, and which appears to be mutually exclusive with pannage. It would be easy to put a purely economic interpretation on the evidence for distribution and management of medieval woodland in North Yorkshire, perhaps along these lines:

1086 found a number distinct types of woodland landscape in North Yorkshire. One, consisting of the Wolds, the Vale of Pickering, the Vale of Mowbray, and the Cleveland Plain was almost devoid of woodland. An area consisting of the Vale of York, the northern slope of the Howardian Hills, the western scarp of the Hambledon Hills, and the Tabular Hills on the southern edge of the North York Moors was, in contrast to this, rather well wooded, the main uses being pasture and pannage early in the medieval period. Later increasing management, necessary because of woodland clearance, led to a decline in pannage due to a shortage of mast bearing trees, and increasing control of woodland pasture. Finally towards the end of the 13th century and during the 14th there was an increasing interest in coppice management. On the Pennine fringe is an area with generally smaller woodlands. A very early indication of coppicing here is the _silva minuta_ woodland of Domesday. The importance of coppice in this area with high population, and fertile soils is underlined by a similar concentration of woods with hagg and fall names. Finally in the Pennines, and the North York Moors woodland in 1086 was restricted to the dale sides. Although the area of woodland was not huge, low levels of population and the widespread availability of peat for fuel may have prevented coppicing from attaining any importance before the 15th century.

The problems of this interpretation are legion. In terms of the spatial distribution of coppice the lack of a convincing correlation with obvious markets for wood such as York is surprising. A tentative correlation can however be observed between coppice in the Vale of York and rivers which would have facilitated transport of coppice products. This situation is analogous to the coastal and riverine distribution of coppice observed by Whitney (1990) in Kent. Any lack of correlation of evidence for coppice and potential markets can perhaps be best explained by the general lack of relevant documents. A more serious criticism concerns the time-scale of the developments. During the 13th century and early 14th when population and land hunger are thought to have been at their height, and the area of woodland at a minimum, there is little evidence for coppicing, with only a slight increase discernible towards the end of the period. It is after the Black Death, when land was plentiful and pollen diagrams appear to show regeneration of woodland, that coppice appears to become really significant. Clearly if an explanation is to be sought to account for these changes something a little more complex than the model proposed at the beginning of the section is required.

Section 11.5

Woodland, Population, and the Wider Economy

Implicit in the foregoing discussion is an assumption that consumption, whether of food or wood, is, in the absence of wood consuming industry, roughly proportional to population. In a situation where population is expanding steadily, and there is still plenty of land suitable for cultivation, this may well hold true. Thus for instance during the early part of the medieval period many pollen diagrams show a curve typical of the equilibrium suggested by the model at the beginning of the section, with clearance proceeding at a very rapid rate initially, then beginning to slow as the value of woodland approaches that of farm land. However when population is very high, and during a period of poor harvests, as at the end of the 13th century this could result in a contraction in the wood market as the 'excess' wealth after purchase of food is likely to have been severely reduced (Miller & Hatcher 1978). In addition the sheer pressure on land may result in clearance of areas otherwise not thought of as suitable for agriculture, and the over-stocking of woodland pasture. Historians of the post plague period have commented on the fact that the massive reduction in population of some 30-50% which followed the first outbreak of the Black Death was not accompanied by a massive desertion of the land. Rental values of many manors remaining within 10 or so percent of their pre-plague value (Hatcher 1977: 32). The implication of this is that there was a sufficient pool of potential tenants with insufficient land to cultivate the vacant possessions. This in turn must have led to a marked rise in the standard of living of the peasantry as a much greater proportion will have had the means for a decent livelihood. A wealthier peasantry may have been able to spend more on items other than food, such as wood, with a consequent change in the relative values of wood and agricultural products in favour of wood (Rackham 1980: 167, fig.11.6 does appear to show that the price of wood rose relative to other consumables in the period after the Black Death in eastern England). If so this could have maintained the coppice expansion which appears to have been occurring in the preceding period. What may in fact have been more important than the relative price of wood were the attempts by landlords to explore new ways of making up the loss in income sustained by the difficulty in finding tenants for marginal land. In addition a revival in the fortunes of the peasantry may have created peasant capital which could be employed in the wood trade. This is for instance implied by the wood sale at Aislaby recorded in 1390 when a consortium of local men bought wood standing in coppices belonging to Sir Philip Darcy (Clay 1940: 1). It may be therefore that a slight relaxation in land pressure as a result of the Black Death shifted the economic balance in favour of woodland management.

The increase in peasant wealth resulting from the lower population of the late 14th and the 15th centuries may have had other important consequences too. Hatcher (1977: 50) and others observe that meat prices remain much closer to their pre-plague values than grain, implying that the demand for meat remained relatively high. He also notes (Ibid: 39) that 15th century agricultural recession affected the arable sector more severely than the pastoral. A change in the agricultural emphasis towards pastoralism which is implied by this would ensure that the pressure on woodpasture was maintained. This would explain why after a considerable period when the population was fairly low dissolution surveys of woodpasture such as Selby Outwood show the stock of trees to be low and management to be intense.

Section 11.6

Manorial economy and inter-manorial exchange

The basic unit of economic space in medieval England was the vill. Within this space the distribution of resources was often determined primarily by the size of an individual's holding within the common fields. The supply of woodland products from within the vill was regulated by common rights. The ideal vill was held as one manor by a single landlord and had within its bounds all the necessities of medieval life. To a certain extent this ideal is expressed in parish and township boundaries. One of the classic examples of this is the pattern of parish boundaries in Ryedale which as pointed out by Roberts (1977: 175-6) cut across the contour with the result that each parish has lowland, scarp, and moorland and each is provided with land suitable for arable, meadow, and upland and lowland pasture. As each parish includes an area of the wooded moorland scarp, woodland products are also provided for. Similar observations can be made in other areas. The parishes of Selby, Monk Fryston, Thorpe, Hambleton, Milford, Birkin, Cawood and Wistow for instance all shared in a large area of woodpasture of which Bishop Wood is now the main remnant (fig.12). Although this kind of self sufficiency might have been the ideal it is probable that, given the woodland distribution deduced for the early medieval period in chapter 6, there were areas such as the Wolds, and the

Vale of Mowbray where no such large areas of woodland existed. In these areas wood products had to be supplied from the hedgerow trees or small areas of woodland which may have escaped the record, or else imported from other better endowed places. Towns such as York also had to import wood and timber to supply their needs. These needs could be met in two ways; through trade or via inter manorial links. Of these the probable effects of trade are fairly obvious. Major sources of demand such as a large town like York would be expected to be surrounded by areas in which the commercial exploitation of wood was relatively well developed; in particular in the vicinity of good transport routes such as navigable rivers (A general discussion of the pattern of trade in Tudor York can be found in Palliser 1979).

Inter manorial links may be at least as important as trade in supplying demand, the more so the further back one goes. One can deduce a rough pattern for the exploitation and location of woodland belonging to Fountains Abbey from the Bursars Books dated 1456-1459 (Fowler 1918). It appears from these that the abbey had coppice woods at Kilnsey, Wheldrake, Aldburgh (near the abbey), Bradley, and Thorpe Underwood. These woods performed the dual purpose of supplying the monastic holdings with wood and timber, and providing an excess for sale (Timber in particular is recorded as travelling long distances between properties). The late medieval leases of the abbey also illustrate the importance of inter-manorial links for the supply of timber. The monastery's responsibility to supply timber for repairs mentioned in many of the leases is matched by the responsibility of the lessees of Thorpe Underwood to oversee repairs in the towns, villages, and farmholds belonging to the abbey in the area (Michelmore 1981). Thorpe Underwood may have been a particularly important asset for the monastery as timber from this source is frequently mentioned in expenses of the crown, and of the minster, in York (Kaner pers. comm.).

A similar pattern can be observed in the accounts of the receiver of the Bishop of Durham's properties in Northallertonshire in the late 15th and early 16th centuries. These illustrate the dual usage for both private and commercial exploitation which must have characterised many medieval woods. The woods of Clack and Cotcliffe not only produced a regular income from the sale of faggots, but in addition supplied timber for the repair of tenements in the Bishop's manors, building work on the manor house at Northallerton, and firewood for use at the manor. The bark and lopps and topps of the oaks felled for these purposes were also sold. The tenants of the Bishop also seem to have helped themselves to wood as a matter of course judging from the number of presentiments for cutting green wood at the forest court.

This combination of inter-manorial supply and commercial exploitation is one factor which may affect the distribution of commercially exploited woodland round major markets such as York. It is likely that woodlands which were important in supplying an estate with its necessities in wood and timber were also important sources of these materials for the market, Thorpe Underwood perhaps being a case in point (see above). In turn this implies that in some cases it is more appropriate to look on the estate rather than the manor or vill as the basic economic unit; within which a shortfall in one location could be made up from the surplus in another. The kind of specialisation of individual properties facilitated by such a mutual interdependence of the individual parts of an estate was most successfully exploited by the Cistercians. Excluded, in theory at least, from participation in normal village based agriculture by the rules of their order, the Cistercians largely operated a system of large demesne farms outside the normal manorial system. These granges, vaccaries and bercaries formed a centralised system where a degree of interchange, particularly the seasonal movement of stock, was common. Donkin (1978: 73) even suggests that surplus oxen may have been kept at some granges in order to supply others. One might therefore expect to find that an organised redistribution of woodland resources between individual properties was particularly a feature of the Cistercian estates, and this the more so in the earlier medieval period when the difference between Cistercian and lay estates was at its greatest.

Chapter 12.

The Structure of Society:

Custom, Law and Tradition

Section 12.1

Introduction

In the preceding section an attempt was made to discuss the effects of economic pressures on woodland to the exclusion of all else. In fact the structure of society and economic trends affect each other mutually, and neither can be considered independent of the other. The distinction between issues which are economic and those which relate to the structure of society is often not clearcut, so that the effect of economic pressures can be seen in much of what is discussed below. The importance of social issues lies both in their effect on the degree to which individuals are empowered to respond to economic opportunities or pressures, and because there may be social motives behind courses of action which seem economically disadvantageous.

Section 12.2

Manorial Custom

Manorial custom was discussed briefly in chapter 3. This effectively regulates the pattern of intra-manorial exploitation including the stinting of commons, the exercise of botes, and the holding of land. In part this body of practice is represented and enforced by the manorial court. It must be remembered however, that the main function of the manorial court was to extract dues from the tenants for the lord. As a result one might not normally see custom recorded which was to the disadvantage to the lord (Thompson 1991: 161). E.P. Thompson points out that the central tenet of manorial custom is usage time out of mind. This in itself argues for a certain amount of rigidity, perhaps severely restricting the capacity for lords or individual tenants to respond to economic opportunities. The argument for a rigid body of practice is supported by the ease with which the fleeting references to medieval practice can be understood in the context of our more detailed knowledge of the 17th and 18th century. This perceived rigidity could have important implications for the development of woodland management. The exercise of common rights to pasture or wood must have restricted the extent to which the lord could exploit the wood market, and in particular have inhibited the creation of demesne coppice. It is arguable therefore that manorial custom tended to fossilise the woodpasture system when the separation of woodland and pasture might have been more productive (especially for the lord). If the possible effects of demographic expansion and decline are added to the equation one might expect common rights to be more vigorously defended in times of high population and land pressure when the woodland resource was stretched, than in times of plenty. Applying this to the trends in medieval woodland management in North Yorkshire portrayed by figure 16 it would seem reasonable to propose that a relaxation of pressure on common resources (particularly common pasture) after the population declines of the 14th century (Hatcher 1977) facilitated the extension of coppice, and that this had been inhibited prior to this by vigorous defence of common rights by the manorial tenants.

Section 12.3

Lord/Tenant Relations

Although the central theme of manorial custom was usage time out of mind, as the custom, and the manor court through which it found expression, are the interface between the lord and his tenants, custom also represents a compromise between lord and tenant. In consequence, though the overall themes may remain the same, custom may change to reflect lord/tenant power relations. Short of physical violence to person or property, one of the few threats available to the peasant was desertion of the land. Conversely the main sanction available to the lord was eviction. It is the balance of the effectiveness of these two which is likely largely to determine the balance of lord/peasant relations. Thus in a period of high population, when new tenants are easy to find and vacant land is scarce, the tenantry may have found it difficult to oppose restriction of their common rights by the lord. In spite of the assertion by Russel (1966) and others (eg Harvey 1966) that the peasantry of the later 13th and early 14th centuries was reasonably well off, this view has been criticised convincingly, and in detail (Titow 1969). The consensus of historical opinion is that a large proportion of the peasantry at this time was in a state of abject poverty, and that the shortage of adequate peasant land was extreme. This land hunger is reflected both by the increasing severity in the terms under which tenants were willing to take land as the 13th century progressed (in spite of a tendency for terms to become fixed by custom), and by the proliferation of holdings incapable of supporting a household (Titow 1969, Bolton 1980, Miller & Hatcher 1978, Hatcher 1977). Archaeologically the pressure on land at this time is demonstrated by the extension of cultivation onto poorer quality land. One would expect therefore that the capacity of the peasants to defend their rights would have been severely impaired by the lack of land to desert to. The lord on the other hand appears to have found no shortage of tenants willing to take up empty tenements on increasingly severe terms. There is however little direct evidence to suggest whether there was in fact a worsening in the situation of peasants with respect to their common rights or not. The problem is in any case complex: the ability of the peasantry to defend common rights is likely to have depended both on the terms on which land was held (eg. whether freehold, or in villein tenure), and on the personal status of the individual. Not only this but the extreme complexity of peasant status at the time of Domesday underwent a process of legal simplification during the late 12th and the 13th century whereby peasants were regarded either as unfree (villeins), or as freemen. Hilton (1983: 14-19) takes the view that this redefinition of status resulted in the enserfment of a significant proportion of the peasantry. This is particularly important from the point of view of common rights because villeins were denied access to the royal court in matters concerning tenure (Ibid: 19). Whether we see the 13th century as a time in which the rights of the peasantry are eroded thus depends partly on what proportion we see as gaining, or losing, as a result of the legal redefinition of peasant status, and to what extent this had any real relevance to peasant conditions. Although Titow (1969: 58-9) holds the view that the landlords were on the whole respectful of manorial custom, it is arguable that in cases where a conflict of interest did occur, a large proportion of the peasantry would have been in a very weak position indeed. This seems likely not only because there was no higher authority than the manor court to which the villein could appeal, but also because there is evidence that the burden on the villein was increased in terms of rents, entry fines, tallages etc. and it seems unlikely that lords willing to exploit the shortage of land in this way were any more scrupulous regarding common.

Not only is the position of the villein likely to have suffered with respect to common rights, but perhaps also that of the freeholder. The Statute of Merton in 1236 (quoted in Titow 1969: 205) can be interpreted in one of two ways: either, as Titow claims, it guaranteed the common rights of freeholders (note that villeins had no common rights in law), or it can be seen as a grave infringement of the same. This latter view is taken by Miller & Hatcher (1978) who note that prior to the statute landlords appear to have been obliged to seek the agreement of their free tenants before extinguishing common rights, whereas afterwards, unless it could be shown that the freeholders were left with insufficient pasture, common rights could be extinguished with impunity. This latter interpretation is supported not only by the practice which Miller and Hatcher observe in cases concerning infringement of common, but also by the wording of the document itself which purports to be a response to complaints by "many great Men of England" who had complained that "they cannot make their profit of the residue (that not held by feoffees and freeholders) of their manors, as of wastes, woods, and pastures". It seems therefore that the balance of evidence indicates a progressive deterioration in the ability of the peasantry as a whole to defend its common rights from the late 12th century to the beginning of the 14th.

If we see the erosion of common rights in the period prior to the Black Death as a direct consequence of high population and a shortage of peasant land, then we might argue that the subsequent population decline may have seen a renaissance in peasant power. In fact this need not necessarily have been the case: in eastern Europe and Russia for instance the Black Death heralded a new era of peasant oppression as draconian measures were introduced in order to bind the peasants to their lords and land, thus guaranteeing the agricultural labour force (Hugget 1975: 9-36). In this country too attempts were made to restrict peasant movement, and to control wages in the face of a much reduced labour force (see for instance the Statute of Labourers). Hilton (1983: 40-43) indeed gives many examples where landlords were successful even in increasing the severity of the terms under which villeins held land. In the long run however the efforts to hold down wages and to prolong servile villeinage did not succeed. By the late 14th century land was increasingly being let as copyhold, or leasehold, which did not have connotations of unfreedom, and rents were declining while wages rose. Although the legal status of the villein did not improve for some time, it is likely that the peasant's bargaining power within the manor was appreciably enhanced, while the lord may have experienced some difficulty in replacing evicted tenants. One would expect therefore to find that the defence of common was more effective after the Black Death than immediately before.

Section 12.4

The Importance of Tenure

The consequences for woodland of the demographic trends of the 13th and 14th centuries predicted in sections 12.2 and 12.3 are quite different. Although the latter is that which best fits the accepted social history of the period, the former best fits the woodland history of North Yorkshire presented in chapter 7. The reason for this may well lie in regional patterns of land holding and security of tenure. The preceding discussion assumes a fairly even distribution of free and unfree tenure. In reality however this distribution appears to have been far from uniform. In particular villein tenure appears to have been much less common in the areas of northern and eastern England, and the far south west, than in the more manorialised central belt where the common field tradition was strongest (for a definition of manorialisation see Bolton 1980: 17-20). It is this latter area, where villein or customary tenure was most common, which appears to have suffered most from the 13th century lordly oppression. Outside this area there was a greater diversity of tenure which Bolton (1980) links to a more pastoral economy. The relative security of tenure, and access to the royal courts (which was denied to villeins in the late 12th century) may have allowed these freemen and sokemen, notwithstanding the limitations imposed by the Statute of Merton, to defend their commons more effectively. The incentive may also have been stronger as many freeholders held comparatively little land and were dependant to a large extent on the resources of the common waste (Bolton 1980: 31-116). In contrast, in the manorialised area a concentration on arable and the expansion of the common fields may have reduced the waste of many manors to a very small area (see Fox 1981: 94). It is their relative security of tenure which may for instance have helped the Densmen of the Kentish Weald defend their rights to underwood, even around the Rother where easy access to markets by boat caused the value of wood to be high (Whitney 1990).

North Yorkshire, with the exception of the Wolds, lies outside the area in which the parliamentary enclosure of open fields was concentrated. Many upland manors in the county barely had any arable, and even in the lowlands in the areas with significant areas of woodland, woodpasture would appear to have been an important part of the economy throughout the high medieval period. A study of Yorkshire field systems by Sheppard (1973) provides more detailed information, suggesting that the Wolds and the Vale of Mowbray were the areas where the common field tradition was strongest. Settlement in the Vale of York on the other hand appears to have been characterised by large numbers of closes surrounding the village fields. This is reminiscent of the situation in 13th century East Anglia where Bolton (1980: 24) observes that 'the nucleus of demesne and villein land was surrounded by a sea of free or semi-free rent paying peasants'. Of course the link between closes and free peasants is by no means well defined. However the implication is that much of North Yorkshire, in common with many areas outside the midland belt, was characterised by a relatively free peasantry with lighter manorial burdens. There are a number of reasons why the burden of lordly oppression might have been lighter in North Yorkshire. The Domesday Book shows the county to have been relatively sparsely populated, due, no doubt, in part to the harrying of the North. It has also been suggested that lordly control was still relatively weak in some areas, and that many estates were still in the process of consolidation. It is likely that the wish to encourage settlement in the less developed areas such as the uplands, and the woodpasture areas of the Vale of York led lords to offer tenancies with relatively light manorial dues as was the case on the Warrene estates in West Yorkshire (McDonnell 1992). A connection between assarting and freer tenure generally is suggested by Hilton (1983: 21) amongst others. The effects of Scottish raids might also have been important, both in rendering even the fertile lowland comparatively unattractive for settlement, and by suppressing to some extent the expansion of agriculture so that land hunger never reached the same pitch here as further south. The instability of the border with Scotland also created the category of tenure called border service or tenant right, by which apart from rent, the main obligation was military service. Tenant right was for instance claimed by the tenants of Lord Wharton in Healaugh (Swaledale) to support their claim to considerable security of tenure in a court case of 1562 (Ashcroft 1984). In conclusion it seems probable that in much of North Yorkshire, in common perhaps with much of northern England, the peasantry retained a much higher level of independence. This, combined with slightly less land hunger than elsewhere, may have encouraged a more successful defence of common in the 13th century than might otherwise have been the case.

