Ancient Monuments Laboratory
Report 12/90

WEST HESLERTON PARISH PROJECT, NORTH YORKSHIRE, SURVEY FOR SITES WITH POTENTIAL FOR POLLEN ANALYSIS.

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Summary

The region covered by the West Heslerton Parish Project was surveyed for sites that could be suitable for palaeoecological study, using the technique of pollen analysis. A number of such sites were visited; at each an investigation of the sediments present was carried out and any promising deposits were sampled. These samples were then returned to the laboratory where their pollen content was analysed. The North of the study area, in the lower parts of the River Derwent valley proved to offer the most potential for further investigation, while the South of the region, associated with the area of chalk, offers very little potential.

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frequently recorded types.

Sample 4. As with the previous two samples pollen preservation was poor here. *Salix* and Cyperaceae dominate the assemblage, but a greater number of pollen types were recorded than in the previous two samples.

Sample 5. Pollen was found to be present in the underlying clay band, Cyperaceae and *Pinus* were the most frequently recorded pollen types, but the trilete spore type *Selaginella* was also commonly found.

Site 3b

Sample 1. Pollen was better preserved at this site than at site 3a. Again a relatively wide range of pollen types were found; *Alnus,* Cyperaceae, *Corylus* and Graminae were the most numerous, but a good spread of other arboreal and herbaceous taxa were present (the 100 grains counted in this study was made up, of 20 pollen types).

Sample 2. The assemblage obtained from this sample was very similar to that recovered from the first sample with again *Alnus*, Cyperaceae, *Corylus* and Graminae types being the most numerous. A similar number of pollen types to that found in sample 1, were also noted within the 100 grains counted.

Conclusion

Obviously, this site does offer potential for a more detailed palynological study. However, because of the high numbers of presumably locally derived pollen types, large pollen counts would again be needed to gather a good picture of the contemporary vegetation. It could prove interesting to compare diagrams from the two sites as the silts/clay is likely to contain pollen from a wider catchment area (via fluvial dispersal) than would be the case from the peat. This may allow one to compare the local and more regional vegetation patterns. Overall site 3b may be the most interesting of the two sites, however the full depth of potential polleniferous sediments at this site has not been investigated here, so the possible timespan that could be investigated is unclear.

Site 4

This site again consisted of a buried peat layer exposed by a drainage ditch (Maureen McHugh, Dept. of Agricultural and Environmental Science, University of Newcastle, has photographs and a brief description of this profile). The map reference for this site is roughly SE 906 761. Fig. 4 shows the location of the sampling site. Three samples were taken from the exposure at:

1. the top portion of the buried peat.
2. the bottom portion of the buried peat.
3. from the underlying sand.

On the basis of a number of shallow borings made with a soil auger, this organic/peat layer appears to be relatively extensive in the fields surrounding the drainage ditch. Again there is a

degree of variation in the nature of the organic layer, a similar variation between peat and organic mud appears to be present.

Results

Sample 1. Cyperaceae is again easily the most numerous pollen type, accounting for around 70% of the total. *Betula, Pinus, Corylus* and Gramineae all occur relatively frequently.

Sample 2. Pollen occurred only very infrequently in this sample, the slide prepared only yielded 23 grains, but this problem may be overcome by more rigourous extraction techniques. However this small number of grains was made up of 10 different pollen types of which Cyperaceae, *Polypodium* and Liguliflorae were the most frequent (obviously this is of little statistical value when one considers the sample size).

Sample 3. Pollen was absent from this sample.

Conclusion

The peat/organic layer present in this field is polleniferous, however the degree of preservation does appear to be rather variable. How valuable the information from this deposit is will obviously depend on its age, as only a limited depth of material is present. Because of the variable nature of the organic sediments it is possibly that deeper, more silty sediments could be present and of use. (A more thorough survey of the sediments present in this area has been made by Maureen McHugh.)

Site 5

This again consists of a peat exposure, similar in nature to those described at site 4, taken from a drainage ditch near its junction with the river Derwent at Yedingham (Map reference SE 894 797). The drainage ditch in question is the one that runs along the bottom of the field associated with the Priory. Fig. 5 shows the position of the sampling site. Only one sample of the peat was taken.

Results.

In the preliminary count of 100 grains undertaken, a wide range of pollen types (over 20) were found. Gramineae was the most frequently occurring pollen type, making up nearly 50% T.P.. Included in this total were a number of individual grains over 40 micometres in size, which could possibly represent cereal grains. A wide range of other herbaceous pollen types were found including *Plantago lanceolata* and *Rumex* spp. that are often regarded as indicators of agricultural activity. Ammounts of arboreal pollen types were very low, suggesting that the area was quite open during this period of time. Smaller numbers of indicators of possible wet conditions, such as Cyperaceae, were present here than at the other sites investigated in this study.

