Late Medieval Whittlewood: an exercise in physical determinism

The recent acquisition of a pre-publication version of the Buckingham geological sheet[1] which covers the southern quarter of the project area, means that, for the first time, the landscape and settlement pattern of the whole study region can be mapped against underlying geology and soils. This sheet, together with its northern counterpart[2], has been digitised to form a single layer in project's Geographic Information System allowing the overlaying of various Ordnance Survey tiles, including OS Landline Plus and the OS Panorama contour survey, in addition to already digitised primary data derived from fieldwork undertaken during the last two years and evidence from aerial photographs and early cartographic sources.

Whilst the evidence for the spatial arrangement of later medieval landscape elements such as fields, woodland and meadow remains fragmentary, the combination of source materials including early maps, the survival of ridge and furrow, and fieldwalking results enables the reconstruction of the general, if not always the specific, pattern. By contrast, the vast majority of the later medieval settlement pattern is known and, whilst it remains probable that a few individual sites may be added to the map with further fieldwork, the current pattern is unlikely to change radically. Taken together our base knowledge of the landscape and settlement of Whittlewood in the period 1300-1500 is now sufficiently established to permit its analysis against the many factors influential in its creation. Just one of these may have been the geology and topography of the region. This working paper thus sets out to explore the relationship between the man-made landscape and the natural landscape, ignoring all other considerations for clarity, at one period in its history for which our datasets are of the required quality and scale.

Geology

The geology of the project area is dominated by glacial till (boulder clay) deposited during and immediately after the Anglian glaciation.[3] This till contains large quantities of chalk and flint together with other more exotic lithologies. Meltwater streams below the ice sheet and emanating from the glacial front deposited fluvioglacial sands and gravels during the glacial advance and notably in the periglacial conditions following glacial retreat. These form discrete pockets or lenses across the area. There is some evidence to suggest that the deposits represent two phases of glaciation separated by an interglacial and helps to explain the complex and unstratified relationship between the till and fluvioglacial deposits. The till forms a cap between 15-25m thick which lies over White Limestone (formerly known as Blisworth Limestone), Blisworth Clay and Cornbrash three elements in the Great Oolitic series laid down in the Jurassic period and which fails to cover Inferior Oolitic formations (formerly Upper Estuarine Limestone) in the Great Ouse valley. The limestone is only exposed within the valleys of the tributary streams draining into the Great Ouse to the south and the Tove to the north-west, where river action has cut through the overlying boulder clay cap. But in the lower reaches of these streams, alluvial and colluvial deposits built up during the Holocene mask the limestone.

In geological terms, therefore, the Whittlewood landscape is a recent creation. Beginning *c*. 470,000 BP with the deposition of the glacial till, this landscape has been subsequently remodelled through stream erosion, to leave the cap intact on the interfluves, but exposing the underlying limestone formations below. In turn, and notably during the last 10,000 years, this exposed limestone has been buried below alluvial silts, gravels and clays on the flood plains of the major rivers and by colluvial deposits probably encouraged by woodland clearance leading to soil instability along the tributaries.

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[1] British Geological Survey (BGS) England and Wales Sheet 219 "Buckingham" 1:50,000
[2] BGS England and Wales Sheet 202 "Towcester" 1" series
[3] Hains, B. & Horton, A. 1987 *British Regional Geology: Central England* (3rd ed., HMSO, London); Sumbler, M. (Compiler) 1996 *British Regional Geology: London and the Thames Valley* (4th ed., HMSO, London)

Primary Settlements

These may be defined as the principal settlements of each medieval parish, containing within them the parish church. Thus in dispersed settlements such as Leckhampstead and Silverstone, only Church End and Little London respectively have been included in this category. Immediately it is clear from the tabulated data below that there is a strong preference for these prime settlement foci to be located on the better draining soils – limestone, fluvioglacial sand and gravel and river terrace gravels. By default, as two of these three soils are only found along the valleys there is an apparent preference for valley-bottom location. Settlement away from the rivers favours fluvioglacial sands and gravels, as at Whittlebury and Stowe. Only Akeley and Furtho are located on the poorly-draining glacial boulder clay. In both instances, however, queries may be raised. First, it is uncertain whether Akeley should be considered a primary settlement, since the relationship of Akeley church to Leckhampstead church implies that former was dependent upon the latter, and might thus be seen as a secondary settlement. At Furtho, the location of the village is unknown, although a holloway running east towards Potterspury may represent the main street. If this is the case, the village may have been located on sand and gravel rather than boulder clay and would thus fit the general pattern.