Pursuing this line of investigation a little further leads to some interesting conclusions concerning the diversity of woodland history within North Yorkshire. We have already seen that some areas of the county resemble the Midland belt in terms of their field systems and rural economy more closely than others. These areas are predominantly those, such as the Wolds and the Vale of Mowbray, which have relatively little evidence for medieval woodland. The wooded areas on the other hand tend to be those areas with irregular field systems, areas of assarting or late settlement, or areas where the pastoral element of the economy was overwhelmingly important. One might therefore argue that similar contrasts in the balance between different forms of tenure must have existed between these areas within the county to those which existed between the Midland belt and many other parts England. Unfortunately there has as yet been little systematic research into patterns of tenure in North Yorkshire. However, the work of Bishop (1935) indicates that freeholders were commonplace in the Vale of York. This is illustrated by the enclosure of Stainer Park south of Selby. When the abbot and convent of Selby wished to create the park in the late thirteenth they found it necessary to obtain quitclaims from a large number of freeholders of their common rights to the area (Fowler 1890: 168-171). The extensive sokes of Pickering, Easingwold, and Sherburn in Elmet recorded by Domesday Book might also be argued to have led to a smaller proportion of unfree tenures in these more wooded areas of the county (for an explanation of socage and its link to freedom see Bolton 1980: 23-4).

In view of this rough correlation between freedom and woodland one ought not to be surprised that when the information relating to medieval woodland is considered for North Yorkshire as a whole the trends observed are those consistent with a society composed of a large proportion of freeholders. It is unfortunate that the evidence is not sufficiently detailed to look at areas such as the Wolds, or the Vale of Mowbray and assess whether, and at what point, coppicing was introduced to any great extent to the few woods which may have existed in these areas (there would in any case be a problem in determining whether tenure or the scarcity of woodland was the deciding factor). There are, however, elements in the distribution of woodland management implied by fig.H which encourage the idea of a diversity of woodland histories within the county, and which are not easily explained in terms of economic factors. One might particularly consider the Pennine fringe as such an area. This is an area for which, though woodland appears to have been in reasonable supply, there is evidence for coppice management from a very early date. Although in the previous chapter an attempt was made to explain this in economic terms the resultant explanation seems wholly inadequate. There is little evidence to suggest that the area was particularly heavily populated in the medieval period, indeed there was sufficient spare land for extensive colonisation by the Cistercians. Nor are there any other reasons to propose that a particularly high demand for wood existed in this area; The lead industry of Wharfedale and Nidderdale would have had much more accessible sources of fuel, and there is no reason to expect that Ripon produced a demand for wood which encouraged coppicing to an extent much greater than York. It would appear therefore that the explanation must be sought elsewhere, and the distribution of tenure may provide a reasonable alternative.

Section 12.5

The Role of the Lord

It may already be apparent from the foregoing discussion that the lord must have played a pivotal role in determining the histories of medieval woodland. Not only was it the lord who on the whole wrested woodland from the common to exploit as coppice for his own profit, but it was also he (or she) who ultimately controlled the exercise of common rights, and punished offenders through the manorial courts. The identity of the lord and the strength of his/her influence could have influenced woodland management and clearance in a number of ways.

We have already seen that a strong tenantry could effectively defend commons from encroachment by the lord. The strength of lordship is in many ways a related issue. The two are however worth considering separately. Strong lordship, and an independent tenantry are not necessarily mutually exclusive; the tenantry will defend the commons against the encroachment while strong lordship ensures an effective manorial court, enforcing stints and punishing waste. The value of a manor and its remoteness from the core of the estate or the main lordly residence may be factors which affect the effectiveness of lordly control. The location of the manor and its suitability for arable might also affect the degree of regulation which it was in the lord's interest to impose.

The interest of the lord might also vary as a result of other factors. For instance, the rules of the Cistercian monasteries encouraged seclusion, which in turn created very characteristic forms of exploitation of the land such as granges, bercaries and vaccaries. Clearly these created a structure within which the conditions for the introduction of coppice management were specially favourable, particularly given the stability of monastic lordship. The issue of continuity may in itself be an important factor. On most North Yorkshire estates continuity of management was provided either by dynastic ambition, or monastic institutionalism. There is however an important exception to this in the person of the Bishop of Durham. The Bishop of Durham was a crown appointee who was neither responsible for his considerable estates to an institution, nor to a dynasty, as the lands which went with the office could not be inherited. This may have had important consequences for his estates as the Bishop had no interest in maintaining their profitability for future generations. The ways in which this could affect woodland is illustrated by the following examples, the first of which is a comparison between the histories of Clack Wood, owned by the Bishop, and a neighbouring wood in other hands.

Section 12.6

Clack Wood, Osmotherley

Clack Wood was one amongst a number of properties owned by the Bishop of Durham in Allertonshire. It is possible to determine its history reasonably confidently from the late Middle Ages onwards from a variety of different sources. The most important of these are the receiver's accounts of which a discontinuous run is available from 1491-1638. Additional information comes from forest court rolls, leases, and a parliamentary survey (Durham University: CC Boxes 84-90, CC 18458-18485, HC M.80, CC Sundry Notitia Bundle 1/iv; NYCRO: ZBD).

The site of Clack Wood is situated immediately to the west of Osmotherley on predominantly gently sloping ground, and is divided into two roughly equal halves by the Osmotherley-Northallerton road. At the time of the first accounts in the 1490s the woods were managed directly by a 'forester'. Products from the wood included building timber which was used to repair the Bishop's properties. These also provided lops and tops for sale. In 1518-19 a large sale of faggots is recorded. This was the result of coppicing as is shown by the following expense in the account for that year. (Durham Universty: CC Box 84, 189509)

'Et in denari solut pro nova factur lxxvi rodd [sepium] circa boscum dm de Clack pro uno virgulto ibm habend pro salva juvio boscm in eodem crescente ubi vendicio bosc ibm fact fuit pro Thome Strangewisse contrarotolae dm hoc anno precii rodd 1d ob.'

[And in money paid for making anew 76 rodd (of hedge) round the lords wood of Clack to have a coppice there to save the young wood growing there where a sale of wood there has been made by Thomas Strangewisse controller of the lord this year price per rodd 1½d]

Consideration of expenses for enclosure recorded in the accounts make it reasonably clear that Clack Wood was managed as a coppice from the start of the accounts. In the first year we find 60s paid for hedging, and a further 16d for a gate. Expenses for hedging are common in accounts for subsequent years. In 1514-15 for instance 490 roods of hedge were made round the North Wood of Clack (the half north of the road, see fig.24), and in 1521-2 59s/6d was spent on 611 roods of hedge.

By 1524-5 the offices of receiver, bailiff, and forester were all held by Edmund Scarlett. After this the three posts were always held by one person. In 1538-9 a custodian of the woods was appointed who oversaw the erection of 348 roods of hedge. At this time there was a new forester who appears to have attempted to exploit his position to his own advantage. In 1536-7 he claimed rights to lopp and topp. This was disallowed as the accounts clearly showed that these had always been sold. In 1550-51 he successfully claimed 21 years wages in arrears, in spite of the fact that he can only have been in office a maximum of 20. The mere fact that the forester was not paid, or there was no record of his payment implies a breakdown of management. Similarly the appointment of a custodian of the woods implies a lack of time or willingness to care for the woodland in person on the part of the forester. It is no surprise therefore that during this period coppicing appears to have been discontinued, the last record of hedging expenses being in 1550-51. Oaks and ash cut for firewood and timber continued to be recorded; however faggots are no longer mentioned. The wood thus appears to have degenerated into a woodpasture with timber trees. In 1621 the herbage of Clack was leased, and from this date not even timber is mentioned in the accounts. In 1647 according to the Parliamentary Survey only pollards remained. In 1754 a decision appears to have been made to convert two small scraps of woodland surviving on steeper slopes to coppice while the remainder, described as the 'land cleared of trees', was leased as a farm. These were depicted on a map dated 1798 (Durham CC Sundry Notitia Bundle 1/iv) and still mostly survive though part has disappeared through the erection of a saw mill, and most of the rest has been replanted with beech and conifers. Only a small patch of grazed, overgrown oak coppice now remains to indicate the character of the medieval wood.

Section 12.7

Arncliffe Woods

Arncliffe woods are situated approximately 2km to the North of Clack on the moorland scarp. The site is rather steeper than Clack and is still well wooded. Most has now been converted into plantation, but old stools of oak coppice can still be located. Again it is possible to determine the history of the wood from the late 15th century with some confidence. The wood was in the possession of the Maulverers and has been the subject of an historical study by Carol Cook (unpublished). There are a number of place-names in and around the wood which imply coppice management, examples being Kiln Spring, Park Spring, and Button Hag Wood. In the late 15th century the demesnes were leased to three tenants who in 1489-90 were accused of trespassing in the springs with their cattle to the value of vjs viijd and for felling wood without delivery ijs. The woods continued to be well managed, with continued records of wood and timber sales and the punishment of offences. In 1699 for instance a local was accused of cutting and conveying wood out of Norwood (NYCRO ZFLa). Account books from 1788-1836 (NYCRO ZFLb) show the wood to have been producing a complex range of products. Not only did the wood yield 'garsell' (hedging material) due to the tenants by common right, but also:

underwood,
firkin rods,
besom shafts,
tops,
rales,
poles,
fences,
fire wood,
charcoal,
bark,
and shipping timber.

In 1836, pit props, side sheaths, waggon soles, bottom sheaths, overings and hootrees were sold to Grace Helling Colliery. The tree species most commonly mentioned were hazel, oak, alder and ash. Clearly Arncliffe woods were well managed and intensively exploited well into the 19th century.

Although one might argue that Arncliffe wood had in any case a better chance of survival due to its steeper slopes which may have made it less attractive for pasture, on the basis of the documented histories of the two woods, both appear to have been subject to illicit grazing. The difference therefore appears to lie in the care taken to see that the woods were properly managed. The 'degeneration' of Clack Wood into woodpasture appears to be more the result of neglect than a matter of policy as its lease as pasture post-dates its degeneration into woodpasture. Equally we can see that although damage through grazing or theft certainly occurred in Arncliffe Woods attempts were made both to punish, and prevent these, with the result that the woods remained a considerable asset to the estate into the nineteenth century.

A lack of determination on the part of the Bishops of Durham to enforce woodland management is also implied by a comparison between Swaledale, and Weardale in County Durham. Both Pennine dales were forested in their upper reaches, both have long histories of lead exploitation, yet their woodland histories appear to be quite different. We have already seen that Swaledale's history is one of woodpasture, and industrial coppice, this latter being introduced in the later medieval, and post-medieval periods. This history is not only reflected by the documentary record, and the archaeology, but also in modern place-names; woods and farms in spring or hag are extremely common in Swaledale, but almost completely lacking in Weardale (there is one group of hag names between Stanhope and Eastgate marked on the 1:25000 OS map). The documentary record too implies neglect of woodland; the parliamentary survey of the forest states that there was no woodland. Similar inferences can be drawn from the fact that the practice of supplying mine timber in return for lott ore was discontinued at a much earlier date in Weardale than in Swaledale (pers. comm. A. Blackburn, Ashcroft 1984).

Section 12.8

Forests and Forest Law

The medieval forests of North Yorkshire are shown on figure I (see glossary for definition of forest). This includes both royal forests and private (these are sometimes referred to as chases). The distinction is not however always a clear one as private forests could sometimes fall into the Kings hands and royal forests were sometimes granted to others (eg. the Forest of Weardale). Also forests were in existence for very different lengths of time. The Forest of Ainsty for instance was disafforested in 1190 and Ouze and Derwent in 1234; Galtres on the other hand survived from at least 1154 to 1629 (Cowling). Even forests such as Galtres and Pickering which were in existence for a long time usually underwent considerable changes in area. The evidence for the forests shown on figure I is also very variable, ranging from Galtres and Pickering for which there is a wealth of documentary material, to those such as

Hovingham where the case rests on a reference to the appointment of a forester dated 1300. The only reference found to the forest at Helmsley is a dispute between the abbot of Rievaulx and William de Ros (Parker 1925:1) in which its legitimacy is questioned by the abbot; it may therefore never have existed in practice. In spite of all this it seems likely that perhaps as much as a third of the area was affected by Forest Law at some time during the medieval period. As much as a third of this again may have remained forest for most of the medieval period. Given that these forests are located for the most part in the areas where there was most woodland, and that forest laws relating to vert were in principle at least designed regulate woodland use to the advantage of the chase, it would seem almost certain that Forest Law had a major influence on the woodland of North Yorkshire, in both management and distribution. What is considerably less certain is of the precise nature of this influence.

Forest Law and its development is discussed in detail by Young (1979) and outlined in chapter 3. The essential points to note here are the restrictions it placed on the management and clearance of woodland. In principle the forest system prevented the erection of buildings, the creation of enclosures, the felling of trees, and the clearing of land within the forest without licence. Wood could be taken for personal consumption but not for sale. These provisions should have had the effect of discouraging assarts and coppicing (both by restricting tree felling and by discouraging enclosure). We have already seen, as a result of work by Oliver Rackham (see above chapter 3) that physical forests are perhaps best considered as a special form of wood pasture. In North Yorkshire the evidence for this is so far indirect. In lowland forests there is evidence of extensive pasture rights. Galtres for instance was mainly exploited by conventional vills which pre-dated the forest, and one or two monastic granges (such as Byland's grange at Boscar (Cowling)). An inquisition as to the customs of the woods of Galtres in the time of King John dated 1250 records that the men of Easingwold and Huby

'were wont to have common for oxen and cows, horses and mares, and for their hogs the whole year except the fence month so that they rendered for every hog over a year old, one penny yearly for pannage whether the Kings woods were agisted or not, and for a hog under a year old a half-penny or a tithe pig in the name of pannage...'.

The situation in the Forest of Pickering is similar, as this too contained a large number of extant vills prior to afforestation. Here a similar inquisition states that there was no right of common for sheep or goats within the covert (ie. there was for cattle and horses). This tendency to encourage cattle and horses can also be detected in many of the upland forests. This is demonstrated by a strong link between these forests and vaccaries. In the Forest of Swaledale there were vaccaries belonging to Rievaulx at Muker, Birkdale, Keld, Oxnop and Thwaite; The Gaunts had a further 12 at Kearton, Feetham, Blades, Smarber, Gunnerside, Ivelet, Stonesdale, Crackpot, 'Rincroft', 'Mosedale', 'Scaldecotes', and 'Ratonrawe', and there were two more held by Bridlington Priory at 'Wallesheued' and 'Frithloc'(Jennings and Fieldhouse 1978: 46-48). This accounts for the majority of settlements in the area today. A similar preponderance of vaccaries can be observed in other Pennine forests. In the Forest of Wensleydale, Jervaulx had vaccaries (Page 1914: 201); in the Forest of Nidderdale, Fountains and Byland (Jennings 1967). In Arkengarthdale the vaccaries were secular (Fieldhouse and Jennings 1978: 50). Extensive rights to pasture for cattle and the exclusion of sheep and especially goats, as in the Forests of Galtres and Pickering, are a common feature of wooded forests. One of the reasons given for the exclusion of these animals is that they are damaging to trees. The fact that the pasturing of cattle and horses was permitted, and widely practiced, leads one to conclude that these were considered more suited to a woodland environment, and that the forest woodland was to a large extent pastured.

Pannage was also often an important feature of forest exploitation. In 1320 well over 200 pigs were agisted in Galtres by the people of Easingwold (Cowling), and pannaging still appears to have been practised as late as the reign of James I. As pointed out in section 7.3 pannage depends on a reasonable stock of mature oak or beech trees. Rackham (1990: 157) notes that timber trees in woodpasture in deer parks tended to be allowed to grow larger than those in [coppice] woodland because of the difficulty in replacing them. This argument ought also to apply to other woodpastures so that the persistence of pannage in forests such as Galtres may be another indication of the importance of woodpasture within the forest. The existence of old and rotten trees is perhaps also indicated by references to dead trees such as the 50 leafless oak stumps given to the dean of York for fuel in 1300 (Cowling: 39). Vills within the forest usually had rights to estovers, which implies the existence of pollards as in other types of woodpasture. In fact references to estovers and pasture together account for the vast majority of references to forests encountered. Pollarding is also likely to have been encouraged by the practice of cutting branches, particularly of holly to feed the deer in winter. Evidence for this practice, sometimes called 'deerfall' comes particularly from the forest of Pickering. Here there are records of money received for the sale of boughs cut to feed the deer in winter, and expenses for cutting holly and thorns for the benefit of the deer in 1313-14 (Turton 1897: 18-20). In the same forest similar expenses are recorded in 1325 (Turton 1897: 223). In Galtres references are post-medieval, but the right of the foresters to deerfall recorded in the Remembrances of 1566 probably represents old established custom (Cowling: 19).

The evidence presented above gives an impression of woodland stability, of conservatism, tending to reinforce the idea that Forest Law tended to preserve woodland, and in particular woodpasture. The only way of deducing the actual effect of Forest Law is to compare areas within and without a forest, but in otherwise similar situations, and contrast their woodland histories. Although there are no ideal candidates for this within North Yorkshire, a comparison between the comparatively well documented area between Sherburn and Selby, and the core area of the Forest of Galtres, which remained forest till 1629, would seem appropriate. Both of these lie in the lowland, wooded zone of the Vale of York. The Domesday woodland for Galtres is difficult to determine as no measurements are given for the entry for the sockages of Easingwold. Probably this area was slightly less wooded than the Sherburn-Selby area. The amount of woodland inferred from place-names and documentary evidence is shown on figures 12 & 27. The date to which this best applies is obviously rather vague, but these probably represent a reasonable estimate of the distribution of woodland at around the time of the conquest. Both areas show evidence for approximately similar concentrations of woodland (about 20-30%). The predominant mode of exploitation is likely to have been woodpasture in both cases. Jumping forward in time to the 19th century and the early O.S. maps both areas can be seen to have lost a very large proportion of their medieval woodland. In the case of Galtres however the loss is almost complete whereas the Selby area has been able to hold on to a little more of its medieval woodland, most importantly, Bishop Wood. To determine whether the existence of a forest had any influence over clearance it is necessary to look as far as possible into the histories of the two areas.

The forest of Galtres has been the subject of an unpublished study by Cowling and the following account consists of a summary of his findings (except where other references are given). The forest was probably created during the 11th century, though the first documentary reference is in 1135-54. According to a perambulation of 1228-9 the area of the forest in the time of Henry II was approximately equivalent to the whole of the wapentake of Bulmer. This was reduced and re-expanded by successive Kings, according to their political fortunes, so that in 1300 the bounds given were those on figure 28. These were in theory the same as the bounds before the afforestations of Henry II (Young 1979: 140). The bounds of the forest probably continued to fluctuate but those given in 1300 probably represent the minimum area under forest law until the disafforestation of 1629. A rough impression of the progress of woodland clearance can be gained from licences to assart woodland areas, from a few other stray references to former woodland areas, and from a survey of the King's demesne by Richard Norwood in 1635, not long after the disafforestation. Records of woodland assarts include a licence to assart 40 acres of his own wood granted to the Prior of Marton in 1291, and that of a corner of wood at Easingwold granted to Robert Creppinges in 1238. In 1315 John de Thornton was licenced to assart 30 acres of the Lund at Sutton. Clearance was not necessarily always, or even mostly, by assarting; pasture could also take its toll. Mirescough, referred to as a wood in 1235, had become a laund by 1630. Similarly the Lund near Easingwold had become mainly open, moorish ground by the 17th century. In a study of the income from the Forest of Galtres, Young (1979) shows that the proportion gained from attachments rose dramatically during the 14th century, and deduces that, as assarts were the major cause of attachments, high income from this source indicates that the needs of agriculture were impinging on the forest. Whilst assarting does not necessarily involve woodland clearance the large numbers of assarts inferred for the later 14th century must to some extent represent an erosion of tree cover. The 1635 survey of the King's demesne shows the area to be still surprisingly well wooded the two major losses of woodland being Mirescough and Easingwold Lund. In a sense this underestimates the amount of clearance which had taken place in the forest as a whole. The map shows what remained in the Kings hands after disafforestation, the bounds of which were almost certainly drawn to include the main core of surviving woodland.

The assarting deduced from the attachment records are in no way exceptional. Records from other forests also appear to show high levels of assarting in the 14th century. Young (1979: 122) correlates this trend with a decline in the importance of the strict enforcement of forest law, which had been an important source of revenue for the Crown in the 12th century. In this context the implication of the survival of the central core of woodland is that this was deliberately conserved, possibly at the expense of other more peripheral woodland, particularly if in private hands. This is also implied by the concerns expressed in inquisitions to determine whether to grant licences to assart. In these one of the main considerations is the distance of the proposed assart from the 'great covert'.

Forest law also had a marked influence on the way in which common rights were exercised. In many North Yorkshire forests, rights of common recorded in charters give rights over the whole forest, rather than appertaining to a particular vill. In Galtres this appears to have been the case in practice as well as on parchment. In 1620 a total of 15 townships claimed common rights in an area called the Howe to the north of Easingwold. As a result there could be vigorous opposition to enclosure which significantly affected common rights. Examples of this occurred in 1347 when villagers threw down the enclosure and burned the hedge round 120 forest acres enclosed by the steward of Galtres, and in 1620 when a vigorous legal defence of common rights in the Howe was mounted in response to licenced enclosure (Cowling: 36 & 50-51).