Conclusion

Although it is difficult to speculate about the age of these sediments, it seems very likely that the pollen record contained within them would give information on a period of agricultural

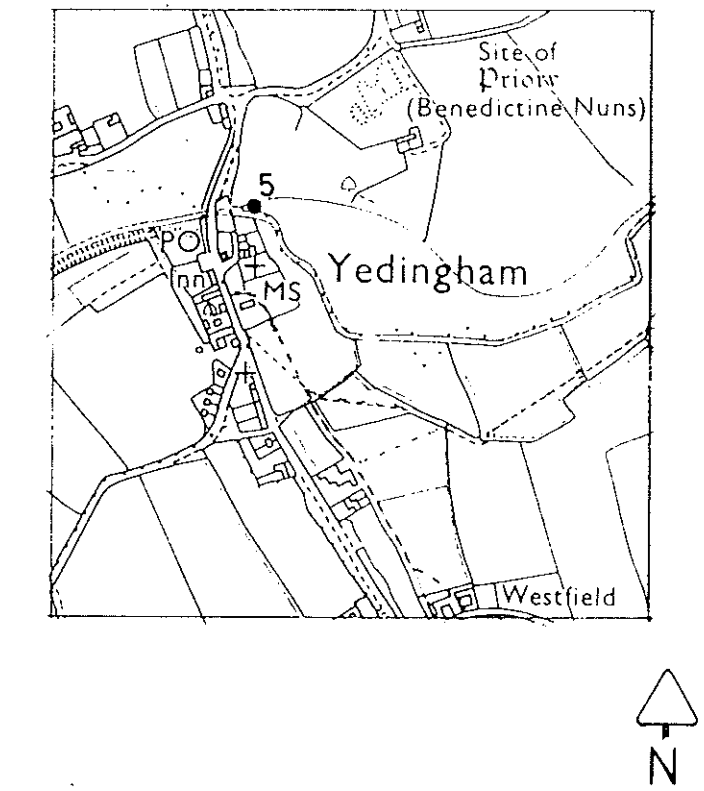

Fig. 5: Location of site 5

activity in the area.

Site 6

In the field immediately to the south of the current excavations at West Heslerton (map reference SE 916 759 - see Fig.1), a number of cores were taken, using a vibro-corer, across the presumed former line of the stream that once flowed from the spring found at the southern edge of the field. The object of this exercise was to investigate the possibility of there being any organic deposits preserved in this area. From the eight cores examined, samples which appeared to possibly contain pollen were taken from three. Maureen McHugh has the details of the stratigraphy of the cores. In all a total of five samples were taken for investigation:

1. Core 2 depth 164cm
2. Core 3 depth 70-72cm
3. Core 3 depth 161-171cm
4. Core 4 depth 135-140cm
5. Core 4 depth 170cm

Results.

The results from this site were very disappointing. Sample 1 yielded nothing, while sample 2 was almost as poor with only the occasional badly preserved grain of Liguliflorae type being present. Sample 3 was of more interest in that apart from a number of poorly preserved, unidentifiable grains, a number of trilete spores and bisaccate pollen grains were present. However these did not appear to be of recent origin and are more likely to be reworked from pre-quaternary deposits in the area. Sample 4 was again devoid of any pollen, while sample 5 yielded a similar assemblage to sample 3.

Conclusion.

The evidence from this study suggests that this site offers no potential for pollen studies.

Site 7

The investigation carried out at this site involved borings being taken through the soils on the side of a dry valley on the chalk to the south of the dig at West Heslerton. The area investigated was in the area of map reference SE 915 742 (see Fig. 1) . It was hoped that the cores might reveal the presence of buried soils or similar organic remains. However, from a total of about 10 bore holes no sign of such material was found abd therefore no samples were taken for analysis. So, as might be expected, the chalk area to the south of the dig is unlikely to provide any potential for palynological investigation.

Overall Conclusion.

The results of this preliminary investigation suggest that the region to the north of the survey area, ie the River Derwent valley offers the most scope for palynological investigation. Although much of this area was formerly covered by deep peats,

these have now been all but lost. Even locations such as Site 1 in this study, where some of the deep peat is still surving, the stratigraphy shows signs of oxidation and it is only a matter of time before such areas are also lost. Therefore the collection of as complete a core as possible from such an area is advisable as soon as possible. However, because of the physical difficulties encountered when trying to sample Site 1 with a Russian Borer this could prove difficult. The other peats found in the area, which tend to be buried by other sediments and of limited thickness, such as seen at Sites 3a, 4 and 5, are polleniferous, but taken individually would only offer fragmented glimpses of the past vegetation. However, if a number of these types of site are looked at, and the results backed up with radiocarbon analysis, it could be possible to reconstruct a more complete sequence, over a relatively wide geographic area.

However an alternative source of information is the organic lacustrine muds in the same area. Those investigated at sites 2 and 3b do appear to be polleniferous, with pollen preservation better than in some of the peats investigated. That such sediments could be less susceptible to disturbance and decay means that it is possble that a long uninterrupted sequence could be obtained possibly as far back as the late glacial period (re. the Flixton diagram in Clark, 1954). However collecting such a core could again prove to be physically very difficult.

Practically all the pollen spectra obtained in this study have in common the fact that they are dominated by locally occuring pollen types. This can be seen to be quite a large disadvantage to obtaining meaningful information: very large pollen counts will have to be made especially if more regional questions are to be asked of the data. This could of course be very time consuming.

The results from the more Southern sites, 6 and 7 are rather disapointing. Although no polleniferous deposits were found in this investigation of site 6, it could still be possible that better, more organic deposits could turn up during excavation. Although this may be unlikely it might be wise to take it into account. The area of chalk, however, does appear to be devoid of any potential for palynological study.

References.

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