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"The Environment of Anglo-Scandinavian York and the North-East"

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Other evidence by members of the York Environmental Archaeology Laboratory.

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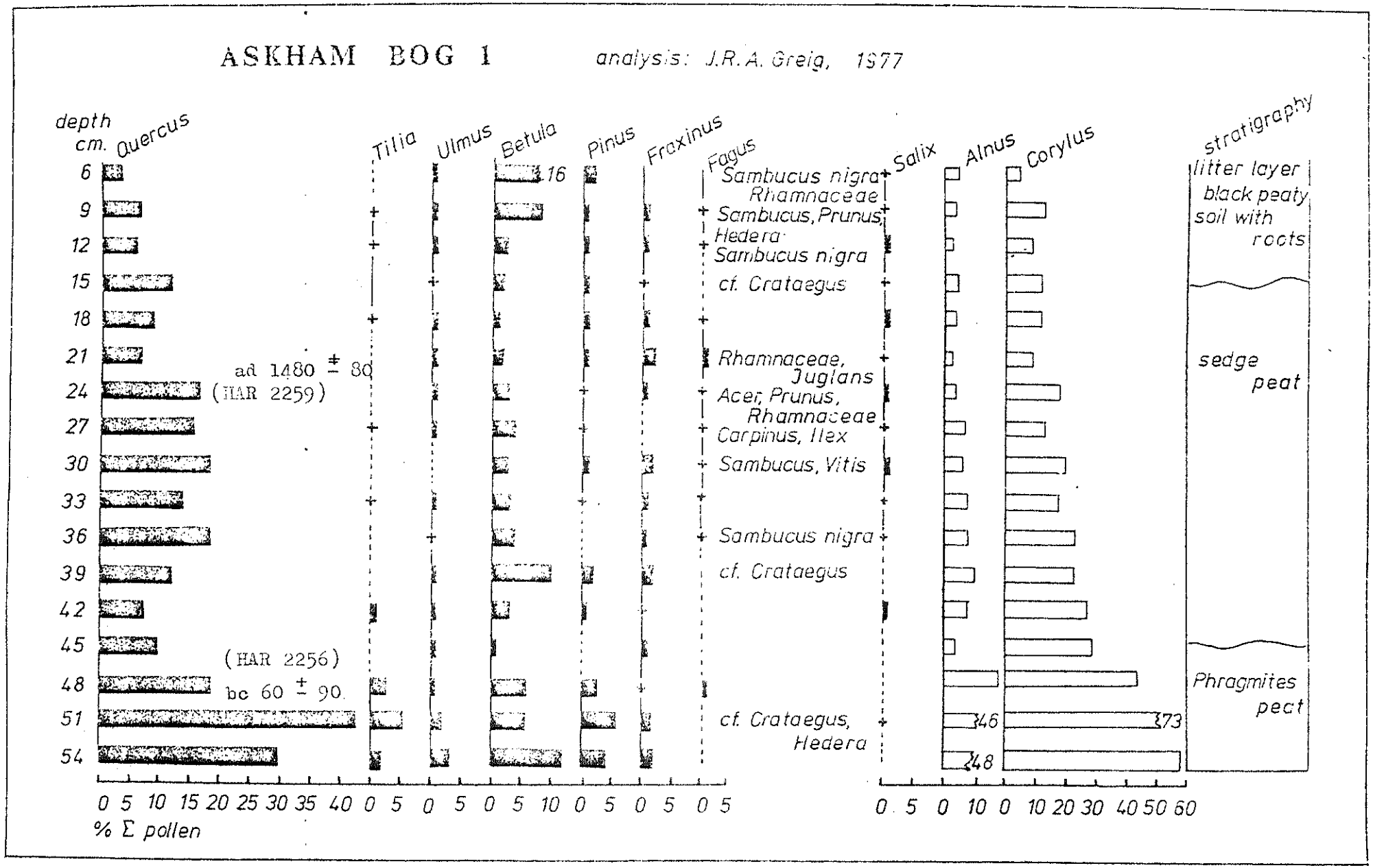
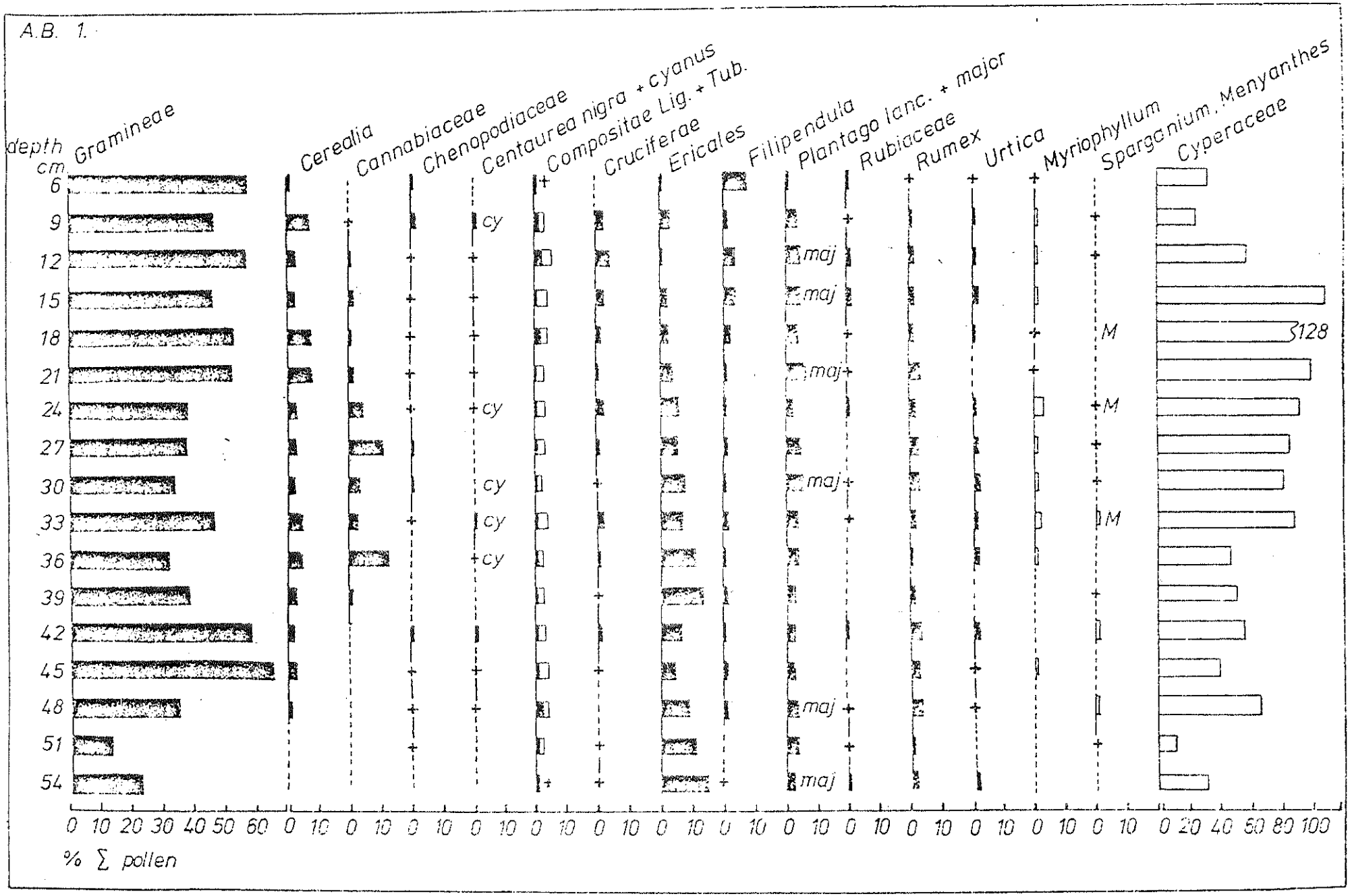