Primary Settlement	***Geology***
Akeley	Boulder Clay
Furtho	Boulder Clay/Sand and Gravel
Leckhampstead (Church End)	Limestone
Lillingstone Dayrell	Limestone
Lillingstone Lovell	Limestone
Passenham	Terrace Gravels
Potterpury	Limestone
Silverstone (Little London)	Limestone
Stowe	Sand and Gravel
Whittlebury	Sand and Gravel
Wicken Dyve	Limestone
Wicken Hamon	Limestone

The phenomenon of principal settlement located on the better drained soils is not unique to the project area. Taken as a whole, there is a clear avoidance of the boulder clay by the primary settlements of Whittlewood Forest. To the north, Paulerspury, Towcester, Greens Norton, Bradden, Adthorpe, Slapton, Wappenham, Blakesley, Adstone, Maidford, Litchborough, Cold Higham and Eastcote are all located away from the Boulder clay; to the east Cosgrove, Yardley Gobion, Grafton Regis, and Alderton are likewise located on better draining soils, as are in the west Syresham, Biddlesden, Whitfield, Helmdon and Sulgrave.

Secondary Settlement

These may be defined as the independent vills – for instance Boycott, Lamport and Dadford in Stowe parish. These have defined territories with access to their own field systems and areas of woodland. Some lack the latter, for example Dagnall in Wicken or Puxley in Passenham. Most are recorded in Domesday Book although there is no entry for Deanshanger, perhaps subsumed within the entry for Passenham or Lady Nether End in Whittlebury. Also included in this category are the dispersed elements of the parochial parishes, for example West End, Cattle End and Olney in Silverstone, and Barretts End, Limes End and Middle End in Leckhampstead. All, however, may be considered to contain more than a single farmstead or manor, these being defined as tertiary settlements.

Once again there appears to be a preferential bias towards the better draining soils, the fluvioglacial sands and gravels, limestone, and alluviums, although this is less strong than for the primary settlements. Boycott, Dadford, and Lamport are all located on Sands and Gravels, likewise Dagnall. Lady Nether End is located on gravels and limestone as is Puxley, whilst Deanshanger and the Silverstone Ends all lie predominantly on limestone. A minority

are located on the Boulder Clay and include the hamlet, possibly Temple End at Knotwood in Furtho, Middle End and Barretts End in Leckhampstead and Olney in Silverstone.

Secondary Settlement	***Geology***
Boycott (St)	Sand and Gravel
Cattle End (Si)	Limestone
Dadford (St)	Alluvium/Sand and Gravel
Dagnall (Wi)	Sand and Gravel
Deanshanger (Pa)	Limestone
Knotwood (Temple End, Po?)	Boulder Clay
Lady Nether End (Wh)	Limestone/Sand and Gravel
Lamport (St)	Sand and Gravel
Leckhampstead (Barretts End)	Boulder Clay
Leckhampstead (Limes End)	Limestone
Leckhampstead (Middle End)	Boulder Clay
Luffield Abbey	Sand and Gravel
Olney (Si)	Boulder clay
Puxley (Pa)	Limestone
Wakefield (Po)	Limestone
West End (Si)	Limestone

It is possible to argue that the availability of better draining soils is directly related to the levels of dispersal shown in individual settlements – the larger the areas of non-boulder clay the greater the level of dispersion – and to the fragmentation of parishes into individual vills. So, for example, Stowe parish contains the largest proportion of non-boulder clay of the twelve study parishes, and contains the greatest number, four, of independent vills. The exposure of limestone through stream action in Passenham provides addition locations exploited by vills of Puxley and Deanshanger. Again, away from the project area, the proliferation of vills within single parishes can be associated with geology: in Blakesley parish for example, there were formerly three independent vills of Woodend, Seawell and Foxley. Again all are located away from the boulder clay. The backbone of Silverstone's various Ends is the bifurcated upper reaches of the Silverstone stream which connects West End, Cattle end and Little London, leaving only Olney divorced from the river system. In Leckhampstead, Church End and Limes End are connected by the river Leck and it might be possible to argue that Over End and Nether End in Lillingstone Lovell are similarly connected by the limestone exposure along the river valley.