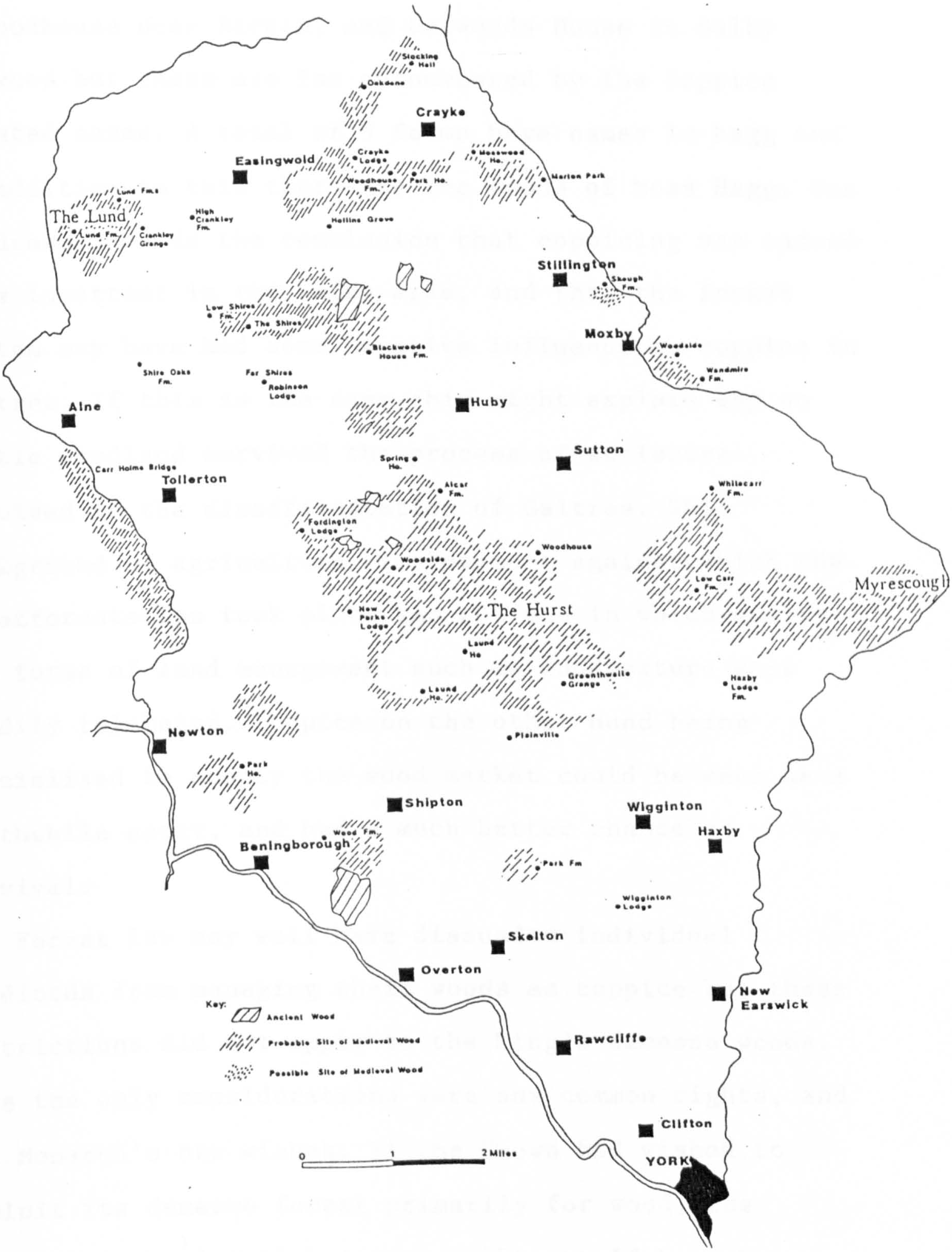
The progress of woodland clearance in the Selby area is even more difficult to chart during the medieval period. The general trend may well have been similar with a gradual encroachment of mainly small enclosures on the woods which were predominantly common woodpasture. Many of these survived at least long enough to be recorded in the dissolution ministers accounts and subsequent surveys of woodland in the 16th century. Assarts are recorded for both Hambleton and Selby in the 13th and 14th centuries. Evidence of opposition to medieval enclosure is lacking, though freeholders were compensated for the loss of common on the enclosure of Stainer Park in the late 13th century (Fowler 1890: 168-171). In general the impression of the two areas is similar with the survival of a recognisably medieval pattern of land use and woodland distribution into the post medieval period, even if, as was probably the case with Selby Outwood, the density of trees was severely reduced.

The real explanation for the thoroughness with which the medieval woodland of Galtres had been lost by the 19th century probably lies in the process of disafforestation and the events which immediately followed and preceded it. Just prior to the disafforestation a series of leases of substantial areas were given which ran into considerable opposition from the commoners as mentioned above. These enclosures, which totalled at least 1445 statute acres, must have led to the clearance of a considerable area of woodland, though the precise fate of the enclosures and the success of the commoners' opposition is not known. The disafforestation itself, which involved the allocation of parcels of land in lieu of common in a similar manner to the later parliamentary enclosures, was followed by a number of leases of the land retained in demesne by the King. Again a considerable loss of woodland would be expected as a result of agricultural improvements. The woodpastures of the Selby area are more likely to have experienced a gradual decline in the number of trees in the post-medieval period, so that by the time of parliamentary enclosure in the 18th and 19th centuries there were few trees left.

Quite apart from controlling the clearance of woodland, Forest Law was also designed to influence its management. In principle, coppicing ought to have been strongly discouraged as neither the cutting of trees nor enclosure were permitted without licence. In spite of the fact that coppicing required a licence, at least in theory, there is some evidence of medieval coppice in Galtres. For instance there is a sale of the all wood, timber and underwood in Lund at Sutton in Galtres by Ranulf de Neville to the abbot of St Mary's York in 1294 which makes it absolutely clear that a coppice wood is involved (Harrison). Licences to fell are also recorded as for instance at Flawith in 1294, and at Skelton and elsewhere in the forest, where a hundred acres were licenced to be felled, a condition being that the coppices were enclosed according to the assise of the forest (Cowling). What these references make clear is that coppicing could, and did, form part of the management of a forest. What is lacking is a measure of the extent to which one form of management was encouraged in preference to another. Do the coppices recorded above represent the exception or the rule? Two lines of argument are possible. On the one hand one might consider that the enforcement of forest law, especially after the 13th century, due to the infrequency of forest eyres and the declining importance of forest revenues to the Crown, was sufficiently lax that the references quoted above represent the tip of the iceberg, and that coppice was at least as common in forest areas as elsewhere in the late middle ages. The alternative view is that the vagaries of successive monarchs, and the exploitation by forest officials of their positions, created an atmosphere which did not encourage the creation of coppices or their survival in the long term.

Although the history of the forest system is reasonably well recorded by authors such as Young (1979) it is much more difficult to find satisfactory information concerning its effect. One of the few options for comparative study is the traces which management has left on the map. The significance of names such as hagg, spring and fall were mentioned in chapters 7 & 8, and the relationship between woodhouses, outwoods and woodpasture are discussed in Appendix 3. The place-names of these types on the 1:25000 O.S. maps for Galtres and the Selby area are represented on figures 12 & 28. This information does not represent the woodland management of any particular point in time, but rather the result of the gradual accumulation and loss over several centuries of place-names which imply one form of management or another. This is in many ways more useful for the present exercise as it is arguable that it is the persistent woodland uses which are most likely to leave a lasting mark on the landscape. The O.S. map records three names of interest in the Galtres area; Woodhouse south of Sutton and Woodhouse Farm near Crayke may be linked with

Fig.28 Medieval Woodland in the Forest of Galtres



woodpasture exploitation. Spring House to the south west of Huby presents evidence for coppice. The Selby map has a Woodhouse near Birkin, and Outwoods House in Selby Outwood but these are far outnumbered by the coppice related names. A total of 5 farms have names in hagg and in addition to this there are the woods of Moss Hagg. One is drawn towards the conclusion that coppicing was indeed more important in the Selby area, and that the forest system may have had some negative influence on coppice in Galtres. If this is the case this might explain why so little woodland survived the process of enclosure involved in the disafforestation of Galtres. The background of agricultural improvement against which the disafforestation took place was not one in which multi-use forms of land management such as woodpasture were readily tolerated. Coppice on the other hand being specialised to supply the wood market could be seen as a worthwhile asset, and had a much better chance of survival.

Forest law may well have dissuaded individual landlords from managing their woods as coppice but these restrictions did not apply to the King's demesne woods. Here the only considerations were any common rights, and the Monarch's own wishes. If the Crown had wished to exploit its demesne forest primarily for wood, the obvious compromise with common rights would have been management as compartmented woodpasture. In fact Rackham records a number of forests where this did take place such as Hatfield, Writtle, and Groveley. It is noticeable that most of the forests managed in this way were relatively small and compact with relatively few vills claiming common rights. The problems of creating compartmented woodpasture in large well settled forests such as Galtres or Pickering can hardly have made the idea an attractive prospect. This does not of course preclude the existence of small areas of royal coppice within the otherwise uncompartmented woodpasture of these forests. The map of 1635 of Galtres depicts just such an area, referred to as the coppice. It is noticeable that the small compartmented forests recorded by Rackham have on the whole survived much better than those like Galtres which were predominantly open woodpasture.

The discussion above relates mainly to Royal forest for which there is a reasonable quantity of information. Private forests though similar in their initial purpose, the preservation of the beasts of the chase for exploitation by a particular individual, were not necessarily quite the same in practice. In particular one might doubt whether the owner of a private forest was able to introduce quite such draconian measures as the King. The creation of a forest essentially involved the reservation of various rights at some point down the feudal chain. In the case of a Royal forest these were obviously retained by the King, and were maintained by a special body of law. Where private forests are concerned this reservation of rights might occur at the level of tenant in chief, or even sub tenant. This latter is the case in Swaledale where the forest was created by the family of the Gaunts, sub tenants of the Counts of Brittany. As a result there were almost certainly major differences between Forest Law, and the legal rights which owners of private forests were able to exercise. It is for instance to be doubted whether the owner of a private forest could have had much jurisdiction over woods which were held by others. The owner of a forest would therefore have to retain the bulk of the woodland in his own hands or at least impose restrictive clauses on any grants or sales if he wished to have control over the vert. In Swaledale the solution to this problem appears to have been to grant extensive pasture rights to various monasteries, leading to the creation of vaccaries. Control over enclosure may also have been more limited as is illustrated when Henry Fitz Ranulf, the lord of the sub-manor of Fremington sued Gilbert de Gaunt for causing his fences to be thrown down because they interfered with his hunting rights. The Jury decided that the enclosures could remain as they had stood for nearly a year (Fieldhouse & Jennings 1978: 46). The implication is clearly that the legal teeth which the owner of a private forest could bring to bear on sub-tenants were considerably blunter than those with which the crown maintained its forests. The difference between the ways in which private and royal forests affected woodland awaits further study. However it is probable that in areas such as the Pennines the most pronounced effect of both was to encourage the establishment of vaccaries which were consistent with a woodpasture economy.

Section 12.9

Parks

The history and management of medieval deer parks was discussed in general terms in chapter 3. Some more detailed consideration is appropriate here. When at their height in the thirteenth century the main purpose of most parks was the enhancement of social position and the provision of venison for the table by farming deer. Some larger parks were also occasionally used for hunting, and others particularly those which were very small may never have contained deer. For the vast majority of parks then management was intended to provide a suitable environment for the deer. Woodland was considered an essential element in this environment. Woodland was also important for providing the raw materials for the park pale, and any other enclosures within the park. Deer had to be provided with winter fodder with the result that many parks contained a hay meadow. As in forests, holly was frequently used as an additional source of fodder. Open areas were necessary to provide the deer with sufficient pasture. The ideal deer park then contained both wood and open pasture, and an enclosed area from which a hay crop could be taken. Holly pollards might be found spread throughout the park or concentrated around the meadow where the deer would be fed in winter. Management of the woodland might be by open woodpasture, with pollards and/or timber trees, or more often by compartmentation. Even in this ideal park there are opportunities for the owner to offset the expense of the park. Wood from coppice compartments and pollards may be sold, money may be raised by selling timber, charging for the agistment of cattle on any excess pasture, or the pannage of pigs in autumn.

Although the woodland of parks, as of any form of woodpasture, may be considered inherently unstable, most parks were also areas of demesne, giving the owner complete control. This ought to have allowed better management than other forms of woodpasture. Even in parks which consisted purely of open woodpasture it would have been easier for the owner to provide a succession of trees than on a woodpasture common. Thus as long as parks were managed primarily for deer, one would expect a better survival of woodland than in other forms of woodpasture. It has already been observed that most parks are likely to have been managed as compartmented woodpasture (Chapter 3). A close parallel to parks then in function and management is the compartmented forest such as Hatfield, or Grovely. These have a surprisingly good survival record. Nor was the woodland in all parks necessarily destroyed; to give a North Yorkshire example, Downholme Park in Swaledale even now retains all the woodland it is likely to have had on emparkation after 1321.

In the later medieval period the balance between the social value of deer parks and the need for a financial return appears to have shifted in favour of the latter. Owners often appear to have sought more profitable modes of exploitation. As on other demesnes this frequently took the form of letting the pasture; but other options were available to the owner. An instance of this is at Aislaby near Whitby where in 1390 amongst other woods the 'Oldpark' was exploited as coppice with standards, and sold to a local syndicate (Walbran 1878: 1). One or two North Yorkshire parks appear to have been retained for their original purpose. An example of this is Duncombe Park in the Howardian Hills. Often like Duncombe these were close to the seats of their owners, and frequently they later made the transition to country house park and finally landscape park. In the case of Castle Howard and Duncombe Park this has led to the incorporation of some aspects of the old deer park including some ancient pollards. In general there seems little reason to conclude that parks actually contributed to the destruction of woodland. The woodland they contained may even have benefited from good management for a while. Only in a few cases however can this have done anything more than delay the clearance of woodland till the late medieval period when many were leased as pasture. One or two survived this process with some remaining woodland. Often this survives on the steeper slopes where woodland tends to have hung on in most other management contexts.

Section 12.10

Traditional Practice: The Leaf Foddering Tradition

Leaf foddering, the practice of feeding leaves and branches to stock in winter, is still practiced in many more remote parts of Europe, including northern Greece, Sweden, and the English Lake District (Buckland pers. comm., Haeggstrom 1983, Denyer 1991). The trees used vary according to the natural vegetation of the area; oak, ash, elm and holly are commonly recorded. Where deciduous trees are involved branches must be cut in autumn before the leaves drop, and dried before storage. Alternatively, particularly in the case of elm, the leaves may be stripped from the tree and stored in a chest to form a kind of leaf silage. Holly, being evergreen is normally cut as required. English practice, as it survives in Cumbria, involves the use of branches of ash and oak pollards which grow both within the enclosed field called the ringgarth, and in pollard woods outside. Holly too is used, also growing in groups outside the ring garth

(Denyer 1991, Fleming pers. comm.). The Cumbrian practice, which now only survives on one farm, and is being actively preserved by the National Trust, has a very long history and may once have been widespread in upland northern England. There is evidence for the use of holly as fodder in the southern Pennines from the 13th century, still being quite important there in the 17th (Radley 1961). Denyer finds documentary references to leaf fodder in the Lake District from the late 13th century. In an attempt to determine the extent of the use of holly fodder Spray (1981) notes references from the Forest of Bowland, West Derby, Macclesfield Forest, Shropshire, Staffordshire, and the New Forest, and a possible reference in 1222 from Essex. He notes that although the earliest reference is from southern England, the bulk, and also the latest references are from northern England. He concludes that the use of holly as a fodder was most important, and persisted longest, in the northern uplands. This conclusion is supported by a survey of hollin place-names which have a similar distribution. Documentary evidence of the use of leaf fodder in North Yorkshire would seem to indicate the widespread medieval use of holly in the Pennine Dales. In Swaledale the grant of vaccaries to Rievaulx in the 13th century included the right to cut holly for winter fodder (Fieldhouse & Jennings 1978: 39). Early 16th century leases of properties belonging to Fountains Abbey and

Bolton Priory (Michelmore 1981, Kershaw 1969) include many references to leaf fodder, referred to as 'brusing', or browsing, or in one instance 'broge'. Often the species of tree is not specified, but sometimes as at Pott holly is specified; here the lessees were not to fell any wood of warrant without licence '...except for lawful felling of holly boughs and other brushwood at seasonable time of year called brousing for pasture of cattle....'. More rarely oak is mentioned, as at Warsill Grange where the lessees were bound to keep cattle with hay, oak, and holly 'broge'(Michelmore 1981). Leaf foddering also seems to have been practised in the dales of the North York Moors as the feeding of holly(?) branches to cattle in winter is mentioned in a dispute between Rievaulx abbey and William de Ross (Atkinson 1889: 161-3). The ministers' accounts for Whitby Abbey record a charge made for browsing of holly for cattle (Atkinson 1879: 745). This charge appears normal practice at this time, as the ministers' accounts for Fountains records a similar payment made by the villages of Hartwith and Windsley. In Cumbria this payment was called greenhewe (Denyer pers. comm.). In Swaledale in the early 17th century the inhabitants of the manor of Muker agreed to pay their 'greenhewes and fisheries' as they had been accustomed to do. Most of these references are early 16th century when to judge from the Fountains Abbey lease book the practice was still important, at least in Wharfdale, Nidderdale and the Pennine fringe. By the later 17th century leaf foddering appears to have died out in Swaledale, as no return was recorded in the accounts for the manors of Healaugh and Muker in 1669-70 (Ashcroft & Hill 1984). Similarly in Bilsdale in the North York Moors just one farm is mentioned as having the 'toppings of certain hollings' in a survey of 1637 (Ashcroft 1980). It is likely that this is a last remnant of a practice in decline, and it is not mentioned in subsequent surveys.

The importance of leaf foddering lies in the potential for creating very characteristic landscapes, as has patently occurred in the Lake District. In North Yorkshire leaf foddering has left few obvious traces. Occasional groups of hollies close to ex-vaccaries, and the occasional ash or elm pollard in Swaledale may be linked to the use of leaf fodder. Slightly more convincing is a small collection of ancient holly pollards in upper Nidderdale. The lack of such traces is hardly surprising considering that it may be 300 or more years since the practice died out in this county. This should not however discourage us from considering the contemporary influence such a tradition might have had.

The major advantage of leaf fodder over hay or other fodder crops used in the medieval period is the reliability of the crop. Even in a bad year when the hay harvest fails a leaf crop can be expected. It is probably this which has led to the predominantly northern and

Photo.9 Holly pollard, Nidderdale.

upland distribution of the practice which Spray (1981) observes (It must however be noted that other, cultural, explanations can be proffered for this distribution). Medieval references also seem to display a strong link with cattle farming, and forests. It is possible therefore that leaf foddering was an integral part of the exploitation of upland woodpasture, in particular in areas of forest where vaccaries were encouraged. The presence of such a tradition may have provided yet another impetus for the defence of common woodpasture. Its continuance in a context of declining woodpasture might be expected to have led to the deliberate conservation of groups of pollards, and to have encouraged the practice of pollarding trees in field boundaries. In other words the expected consequence of a leaf foddering tradition in the long term is precisely the type of landscape which Denyer observes in Cumbria, and it may be in this context which the elm and ash pollards, and the groups of hollies in areas such as Swaledale should be understood.

The bark stripped branches left after feeding the stock could be an important resource in their own right. Denyer (1991) notes the use of these bare poles for purposes such as roofing, and Fell (1968) records the use of browse wood to make potash in an elling hearth (see Davies-Schiel 1974 for a description of this industry). It is likely that as with deerfall, secondary use of the wood was normal, and may have been intimately connected with the exercise of rights to estovers. The practice of pollarding and perhaps the payment of greenhewes may thus continue when leaf foddering is no longer practiced.

Denyer (1991), Spray (1981), and Radley (1961) all attempt to explain the abandonment of leaf foddering in terms of the agricultural improvements of the 18th and 19th centuries. In particular the use of alternative fodder crops such as turnips, and the improvement of land by limeing and marling are cited as possible causes. In fact the evidence suggests that the practice may have fallen into disuse in North Yorkshire at a rather earlier date; perhaps as a result of the decline of woodpasture, both by enclosure and by a gradual thinning due to grazing.