ASKHAM BOG 1
analysis: J.R.A. Greig, 1977
depth cm.
Quercus
Tilia
Ulmus
Betula
Pinus
Fraxinus
Fagus
Salix
Alnus
Corylus
stratigraphy
6
9
12
15
18
21
24
27
30
33
36
39
42
45
48
51
54
ad 1480 ± 80
(HAR 2259)
(HAR 2256)
bc 60 ± 90
16
Sambucus nigra
Rhamnaceae
Sambucus, Prunus,
Hedera
Sambucus nigra
cf. Crataegus
Rhamnaceae,
Juglans
Acer, Prunus,
Rhamnaceae
Carpinus, Ilex
Sambucus, Vitis
Sambucus nigra
cf. Crataegus
cf. Crataegus,
Hedera
46
73
48
litter layer
black peaty
soil with
roots
sedge
peat
Phragmites
peat
0 5 10 15 20 25 30 35 40
0 5
0 5
0 5 10
0 5
0 5
0 5
0 10
0 10 20 30 40 50 60
% Σ pollen


A.B. 1.
depth cm
Gramineae
Cerealia
Cannabiaceae
Chenopodiaceae
Centaurea nigra + cyanus
Compositae Lig. + Tub.
Cruciferae
Ericales
Filipendula
Plantago lanc. + major
Rubiaceae
Rumex
Urtica
Myriophyllum
Sparganium, Menyanthes
Cyperaceae
6
9
12
15
18
21
24
27
30
33
36
39
42
45
48
51
54
cy
maj
M
3128
0 10 20 30 40 50 60
0 10
0 20 40 60 80 100
% Σ pollen

The Environment of Anglo-Scandinavian York and the North-East

The plant remains.

Regional Environment

The city of York stems from the establishment in circa 72 A.D. of a Roman legionary fortress on strategically important raised ground near the confluence of the rivers Foss and Ouse. The development of the city since that date has depended as much on aspects of its environment such as vegetation, soils and topography as on the successive waves of migrating people and cultures.

Our knowledge about the past environment of the area comes mainly from pollen analysis. A suitable site just outside the present day city, Askham Bog, is yielding very useful results that are directly relevant, and these can well be compared with the radiocarbon dated pollen diagrams from the surrounding regions, few though they are. There is one such from Rishworth, in the uplands of west Yorkshire (Bartley, 1975) and also a useful collection of work from round Durham (Bartley, Chambers and Hart-Jones, 1976). For the medieval period there is some documentary evidence mainly concerning forests in the area (Cox, 1905). Plant macrofossils from sites in York itself have sometimes provided evidence of types of vegetation that must have existed outside the city limits at particular times, for instance heathland.

The earliest part of the Askham Bog pollen diagram appears to represent, for reasons discussed later, the vegetation that existed there before the Iron Age. This would have been thick forest with oak and lime (the latter perhaps especially where Magnesian limestone outcrops, as for example round the Howardian Hills) and a range of other trees like elm ash and birch. Lime is usually regarded as being under-represented in pollen diagrams, so its importance is more than the pollen percentages (Godwin, 1975 p. 163) would suggest, and its presence confirms the deduction from the finds of Tilia pollen in the Roman sewer that there was lime-rich woodland somewhere in the vicinity (Greig, in Buckland, 1976).

This woodland may well not have been the original undisturbed forest that would have developed by the Atlantic period over all suitable land (and thi seems to have been most of Britain up to an altitude of around 2500 feet) for there is a certain amount of evidence of Mesolithic occupation in the region, from sites like Starr Carr (Clark 1954). There is also some evidence that even from this early period there may have been some changes made by the effects of human occupation on the countryside. By ca. 5100 B.P the effects of Neolithic opcupation would have had a dramatic effect with first forest clearance for pastoral grazing, and then an increasing dependa on cereal crops, shown in the first instance by the elm decline and the appearance of Plantago lanceolata and other indicator species in the pollen diagrams, and in the second case, the appearance of cereal pollen as well. There is little reason to suppose that the sequence of events interpreted and dated from the pollen diagram from Thorpe Bulmer in County Durham (Bartlgy, Chambers and Hart-Jones, 1976) do not show what happened round Yo too. Cereal pollen appears there at 3500-3200 B.P. and increases as does evidence of forest clearance at levels dated to Bronze Age times. Forest which had been cleared and settled for a while was probably abandon when the soils became depleted, and much of the cleared areas of forest would have regenerated over the years. Some trees like birch and ash may have become more abundant, as they need plenty of light and can thrive in a colonising situation. Holly can also form such secondary woodland, and give way to beech, but there is not much sign of this here. In places with thin or unstable soils such as the sandy millstone grit derived ones there was probably irreversible damage done there with the initial clearance. With erosion comes podsolization, and the Ericales (mainly Calluna) record show that in some places the vegetation gave way to heath in response to these soil changes which prevented the regeneration of woodland. Evidence of heathland has also been found abundantly in post-Roman to early medieval deposits (D.W.) and in pollen found in the Roman sewer and other places.