Tertiary Settlement

There are a number of settlement sites within the project area of less than vill status, often with specific functions, notably administrative in nature. These include the monastic foundation of Luffield Abbey, located on an island of fluvioglacial sand and gravel within a sea of boulder clay, but also the forest lodges and monastic granges. Here the relationship between site location and geology appears to be the exact opposite to that observed for the primary and secondary settlements. Of the forest lodges, only Silverstone and Wakefield appear to be located on limestone, although the exact location of both is subject to conjecture. Otherwise, the lodges of Sholebroke, Hanger and Shrobb are all located on boulder clay. The monastic granges of Monk's Field and Heybarne are also located on boulder clay, as are the moated sites of Elm Green, Wicken, and Lordsfield Farm, Whittlebury. The single late manorial creation of Stockholt similarly lies on the glacial till.

The location of these tertiary settlements away from the best geology, it might be argued, results from the fact that prime locations were already settled, thus forcing expansion onto the boulder clay. Certainly in the case of the forest lodges, their location was dictated by the arrangement of woodland and field discussed more fully below. But it would be unwise to ignore the possibility that the boulder clay, rather than being a second choice geology, was actually specifically chosen over the better draining soils. For the moated sites at Elm Green

and Lordsfield Farm, location on the boulder clay would have provided ideal conditions for the retention of water without the need to clay line the ditches. Both Monk's Field and Heybarne are in form ditched enclosures and once again the qualities of water retention on the boulder clay may have been purposefully sought rather than avoided. The nature of the manorial establishment of Stockholt is unknown, but its thirteenth-century origins, at the height of the trend for moated enclosure, may indicate why the boulder clay was chose over outcrops of sand and gravel occurring in close proximity.

Tertiary Settlement	***Type***	***Geology***
Elm Green (Wi)	Moated Site	Boulder Clay
Hanger Lodge (Pa)	Forest Lodge	Boulder Clay
Heybarne	Monastic Grange	Boulder Clay
Lords Field (Wh)	Moated Site	Boulder Clay
Monks Field (Wh)	Monastic Grange	Boulder Clay
The Homestead (Po)	Moated Site	Limestone
Sholebroke Lodge	Forest Lodge	Boulder Clay
Shrobb Lodge (Pa)	Forest Lodge	Alluvium/Boulder Clay
Stockholt (Ak)	Manorial Site	Boulder Clay

A Predictive Settlement Model

Whether or not geology was the principal factor in the location of medieval settlements of various type, it is clear that it was influential. The correlation is so strong that it might be used to propose, if tentatively, a predictive model to be tested through further fieldwork. At its simplest, village and hamlets appear to be concentrated on the better draining soils, isolated farmsteads, granges and moated sites on the boulder clay. Survey of the limestone outcrops and the islands of sand and gravel thus carry with them a higher potential for the identification of further sites, and perhaps more importantly, sites which date to the early medieval period. Large parts of the parishes of Stowe, Silverstone and Passenham/Deanshanger are covered by the better draining soils and remain to be surveyed in detail. These areas may provide crucial additional material. Survey of the boulder clay is unlikely to produce much additional settlement data. Fieldwalking data already collected can be shown to fit this model. Despite extensive survey on the boulder clay no new medieval settlement sites have been identified, although known sites have been shown, as in the case of Middle End and Barretts End, Leckhampstead, to have been larger than previously thought.

Landuse and Geology

Each parish contains a range of solid and drift geologies. All, however, are dominated by glacial till. Only in the southern parts of Passenham, where limestone outcrops and estuarine deposits occur, in the northern part of Silverstone, and in the southern part of Stowe, where sand and gravel deposits are encountered, does the balance shift towards predominately better draining soils. When mapping the arrangement of fields, woodland, meadow and pasture, therefore, it is unsurprising that these appear take little account of underlying geology, encompassing areas of limestone, sand and gravel, estuarine deposits and the boulder clay. If geological factors little influenced the location of these landscape elements, they do, however, appear to have been affected by local topography.

