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The role of palaeoecology in understanding variations in regional survey data

A. J. Schofield *

Summary

This paper is presented, not by a trained palaeoecologist, but by someone involved with regional survey and the interpretation of variations in the density and form of lithic collections across the landscape. It is suggested that broad generalizations regarding early prehistoric land-use can be made from existing palaeoecological evidence - in this case defined as pollen and non-marine mollusca - in its published form, and used as a framework within which variations in artefact density may be more fully understood.

Introduction

Over the past decade, central-southern England has seen a renaissance of archaeological activity brought about, at least in part, by the switch from site-based research projects to a broader regional frame of enquiry. A considerable amount was known about prehistoric 'places' in the Wessex landscape, but our knowledge of the 'space' between those places was, to say the least, limited.

At around the same time, palaeoecology really came of age (see, for example, Evans 1975), and in the last decade our knowledge of how and to what extent early prehistoric communities were manipulating the Wessex landscape has increased dramatically. In particular, it has been demonstrated that events were taking place not only in different places and at different times, but often at varying scales of intensity. Work in coastal and estuarine environments (e.g. Haskins 1978), on areas of chalk downland (Waton 1982), on Tertiary sands and gravels (Seagrief 1960; Barber 1975) and in major river valleys (Allen 1986; Seagrief 1959; Scaife and Burrin 1983; 1985) has demonstrated the extent to which land-use intensity varied between distinct resource patches within the environment.

Unfortunately the potential for integrating this kind of information into regional field survey projects has not yet been fully realised (but see Schofield in press), possibly because such information is only useful if it reflects events within the precise study area under investigation. This may not necessarily be the case and it is argued here that such a relationship would in fact be of considerable benefit in understanding patterns of both settlement and land-use for the mesolithic, neolithic and Bronze Age periods. This paper defines the case for integration by means of a case study from the upper Meon valley, south-east Hampshire.

* A. J. Schofield, Department of Archaeology, The University, Southampton SO9 5NH, U.K.

Palaeoecology

With the exception of the analysis by Gordon and Shakesby (1973) of dry valley-fills at Butser Hill, no palaeoecological results were available from anywhere near the study area itself. Rather than treat that as a lost cause, however, it was decided to draw in results from other river valleys in the region by way of analogy, to see whether any generalizations could be made and a general model of changing land-use devised. It became clear that in the mesolithic few areas in this part of southern England were open, an exception being Winnall Moors in the Itchen valley near Winchester, where the grass pollen was equivalent to around 40% of the total arboreal pollen sum (Waton 1982). Another example is the Avebury region where Smith (1984, 107) noted the tendency for mesolithic finds associated with early woodland disturbance to be concentrated in the valley bottoms.

It is not until the early neolithic that distinct trends really begin to emerge. At Easton Lane (Allen 1986), Easton Down (Mason 1982) and other low lying sites in the Itchen valley, for example, clearance occurred at an early date, with cereal cultivation present on valley slopes. In the Ouse and Cuckmere valleys in Sussex, Scaife and Burrin (1983; 1985) suggest a similar theme with woodland being opened up at an early neolithic or even mesolithic date.

On the surrounding chalk uplands and gravel interfluves however, a very different picture is presented. In contrast to the large-scale clearance occurring in river valleys, temporary small-scale deforestation was more typical, appearing for example at Brook, Kent (Kerney *et al.* 1964, 165) and on the Sussex Downs (Thomas 1982). In each case this was followed by the regeneration of scrub and woodland. It was not until the early to middle Bronze Age that many of those areas still maintaining primary woodland were cleared on a permanent basis. This was the case, for example, on the Hog's Back, Surrey where 'wild wood' was removed on a local scale for the construction of a Bronze Age barrow (Allen 1984). A similar theme is reflected in the sequence from the Vale of Brooks, where temporary clearance in the neolithic was succeeded by a more substantial clearance episode in the middle Bronze Age (Thorley 1981), and at Itford Bottom, where an early Bronze Age date was produced for primary clearance (Bell 1983).