The second part of the Askham Bog diagram has abundant signs of forest clearance and agriculture, including the Cannabiaceae pollen curve, starting at 39 cm. Although it is not usually possibly to distinguish the pollen of the two British members of this family, Cannabis sativa and Humulus lupulus, the known history of the cultivation of the former compared with the rather late popularity of the latter in the seventeenth century, (Rackham 1975) suggests that this record represents the hemp. The Thorpe Bulmer diagram already mentioned has a dated level at 2064 $\pm$ 60 B.P. corresponding to the start of the Cannabiaceae curve, and other dated diagrams from that area confirm that hemp cultivation started in the Iron Age / Roman period. It therefore seems reasonable to equate the second part of the Askham Bog diagram with the Roman period and subsequently.

Changes in the landscape relating to this period are rather hard to trace because there is not enough information on the relationship between pollen production and different types of woodland which (Rackham, 1976) may deposit pollen in very different proportions to the importance of the various trees as woodland components. Pollen diagrams can easily detect gross changes like episodes of more intensive forest clearance, or of regeneration, but it is not yet possible to fill in the fine detail. It would appear that in this Roman and later period that the countryside around York consisted of a mosaic of arable and pasture land, where perhaps the soils were most suitable for this, with forest, wood and coppice on the rest of the land, apart from areas of heathland.

The documentary evidence, although it mainly relates to the Early Medieval period and later, can probably be safely extrapolated back to the Roman period to fill in a few details. The great forest of Galtres probably became a royal forest in the Norman period but is known to have been a favourite hunting ground of the Saxon kings prior to this (Cox, 1905). In pre-conquest times it probably represented a belt of well wooded country

extending up the east side of the Vale of York; its name is of Scandinavian origin, meaning "boars' brushwood" which indicates the nature of the habitat. It is stated that the forest commenced right at the foot of the city walls and extended for twenty miles northwards to Crayke, and was bound by the rivers Ouse, Kyle and Foss. Most of this area would have been open woodland and parkland, broken up with villages and their associated areas of tillage and grassy clearing for deer herbage, although thicker wooded are or coverts would have been retained strictly for game. This forest would have been under continual pressure, form grazing animals, swine pannage, assarting and the felling of trees for timber and fuel although the royal forest laws would have given protection. Also, it appears that medieval forest management practises maintained particular types of woodland with a long term view to timber production, which inhibited change to these woodlands, once established (Rackham, 1975).

Documents of the medieval period (Cowling) give details of the granting of large oaks from the forests for building, particularly of ecclesiastical establishments, and the larger oak timbers found in the urban excavations in York were probably derived from this source. The forest suffered greatly during the Civil War and deforestation was completed in the reign of Charles 11.

Medieval documentation of royal forests indicate that several other parts of this region were probably extensively wooded, for example the forest of Pickering mentioned in the Domesday Book (Cox, 1905), the forests of Knaresborough, Hatfield Chase, forested areas between the Ouse and the Derwent (Cox 1905) and Ferndale.

Pollen analysis work has only started to show up its side of this story of local woodland and other vegetation, and there is obviously plenty of information yet to be gained from this source.

Plant macrofossils and pollen recovered from urban archaeological excavations mainly provide evidence of human activities rather than of the environment in and outside the city. Nevertheless the regular recovery of large amounts of the remains of certain types of plants in deposits im York strongly testify to the occurrence of particular habitats, probably close to the city. The presence of heathland has already been mentioned. Macrofossil remains of heather (Calluna vulgaris L.) have been found in post-Roman to early medieval deposits, probably gathered from the nearest suitable sourse, such as Skipwith Common. No evidence of the heather being used by the Romans has been found, although the Askham and Ebor pollen diagrams demonstrate the presence of heathland then and earlier. Further evidence of heathland is provided by the collection of large volumes of mosses typical of a heath bryophyte flora in the Ebor Deep Trench (Seaward and Williams, 1976) or the 12th century moss lined pit on Skeldergate (Williams, unpublished). Erica leaves and seeds of Scots Pine (Pinus sylvestris L.) were found with heather fragments in the Anglo-Scandinavian leather workers tenement at Lloyd's Bank.