Chapter 13

Conclusion & Discussion

Section 13.1

Prehistoric Woodland

For the prehistoric period, information is naturally scarce. Pollen evidence is difficult to interpret (especially where management of trees is concerned) and spatially limited. Large areas of the county are virtually invisible in the known pollen record. Archaeological information only goes a small way to fill these gaps, and in any case reflects only very indirectly the fate of woodland. It has nevertheless been possible to elucidate the timing of major phases of woodland clearance, and the possible locations of woodland refugia. By proposing a model for the interpretation of the upland pollen record, some aspects of prehistoric woodland exploitation have been investigated. For much of upland North Yorkshire the large number, and wide distribution of pollen sites allows a reasonably confident account of the main events. During the Mesolithic the main human activity which affected woodland cover is likely to have been woodland burning. This may have created an upland landscape consisting of a mosaic of mature woodland, regenerating scrub, and both permanent and temporary open areas. Variation in the relative representation of different tree species between pollen diagrams immediately before the Elm Decline suggests that the composition of the woodland is likely to have varied naturally according to edaphic conditions, and as a result of differing intensities of human activity, which may have particularly favoured hazel.

At the beginning of the Neolithic woodland burning appears to have stopped. Conventional interpretations of the pollen record for this period tend to suggest that shifting agriculture, or clearance for pasture, may have created small, mostly temporary clearances in the wildwood. This type of interpretation is thought to be inadequate for several reasons. As pointed out by Edwards (1979), pollen sites tend to be in areas which were probably distant from the main locations of settlement. Little attempt has been made to model the possible effects of pastoral exploitation on the landscape in spite of the repeated assertion that pastoralism was probably responsible for the observed changes. It is usually assumed that drops in the proportion of arboreal pollen represent clearance rather than thinning of woodland. Little account has been taken of possible changes in the structure of woodland as a result of exploitation. In response to these criticisms of existing interpretations a model for the neolithic and bronze age exploitation of upland woodland has been proposed, involving the transhumant use of upland woodpasture. This model is thought to offer a better interpretation of some features of the pollen record, especially the _Tilia_ decline. It is also consistent with a landscape in which ritual features such as barrows and carved rocks occur distant from the areas likely to have been important for settlement, providing a reason for the regular exploitation of, and movement through these landscapes.

The inferred transhumant use of upland woodpasture in the Neolithic and Bronze Age was followed in the Iron Age by widespread, rapid clearance, reducing woodland to a small part of the landscape, probably largely restricted to refugia such as steep slopes and stream-sides. The magnitude of this clearance indicates a major change in the intensity of upland exploitation. It is perhaps significant that in some areas such as Swaledale the uplands were divided up by large regular field systems at about this time. Clearance may therefore have been accompanied, or followed, by a parcelling out of the landscape. The upland land use of the Iron Age therefore probably took the form of intensive exploitation of the now treeless pastures. This may sometimes have involved the 'privatisation' of earlier woodpasture 'commons'.

The paleo-environmental evidence for the rest of North Yorkshire is very scarce, rendering a much more tentative interpretation. On the Wolds the abundance of evidence for Neolithic and later settlement suggests that woodland may have been extensively cleared here at a much earlier date than the uplands. This conclusion is supported by pollen evidence from Willow Garth (Bush

1988) which suggests a predominantly open landscape by the Bronze Age. On the Tabular Hills of north east Yorkshire the archaeological evidence again implies earlier clearance, perhaps reducing woodland to the steeper slopes during the Bronze Age. The widespread nature of this refugium in this area may have ensured the long term survival of quite large areas of woodland. For the Vale of Mowbray the sequence of events is even less clear; however, perhaps the best interpretation of the meagre evidence is progressive clearance, with the emphasis on late prehistory, resulting in a mainly open landscape by the end of the Roman period. For the Vale of York on the other hand, settlement and cleared land may have been quite limited till very late, probably only reaching a stage where the area which was unwooded exceeded that supporting woodland in the Iron Age or the Roman period.

Section 13.2

Historic Woodland Distribution

In principle the pattern of post-Roman woodland ought to be reflected by the distribution of woodland related place-names. However, comparison of the distribution of these with evidence for woodland in Domesday and other medieval sources has shown that the relationship between woodland and place-names may not have been a simple one. These three sources when considered together indicate a very uneven distribution of woodland in the early medieval period (see figures D, E & G). The lack of evidence for woodland in areas such as the Wolds and the Vale of Mowbray must either represent a lack of trees at the end of the Roman period from which woodland might regenerate, or, more probably, that the level of population in these areas was sufficient throughout the post-Roman period to prevent substantial regeneration. In addition to these relatively fertile areas, the extremely infertile moorland tracts of the Pennines and the North York Moors appear to have remained largely unwooded. It is possible that environmental factors such as podsolisation of the soil, exposure, and the growth of blanket peat, may have been important in inhibiting woodland regeneration. However it is probable that continued use of upland grazing was more important. The remaining areas, most importantly the dales of the Pennines and the North York Moors, the Tabular Hills, and the Vale of York, probably had both more woodland which survived the Romans, and experienced more woodland regeneration in the succeeding period.

Information from pollen profiles implies that the period from at the latest the tenth century until the late 13th was one of considerable woodland clearance. This is to some extent reflected in the documentary record by references to assarts, and the foundation of monastic houses in woodland areas. Much must, however, have been invisible to the documentary record, particularly where destruction by grazing is concerned. Pollen diagrams show a recovery in woodland in the 14th and 15th centuries. These pollen diagrams are situated on moorlands and the increases in arboreal pollen appear to reflect woodland regeneration on the valley sides and moorland scarp. Whether any regeneration occurred in lowland areas is unknown. Rapid woodland clearance was soon resumed in the areas represented by the pollen diagrams. By the end of the medieval period surveys show a considerable loss of the woodland recorded in the early medieval period, though the pattern of woodland distribution is still very similar.

Section 13.3

Historic Woodland Management

Medieval documentary sources allow a glimpse of the management trends during the medieval period. The small number of references which can be given a management interpretation render the the conclusions which can be drawn from this evidence tentative. However, distributional analysis of the evidence for woodland management shows that in most of the more wooded areas, woodpasture is likely to have been the dominant form of management. An area of the Pennine fringe to the north and west of Ripon stands out as having a particular concentration of references which can be interpreted as coppice. The coincidence of this with a similar concentration of <u>silva minuta</u> entries in the Domesday Book gives additional credence to Rackham's interpretation of <u>silva minuta</u> as coppice.

In addition to considering the spatial patterns of management, the medieval evidence has also been used to consider changes in management over time. On the basis of the analysis of references to woodland in chapter 7, the management history of medieval woodland in North Yorkshire can be divided into three phases. In the first of these, up to c.1200 references to pannage are most important, implying that this was the main source of income derived from woodlands by landlords. This suggests that common woodpasture was widespread, and that coppicing and pollarding may not have been extensive. The succeeding period from c.1200 to 1320 is characterised by a large number of references to woodland pasture. This may be the result of increasing pressure on the woodland resource, leading to more precise definition of pasture rights. During the final period from c.1320 onwards, there is a marked rise in the number of references to coppice. It appears that the area managed as coppice was very much extended in the late Middle Ages and after, so that by the mid-sixteenth century coppicing was the dominant form of management in many areas.

Post-medieval surveys not only show that coppices formed a major proportion of the surviving woodland, but also that woodpastures were in decline. Some had lost a large proportion of their trees, whilst others had already been enclosed. The destruction of woodpasture continued in the following centuries so that by the time of the O.S. maps and Tithe maps of the 19th century very little remained. Coppice fared rather better in the post-medieval period and in some areas such as Swaledale the area under coppice may have reached a peak in the 17th century (see section 11.3). The post medieval period also saw a movement towards plantation as a method of producing timber. This is amply demonstrated by the large areas of plantation observed on tithe and early O.S. maps.

Section 13.4

Models for Diversity and Change

In part 3 it was demonstrated how a diversity of woodland histories might develop. Different areas may have topography which is more or less favourable to the survival of woodland. The value of wood may vary from place to place as a result of specific sources of demand such as towns or industry, or because of a relative scarcity. The defence of common may vary according to such factors as the security of tenure, scarcity of grazing, the strength of lordly control, and variability in lordly interest. Additional factors such as the influence of deer parks and private and royal forest on land use and on the exploitation of woodland, help to create further diversity. Even the social position, and person of the lord must be considered. Some of these factors help to create regional patterns which have begun to be identified in the present study, others ensure that no woodland has the same history as its neighbour.

As discussed in Chapter 10 woodland has typically become restricted to areas which present difficulties for other forms of exploitation. In many areas of North Yorkshire such as the Yorkshire Dales, the North York Moors, and the Vale of York grazing animals are likely to have discouraged woodland regeneration on the land where pasture was more accessible, or of better quality. A rather smaller area of woodland is likely to have been cleared intentionally for agriculture. The result of these processes has been that at times of stress woodland has become restricted to areas prone to flooding as in the Vale of York, or with very steep slopes as in north east Yorkshire or the Yorkshire Dales. The consequence of this has been that at all times since the Roman period the main determinant of woodland distribution has been the availability of refugia in which woodland has survived during periods of agricultural expansion, and from which it has been able to spread during agricultural recession.

Chapter 11 introduced the concept that the higher the value of woodland compared to other land uses, the better the chances of its survival. This in turn was linked to the adoption of ever more intensive methods of woodland management, both as the area of woodland decreased, and in circumstances of enhanced demand. This trend towards increasingly intensive management is observed both in the evidence for the adoption of coppice management in order to supply wood using industries in the post medieval period, and in evidence for the adoption of increasingly intensive methods of woodland management during the medieval period, culminating in the widespread use of coppicing. The economic view helps to explain some aspects of the regional diversity in woodland history. The survival of woodpasture commons in the upper dales may be in part a result of the slow growth rate of trees at such high elevations and the unsuitability of the land for more intensive forms of exploitation. Similarly the late adoption of coppicing in the Vale of York might be viewed as a result of the large areas of woodland available here during the medieval period, which may have allowed relatively inefficient methods of exploitation to persist. An expanded market for wood for lead smelting and mining can certainly be seen as the main cause of the introduction of coppicing to parts of Swaledale in the sixteenth and seventeenth centuries. Local industrial demand may also have encouraged coppicing in other areas such as Ryedale where there was an active post medieval iron industry.

This economic view of woodland history cannot portray the complete picture. There are for instance problems in accounting for the apparently rapid expansion of coppice in the post plague period. Even if there was an increase in personal consumption due to higher per capita wealth this is surely unlikely to have produced an increase in total demand, as would have to be the case if economic considerations were the only issue. Besides economic pressures can only operate within society. In particular, if we accept Rackham's view (1990: 91-93) that plantation was uncommon in the medieval period, any expansion of coppice woodland must have represented an encroachment on wooded commons, or the encoppicement of secondary woodland on arable. In this context a post Black Death expansion of coppice might be best explained by a relaxation of grazing pressure on wooded commons, leading to a less vigorous defence of common rights to pasture. This explanation would reconcile an expansion of coppice to meet demands already created during the preceding era by the expansion of towns and the presence of areas such as the Wolds and the Vale of Mowbray in which woodland was scarce, with a decline in population, and, in some areas at least, the formation of secondary woodland. A social view of woodland history would also help to explain why coppicing was not adopted more widely before the Black Death. Pressure on resources may have prevented enclosure (and thus coppice management) by promoting a more vigorous defence of common rights. This may have been particularly the case in the more wooded areas where one might suggest a greater proportion of free tenure. Variation in tenure and the resultant effects on the defence of common might also have enabled the survival of common woodpasture into the sixteenth century and beyond in some areas (the Vale of York and the upper Yorkshire Dales), while other, equally wooded areas, such as the Pennine fringe and the lower Dales appear to have lost the majority of their wooded commons comparatively early. Post-medieval developments such as the further expansion of coppice, the enclosure of common woodpastures, and the spread of plantation are also best considered as the result of a combination of factors. Economic factors such as population expansion and the growth of industry and towns must certainly have played a part. This is perhaps particularly the case where a particular market created local demand, as was the case with the Swaledale lead industry. However as shown by others (eg. Thompson 1991, Huggett 1975) the enclosure movement and agricultural improvement also had their social dimensions. The same may be true of plantation, particularly in view of the observed connection with landscape parks, and the existence of fashions in trees (see Rackham 1990: 93).

Section 13.5

Comparison with Other Areas

It has already been observed that Rackham's studies of woodland history are based mainly on the woodlands of southern and eastern England. In general his findings and those of the present study are very similar. Both identify the importance of woodpasture and coppice from an early date. Similar methods and trends in management are observed. An increase in coppice and a decline in woodpasture is observed in both studies. There are however also contrasts to be made. Rackham finds that coppicing had already become dominant during the 13th century. Although he applies this to the whole of England, this statement is based mainly on his own work in the southern and eastern parts of the country supported by some records of coppice from elsewhere. He also observes that woodpasture had much declined by the thirteenth century in most areas. Although there is evidence that the importance of coppice was increasing and of grazing pressure on wooded commons during the 13th century in North Yorkshire, the evidence would suggest that woodpasture continued to be important into the period after the Black Death. It was probably not until the 14th and 15th centuries that coppicing experienced a major expansion.

The apparent contrast between North Yorkshire woodland and that studied by Rackham is also observable in the field. The present work appears to confirm Guliver's (1989) observation that woodbanks are lacking in the Vale of York, indeed this would seem to apply to the whole county, with the possible exception of the Howardian Hills. It is possible that this is linked to the late emergence of coppice as the dominant form of woodland management.

Section 13.6

The Potential for Further Study

In undertaking this study it was intended to produce a framework in which more detailed studies of woodland could be considered rather than produce a definitive statement on the woodland history of North Yorkshire. Almost every topic covered warrants further study. For the prehistoric period effort must be made to fill the gaps in our knowledge of the vegetation history of the lowlands and those areas with calcareous geology. The scope for such study is severely limited by a lack of potential palynological sites. However, in the calcareous areas the study of snail shell assemblages may have potential. Where palynology is concerned the possibilities for detecting changes of woodland management are only just beginning to be realised. For historic period the pollen record provides a continuity of narrative the importance of which has been largely underestimated, leading to a lack of well dated profiles for this period.

Where the documented history of woodland is concerned many medieval documents remain to be studied both in public archives and in private collections. Further study of this material may allow the trends of medieval management tentatively presented here to be confirmed or questioned. Similarly a further study of these sources may help to further define the characteristics of the different woodland landscapes identified here, their histories, and the way in which the character of woodland in these areas relates to other aspects of the landscape. Further documentary work might also help illuminate the darkness of the 14th and 15th centuries when a major movement towards more commercial exploitation of woodland appears to have taken place. Study should also be made where possible of the actual, rather than the theoretical, effect of both private and royal forest on the management of woodland, as well as other aspects of medieval life and landscape.

As the factors which affect woodland history, and the diversity of this history, both in North Yorkshire and nationally, become increasingly clear, intimations of the links between woodland and the other features of the landscape begin to emerge. Williamson and Rackham have already begun to define some of the problems in this area by attracting attention to distinctions between Ancient (or Woodland) and Planned (or Champagne landscapes). Each offers their own suggestion as to how such distinctions might come about. An important feature of this discussion is the extent to which landscape characteristics coincide. Thus the distribution, and utilisation of woodland must be considered as one aspect of a cultural landscape of which patterns of settlement, field systems, and commons form a part. Comparison between the increasing data on field systems, the use of commons, patterns of settlement, and the utilisation and distribution of woodland, may lead towards an understanding of the processes which govern landscape formation and change which would prove elusive if these were considered in isolation.

The relationship between woodland and medieval industry is also still unclear. By the dissolution of the monasteries it is certain that the relationship between the iron industry and coppicing was well established, and it is probable that a similar relationship existed to supply the lead industry with fuel. It is not clear when this relationship emerged or whether pre-Black Death industries were supplied on a more casual basis, or were more restricted by competing common rights. A further study of the many other industries and markets for wood in medieval North Yorkshire may further illuminate the reasons for observed variations in woodland management and distribution.

Field work also has an important role to play. Where management for industrial purposes is concerned charcoal platforms represent a considerable, and largely untapped record of woodland history. The study of Ivelet Wood presented here illustrates the potential of these features to provide information on woodland history. Investigations need not even be as complex as this. Charcoal platforms survive well in areas where pastoralism has been dominant and their distributions may reveal the areas affected by particular industries. Study of surface charcoal samples may reveal evidence of selectivity, or provide information on past woodland structure. The potential of detailed field work in combination with other forms of evidence is also illustrated by the work currently being undertaken by Andrew Fleming in Swaledale which is helping to put woodland in the context of other aspects of the landscape.

The one source of information on woodland of which only limited use has been made in this study is woodland ecology. There is now an established link between the age of woodland and its flora (Rackham 1990, Peterken 1974). Different woodland environments may act as refugia for specialised flora and fauna. Woodland grassland may for instance have its own characteristic flora (Rackham 1980: 82). Woodpasture is particularly associated with rare lichens (Rose 1974) and invertibrate animals (Rackham

1980: 201-2). In spite of the undoubted link between the nature of woodland and its ecology the study of this subject has not yet reached a stage where woodland floras can be used to determine woodland history. It has been observed by a number of authors that the behaviour of plants may vary from region to region (eg. Rackham 1990: 133). It has therefore been considered that in an area such as North Yorkshire, which has extreme variations in surface geology, drainage, elevation, altitude, and rainfall from one location to another, such information should be treated with some caution. This is not to say that plants have no information to yield, rather that the detailed field work necessary to understand this information was considered too time consuming to play a major role in this particular study. Indeed a more accurate knowledge of the long term response of woodland flora to differing forms of management would be useful both to students of woodland history, and to conservationists wishing to preserve or enrich an ancient woodland habitat.

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APPENDIX 1

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APPENDIX 2

Ivelet Wood Project

Introduction

Physical Background

This project was designed to investigate the past history of Ivelet Wood in Swaledale. The wood, which is currently part of Ivelet common pasture, is one of a number of woods in Swaledale believed to have been used to supply the local lead industry with fuel. It lies on a steep slope composed mainly of boulder clay and sandstone scree, overlooked by a limestone scar, situated on the valley side 1km north of Muker (see fig.29). The wood extends onto the flood plain of the Swale in places, and there is a small outcrop of sandstone near the base of the slope. The vegetation of the southern part of Ivelet Wood has been described in a survey of ancient woodland in the Pennine Dales undertaken jointly by English Nature and the Yorkshire Dales National Park. As shown on figure 30, the northern end of the wood consists mainly of birch, with hazel scrub dominating the south. Occasional sycamore are present in the southern end, as is rowan. Ash, blackthorn, and bird cherry are present but rare in this part of the wood. Hawthorn occurs throughout. The sandstone outcrop supports a more mixed woodland with wych elm, ash, birch, hazel, and hawthorn. Alder carr occupies the flat boggy area on the Swale flood-plain. Where herbaceous plants are concerned, flora normally associated with woodland is limited due to heavy grazing. The woodland plants which do occur, such as bluebell, woodsorrel, wood forgetmenot, and yellow pimpernel, are most common in the denser parts of the wood and on the sandstone scar; dog's mercury and honeysuckle are confined to the sandstone scar.

Historical and Archaeological Background

Ivelet Wood was chosen for investigation because it is particularly rich in archaeological features relating to its industrial use, and because of its relative accessibility. The features in Ivelet Wood consist of a large number of charcoal burner's platforms, a smaller number of wood drying kilns, and a complex of tracks, enclosures, and possible hut platforms. There are also levels and a mine lodge of probable 19th century date in Arn Gill on the eastern side of the wood.