Domesday Book records extensive areas of woodland in the Whittlewood manors. Whilst the exact nature of this woodland is unknown, it is clear that Whittlewood Forest falls into the sub-category of 'wooded' forests. Some precision to the location of this woodland can be ascertained from early seventeenth and eighteenth century maps, and additional information from fieldwalking has verified and added to our understanding of where this woodland was situated. Surviving ridge and furrow, and evidence from aerail photographs of ridge and furrow now lost to the plough, point to the location of the open fields of each of Whittlewood's constituent vills. Lack of ridge and furrow evidence may by association suggest additional woodland areas and vice versa. As already stated, despite the fragmentary nature of the evidence there is sufficient precision to assess medieval landuse against both geology and topography.

General landuse arrangements can be seen for each parish. In those parishes within the Great Ouse basin – from west to east, Stowe, Akeley, Leckhampstead, Wicken, and Passenham – woodland dominates the northern parts of their territories with their fields largely restricted to the central and southern parts. In Potterspury, woodland restricted to the west and its fields located east of the settlement. In the cases of Passenham and Deanshanger, this arrangement does appear to have been influenced by the geology of the territory, with the fields largely located on the limestone and estuarine deposits whilst the woodland appears to dominate the boulder clay areas. In similar fashion, the fields of Stowe's four vills area again correlate well with large areas of fluvioglacial sands and gravels, with woodland once gain located on the heavy intractable boulder clays. In parishes which lack large areas of well-drained soil, however, this strict north-south division cannot be seen as geologically determined. The quality of soils, for instance in northern and southern Akeley, Leckhampstead or Wicken, or between the soils of eastern and western Potterspury, do not differ, yet their exploitation for woodland or arable cultivation is obviously spatially exclusive. Two parishes lie within the Tove basin. Here the arrangement of fields and woodland is equally differentiated. In Silverstone, woodland is found in the southern and western parts of the parish, in Whittlebury it is found to the south and the east. Their fields occupy the central and northern parts of their parishes. Again it is possible to identify a preference for the fields to be located over better draining soils and the woodland found on the heavy boulder clays. But the correlation is not strong, and it must be noted that the majority of all the field systems lie over boulder clay.

There is, however, a very close association with landuse and topography which is far more striking than that between landuse and geology. Potterpury can serve as an example. Both in the eastern and western parts of the parish, boulder clay predominates. Yet woodland is found in the west and the fields to the east. Potterspury lies in the Great Ouse basin, with streams draining initially eastward before combining to flow south-east to join the Ouse north of Old Stratford. The land thus dips gently from west to east. Woodland is located in the highest parts of the parish. This is also the case for all the other parishes. For example, woodland in Lillingstone Dayrell is found to the north and west of the parish, in Lillingstone Lovell where the stream drains south it is found in the north. Beyond the Ouse/Tove watershed, the highest parts of the parish lie to the south, and it is here that the woods of Whittlewood and Silverstone are found. In Akeley, the extent of medieval woodland parallels closely the contour map, lying above the 100' contour.

Whilst the topography of Whittlewood is nowhere extreme, rather gently undulating, conscious decision making can be seen in the arrangement of woodland and field, the former largely restricted to the upland interfluves, whilst the latter were laid out in the lower-lying areas. Small almost imperceptible differences in temperature and precipitation between upland and lowland areas may have influenced the arrangement of landuses more than the quality of soils.

Finally, it is possible to identify small areas of low-lying land which fall outside the field systems (ridge and furrow evidence is absent). This is most remarkable in the parishes of Passenham/Deanshanger, Wicken and Leckhampstead. All terminate at the Great Ouse. Here ridge and furrow concludes 200-300m from the current river course, at the interface of alluvial deposits with the estuarine terraces. It is clear that these areas were reserved for meadow and pasture and it is probable that this trend would have been repeated along the narrow flood plains of the tributaries of the Great Ouse and Tove providing meadowland for those parishes which did not occupy river-bottom locations. Domesday Book indeed records that all of our constituent manors held, albeit small, areas of meadow.

A Predictive Landuse Model

A simple formula presents itself. Boulder clay plus height will probably equate to woodland use. All mid-slope geologies, and particularly the well-drained soils will probably lie within the ambit of the fields of the each settlement. Meadow will be restricted to alluvial deposits along the major river-valleys and their tributary streams.