Another habitat strongly represented in early historical urban deposits in York is marshland, detected from the large quantities of the remains of reeds (Phragmites communis L.), tall growing sedges (Carex spp.) and to a lesser extent rushes (Juncus spp.) together with water crowfoot (Ranunculus subgenus Batrachium). This material would have been mainly gathered for use in thatching and flooring; the latter usage was conclusively shown from the Anglo-Scandinavian floors found in situ under Lloyd's Bank. The Askham Bog pollen diagram has ample evidence of marsh vegetation since it is the build up of this very material that has preserved the evidence of vegetational changes of an area larger than the immediate bog limits. The upper layers are sedge peat made up of the remains of the reeds, sedges and rushed already mentioned and incorporating very large quantities of Cyperaceae pollen from the first two, while rushes are not represented since their pollen does not get preserved. Alder carr also existed, although it decreased with the Roman period.

A range of other water plants are also in evidence, such as the milfoil (Myriophyllum sp.), bog bean (Menyanthes trifoliata), the bulrush (Typha sp and the bur-reed (Sparganium sp.), and plants of water meadows and damp fields like meadowsweet (Filipendula ulmaria). The pollen diagram from the series of samples from the Ebor deep trench demmnstrates the presence of Cyperaceae, Sparganium, Myriophyllum and Filipendula but it is not clear whether they could have grown in situ there, or whether the pollen could have blown in or come in with this vegetation.

There are two pollen diagrams from York itself, Ebor and Lloyd's Bank, as well as pollen spectra obtained from single samples like those from the Roman sewer. The Ebor Deep Trench diagram comes from a section of organic sediment apparently laid down from the Roman period and onwards until the 12th century in a pond or pool with occasional layers of wood or heather between the layers of clay material that could be deposited by natural or human means. The pollen from this could also be naturally transported in the wind (aerial) or it could have come from plant material brought in to York and eventually deposited in this place (the heather is a case in point), in other words derived pollen. The presence or absence of macrofossils to correspond to the pollen often provides valuable information on the likely origin of the pollen itself.

The Lloyd's Bank pollen diagram comes from a series of samples from archaeologically recognisable layers, originally the floors of the Anglo Scandinavian leather workers tenement already mentioned, and which should contain mainly derived pollen.

Both these diagrams, being partly based on aerial and partly on derived poll pose great problems in interpretation, but together with the results of the Askham Bog diagram they can help show a considerable amount about the urban and rural environment in and around York. Before assessing the result it is necessary to make an estimate of the aerial and derived pollen compon of the two diagrams. The Ebor diagram has much less tree pollen than that Askham Bog, which is hardly surprising considering the relative posisions o

the two sites, the one urban and the other rural. However the trees present in the Askham Bog diagram are also present in the Ebor diagram, with oak [illegible] pollen probably coming from the nearest oak woods to the city together with pollen traces of elm, lime, ash and hornbeam in proportion to their small frequency compared with oak on the Askham diagram. Birch, alder and hazel are rather more frequent than oak in the Ebor diagram, which probably reflects the presence of scrubby woodland closer to the city than oak woods. Elder (Sambucus nigra L.) is quite frequent in the Ebor diagram (there are only traces from Askham) which is a shrub that readily grows on abandoned land, and is common in York today, so perhaps this pollen record represents elder growing in or very near York at this time. The herbaceous pollen records in the Ebor diagram are much higher than the Askham levels, especially those from weeds like Cruciferae, Urtica, Compositae. Much ofthis could be either derived or aerial pollen. One way of distinguishing between the pollen types is the appearance of the corresponding seeds in quantities that suggest that the pollen as well came from decayed vegetation. The very large amounts of Ericales pollen in the upper part of the Ebor diagram correspond with D. Williams' finds of the remains of Erica, so these high pollen values are the result of derivation, and very probably the high values of Gerealia pollen too. However there are very many records of pollen from plants with weedy tendancies that are hard to explain fully by aerial pollen transport of derivation, such as Chenopodiaceae, Artemisia, Centaurea nigra type, Caryophyllaceae, Polygonum, Rumex and Umbelliferae, apart from the three already mentioned. It would therefore appear that there may have been a significant weed flora in the city as there is today, but probably more widespread in the days before tarmac and concrete paving. The seed flora corresponds closely with this pollen record, with Chenopodium bonus-henricus (fat hen), C. rubrum (goosefoot), elder, Polygonum aviculare (knotgrass) and Conium maculatum (hemlock), all plants of disturbed ground, preferably nitrogenous, and strobgly associated with human habitations in their past fossil records (Godwin 1975).