The archaeological features in Ivelet Wood indicate at least one period of intense industrial exploitation. The most obvious purpose for this is to supply the local lead industry with fuel. Wood is believed to have been the major fuel for lead smelting throughout the medieval period and until sometime in the 18th century when it was largely replaced by peat and coal (Gledhill 1992). Charcoal was probably used for re-smelting slags during the medieval period (as is for instance revealed by large heaps of apparently unused charcoal adjacent to two bale-

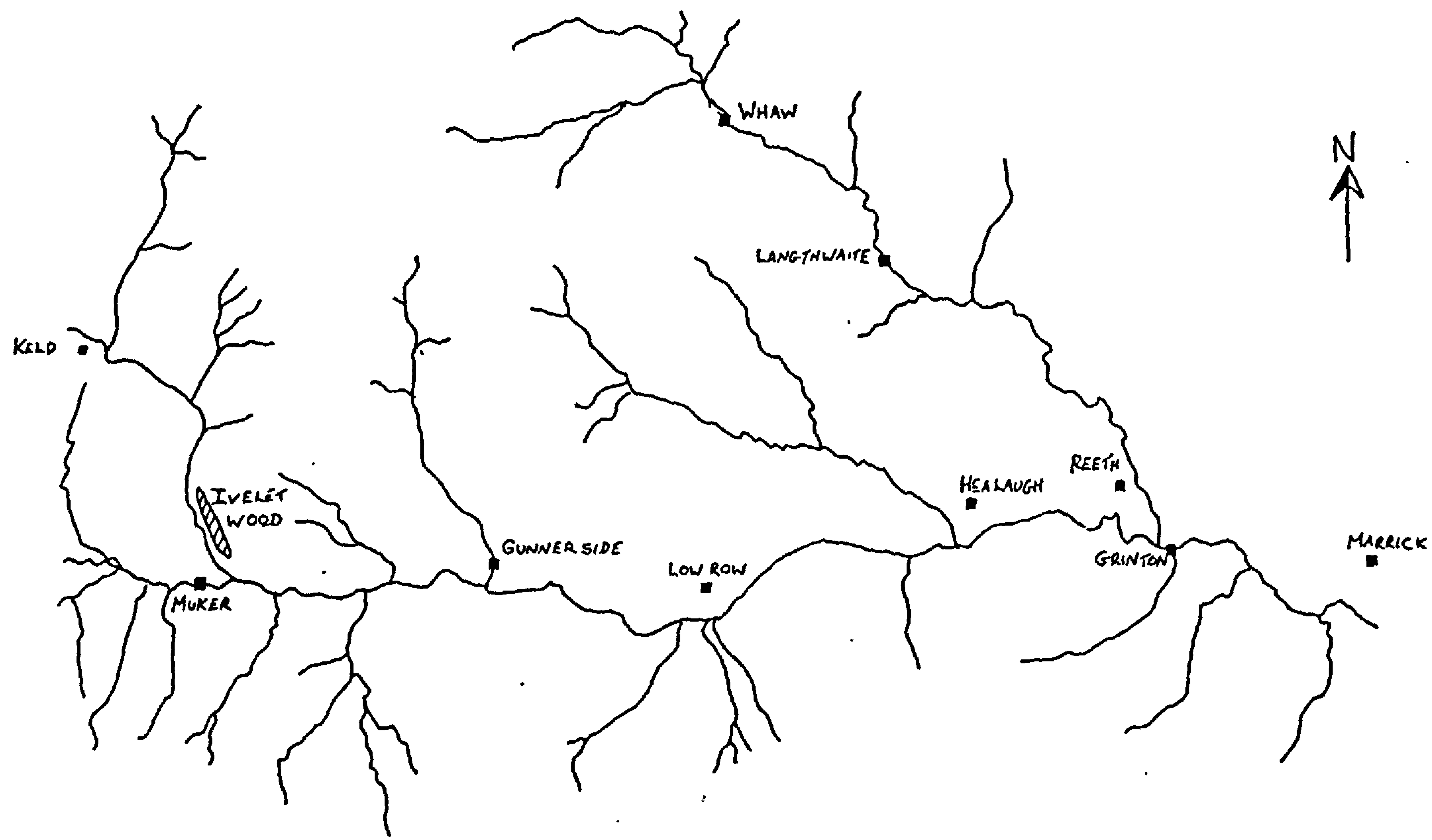


Fig.29 Location map

Fig.30
Outline survey of dominant tree cover

smelting sites on Calver, Swaledale). Charcoal may also have been used for post-medieval re-smelting of slags, though the documentary evidence points to the use of coke (NYCRO ZCC, ZKU). It is, however, possible to suggest other uses for the products of this wood. The charcoal may for instance have been used to fuel a nearby iron bloomery, though none is at present known in the immediate area (a possible site is thought to have been found by the late D.Hall between Thwaite and Keld, but has not recently been relocated (Barker pers. comm.)). Where the kilns are concerned, it is possible that these were not for drying wood but for potash production. A number of similar kilns have been related to this activity in Cumbria (Davies-Schiel 1974). Wood drying would however appear to be the most likely purpose as there are a few documentary references to wood drying in the North Yorkshire Dales, and also because the known distribution of kilns closely follows that of the main lead producing areas. Kilns are known in Swaledale, Wensleydale, Wharfedale, and Nidderdale (pers. comm. L. Barker, R. White & T. Laurie).

The Wider Implications of the Project

The investigation of Ivelet Wood is relevant to a wider debate on the role of fuel-using industries in woodland destruction/conservation, and will make an archaeological contribution to a debate which has largely been conducted in the context of the documentary record and the iron industry (eg. Rackham 1990: 83-6, Hammersley 1973). The project also has implications for nature conservation. There has in recent years been an increasing awareness on the part of ecologists that the age and past management of a wood may have a considerable bearing on the present ecology. An awareness which is for instance reflected in the production of an inventory of ancient woodland by English Nature. An historical perspective is essential in order to produce good management plans for ecologically important woodland. Ivelet Wood is likely to share in outline a history with many ancient woods in the Pennine Dales E.S.A. The elucidation of the past management and vegetational history of this wood consequently carries implications for the management of ancient woodland over a wide area.

Aims of the Project

To investigate the past tree composition of Ivelet Wood by identification and statistical analysis of charcoal fragments, and by pollen analysis; to confirm the nature and purpose of the charcoal platforms and kilns by excavation; to date the industrial exploitation of the wood by C14 dating; to explore the relationship between individual structures and the probable mode and direction of transport of the products by survey.

Fig.31 Survey of Ivelet Wood

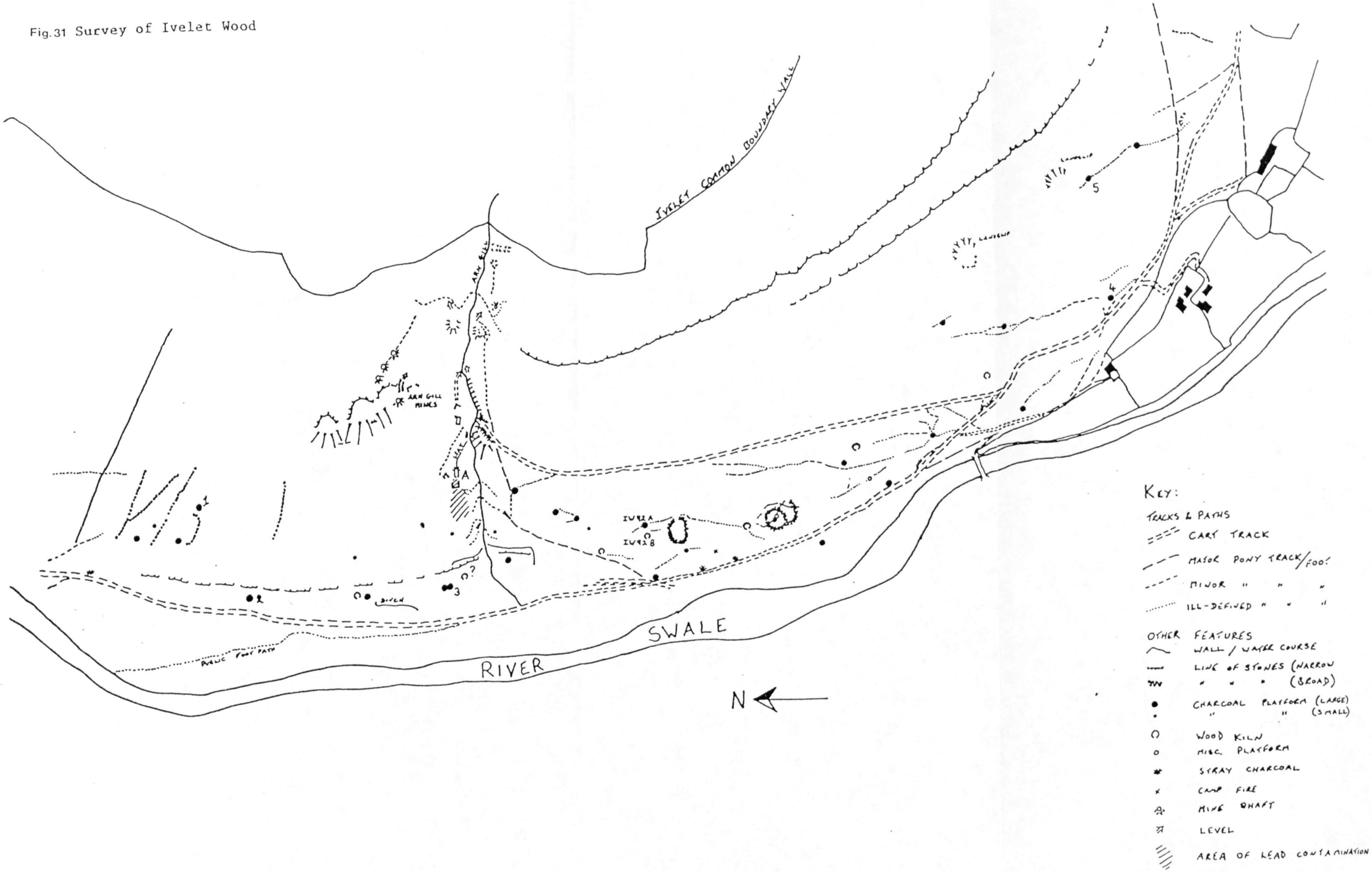


Fig.32 Survey of Ivelet Common

The Survey

Technique

The survey of Ivelet Wood was conducted during April 1993. A detailed survey of the immediate area of Ivelet Wood was made, including all visible archaeological features. A larger area of Ivelet Common was surveyed, recording only possible boundary features, kilns, and charcoal platforms. Both surveys were conducted by plotting features onto an enlargement of the 6" Ordnance Survey map. It was felt that the speed and convenience of this method outweighed any possible lack of accuracy, whilst solving the problems posed by surveying in dense hazel scrub.

Results and Discussion

The results of the detailed survey of the area immediate to Ivelet Wood are illustrated on figure 31. It will be observed that a minimum of 31 charcoal platforms and 6-7 kilns were identified, re-enforcing the impression of a major woodland industry. A number of boundary features were located ranging from a substantial, though derelict wall to the north of the wood, to a number of ephemeral lines of stones, both to the north and the south of the present wood. However as none of these features delimit the distribution of charcoal platforms it is unlikely that any of these served as enclosure for the wood.

Tracks within the area are of three distinct types, the most prominent being those marked on figure 31 as cart tracks. Although there is some evidence of time depth within this group, all are likely to be 19th century or later in their present form; the earliest being that which runs through the wood to the mines in Arn Gill. A second series of tracks, largely cut by, and therefore earlier than, the cart tracks, have been depicted for the most part as major pony tracks. The slightly less distinct continuations of these have occasionally been classed as minor pony tracks. The most significant of this group of tracks is that which passes up through the wood to the south of Arn Gill, one branch crossing the gill towards the group of structures marked A on the plan. The other branch serves the mines towards the head of the gill, and is obstructed by the revetment for the cart track where these cross. This therefore represents the remains of an earlier phase of mining activity, possibly of 18th century date. Finally a system of minor and indistinct pony tracks appears to serve the charcoal platforms and kilns. In one instance, where one of these tracks is crossed by a major pony track, the latter appears to be later. In another place a kiln is situated close by a major pony track (that serving the mines), but has its own almost parallel track. The system of minor pony tracks and the woodland industry they served must therefore be earlier than any of the observed mining features in the area. Transport of dried wood and charcoal was almost certainly by packhorse or pony, and the direction of that transport was to the south. Although the system of tracks serving the charcoal platforms and kilns is in many places ephemeral, where these cross boulder strewn slopes, boulders have been moved aside to allow easier passage. This implies more than a one-off exploitation of the wood, as does the density of charcoal platforms and kilns.

Further deductions are possible from the relative distributions of kilns and charcoal platforms. These are such that in some cases the two types of site must have exploited the same area of woodland. The kilns and charcoal platforms in these situations must therefore either not have been contemporary, have competed for resources, or have avoided such competition through complementary selectivity. The charcoal platforms themselves appear to be of two distinct sizes, perhaps indicating different periods of use.

A number of additional features were located during the survey. These included two enclosures with broad stone banks of approximately 2m width. These displayed evidence of facing in places. Both enclosures appear to pre-date the system of tracks which serve the charcoal platforms and kilns. A platform in the southernmost of the enclosures appears to be intruded upon by a charcoal platform, though the relationship is far from clear. A second, small, sub-circular platform is crossed by the minor pony track system.

The complex of structures marked A on the plan remains enigmatic. A spread of charcoal, cinder, and one or two fragments of roasted ore imply a process involving heat. The provision of water from Arn Gill via a leat may imply some ore processing activity. On the basis of the tracks this complex is most likely to be connected with the exploitation of the mines towards the head of Arn Gill.

The survey of the wider area of Ivelet Common, the results of which are illustrated on figure 32, identified a further 19 charcoal platforms. These features then are distributed across most of the lower slopes of Ivelet Common. The clear implication of this distribution is that woodland on the common was once much more extensive, both than that which now remains, or that marked on the 1st edition 6" Ordnance Survey map. The highest concentration of platforms is in the area of the present wood, which may indicate that the woodland here was densest. The kilns on the other hand are entirely confined to the lower slopes of the present wood. This may mean that the woodland was much more limited in extent during the period of their use, or that the woodland of this area was particularly suited to this activity.

Other features observed include a spread of black glassy slag with adjacent charcoal 'dump' in the south of the area. This is published by Barker & White (1992) as a possible bale smelting site. The charcoal 'dump' is large compared to the charcoal platforms, and not situated on a discernibly levelled area, though the ground surface is naturally fairly level at this point. A fragment of a field system was located close to West Arn Gill. This is slighted by a charcoal platform and may be of prehistoric date.

The Excavation

The Charcoal Platform (IW 92 A)

Excavation Strategy

Two trenches at right-angles to each other were dug into the platform as illustrated on figure 33. The working surface of the sub-circular platform revealed in this way was planned and a context record was made. Charcoal was sampled for identification from stratified deposits on the original surface of the platform. Samples were also taken from the topsoil and from upcast material from rabbit burrows. In order to allow for the possibility that a sample from a restricted area of the platform might have an unrepresentative species composition, samples of the stratified deposits were taken by square metre from the whole length of trench 1. A well stratified charcoal sample was also taken for radio-carbon dating. In addition to this a thick deposit of charcoaly material was observed on the steep slope below the lower lip of the platform. Trench 2 was extended to include this as it was hoped that this might represent material cleared from the platform each time it was used. A section was cut through this deposit and the stratigraphy was recorded. A pollen sample was taken from the buried soil beneath this charcoaly deposit.

Results

The stratigraphy of the surface of the platform was very simple. Turf removal revealed an extremely charcoal rich topsoil covering most of the surface of the platform. This graded into a much less charcoaly topsoil towards the top (eastern) end of trench 2. The much greater depth of topsoil in this area is thought to be the result of hillwash buildup in this part of the site. Removal of topsoil revealed what appeared to be the operational surface of the platform. This consisted of a layer of silty loam with a very high charcoal dust content and fragments of charcoal and burnt stone. The fragments of burnt stone were most common towards the front and sides of the platform. This surface was overlain in places by small heaps of virtually pure charcoal, including one large fragment of in-situ branchwood. Part of this was sampled for radiocarbon dating. The base of the platform consisted of a similar silty clay to the remainder of the surrounding hillside. The platform appeared to have been produced by cutting into the hillside at the back of the platform and throwing the material forward to create the apron. The base of the apron was clearly visible in the slope down from the western lip of the platform. The silty-clay surface of the platform was found to be burnt red-brown in places, particularly near the edges of the platform, and under the heaps of charcoal.

Discussion

The structure of the platform as described is entirely consistent with charcoal production. Roughly eliptical in shape, virtually the whole of its level surface was covered in charcoal rich deposits. Traces of burning of the platform surface were most intense at the edges, particularly at the front and sides, though fragments of burnt stone and small patches of burnt clay were present in several locations across the platform. This intense burning is interpreted as the result of increased heat near the edges of the stack due to the greater availability of Oxygen at this location during the coaling process.

Investigation of the deposits on the slope below the platform revealed three charcoal rich layers which appeared to be distinct from each other in spite of the fact that their interface zones had to some extent been blurred by worm action. The lower two of these charcoal layers were interpreted as material cleared from the platform during use. The upper, rather thinner, layer may be material thrown up by rabbit burrowing a little higher up the slope. Below these layers was a leached grey horizon overlying an iron enriched subsoil, which was interpreted as a buried soil. Although it has been possible to determine that the charcoal platform was used for at least three different firings (one for each of the two lower charcoal layers and one which was responsible for the material remaining on the platform), it has not been possible to determine whether these took place during a single campaign or whether more than one campaign is represented.