A similar picture is suggested by work in the area west of Poole Harbour. Seagrief (1959) quotes an early neolithic date for floodplain clearance at Wareham, while in the surrounding area Haskins (1978) records little evidence for the impact of man, again prior to the middle Bronze Age. The only exception to this is the site at Rimsmoor which produced cereal pollen grains dated to the late Atlantic phase; it may be no surprise that here, as at Wareham we are dealing with a valley bottom location.

Although the evidence for woodland disturbance is therefore fairly widespread both in time and space, it does appear to show a clear distinction between the scale and intensity of land-use in river valleys and that over the rest of the landscape (Table 2 and Fig. 1). There is clearly a case to be made for applying these general observations to the distribution and behaviour of prehistoric communities in southern England. In order to clarify the nature of this distinction in terms of the results described below, two types of population response may be identified:

(a) coarse-grained response: in which groups will spend disproportionate amounts of time in particular resource patches;

(b) fine-grained response: where a group encounters and uses resources in the same proportions in which they actually occur.

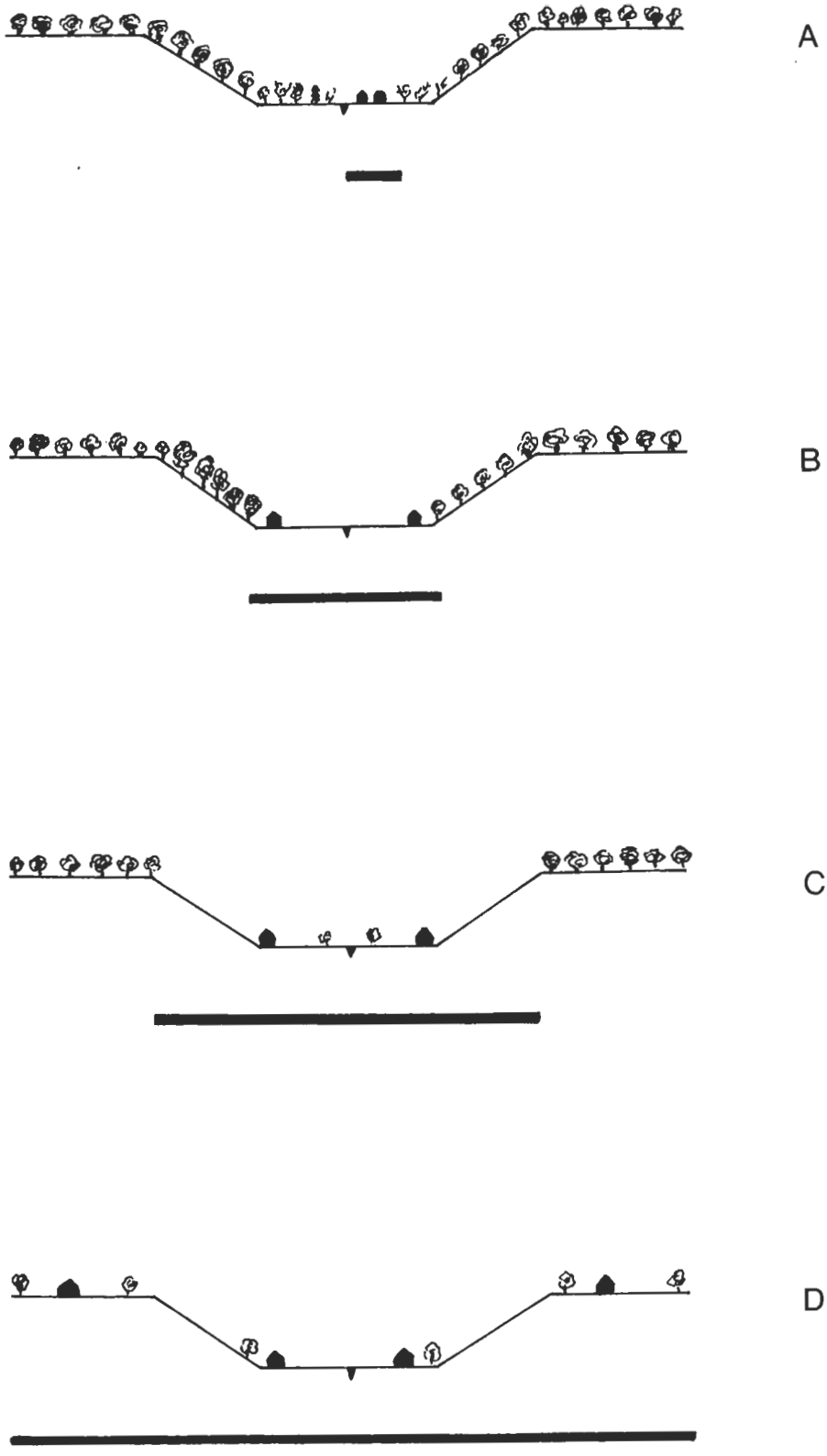
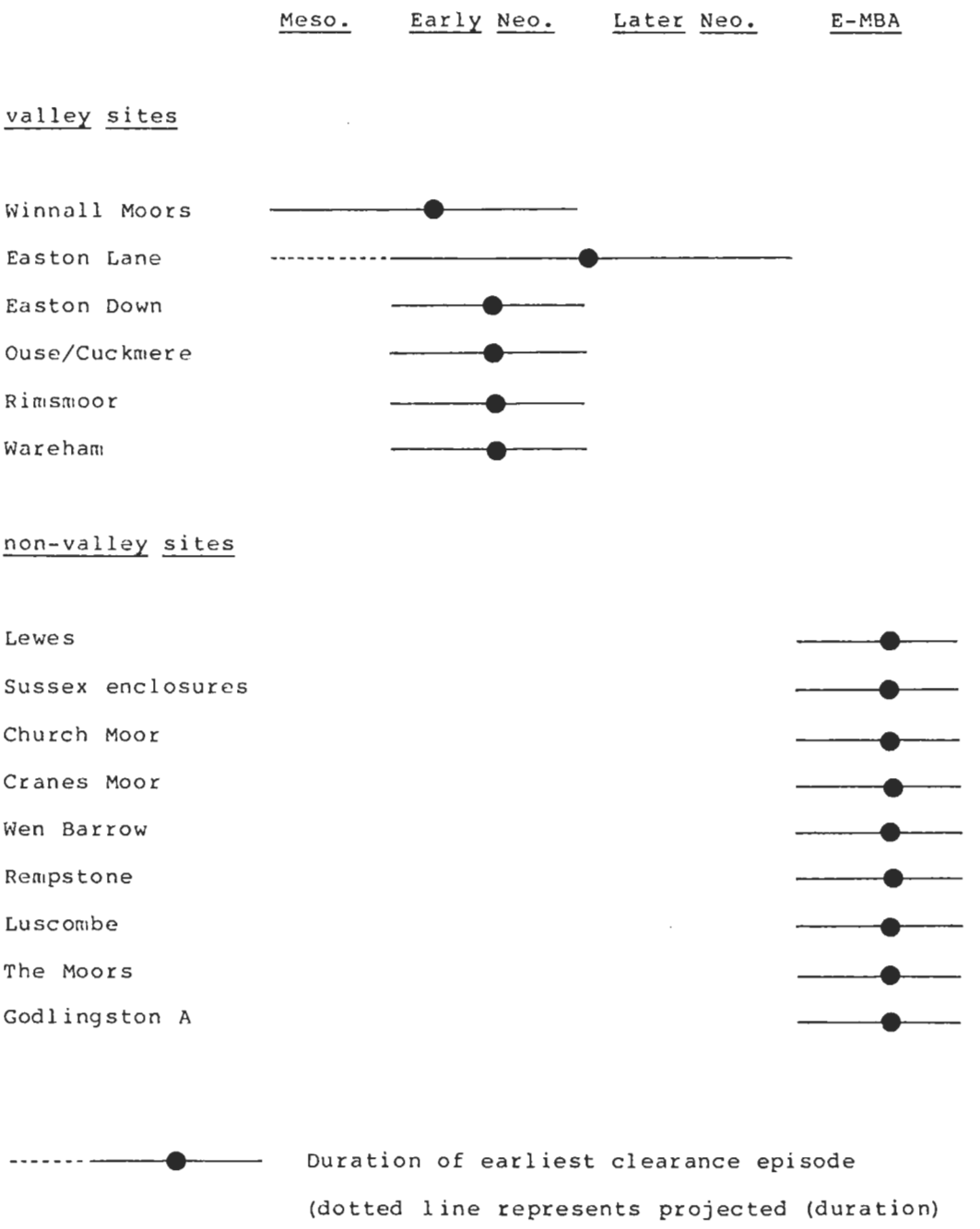