They do not seem to fall into the catagories of useful plant material brought into the city for thatch, for example or some such purpose, and even though almost all plants have had some real or supposed use in the pas (cf Bowser, 1963) it is unrealistic to use the presence of remains of such plants as evidence that they were actually being used. Even the most modern "concrete jungle" urban developments seem to manage to support some plant life, and this must have been true in the past, that towns supported a healthy weed flora growing in odd corners.

Human activities and crops.

The Anglo-Scandinavians had distinct cultural differences compared with earlier periods, particularly the Roman period, and this is well demonstrat by the study of plant macrofossils. Whereas spelt (Triticum spelta) was the predominant dereal crop in the Roman period, judging by the amounts recovered, the Anglo Scandinavian levels of the Lloyd's Bank site produced mainly oats (Avena sativa). Godwin (1975) has suggested that the concentration of oat records in East Anglia may reflect the introduction of this crop with the migration of the various Saxon people from their homeland, and it would appear that a similar situation obtained in York. The pollen studies do not add much to this picture because it is not generally possible to identify the various types of cereal from their pollen

Post- Roman agriculture at York can usually be pinpointed by the presence of a particular cereal weed, stinking mayweed (Anthemis cotula L.) which was found to be present in appreciable quantity as a contaminant of the Anglo-Scandinavian grain at Lloyd's Bank. This species has a strong affini for heavy clay or clay-loam fields particularly if they are base-rich (Kay, 1971). The absence of such soils in the immediate vicinity of York today may suggest that the mayweed and grain had been brought from some distance, perhaps as far afield as the Vale of Pickering or the Wolds, very godd grain growing areas today. The evidence from the Askham Bog pollen diagram shows that at least some of the cereals were grown close to York, and had their associated weeds such as cornflower (Centaurea cyanus),

Deposits in the city itself oftem seemed to be comprised of the decayed remains of hay and straw, so that pollen spectra from Lloyds Bank oftem had very high values of pollen from cereals, and rather unspecific pollen types such as Compositae (Liguliflorae) and (Tubuliflorae). The latter could possibly be equated with the finds of Anthemis cotula achenes already mentioned. The difference between Roman and Anglo-Saxon agriculture obviously needs further exploration, and apparent changes in plant remains recovered examined to see whether they represent changes in practise or changes in the types of evidence recovered.

Other crops that are strongly represented in post-Roman York are hemp, (Cannabis sativa L.) and flax (Linum usitatissumum). Hemp seeds were very common throughout the Lloyd's Bank deposits and have also been recovered in appreciable numbers in other Anglo Scandinavian to Early Medieval deposits. The palynological evidence shows a strong hemp record, but since it appears to date back as far as the Iron Age the recovery of hemp seed from post-Roman deposits would appear to indicate that there may be a fundamental difference between the types of deposit preserved in the two periods, such as the floor layers which seem to be post-Roman only.

The flax is only so far known from macrofossils, as the single grain from Askham Bog proved to be referable to Linum catharticum (purging flax). However traces of L. usitatissimum pollen were found in levels of the Thorpe Bulmer core (Bartley, Chambers & Hart-Jones, 1976) dated to the Iron Age and after. Perhaps the flax was not grown in the immediate vicinity of York, or it has yet to be detected.

The hemp and flax probably formed part of a flourishing textile industry in York, producing coarse fabrics and rope from the hemp, and linen. The High Ousegate/Coppergate and Pavement area of York has previously been referred to as the industrial centre of the Anglo-Scandinavian town (Radley 1971) with such other activities as tanning and dyeing being carried out there as well. The macrofossil evidence from the Lloyds Bank would agree with this, with abundant evidence of tanning (Buckland, Greig

and Kenward, 1974), textile processing and even dyeing, the latter shown by the presence of such species as dyer's rocket (Reseda luteola L.) dyer's greenweed and probably heather, of which only the young tips and florets were found ---- the former are known to produce a yellow dye.