Fig. 33 Plan and Section of the Charcoal Platform

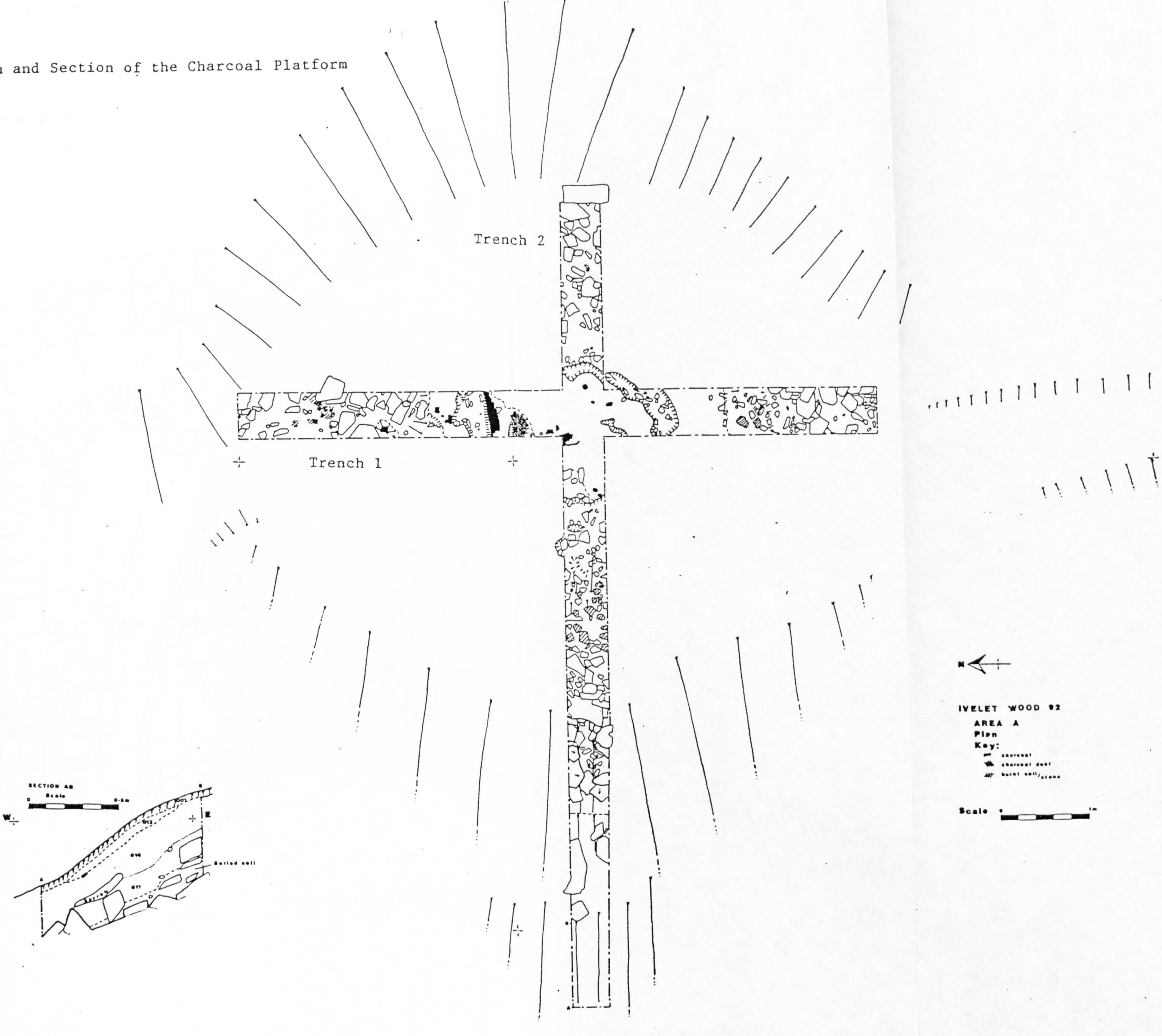


Fig.34 Plan of the Kiln

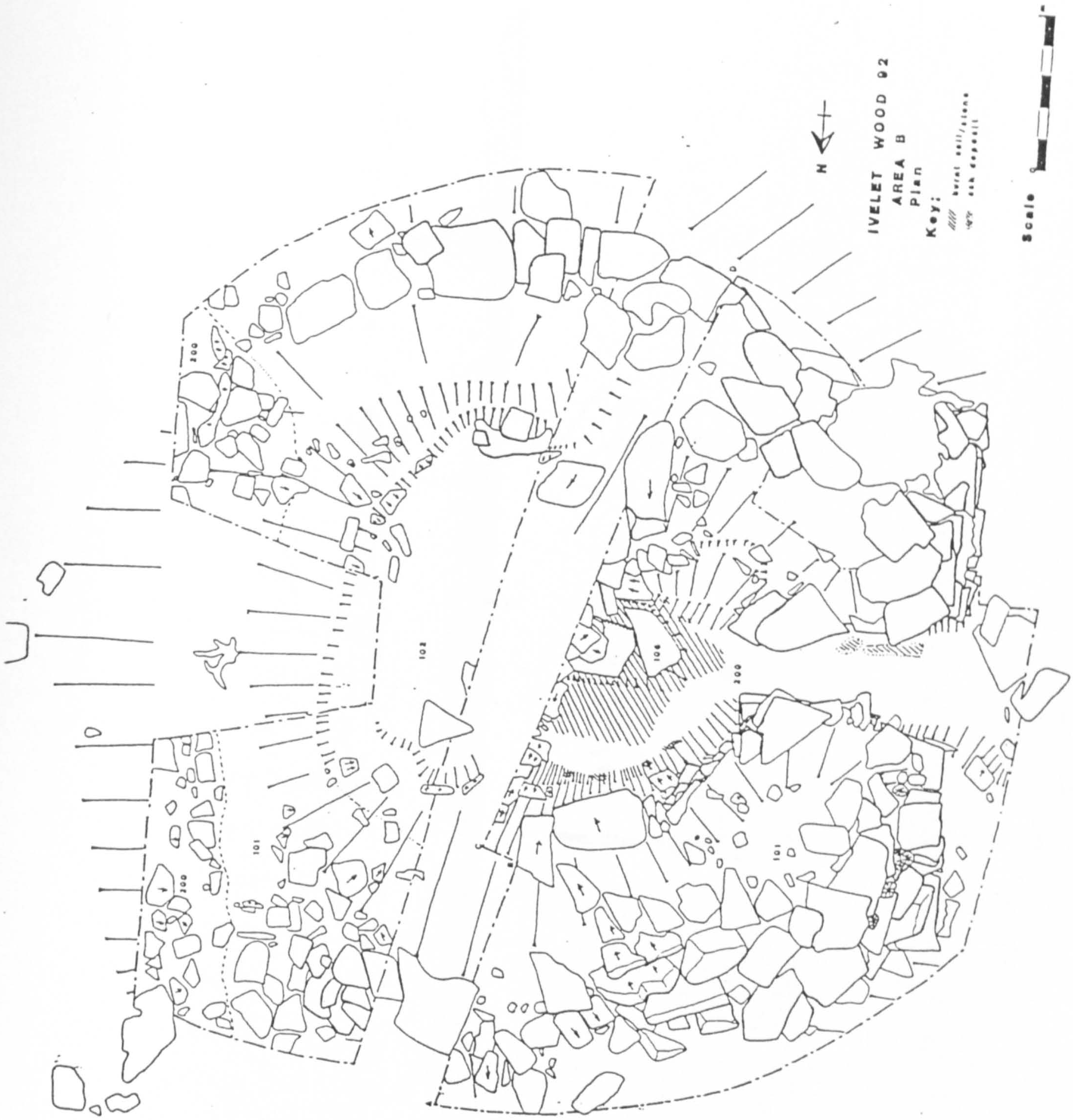
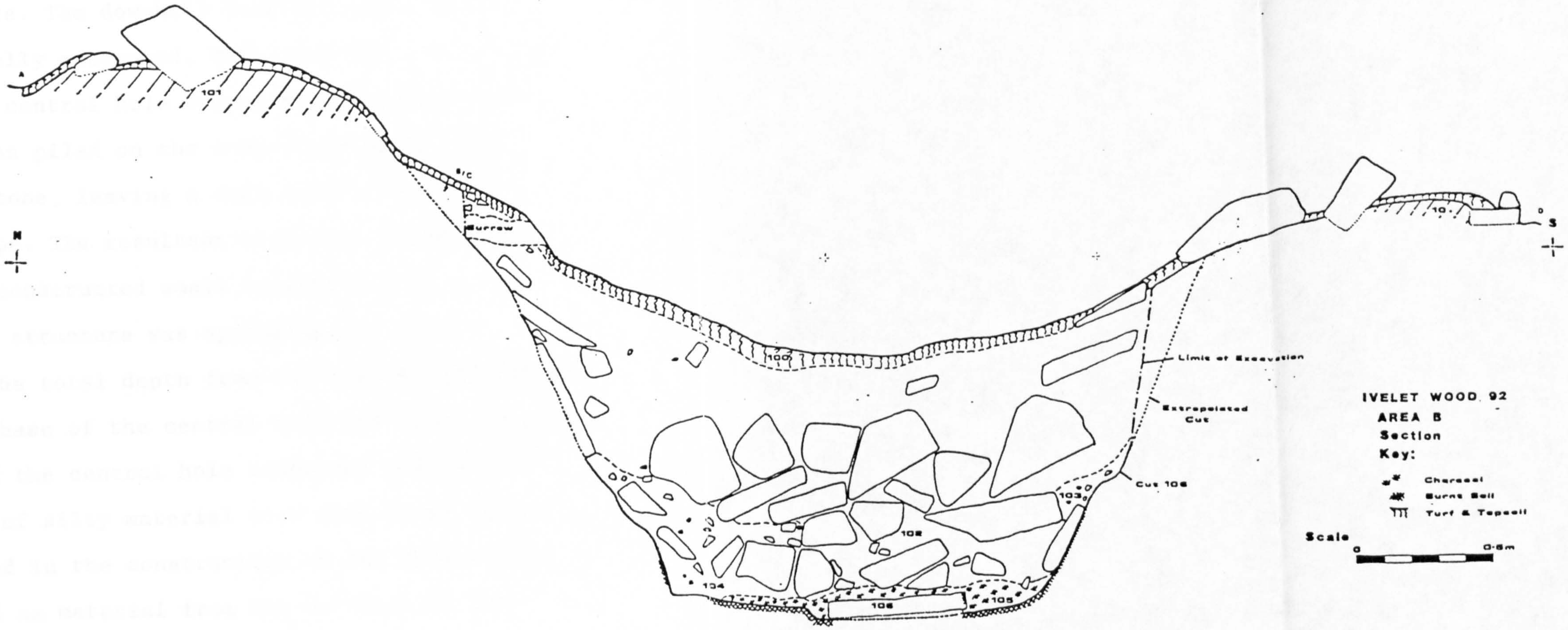


Fig.35 Section of the Kiln



The Kiln (IW 92 B)

Excavation Strategy and Results

Excavation of the kiln proceeded by removal of turf from the whole structure, leaving only a narrow balk running across the centre. The downhill (western) side of the balk was then fully excavated. This revealed a structure consisting of a central hole around which the excavated material had been piled on the down-slope sides, and revetted with stone, leaving a well constructed vent facing down-slope. The resultant structure resembled a rather roughly constructed small lime-kiln with a flat base. The whole structure was approximately 5m in diameter, and the total depth from the highest upstanding remains to the base of the central hole was approximately 2m. The fill of the central hole consisted mainly of a single deposit of silty material with many large stones of the type used in the construction of the kiln. This was interpreted as material from the collapse of the sides of the kiln, which appear to have collapsed inwards due to the very steep sides of the inside compared to the marked batter of the outside. In addition to this two small spills of material derived from the erosion of the sides of the hole were visible low down the section. Below these layers was a 10cm thick layer of brushwood charcoal and ash which covered the base of the kiln; traces of ash were also observed in the base of the vent. Placed within the charcoal layer were two large stone flags. These are not an original feature of the kiln but appear to have been placed there during its period of use in order to fill a depression in the base of the kiln. The whole of the base of the kiln including below the flags was burnt an intense brick red. Some burning of the sides of the kiln was also visible to a height of about 40cm.

Discussion

In general the structure of the kiln would appear to confirm that it was used for drying wood; in particular its resemblance to features observed in woodlands in the Peak District, and locally known as 'Q holes' is remarkable. A number of these have been excavated (Franklin 1991) and are believed to have supplied the Peak District lead smelters with kiln dried wood or 'white coal' for fuel (Crossley 1992). The fuel used in the kiln in Ivelet Wood appears to have been brushwood which does not seem to have been previously charred (much of the charcoal recovered from the base of the kiln was still only partially carbonised). In view of the fragility of the structure, it is thought that some collapse would have occurred between campaigns. The expected result of this would be the survival of successive hearths in the base of the structure, as was found in some of those published by Franklin (1991). As only 1 hearth was found it seems likely that this structure was only used for a single campaign. This however must have consisted of more than one firing given the evidence for the restoration of the base of the hearth by the placement of sandstone flags.

Post Excavational Analysis

Radio-Carbon Dates

A well stratified sample from each site was taken for radio-carbon dating. These were sent to Roy Switsur of the Department of Quaternary Studies at Cambridge University for analysis. The results were as follows.

Uncalibrated dates:

Laboratory Reference	Sample Reference	Radiocarbon Age (BP)	Uncertainty +/-
Q-3236	IW 92 A 1	240	40
Q-3237	IW 92 B 1	285	40

Calibrated Date-Ranges (Calendar years AD):

Sample Reference	Calibrated Date-Range 68% Probability	95% Probability
IW 92 A 1	1535 to 1540 or 1635 to 1670 * or 1770 to 1795	1515 to 1595 or 1620 to 1685 * or 1735 to 1805 or 1926 onwards
IW 92 B 1	1520 to 1585 * or 1625 to 1655	1480 to 1665 * or 1785 to 1790 or 1946 onwards

The starred date-ranges are those which Roy Switsur has calculated to have the highest relative probabilities.

Discussion

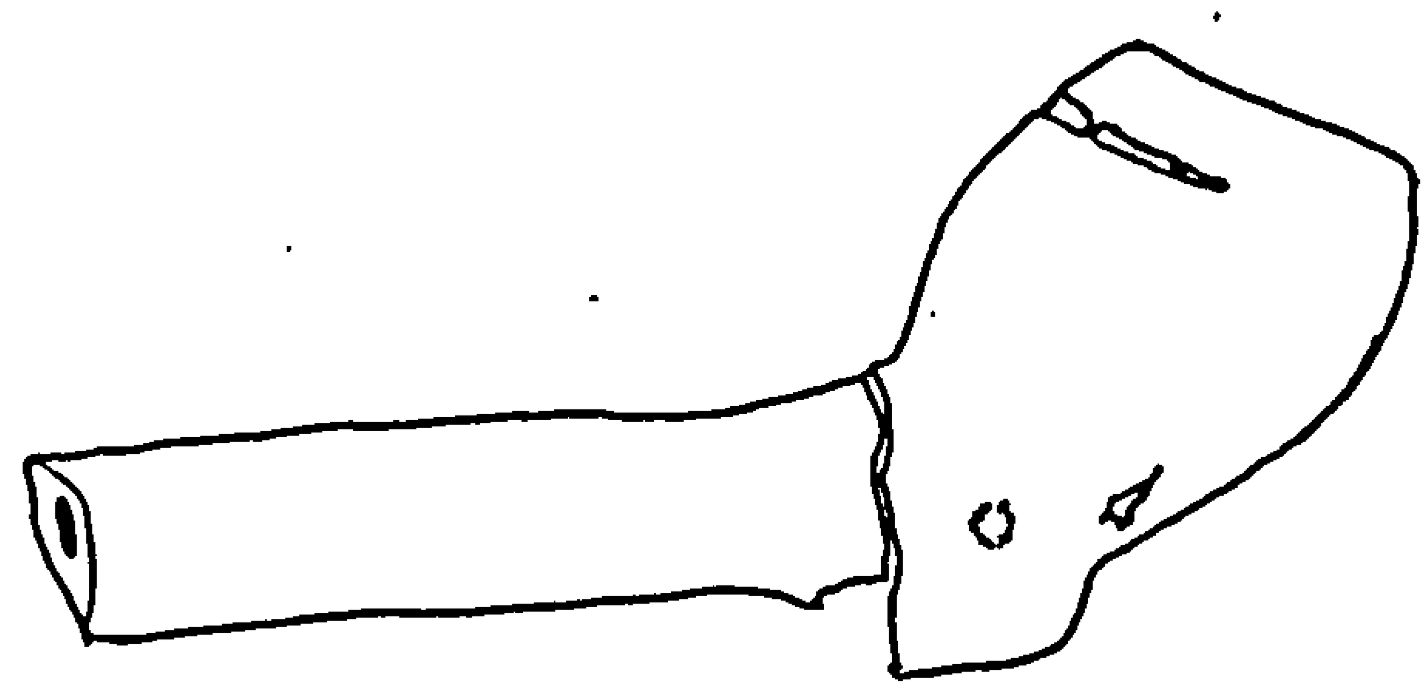
The most probable date ranges (1635-70 at 68% probability, 1620-85 at 95%) calculated for the sample IW 92 A 1, which comes from the charcoal platform, fit well with the conclusions of the survey. These would tend to indicate that charcoal burning pre-dated possible 18th century mining in Arn Gill Head.

The date-range 1520-85 (68% probability) for sample IW 92 B 1 does not fit well with the other data. Kiln dried wood is usually associated with early ore hearth smeltmills. The first documentary reference to such a mill in the dale is dated 1575 (Gill 1988). Smeltmills in the upper dale are not documented until the late 17th century. A 17th century date for the kiln would therefore be more consistent with the documentary history of smelting in Swaledale. This conclusion is supported by the presence of a mid to late 17th century clay pipe bowl within the material deposited by the collapse of the kiln. In conclusion it is probably safe to assert that the date of the last use of the kiln lies between 1575 and 1665 (cf. the 95% probability range above).

Finds

Other than charcoal which is discussed below, very few objects were recovered during the course of the project, and only one during excavation. This was a clay pipe bowl with an accompanying fragment of stem which was found in the main layer of collapse in the central hole of the kiln.

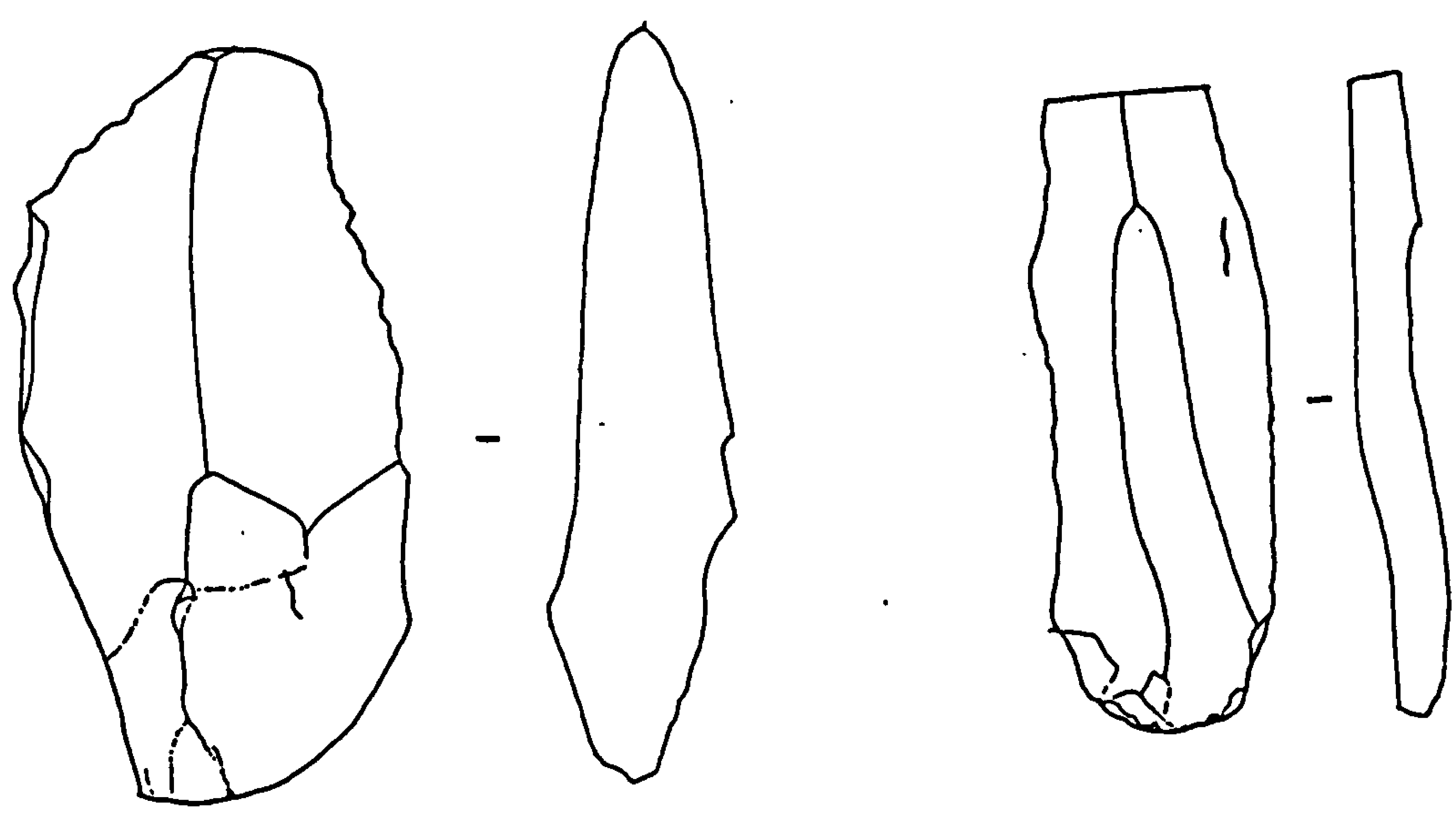
Fig. 36



Description:
Fabric; very pale cream - very pale grey
Bore; 1/8th inch
Base broad, damaged, probably originally shield shaped
Rim incompletely rouletted
No stamp or makers mark
Slight protrusion close to the base, probably the result of a blemish in the mould.
Comparison with published material would suggest a date in the mid to late 17th century (Parsons 1964, Edwards 1988, Oswald 1975).

During the survey a number of pieces of fractured, coarse, mid-grey chert were found. The two illustrated below are certainly the product of prehistoric lithic industry and were found close to the possible fragment of prehistoric field system near West Arn Gill.

Fig.37



Description:
Material; coarse mid-grey chert
Secondary flake, no retouch.
Grid Ref. 391100/5000025

Description:
Material; coarse mid-grey chert
Secondary flake, broken at distal end, no retouch.
Grid Ref. 391075/500000

The remaining two chert flakes displayed only single fractures and may have been the result of more accidental damage. These were found close together within the area of lead-contaminated ground below the structures marked A on figure 31. Grid Reference 390975/499250.

The chert is very similar to that found in the Laurie collection of stone artifacts at Richmondshire Museum.

Charcoal Identification

The Charcoal Platform

Sampling technique

Samples were taken from the surface of the site prior to excavation by hand picking charcoal from spoil resulting from rabbit burrowing. Hand picking was also used to sample charcoal from topsoil. Soil samples were taken from stratified contexts on the platform surface by the square metre.

Preparation and identification

Soil samples were wet sieved using a 5mm grid. A maximum of 150 charcoal fragments were identified per sample by comparison with a reference collection which has been obtained from similar environmental situations.

Results

The following table shows the results for a number of samples.

Sample		% Composition							
Context	Grid Ref.	Ash	Elm	Hazel	Birch	Haw-thorn	Bird-cherry	Rowan	Other
Surface		70	2	8	10	8	2	-	-
Topsoil		83	-	4	4	10	-	-	-
002	20/106	94	-	1	-	2	2	1	1
002	20/108	73	-	4	2	7	11	-	2
004	20/104	77	-	9	2	2	9	-	-

Although comparison between different samples from this group does reveal some difference in composition between samples taken from different parts of the platform surface, on the whole the general impression gained from all samples is very similar. Ash charcoal predominates to a large degree in all samples; hazel, birch, hawthorn, and birdcherry are typically minor components. Of particular importance is the fact that the results from the hand picked surface sample are reasonably consistent with those which were better stratified and sampled more scientifically. The results from this set of samples was held to be sufficiently consistent to obviate the need to analyse any further samples from this structure.

The Kiln

Sampling, Preparation, and Identification

Two soil samples were taken from the charcoal rich layer at the base of the kiln. These were wet sieved and the charcoal fragments were identified as described above.

Results

Sample Reference	% Composition							
	Ash	Elm	Hazel	Birch	Haw-thorn	Bird-cherry	Rowan	Other
105 Bag 1	-	-	45	10	16	28	-	-
105 Bag 2	-	-	50	6	15	27	-	1

The charcoal identifications from the kiln are in complete contrast to those of the charcoal platform, with hazel accounting for approximately half of the charcoal, and ash not being present at all. In general those species which were the minor components of the samples from the charcoal platform are the most important here.