Figure 1. Schematic reconstruction of valley land-use strategies through time. The black bar beneath each section represents the spatial limit of home-range activity as represented by surface artefact collections. A: mesolithic - localised small-scale clearance episodes focussed on valley floor. B: early neolithic - intensive floodplain clearance and cereal cultivation. C: later neolithic - clearance of terraces; some woodland regeneration. D: early to middle Bronze Age - clearance on a large scale including for the first time areas of interfluve and chalk downland.

Table 2. Dates for the earliest major clearance phase in valley and non-valley contexts.



We may therefore expect to see a coarse-grained selective response in valley floor environments where the resource 'package' is both stable and particularly favourable to long-term settlement. It is here that we should expect to see intensity and continuity of

land-use throughout the prehistoric period and displayed in the palaeoecological record in terms of long-term and large-scale clearance. A fine-grained response will occur in areas away from river valleys and will be characterised by a lack of continuity or intensity of prehistoric land-use and occupation.

Archaeology

The concentration of early prehistoric communities in river valleys indicated by palaeoecological evidence is an inference further maintained by the archaeological record. Although few known 'settlement sites' have been excavated in southern England, those that have tend to occur, with very few exceptions, in the narrow, compact ecological zones which run parallel to river valleys. For the mesolithic period this is most clearly illustrated by Froom's (1972) investigations in the Kennet valley and the relationship between that area and the Berkshire Downs (Richards 1978) from which few mesolithic finds were recovered. This is a pattern which continues into the neolithic and is illustrated in the case of northern France where settlements display a marked concentration on river valleys, with a particular emphasis on gravel spurs overlooking the valley floor (Howell 1983). This is also the case in southern England, although the evidence is far less substantial. At Pamphill, Dorset (Field et al. 1964), Corhampton, Hampshire (Piggott 1954, 383) and Downton, Wiltshire (Rahtz 1962), for example, settlements appear in analogous situations to those in the Aisne and Marne valleys of northern France. It is only in the Bronze Age that we begin to see settlements appearing with any frequency on the chalk uplands, although they still continue to occur in valley contexts.