There is a large record of Cruciferae pollen from the Askham Bog diagram, which cannot certainly be ascribed to any member of this family which includes many weeds and crops as well. Weeds such as Rhaphanus rhaphanist (charlock) are common today and may have been in the cornfields them. On the other hand there are planty of crucifer crops that might have been grown, such as mustard (Sinapis alba)or gold of pleasure (Camelina sativa) grown for oil seed, or woad (Isatis tinctoria) grown for dye, which would all have been allowed to flower and liberate pollen before harvest. Crop such as cabbages and turnips would not appear in pollen diagrams since flowering is most undesirable before harvest, and there is a great dearth of evidence of these two crops as a result.

There are somewhat scattered records of pollen that is attributable to Vicia type. This could repfesent Vicia faba the bean, or perhaps Pisum sativum the pea. This group of leguminous crops tends to leave little trace because thecrop processing evidently did not involve heat that would like the cereal grains, lead to preservation through carbonisation. Thus finds of peas and beans are lamentably rare, although these foodstuffs may have been important in the past as easily stored protein rich food. The pollen record from Askham suggests local growing, and a trace of pollen from Lloyds Bank suggests an Anglo-Scandinavian date.

Two other records that may be of interest, especially if they are substantiated by further results; the first is a single pollen grain considered to be that of Vitis vinifera the vine and probably dating from the medieval period. The question of whether grapes were grown in Britain has often dogged the interpretation of finds of grape pips, and though it is generally believed that viticulture was successful from perhaps 1100-1[illegible] there is very little botanical evidence.

The second record is a single grain of Juglans regia the walnut, also probably medieval. This tree came from southern Europe originally, and seems to have been transported by prehistoric people, reaching the Alps by the neolithic (Beug 1961). Its pollen is easily recognised, and in European pollen diagrams there is often a Juglans pollen curve from Roman times onwards. Macrofossils have also been found, as for example at Novaesium (Neuss) on the Rhine (Knörzer, 1970). Although there are very few Juglans records from archaeological sites in Britain, if at all, its presence is not unexpected.

REFERENCES

Bartley, D.D. (1975). Pollen analytical evidence for prehistoric clearance in th upland area west of Rishworth, W. Yorkshire. New Phytol. 74, p. 375-381.

Bartley, D.D., Chambers, C. & Hart-Jones, B. (1976). The vegetational history of parts of south and east Durham. New Phytol. 77 p. 437-468

Beug, H-J. (1961). Beiträge zur Postglazialen Floren- und Vegetationsgeschichte in Süddalmatien; Der See "Malo Jezero" auf Mljet, I & II. Flora 150 p. 600-65

Bonser, W. (1963). The medical background of Anglo-Saxon England. The Wellcome Historical Medical Library, London.

Buckland, P.C., Greig, J.R.A. & Kenward, H.K. (1974). York: an Early Medieval site. Antiquity 48 p. 25-33.

Buckland, P.C. (1976). The environmental evidence from the Church Street Roman sewer system. York Archaeological Trust / Council for British Archaeology, volume 14 fascicule 1.

Clark, J.G.D. (1954). Excavations at Starr Carr. Cambridge University Press.

Cox, J.C. (1905). The Royal Forests of England (The Antiquary's Books). London.

Godwin, Sir H. (1975). The History of the British Flora 2nd Ed. Cambridge

Kay, Q.O.N. (1972). Variation in Sea Mayweed (Tripleurospermum maritimum (L.) Koch) in the British Isles. Watsonia 9 81-107.

Knörzer, K-H. (1970). Römerzeitliche Pflanzenfunde aus Neuss. Limesforschungen Band 10, Novaesium IV. Verlag Gebr. Mann, Berlin.

Rackham, O. (1975) Hayley Wood, its history and ecology. Cambridge & Ely Naturalists Trust.

Rackham, O. (1976) Trees and Woodland in the British landscape, Dent.

Radley, J. (1971) Economic aspects of Anglo-Danish York. Medieval Archaeology XV p. 35-57.