Surface Samples from Other Charcoal Platforms

Sampling

During the course of the survey surface samples were hand picked from five additional platforms which are numbered on figure 31. These were analysed in the same way as the surface samples from IW 92 A.

Results

Sample from Charcoal Platform number	% Composition							
	Ash	Elm	Hazel	Birch	Haw-thorn	Bird-cherry	Rowan	Other
1	44	-	25	14	14	2	2	-
2	12	14	18	20	28	3	2	3
3	2	2	23	40	26	8	-	-
4	8	-	22	29	31	8	2	-
5	32	-	14	4	51	-	-	-
IW 92 A	70	2	8	10	8	2	-	-

It will be observed that there is considerable variation between samples from different platforms. In particular the very high proportion of ash charcoal in the material from the excavated site appears to be exceptional.

Discussion

In view of the fact that samples from the two excavated sites display such radically different species compositions, and that due to their proximity these must have involved the exploitation of a similar area of woodland, it would seem almost certain that selectivity of some sort was employed in choosing the wood used in each structure. This selectivity may have operated in a number of ways. It may have been positive or negative. In other words certain types of wood may have been deliberately selected for a particular purpose, or they may have been deliberately avoided. Selection may have been on the basis of species, diameter, length, or some other criteria such as straightness. If first of all we consider the charcoal platform it is apparent from the variation between surface samples taken from different charcoal platforms that a wide range of different woods were suitable for this process. The only instance where selectivity on the basis of species might be suspected is in the case of alder as this is not represented in the sample from the site within the present alder carr. Alternatively the alder carr may be of more recent origin. Given that very little small roundwood was observed either in the excavated or the surface samples, selection on the basis of diameter may be suspected. this would result in some species bias, favouring larger trees such as ash, elm and birch, and discriminating against hazel. This may indicate that hazel formed a larger proportion of the woodland than it does of the sample. With this proviso therefore it seems reasonable to conclude that the surface samples from the charcoal platforms are in this case fairly representative of the surrounding woodland.

If we accept that the samples from IW 92 A are reasonably representative of the surrounding woodland, then we must conclude that the samples taken from the base of the kiln exhibit selection against ash. They also show that brushwood was deliberately selected, very few fragments being of roundwood over 20mm diameter. When considering the possible reasons for this selectivity two factors should be taken into account. Firstly the actual product of the kiln, which was presumably dried wood, is not represented by the samples. Secondly the samples probably represent only the last batch of fuel in a protracted campaign, all previous fuel being either completely consumed or raked out. It is extremely unlikely that ash brushwood was unsuitable for firing the kiln, therefore the ash must have been used for some other purpose for which it was especially suitable, or it must for some reason have been used up in earlier batches of fuel. It seems unlikely that the charcoal burning was responsible for any preferential use of ash brushwood, as this would have been to small for this purpose. Ash wood may have been preferentially used as the product of the kiln, but one would expect similar size preferences to those for charcoal burning. The most likely explanation is therefore that the ash brushwood was used first for firing the kiln. A preference for ash in the wood to be dried would in fact provide a reasonable explanation for such behaviour. Such a preference would mean that ash was cut first, thè larger diameter material being cut and stacked for drying, while the brushwood was used to fire the kiln. As the firing proceeded, the ash brushwood may have run out. This would have necessitated the use of wood from other trees, with the result that their charcoal only is found in the archaeological record. Whilst such an interpretation limits the extent to which we can use this set of samples to determine the species composition of the surrounding woodland, certain features do help to add to the picture provided by the charcoal platforms. In providing samples which has the reverse bias to the charcoal platforms these samples may provide a better appreciation of the importance of hazel, which may on this basis have been more than twice as important than is indicated by the samples from the charcoal platforms.

Analysis of Growth Ring Data

Technique

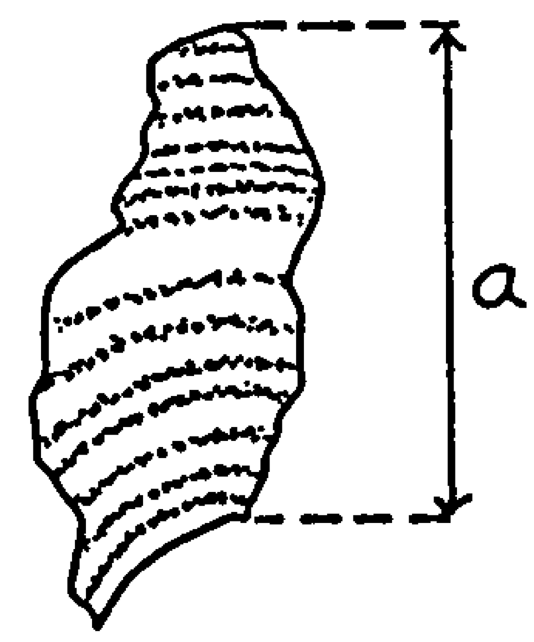
Analysis of the annual rings of the ash charcoal from site IW 92 A proceeded in three stages.

1. The mean number of rings per millimetre (g) was established for each charcoal fragment by dividing the number of rings (N) on each sample by the distance (a) across the rings (see fig. 38). The mean value of 'g' (G)

for all the charcoal fragments was then determined, thus:

$$G = \frac{1}{n} \times \sum \frac{N}{a}$$

Fig.38



2. An estimated minimum radius (r) was established for each charcoal fragment by comparison of the curvature of the growth rings with a series of standard curves.

3. A projected minimum age was determined for each sample by the following calculation.

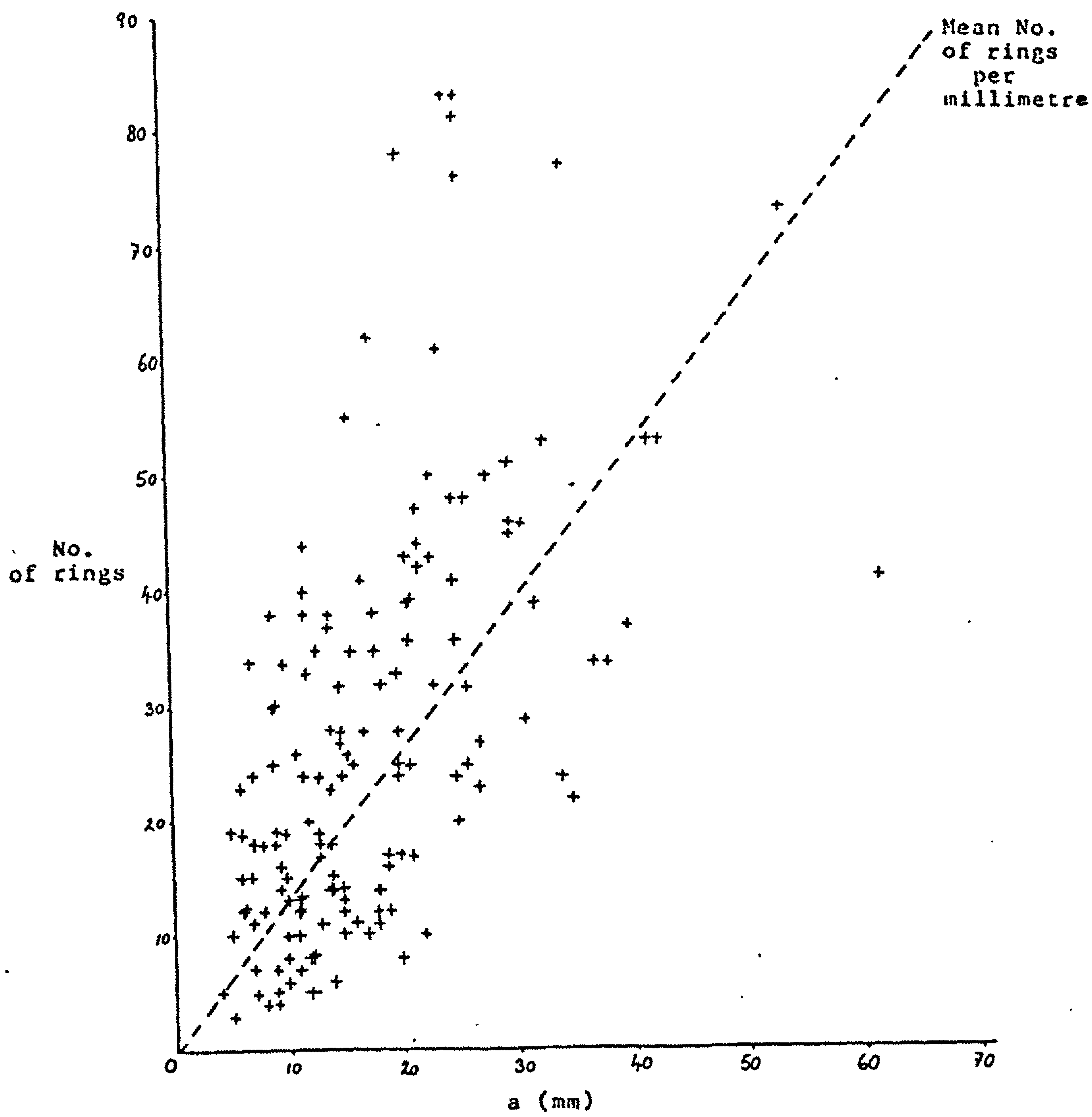
Projected minimum age = N + G(r-a)

All fragments of ash charcoal from site IW 92 A sufficiently large to estimate a minimum radius were subjected to this analysis, the total number of fragments so analysed being 149.

Results

It will be observed from figures 39 and 40 that a very wide range of values for 'g' were determined, with a mean value of 1.3 rings/millimetre. Any calculation of projected minimum age deriving from this figure will

Fig.39



90
80
70
60
50
40
30
20
10
No.
of rings
Mean No.
of rings
per
millimetre
0
10
20
30
40
50
60
70
a (mm)

Fig.40

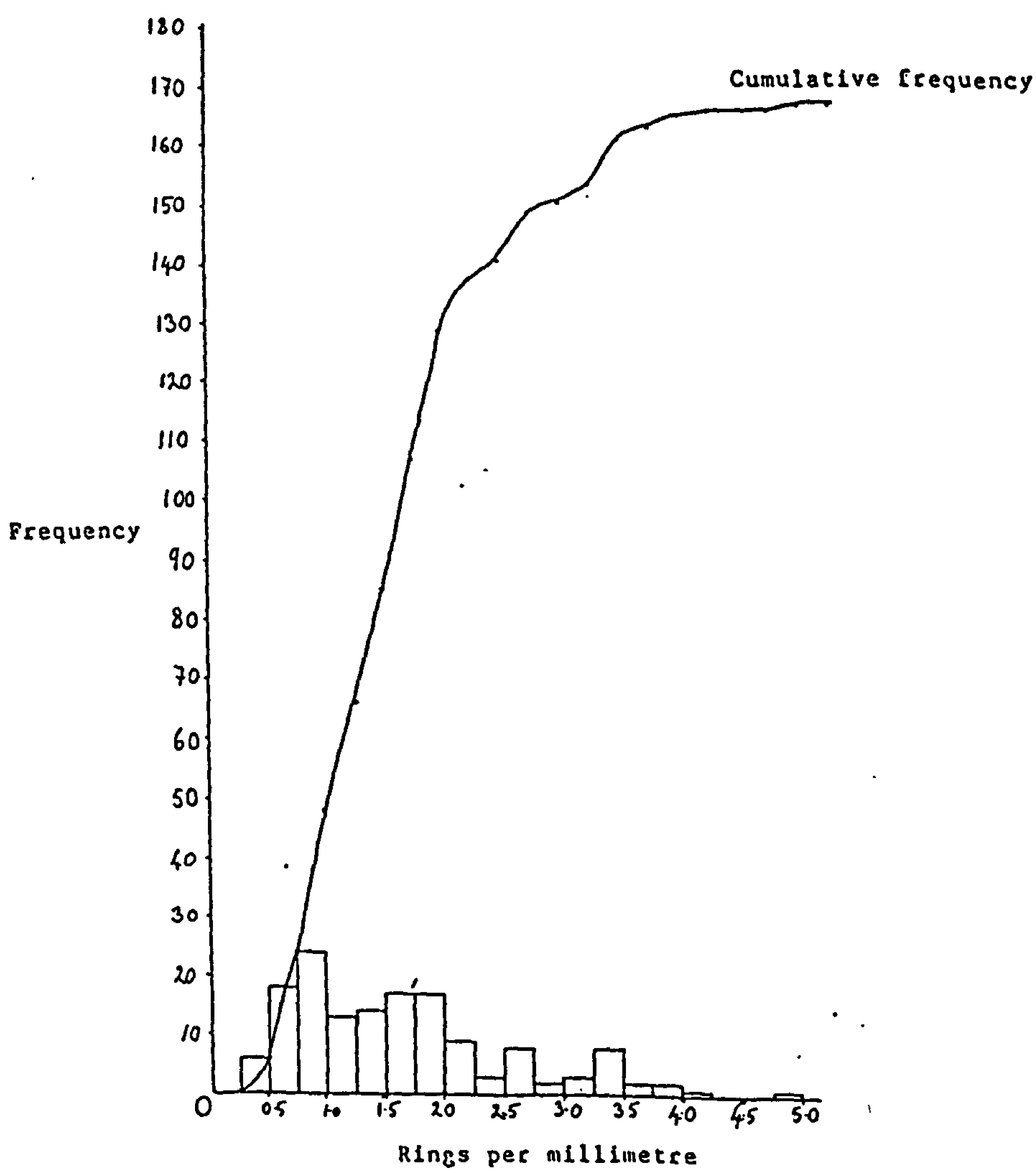

Cumulative frequency
Frequency
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
0·5
1·0
1·5
2·0
2·5
3·0
3·5
4·0
4·5
5·0
Rings per millimetre

Fig.41

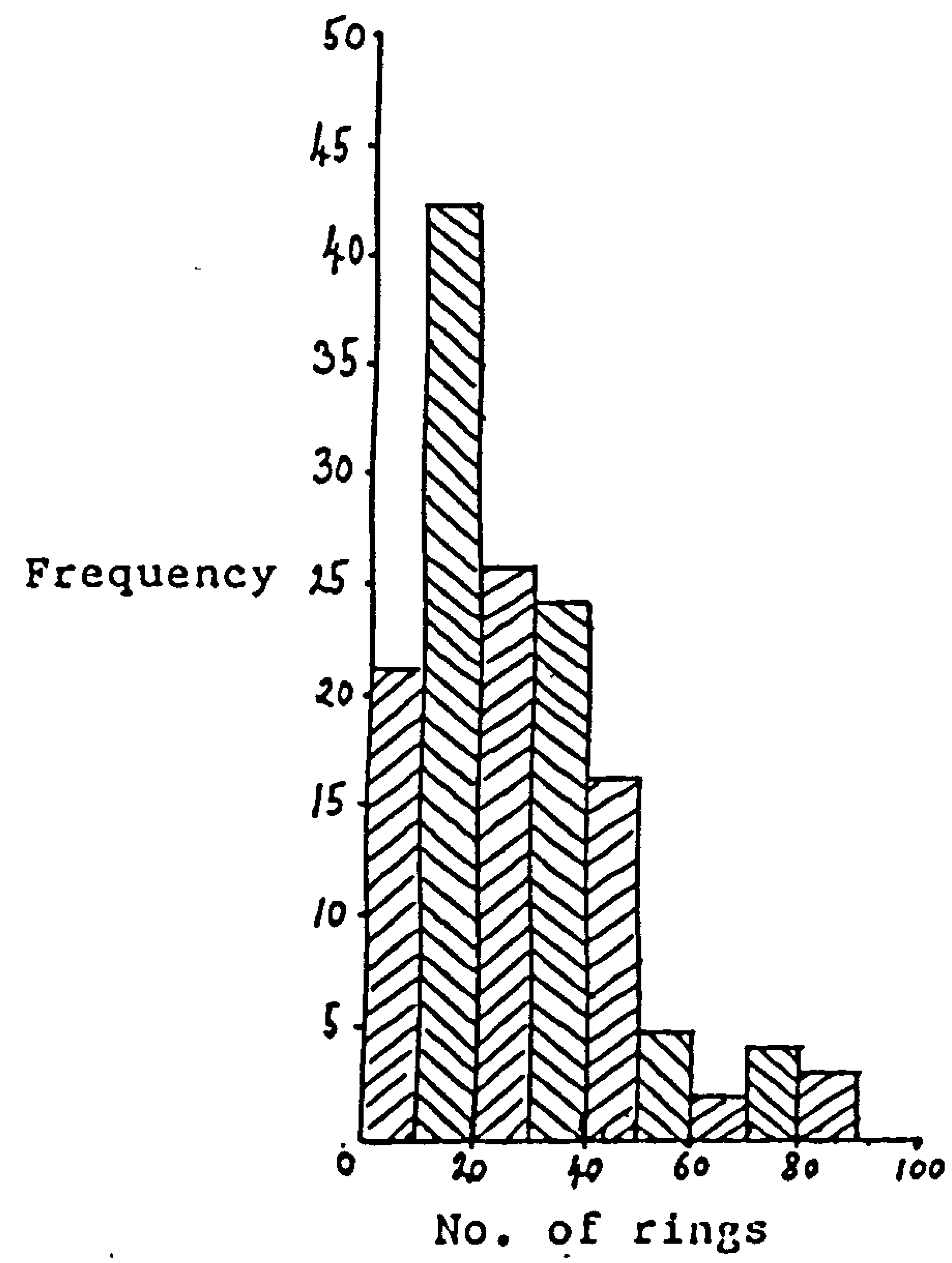
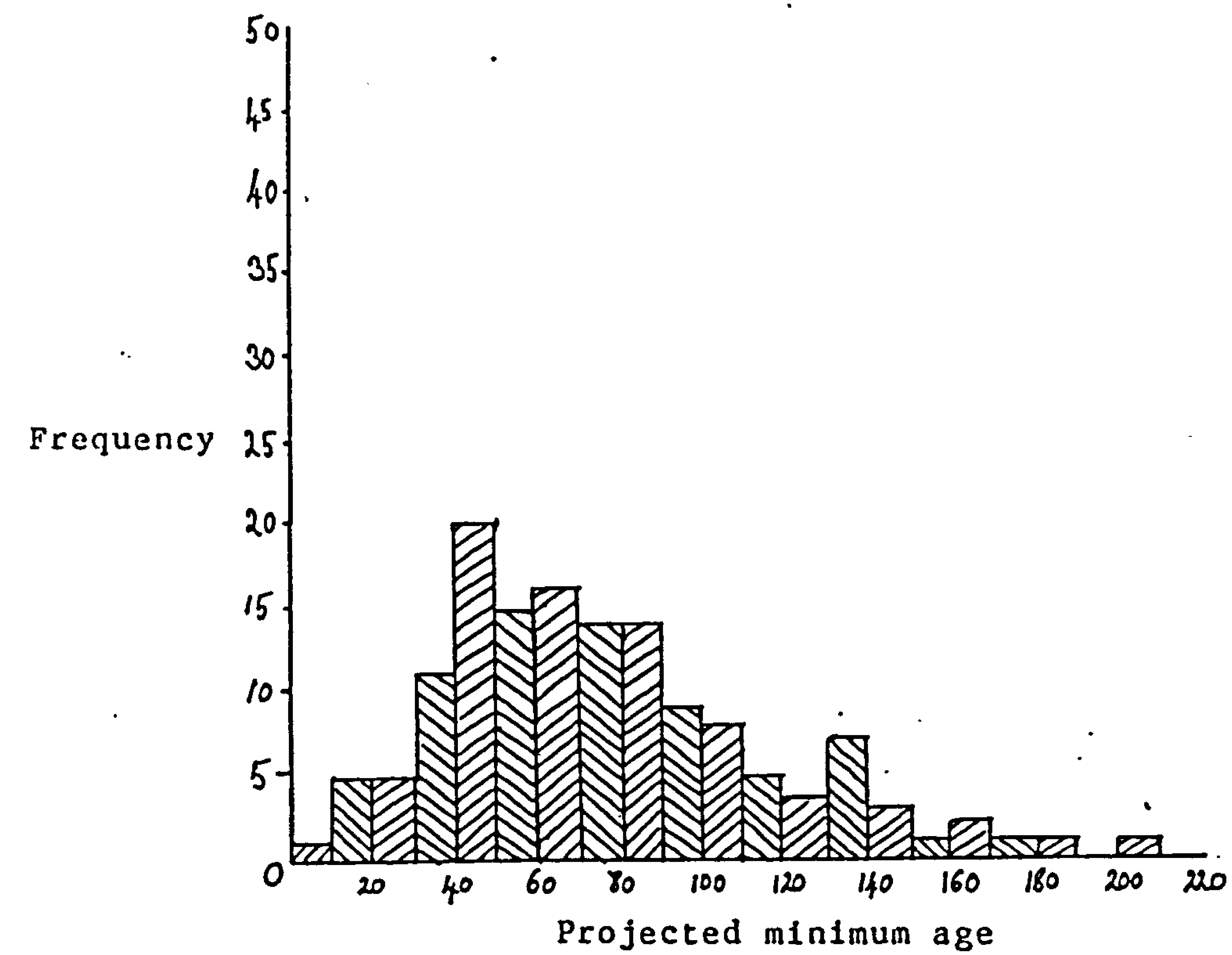

Frequency
50
45
40
35
30
25
20
15
10
5
0
20
40
60
80
100
No. of rings

Fig.42


Frequency
50
45
40
35
30
25
20
15
10
5
0
20
40
60
80
100
120
140
160
180
200
220
Projected minimum age

therefore have a very large margin of error (depending on the relative proportion of 'a' and 'r-a').

