BOXGROVE 1985: PRELIMINARY POLLEN DATA PRESENTED AT ONE DAY COLLOQUIEM JANUARY 16 1986.

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Initial attempts at pollen analysis of the Slindon Sands and the brickearth/clay with flints deposit failed to produce more than a few pollen grains. A section opened up by mechanical excavator on the East side of the quarry in November 1985 produced a fine section spanning the Slindon Sands, an overlying greyer sand in which the upper part contained the archaeological horizon (Mark Roberts pers. comm.) an overlying Fe/Mn layer (2-3cm) and the clay with flints sequence. This section was sampled sequentially and it is from three of the samples obtained that data presented here is taken.

POLLEN PROCEDURE

Low absolute pollen frequencies necessitated special concentration techniques utilising larger volume samples than normally used in pollen analytical investigations (excepting cave pollen studies). Here, 30 grams of sample was subjected to initial warm HCL treatment; boiling in NaOh (10%); sieving through 150u; double HF treatment for digestion of Silica; warm HCL for removal of Silica fluorides;

micromesh sieving (10u) for removal of fine (clay fraction) silica which remained. The resdidue containing pollen was stained with safranin and mounted in glycerol jelly. It is interesting that certain but small quantities of silicates remained after the above treatment. These included opaline phytoliths, perhaps of coniferous taxa. It is hoped to pursue this evidence in a more detailed phytolith investigation.

Pollen was sufficiently abundant to enable preliminary counts of 150-200 pollen grains from each of the three levels prepared. The recovered pollen comprised largely saccate coniferous forms. These were of moderate preservation but with evidence in some cases of degradation (shrinkage) and rupturing of the air sacs. Where the latter had occurred, the total of individual air sacs was halved. Where determination to genus was not possible, these have been assigned to an indeterminable category. A small number of pre-Quaternary spores was also noted. These were not included in the pollen sum calculations (Table 1).

DISCUSSION OF DATA

Arboreal pollen is dominant throughout the samples counted. These taxa comprise predominantly ***Pinus*** and ***Picea*** with smaller quantities of ***Abies*** and ***Quercus***

Fe layer: The uppermost sample analysed. Dominated by ***Pinus***

(50.3% Total pollen) and *Picea* (22.8% Total pollen). In view of the often under-representation of *Picea* in pollen spectra this high occurrence is of great importance. A small quantity of *Quercus* is also present.

11-16cm and 21-23cm. The arboreal pollen spectra of these two levels are similar, being dominated by *Pinus* with greater values than in the Fe horizon (80-83% total pollen). Lesser quantities of *Picea* are also noted (8.7% and 5% total pollen resepectively.

There is a marked absence of herbaceous pollen types in relation to arboreal taxa and this raises the question of whether differential destruction and preservation of some pollen types has occurred or whether the paucity of taxa is due to taphonomic or ecological reasons. The following mechanisms may be suggested;

i) Dominance of *Pinus* may be from deposition in marine or brackish water sediments where over-representation of saccate pollen grains may occur.

ii) Differential destruction of the pollen flora. It is known that pollen of the conifers is more resistant to degradation than the majority of deciduous taxa. Thus, *Quercus* and other arboreal and herb types may have been degraded due to adverse depositional or preservational criteria. These taphonomic proccesses might therefore result in a skewed ecological picture.

iii) Saccate pollen grains may have been reworked (ie derived) from earlier sediments.

It is hoped to confirm or deny the contemporaneity of the flora by studying the phytoliths present in these sediments. Quantities of phytoliths were evident during pollen preparation and it is possible that these are derived from the tracheids of conifers. This requires careful comparisons with modern reference material. There is, however, the possibility that these could also have been reworked although because of their fragile nature, it can be suggested that they are broadly contemporaneous with the sediments. Secondly, it is hoped that close liason with Dr Macphails soil and sediment micromorphological investigations may show the presence or absence of allochthonous material which might contain pollen.

In these highly minerogenic sediments, however, it is likely and illustrated in some cases (Scaife and Burrin 1983; Burrin and Scaife 1984) that pollen contained in, and transported in such sediments is likely to have been rapidly destroyed through abrasion. It is thought, therefore that the pollen is contemporaneous with the sediment deposition. It does, however seem likely that some differential preservation acting in favour of conifer pollen has occurred with resulting over-representation of ***Pinus, Picea and Abies***. It should be considered that other deciduous woodland elements

may have been constituents of the flora. If it is proven that these sediments were lain down in marine/brackish water, similar overepresentation of ***Pinus*** in relation to other (largely deciduous) elements would also occur.

DATING

In view of the above considerations, it is clear that conifers may have formed the dominant component of the vegetation at the time of sediment deposition although the distinct possibility that other types may have been destroyed must also be taken into account. In comparison with the Hoxnian interglacial type sequences at Hoxne (West 1956) and Marks Tey (Turner 1970) it would appear that the assemblage of samples may be:

Fe. ?HoIV Post Temperate zone or ?late HoIII

11-16cm, HoIII Late Temperate Zone

21-23cm, HoIII Late Temperate Zone

The markedly high percentages of ***Picea*** pollen in the uppermost sample may indicate a Post Temperate (HoIV or HoIII) date of the Hoxnian interglacial. High percentage of ***Picea*** are not seen in the

more complete sequence of Marks Tey (Turner 1970) but are seen at the Hoxne type site (West 1956). The presence of dominant ***Pinus*** and smaller amounts of ***Abies*** are also consistent with a late Hoxnian date. However, it is notable that there is an absence of ***Carpinus*** and of ***Betula*** both of which might have been expected from sediments of these sub-zones.

In the generally accepted sequence of interglacial stratigraphy ie. Cromerian, Hoxnian, Ipswichian, it could be postulated that another interglacial succession is represented as for example the ***Pinus*** domination at the begining of the Ipswichian. However, the quantities of Picea and ***Abies*** indicate a late temperate sub-stage and a late Hoxnian date is in more accord. It is not proposed here to discuss the possibility of a further temperate stage between the Hoxnian and Ipswichian until a full pollen sequence has been completed.

SUMMARY

Preliminary pollen analysis of three samples has yielded pollen spectra dominated by coniferous taxa. The uppermost sample (the Fe level) shows domination by ***Pinus*** and ***Picea***. The lower two samples from within the grey sands show a dominance of ***Pinus***. Small quantities of deciduous taxa are present (largely ***Quercus***) but there is the strong possibility of differential destruction in these sediments and therefore a skewed ecological picture. The data is,

however, commensurate with a late Hoxnian (HoIII and HoIV) sub-stages.

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