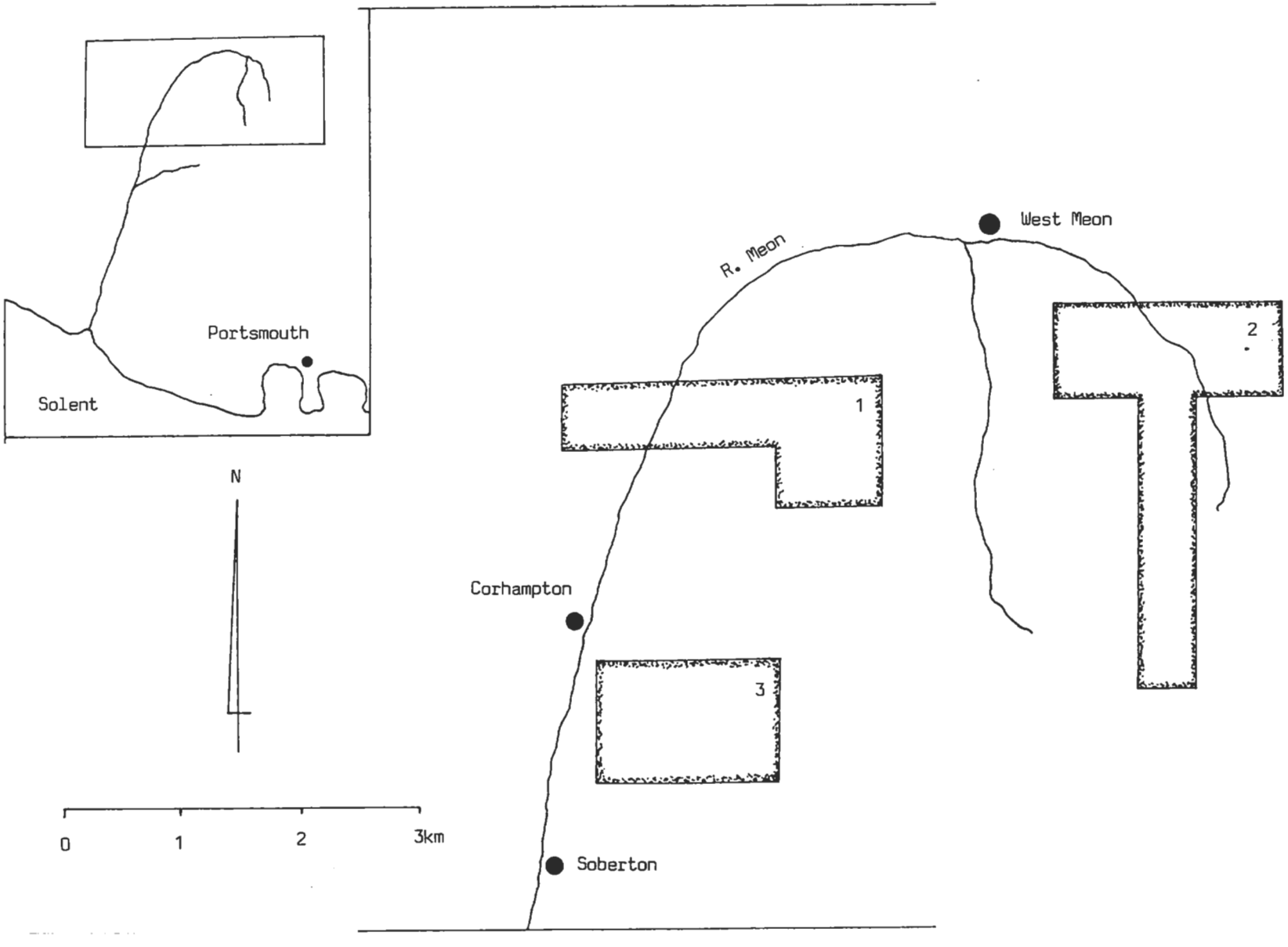
Smith's (1984) investigation of neolithic human ecology in the Avebury region further maintains this idea of a 'valley adaptation'. The distribution of both mesolithic and early, middle and late neolithic settlements in the area displays a clear tendency towards river valley locations. Few valley settlements in this area have significant breaks in their occupational history, while if sites such as Hemp Knoll are truly reflective of what was happening on the surrounding uplands, settlement here was distinctly intermittent.

We can conclude therefore that the evidence both from archaeological sources and from palaeoecological investigations in the south of England suggests that a coarse-grained response can be identified, with foragers and early farmers spending a disproportionate amount of time in valley environments, at least up until the end of the neolithic. We may now consider, by means of a case study of a regional surface survey, whether this relationship can be confirmed.

Case Study: the upper Meon valley survey

The river Meon is one of several chalk streams maintaining a constant year-round temperature which run from north to south across the Hampshire Basin, with low river terraces and pastures on the valley floor, valued today for their quality spring grazing. The survey of the upper reaches was carried out between 1984 and 1986 with the aim of locating areas of mesolithic and neolithic activity and trying to identify changes in land-use between those periods. Data collection was carried out by field walking based on a 15m line interval and concentrating on three blocks of land which each encapsulated an area of floodplain, terrace and interfluve and which were spaced at 2-3 km intervals (Fig. 2). Areas 1 and 2 were situated on an area of Lower Chalk while area 3 was located on an area of undifferentiated Upper Chalk downland.

