

## A critical review of the role of pollen-analytical research in the environmental archaeology of central southern England

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### Summary

The misuse of pollen-analytical data in a recent paper on the role of palaeoecology in understanding variations in man's impact on the landscape is reviewed. It is clear that empirical data from the various specialisms within environmental archaeology should be reviewed by, or in co-operation with, the relevant specialist.

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I am compelled to reply to Schofield's (1987) paper in the last issue of Circaea, on the role of palaeoecology in understanding variations in regional survey data, since he misinterprets my own research and that of two former research students of mine, Lesley Haskins and Paul Waton. I have no comment to pass on Schofield's interpretation of snail or lithic assemblages - the following points all refer to pollen-analytical investigations.

First, there is the general point of the representativity of pollen diagrams. The size and type of site are vitally important factors in the interpretation of any pollen sequence, the most frequently cited papers in this regard being those by Jacobson and Bradshaw (1981) and Edwards (1979), the latter having an avowedly archaeological bias. Schofield ignores the elementary fact that large pollen-collecting basins, such as those at Wareham, Cranes Moor and The Moors, will have a pollen catchment of several square kilometres, whereas small bogs such as Rinsmoor and Church Moor receive most of their pollen from a few tens or hundreds of metres away. A few moments spent studying the diagram relating basin size to pollen catchment in Jacobsen and Bradshaw - a diagram repeated in a number of other reviews - would have avoided this elementary error. The fact that different-sized basins are 'sensing' the palaeoenvironment at different scales (Barber and Twigger 1987) makes a nonsense of Schofield's figure 1, where clearance of trees is shown extending from the floodplain to terraces and hillsides: this could only be shown by careful analysis of a number of small sites situated in the same area and by consideration of the habitat preferences of the tree taxa being cleared. For example, Brown and Barber (1985) have demonstrated that in the Lower Severn valley there was massive Iron Age clearance which first affected limewoods on the drier terrace soils, with floodplain clearance of alderwoods occurring later.

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This leads on to a second general point - the importance of some ecological knowledge when interpreting pollen diagrams. Different tree species have different ecological niches and, fortunately for pollen-analysts, we are able to identify the major tree species of northern Europe down at least to generic, if not specific, rank. However, the same good fortune does not extend to grass and herb species, and all environmental archaeologists would do well to read Behre's (1981) review of the interpretation of anthropogenic indicators in pollen diagrams. Schofield perpetrates the gross error of equating grass pollen percentages of 30-40% at Winnal Moors (Winchester) with 'open' conditions in the mesolithic, going on to mention the Avebury region where there was a '...tendency for mesolithic finds associated with early woodland disturbance to be concentrated in the valley bottoms'. Now, apart from cereal-type pollen grains, it is virtually impossible to tell apart the dozens of grass species from their pollen. In fact there is macrofossil evidence in the peat from Winnal Moors which led Waton (1982, 216) to conclude that the high Gramineae pollen levels originated in Phragmites, the common reed, and other wetland grasses, growing naturally in a mixed fen. Winnal Moors during mesolithic times was probably very like it is today - a tangle of brambles, tall reeds and scrub, unsuitable for colonisation by the major forest trees because of a high water-table.

Schofield's table 2, dividing some pollen and snail sites into 'valley' and 'non-valley' sites and plotting thereon a number of 'dates for the earliest major clearance phase', is highly misleading. Setting aside the misuse of a symbol suggestive of a radiocarbon date plus error bars, I can list the following errors with regard to the pollen sites:

- (1) The early neolithic clearance at Winnal Moors does not extend back into mesolithic times, nor does it finish at the end of the early neolithic, but instead extends through to the historic period;
- (2) Rinsmoor is not a valley site but a doline or solution hollow filled with peat (Waton and Barber 1987). Amongst Schofield's 'non-valley' sites, Church Moor and Cranes Moor (Clarke and Barber 1987; Barber and Clarke 1987) and Rempstone, Luscombe, The Moors and Godlingstone (Haskins 1978) are all valley bogs. If one substitutes 'floodplain' for 'valley' the list is still misleading.
- (3) The dates ascribed to the 'earliest major clearances' are at best imprecise and in some cases quite wrong. There is no major early neolithic clearance at Wareham (Haskins 1978, 155-8), nor is there any clearance evidence from Church Moor (Barber 1975; Clarke and Barber 1987) in the Bronze Age. At Cranes Moor (Barber and Clarke 1987, but also Seagrief 1960, not cited by Schofield) there is something like two metres of peat missing from the top of the mire because of historic peat-digging, and the record is truncated shortly after the elm decline (radiocarbon dated to 2600 bc) - so where does the Bronze Age clearance evidence come from? The 'Early-Middle Bronze Age' clearance dates in table 2 from the Dorset basin sites of Rempstone, Luscombe, The Moors and Godlingstone are not supported by the pollen-analytical evidence - both Haskins (1978, 160-73) and Waton (1982, 310-26) see the late Bronze Age as the time of major clearance.

One of the major themes coming through from our palaeoecological research at Southampton, and that of Scaife (1987), is that the differential impact of man across central southern England is closely connected to soil type and geology. This is clearly shown by the early and permanent clearance of the chalkland around Winchester, contrasting

with the persistence of woodland cover on clay-rich soils at Snelmsore, near Newbury, through most of prehistory (Waton 1982, 303-7) and throughout the whole of the Holocene in parts of the New Forest (Barber 1981). Such differential impact may be linked to factors such as seasonal soil waterlogging and soil workability, as well as inherent fertility and the ease with which such fertility may be maintained. The prehistoric use of major river valleys as routeways, and of gravel spurs and valley constrictions as favoured settlement sites, may well be indicated by lithic assemblages, but sensible speculation on man's overall use of the landscape demands a close understanding of the palaeoecological data. Schofield's statement (p. 37) 'the concentration of early prehistoric communities in river valleys indicated by the palaeoecological evidence...' is simply not borne out by pollen diagrams from central southern England.

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