Figure 41 shows the frequency of samples with different numbers of rings. The peak in the 11-20 ring range probably reflects the dominant size of charcoal fragment subjected to this analysis. Frequencies decline from this peak to a minimum in the 71-80 ring range, A particularly sharp drop being observed between 41 and 60 rings. There is a small peak at 81-90 rings which corresponds with a group of charcoal fragments which have distinctively slow growth rates (see fig. 39)

Figure 42 shows the frequency of different projected minimum age ranges. Here the main peak occurs at 41-50 years. No major decline is observed till 91-100 years. A second minor peak can be observed at 131-140 years.

Discussion

The results obtained from this analysis display a number of unexpected features. Firstly growth rate: not only is this very slow indeed for the majority of charcoal fragments, there is also a distinct group of these which have rings which are so closely spaced that it was necessary to use a microscope to count rings. This group is clearly visible on figure 31 where they form a cluster of points with small values for 'a' and very high numbers of rings. Secondly in view of the fact that the survey evidence would suggest more than casual or exceptional use of the wood, the number of rings observed in the samples in general is surprising. On the basis of figure 41 it would seem unlikely that the surrounding woodland had last been cut less than 40 years before, and it is possible that the time lapse between harvests was considerably larger

If we consider the frequency distribution of projected minimum age ranges the data looks even less like that which would be expected from conventional coppice managed woodland. Indeed at face value the age distribution seems more consistent with the felling of a woodpasture which had not been subject to previous tree management. Before accepting this conclusion it is worth considering the likely effect of error in the calculations used to construct figure 42. Error essentially derives from two sources. First the use of a mean value for the number of rings per millimetre to calculate the number of rings in the portion of branch which is missing from each charcoal fragment. Figure 40 represents the frequency distribution of the values for 'g'. This distribution is clearly skewed as a result of the small population of charcoal fragments with abnormally slow growth rates. This means that the mean value (G) is too high for the bulk of the material. Although this will result in a tendency to over-estimate the age of many of the charcoal fragments, it is unlikely to affect the shape of the frequency curve. Of perhaps more significance is the wide spread of different growth rates. This variation must also apply to the missing portion of each branch, with a resulting variation in the appropriateness of 'G' used to calculate the number of rings in this portion. As the error due to this variation will be proportionate to the size of the missing portion (r-a), it will tend to skew the frequency curve of the projected minimum age.

The second source of error arises in the estimation of the minimum radii. Error may occur in two circumstances in this estimation. There may be error in matching the sample with the standard curves. This becomes more difficult, and is therefore subject to greater error, as the projected radius gets larger and the standard curve flattens out. In addition, as branches are never perfect cylinders, error will arise when the curvature of the rings in the charcoal fragment are not representative of the branch from which it came. As larger branches are more likely to exhibit distortions of this type the error from this source also increases with increasing projected radius. The estimation of minimum radius is therefore itself likely to produce a frequency distribution which is markedly skewed to the left, thus making it impossible to distinguish between a distribution generated by a long rotation, or that of a wood which had not previously been intensively exploited.

Although it may seem from the above discussion that the analysis of the tree ring data is valueless, there are in fact a number of conclusions which can be reached. At least two distinct populations are represented within the data, one of which is a great deal older and slower grown than the other. This might be interpreted as coppice and timber or coppice-stools, or as the result of successive periods of regeneration at times of relaxed grazing pressure. If the industrial exploitation of Ivelet Wood did involve more than a single exceptional felling, then the rotation must have been very long, probably between 50 and 60 years.

Pollen Analysis

In addition to the environmental information provided by charcoal identification, pollen analysis was carried out on the buried soil on the slope below the platform, and on a modern surface sample. The results of these are contained in a report by Duncan Hale (1993). The pollen for the various tree species is shown below as a percentage of total arboreal pollen (inclusive of hazel and alder).

Pollen Type	Buried Soil	Modern Surface
Pinus	2	4
Betula	2	34
Ulmus	5	3
Quercus	-	2
Alnus	-	2
Fraxinus	5	1
Corylus	86	55

A particular feature of the pollen spectrum for the buried soil is the very high proportion of *corylus* pollen and a rather low proportion of *fraxinus* pollen. Four possible interpretations are suggested by Duncan Hale for this. These are:

1. the pollen is not contemporary with the onset of charcoal burning,
2. there is differential pollen preservation,
3. coppice management inhibited the flowering of trees other than hazel,
4. ash trees may have been harvested from a recently formed secondary woodland before acquiring sufficient maturity to flower.

These interpretations were made on the basis of the charcoal identifications for IW 92 A. Ash was therefore assumed to be a major component of the surrounding woodland. This view has since had to be revised in the light of the surface samples from other charcoal platforms. In spite of this the suggested interpretations retain some validity, particularly if one considers the pollen rain to be representative mainly of trees in the immediate vicinity.

It is possible in the light of the tree ring data from IW 92 A to rule out two of the above interpretations. As this data indicates that most of the ash wood used for charcoal burning was 40 years old or more it seems unlikely that either coppicing or the use of young ash trees is responsible for the low proportion of ash pollen. The explanation must therefore lie either with the differential survival of different pollen, or with the erosion of the ground surface prior to the use of the charcoal platform, so that the pollen in the sampled soil pre-dated the platform. Both the topography of the site, and the poor preservation of the pollen would favour the former interpretation.

Conclusions

Woodland Extent and Composition

Information on this topic comes from a variety of sources. The distribution of charcoal platforms indicates that woodland was once much more extensive on Ivelet Common in the past. Evidence of relict hazel stools around the eastern and southern edges of the wood, and extensive ring barking by sheep and rabbits within the surviving woodland confirms that this process is still proceeding. Comparison of the present woodland area with that of the mid-nineteenth century Ordnance Survey 6" map indicates a substantial reduction in area as a result of this process.

Identification of charcoal fragments has made it possible to assess the past composition of the wood. In some respects the woodland reflected in the charcoal samples differs from that of today, but the general impression is similar. Some species such as sycamore, which are absent in the charcoal samples are unlikely to have been present in the woodland of that time. In other cases, as with alder the charcoal might not have been suitable for the purpose in mind, and therefore present in the woodland but not reflected in the charcoal record. Other differences occur in the distribution and relative importance of the trees. In the northern part of the wood for instance there now appears to be a much greater proportion of birch than was previously the case. This may point to a fluctuation in woodland area rather than a simple decline. Ash now forms a much smaller part of the wood, having become confined mainly to the sandstone scar. It is possible that ash is particularly sensitive to grazing pressure, either because of ring barking, or by suppression of seedlings.

One distinctive feature of both the present wood and the charcoal record is the ubiquity of hawthorn. This is normally a tree of rough open grazing in Swaledale. Its presence may indicate an even earlier phase when woodland on the common was much reduced, possibly of medieval date. It seems reasonable to suggest that the subsequent regeneration to form the woodland exploited by charcoal burners was part of the more general woodland expansion in the late medieval period observed in Pennine pollen profiles (see for instance Honeyman 1985 for Wensleydale).

The Industrial Exploitation of Ivelet Wood

1. Dating Evidence

The two types of industrial activity which left their material traces in Ivelet Wood present slightly different problems. In the case of the wood drying industry, present knowledge of the use of dried wood in lead smelting would seem to impose some constraint on the possible date range. As the use of this fuel is thought to be restricted to early ore-hearth smeltmills, documentary evidence would seem to restrict the possible dates for wood drying kilns to between 1575 and the mid-eighteenth century in Swaledale. It is much more difficult to associate the charcoal burning activity to a particular industry or technology. Charcoal has in the past been used in an extremely wide range of industrial and domestic contexts. There is however a tendency to think of charcoal platforms (as opposed to pits) as late medieval and after (Peter Crewe, pers. comm.).

Survey evidence also gives some indication of date as the tracks serving the charcoal platforms and kilns appear to pre-date mining activity in Arn Gill Head which may be of 18th century date. Both charcoal platforms and kilns appear to use the same system of pony tracks, which may indicate that there was some overlap between the two industries.

Finally there is the evidence from the excavation of the two sites. For IW 92 B a clay pipe bowl which was found within the material deposited by the inward collapse of the kiln is likely to date from the mid to late 17th century. Both sites also have well stratified radio-carbon dated charcoal samples. In the case of the kiln the most probable date range calculated for these at 68% probability appears to conflict with all the other available evidence. It is therefore more likely that the true date (which represents the last use of the kiln) lies between 1575 and 1665, a date after 1600 being the most likely. In the case of the charcoal platform there is no such problem in accepting the most probable date range as correct. The true date is therefore likely to lie between 1635 and 1670.

Woodland Management

The density of charcoal platforms and kilns, coupled with a network of pony tracks may be thought to carry implications of long term exploitation, perhaps involving compartmented woodpasture. When the evidence of the growth ring data is considered it would appear that though this is not entirely inconsistent with compartmentation, an extremely long rotation of perhaps 50-60 years is indicated.

The Duration of Industrial Exploitation

The dates determined by radiocarbon analysis for the two excavated structures relate only to their last use and give no indication of their period of use. The excavational evidence is inconclusive, though it is probable that the kiln in particular was used for one campaign only. There are, however, some lines of argument which would suggest more than a single episode of exploitation. In discussing the survey evidence it was pointed out that the relative distribution of kilns and charcoal platforms was such that in some cases they must either have competed for wood or have been of different date. It has also been observed that the relatively restricted distribution of kilns may be due to specificity for a particular tree species or a range of tree species (ash being the obvious candidate). It is also thought that as far as the product of the kiln is concerned, large diameter roundwood was preferred. Were this the case, then the two excavated sites would inevitably have competed for resources had they been contemporary. Given the abundance of ash charcoal in the samples from the charcoal platform, and the difference between the date ranges for these two sites, it seems likely that the kiln was last used before the last use of the charcoal platform. Thus if we accept a rotation of approximately 60 years then the two structures together represent a considerable period of industrial exploitation. This period may be further extended if we accept that the smaller charcoal platforms identified during the survey represent a yet earlier period of use.

Destination and Use of the Products

As we have seen there is at present little reason to dispute that kiln dried wood was produced specifically for the primary smelting of lead in early ore-hearth mills. The problem in this case lies more in determining the location of the relevant mill(s). There is evidence (Gledhill 1992) to suggest that in the latter half of the 17th century competition for wood, both for fuel and for timbering in the mines, was such that wood was transported long distances. If this were the case when the kiln was in use then the dried wood could have been utilised anywhere in Swaledale.

In the case of charcoal there are an immense number of potential uses. For the last, dated, use of the excavated site a connection with lead smelting is considered the most likely. Charcoal would have been a suitable fuel for re-smelting slag at a slag hearth, though at present the scant documentary documentation of the period for Swaledale indicates the use of coke. The re-working of lead slag is not restricted to the 17th century, or to slag hearth technology. There is evidence (Blanchard 1982) to suggest that slags were re-smelted in the late medieval period, and again charcoal would have been an attractive fuel capable of producing the necessary heat. It is possible that the spread of slag with adjacent charcoal dump in the south of the survey area was the site of such activity, and represents an early phase in the exploitation of the woodland. The slag for smelting at this site may have come from nearby bales, two possible sites having been located by Barker (Barker & White 1992) on the scar above. These too may of course have relied on the woodlands of Ivelet Common for their fuel.

General Implications

The industrial exploitation of Ivelet Wood, though spanning perhaps as much as two centuries or even more and leaving considerable material remains, may in fact have had little long term effect on the ecology of the woodland. The length of time between fellings, presumably with long periods of grazing in between, is such that these can be regarded as episodes of relatively little ecological importance, superimposed on a more long term pattern of woodland expansion and recession in response to grazing pressure. From the historical point of view, however, the industrial exploitation of Ivelet Wood is more significant. The long time lapse between fellings implies that, even if the different parts of the wood were cut at different times, there must have been long periods when no wood was available. For the period when re-smelting of slags may have taken place in the southern part of the common this implies a degree of opportunism, and perhaps transhumance, in the industry at this time. In the case of the later industry, the transport of fuel over relatively long distances, and a vigorous trade in wood is implied by the exploitation of a wood which could not by itself support a long term industry.

APPENDIX 3

Outwoods and Woodhouses

The potential for interpretation of coppice in both field and documentary evidence provided by the occurrence of terms such as hagg and spring is to some extent mirrored by the occurrence of terms which imply common woodpasture. The least problematic of these is the term 'outwood'. This is used in a number of 16th century documents in a way which strongly suggests that common woodpasture is meant. In the case of Selby Outwood, not only is common woodpasture suggested by the documentary context, but a study of the modern map also makes it clear that this wood was located on Selby Common, and indeed occupied most or all of the common. Although the evidence for Selby Outwood is unusually good, outwoods are also documented for other vills such as Hambleton in ways which imply common pasture.

The above interpretation of 'outwood' is also consistent with a consideration of the possible meaning of the term. 'out' implies that the wood is outside of some entity. This could mean outside the vill or parish, but these are ruled out by the documentary context. The only other conceivable meaning is outside the enclosed land, ie. on the common. If we accept this interpretation, a study of medieval documents makes it apparent that outwood has a latin equivalent, '<u>boscum</u>

forensicum', which occurs in similar documentary contexts.

Whilst the connection between outwood and common pasture is reasonably secure, the status of 'woodhouses' is a little less certain. There are several lines of argument to suggest that the exploitation of common woodpasture often gave rise to a characteristic outpost of the vill referred to as the 'woodhouse'. Although the name woodhouse implies an isolated farmstead woodhouses do not normally appear in the medieval documentary record unless they have developed into settlements in their own right. References to woodhouses in Yorkshire include 'Wodehus', Emley, West Yorks. 1236 (Parker 1925: 44), 'Wodehus', Sutton-on-Derwent, East Yorks. 1252 (Parker 1932: 82), 'Wudehus/Wudhus/Woodhusum', probably Wothersome near Bramham, West Yorks. 1233-56 (Purvis 1935: 48-50), and Wodehous near Skipton, North Yorks. 1296 (Brown 1902: 48). If we accept that the term woodhouse implies an initial state which was equivalent to a single farmstead, or even a single building, then we are suggesting a form of settlement which was uncharacteristic of the largely nuclear pattern of medieval settlement. Moreover study of the modern map shows that woodhouses almost invariably form part of a vill with a single nucleated settlement, and are lacking from those areas in which dispersed settlement is typical. This strong link between woodhouse and mother settlement is also implied by pairs of names such as Annesley and Annesley Woodhouse, or Norwell and Norwell Woodhouse (Nottinghamshire). The distinctive nature of woodhouses is emphasized by a consideration of the dominant form of settlement expansion. Expansion of settlement typically manifested itself as additions to existing villages, thus a one row settlement might become a two row settlement, and so on. Additions to the field system tended to be located around the existing arable as at Wheldrake (Sheppard 1973). Isolated farmsteads and fields are a feature of post-medieval enclosure, rather than medieval expansion. Exceptions to this predominantly nuclear settlement pattern tend to be special cases, such as the granges and vaccaries typical of Cistercians. It seems reasonable therefore to assert that woodhouses had some specific, but as yet uncertain connection with the exploitation of common woodpasture, and that their presence is thus tentative evidence for the former existence of woodpasture.

GLOSSARY OF TERMS AND CONVENTIONS

Assart: An enclosure made for agricultural or pastoral purposes out of part of a wood or common, often in the context of forests.

Brushwood: Small diameter roundwood.

Clearance: Removal of woodland. In a pollen analytical context clearance is usually interpreted from a fall in the proportion of arboreal pollen. There are in fact a large number of possible reasons why levels tree pollen might fall. These include thinning of the woodland, the inception of coppicing or pollarding, and the replacement of trees which are high pollen producers with others which produce little pollen.

Coppice: Felling trees at, or close to, ground level, with the intention of producing a subsequent crop of poles. This usually involves enclosure to prevent damage to the new growth by stock or deer.

Covert: The woodland within a forest in which the deer lived.

Disafforestation: The discontinuance of Forest Law.

Encoppicement: The first felling and enclosure of a wood which was not previously coppiced.

E.S.A.: Environmentally Sensitive Area; an area within which farmers are encouraged to use management techniques thought to preserve sensitive habitats.

Estate A collection of dispersed properties under one ownership.

Forest: An area in which deer are preserved by law. In the case of royal forests the deer and their habitat were protected by Forest Law. In the case of private forests the position is less well known.

Forest Eyre: An itinerant court used to judge the more serious transgressions against Forest Law (Young 1979: 88-92)

Freeholder A tenant holding land by a fixed payment and minimal services. Freeholders were able to buy and sell land without their lords permission, and were not subject to the many fines which were imposed on villains.

Gill: A steep sided valley containing a stream.

Landnam: A term coined by Iversen (1941) to describe a farming system based on small temporary clearings which he thought was employed by neolithic farmers. More recent pollen evidence has revealed that the life of such clearings must have been significantly longer than the 50 years he originally envisaged. For a recent critique of landnam see Edwards 1993.

Leaf Meadow: An area used to provide both grass hay and a crop of leaves for feeding to stock (described in Emanuelsson 1987)

Park: This has had a variety of meanings at different times in the past (see for instance Rackham 1990: 151). The three types of park discussed here are; medieval deer parks, which were enclosed areas of land used for keeping deer; country house parks which were popular in late medieval and Tudor times, and combined the functions of a deer farm and provided a suitable setting for a country house or palace; Landscape parks involved the manipulation of the surroundings of a gentleman's residence to emphasize its importance, and were popular in the 17th to 19th centuries. For further discussion of all these types of park see Lasdun 1991.

Peasant: This term is sometimes defined very narrowly in academic texts (see for instance Macfarlane 1987), or used as an equivalent to villain (Bolton 1980). Here it has been found convenient to use peasant more loosely to include all types of tenant directly involved in farming, including freeholders.

Regeneration (of woodland): The formation of secondary woodland. In a pollen analytical context this has been used to refer to rises in the proportion of tree pollen, which may be the result of an increase in non-woodland trees (eg in hedgerows), a discontinuance of coppicing or pollarding, or changes in the dominant tree species.

Scrub: Land with mainly small trees and bushes, especially gorse, broom, hazel, hawthorn and blackthorn. It is usually associated with land where the growth of other trees is restricted by grazing and/or extreme environmental conditions, or recent secondary woodland. Scrub is not the same as coppice which is described above.

Shrubs: Used in a pollen analytical context to describe small trees especially hazel, partly because hazel pollen cannot be distinguished from that of Myrica gale (Bog Myrtle).

Sub-infeodation: Under the Norman feudal system all land was owned by the King. Tenants in chief held land from the King in return for various services, in particular the service of a number of knights. In order to provide these services, and to facilitate the exploitation of widely dispersed properties lands were often granted away to sub-tenants who served as knights (Bolton 1980: 37-40). This is called sub-infeodation.

Vill: The vill was an administrative area which had a single manor court. In lowland England vills were often eqivalent to a single settlement with the land belonging to it. In upland areas such as the Pennines vills often consisted of collections of hamlets of which one would perform the function of caput where the court was held. Vills later developed into townships and civil parishes.

Villein: A tenant considered to belong to his lord. Villeins usually owed a much heavier burden of services, often consisting of several days work each week plus extra days, called boon days, at times when extra labour was needed on the lords demesne, as at harvest. Villeins were also subject to heavy fines such as merchet payable on the marriage of a daughter, or heriot paid on the death of the householder. They could not leave the manor without the lord's permission, or buy freehold land without the lord's licence (Bolton 1980:20).

Woodland: Land covered in trees. In this thesis woodland includes woodpasture and coppice, but is regarded as distinct from plantation.

Woodpasture: Woodland primarily exploited as pasture. The point at which woodpasture becomes pasture with a few trees is difficult to define. In practice when dealing with documents or maps the decision whether or not an area is woodland or not lies with the compiler of the document and may be difficult to retrace.

FIG. 43
GEOGRAPHICAL AREAS
IN NORTH YORKSHIRE