Figure 2


Portsmouth
Solent
N
0
1
2
3km
R. Meon
West Meon
Corhampton
Soberton
1
2
3

From both the high density of artefacts in fields within the Meon valley in relation to those over 1 km distant (Table 3) and the disparity between density figures from valley contexts and those from areas which contain no major valley system (Table 4), it is clear how closely the evidence is associated with river valleys. It is also interesting to note the degree of consistency in the proportion of tertiary flakes which occur in fields within the Meon valley. Tertiary flakes were by far the most frequently retouched waste class and such a degree of consistency as is suggested by the low standard deviation given in Table 3 may well reflect a degree of functional autonomy within that context, namely for settlement as opposed to hunting or quarrying activities. It has been demonstrated both here and in the Avon valley survey (Schofield forthcoming) that these types of activity do produce very different patterns and combinations of artefacts, and that any degree of regularity must be looked at in terms of a coarse-grained adaptation.

Table 3. Density of worked flint in relation to valley/non-valley contexts within the Upper Meon survey area.

		valley (n = 25)	non-valley (n = 19)
flint per ha.	mean	36.3	11.7
	s.d.	29.5	13.3
% retouch	mean	7.0	6.9
	s.d.	5.1	4.5
% tertiary waste	mean	20.0	20.5
	s.d.	3.8	8.4

Most of the material described was either mesolithic or early neolithic in date; there was a high proportion of blades, while numerous microliths and blade cores were recovered on the valley floor and terraces. Both the density of artefacts and the high proportion of scrapers tend to support the idea that it was in these areas that settlements were concentrated. Both from existing finds and from the survey, a clear distribution of axes and arrowheads has emerged which appears mutually exclusive to that of settlement. The arrowheads and axes - suggesting extractive activity, such as hunting and felling timber - all occur on the Upper Chalk and away from the river, a trend which is mirrored elsewhere in southern England and which applies to all periods of prehistory (Gardiner and Shennan 1985; Bradley and Ellison 1975).

Figure 2 (opposite). Location of the survey area and the three sample units within it.

Table 4. Variable flint-density characteristics between survey areas in southern England.

	mean density per ha	s.d.	min.	max.	no. cases
East Hampshire	8.0	10.0	0.0	70.0	275
Avon valley	18.7	12.8	0.5	61.8	82
Meon valley (Lower Chalk)	12.4	12.5	0.0	66.0	31
Meon valley (Upper Chalk)	50.0	29.8	16.8	110.6	13

It is suggested therefore that the valleys contained settlements and were subject to the coarse-grained response described above, while the areas away from river valleys remained wooded through to the Bronze Age simply because their role as extended territories did not necessitate large-scale clearance. These areas were used throughout prehistory for hunting and foraging, as reflected in the distribution of microliths, leaf-shaped, transverse and barbed and tanged arrowheads, and the supply of timber, as reflected in the distribution of tranchet and polished stone axes.

Discussion

The case study demonstrates quite clearly the advantage of applying general models of settlement and land-use history to artefact distributions supplied by regional survey. In the past, our concern has been with locating 'places' where people lived at a particular time. Instead we should begin to focus on those aspects of behaviour which are repetitive and accumulative in nature, and leave the analysis of precise moments or events to those involved with excavation. Regional survey cannot answer those very specific types of question but can provide a very detailed general picture of land-use and settlement over a long period of time. This picture would be greatly enhanced if we were to spend a little more time studying the palaeoecological evidence and establishing hypotheses which could direct the focus of attention for areas and questions under investigation.

The relationship between palaeoecology and the interpretation of surface artefact collections is therefore crucial if we are to achieve a fully integrated picture of what prehistoric communities were doing in this area of southern England. It would enable us to produce not a random collection of black-and-white snapshots but a full portfolio, illustrating in 'glorious colour' the extent to which prehistoric communities were exploiting their environment.

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