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Post-Conquest Medieval Environmental Background

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11.1 Introduction

This is not a full review of all the palaeoenvironmental studies carried out in the region, but a general summary with most emphasis placed on the environment in which later Medieval communities lived. It does not provide a comprehensive review of crop and animal husbandry in the region. Reviews of environmental archaeology carried out or commissioned by English Heritage are in progress or complete and will give an account of knowledge in these areas. Those wishing to follow this up should consult the English Heritage website (`http://www.english-heritage.org.uk` and follow the links Research & Conservation → Archaeology & Buildings → Scientific Techniques → Environmental Studies → Regional Reviews). At the time of writing, the reviews on insects (Robinson 2002) and wood and charcoal (W Smith 2002) were available as PDF files. Reviews of plant macrofossils, pollen, animal bones and geoarchaeology from southern England are in preparation and will be placed on the website when available. Rob Scaife very kindly made available a draft of his pollen review for this resource assessment. The excellent review of environmental archaeology in South West England by Martin Bell (1984) is still a very useful source of information. There are also reviews of environmental evidence in the Urban Archaeological Assessments for Bath (not yet published) and Bristol (Brett 2005), which are of particular relevance for this period. Urban deposits have not generally been referred to, but will be included in the reviews noted above. The inclusion of "grey" literature has not been comprehensive. The introduction to the Late Bronze Age and Iron Age chapter (on page 103) includes a summary of sources of evidence and conditions for preservation which are not repeated here, but are relevant for this period, apart from site specific references. There are few studies of "off-site" sequences. Some upland and lowland wetland sequences do cover the Medieval period and have the potential for understanding the contemporary local or wider environment, depending upon the nature and catchment of the sampling site.

11.2 Climate

A "warm period" which is thought to have occurred between the 11th and 14th centuries, is frequently referred to in the literature. For example, Rippon (2002) refers to favourable climatic conditions in the 11th to 13th centuries and climatic deterioration in the 14th and 15th centuries. In the context of understanding present and predicting future climate change, the IPCC (Folland *et al.* 2001, 2.3.3) has reviewed much research and states that "The long-term hemispheric trend is best described as a modest and irregular cooling from AD 1000 to around 1850 to 1900, followed by an abrupt 20th century warming". The report notes that regional evidence is, however, very variable and Medieval warmth appears to have been largely restricted to areas within and bordering the north Atlantic, considered by some as mainly reflecting changes in the North Atlantic Oscillation (Folland *et al.* 2001, 2.3.3). Kenward (2004) reviews the evidence from insects in northern England and concludes that, while the effects of climate change and human activity are hard to separate (Buckland and Wagnew 2001), evidence from some bug species may provide an unambiguous signal. He argues that many of the insect remains from occupation sites have potential for climatic reconstruction and that systematic analysis of the existing records from British sites is needed (Kenward 2004, 48, 49). There is clearly much that could be done using palaeoenvironmental proxies to better understand climate in the Medieval

period in South West England. As for other periods, a range of studies using biological indicators such as chironomid larvae, other insects and testate amoebae combined with some more applied scientific methods are a priority for the future.

11.3 Area reviews

A brief summary of present knowledge is given for each of the physiographic sub-regions in the South West but there are very few studies, principally because of the scarcity of suitable deposits preserving a wide range of palaeoenvironmental data.

Wild plants from Medieval smoke-blackened thatch and daub or cob are sources of direct information on the character of arable fields and meadows. They also give insight into farming practice, in terms of degree of weeding and infestation. Reporting on smoke-blackened thatch of 14th- to 15th-century date from cottages in Dorset and Wiltshire, de Moulins (2007) noted the possibility that shortage of labour after the Black Death could be responsible for an apparent low level of weeding.

11.3.1 Jurassic and Carboniferous uplands (Cotswolds and Mendip)

Although there is little bioarchaeological evidence for the detailed nature of Medieval environments in the Cotswolds, some comments by Bowden (2006) using air photographic evidence are useful. He noted the views of Dyer (1995, 160; 2002, 16), that arable farming was important on the Cotswolds from an early date and comments that air photographic evidence supports this. He does question the assumption that all ridge and furrow is necessarily of Medieval date, though acknowledges that it most probably is. He also reminds us that some ridge and furrow could result from improvements to pasture as well as arable. However, both Bowden and Dyer acknowledge the importance of arable and the role of sheep in keeping the land fertile. It seems that in parts of the Cotswolds there was little pasture in the Medieval period and sheep were fed on stubble, fallow land and imported hay (Dyer 1995, 158). As in other periods, a former river channel has proved to be an important source of information. Detailed pollen analysis of the fill of what is thought to have been the former channel of the river Churn, near Stratton gave useful insight into the local environment in the Late Medieval period (Scaife 1999d). A range of species characterised slow-flowing water and a marshy local environment. The wider landscape was very open with few trees. Mixed agriculture included rare evidence for cultivation of hemp and vine (Scaife 1999d). Radiocarbon dates at 68cm, from near the base of the sequence and at between 40 and 60cm calibrate to cal AD 1310–1640 (NZA-9082) and cal AD 1390–1640 (NZA-9083) respectively. For the basal date (NZA-9082) at 79.7% confidence the age range is cal AD 1380–1530 and for NZA-9083, at 74.6% confidence it is 1390–1530. If the dates are combined at 92% confidence, the age range is cal AD 1400–1520. It is thus highly likely that the fills are of Late Medieval date. The other possible evidence for viticulture in the South West comes from Market Lavington (Wiltshire 2006), and is noted in the section on Early Medieval environments (page 164). Charred and waterlogged plant macrofossils from Gloucester give an indication of the range of crops available to the townspeople, but there has been less research on this than in other Medieval towns in the region. The identification of spelt wheat in a 10th- or 11th-century context was an unexpected find (Green in Heighway *et al.* 1979) which has not been repeated in other similar contexts, though it is now known from Saxon deposits in the Thames valley (Pelling 2003). Animal fodder or stable litter containing plants of wet grassland was reported both from Medieval pits on Westgate Street (Green in Heighway *et al.* 1979) and accumulation on a street surface outside St Nicholas Church (Straker and Heighway 1985).

11.3.2 Upper Thames valley

No studies of the wider environment of this date from this sub-region are known.

11.3.3 Coastal lowlands (Somerset, Severn and Avon Levels)

As noted below (on page 193), most progress on the reclamation that created large areas of agricultural land, by draining and enclosing the coastal saltmarshes and freshwater wetlands along the Severn and in central Somerset, took place in the 11th to 13th centuries. Small-scale saltmarsh reclamation of started in the 10th or 11th century in a few places, including Puxton, in North Somerset. More substantial embankments along the higher coastal alluvial marshes and some tidal rivers are thought to have taken place by the mid-11th century, while the backfens remained unreclaimed. These were a valued source of grazing (Rippon 2006). The reclaimed farmland at Church Field, Puxton supported meadows and damp herb-rich pasture as well as arable (J Jones 2006 – giving an overview of the analyses of pollen (Tinsley), plant macrofossils (Jones), molluscs (Davies), diatoms (Cameron) and foraminifera (Kreiser)). Wheat, barley, rye and oats were grown as well as garden pea (*Pisum sativum*), field bean (*Vicia faba*) and flax (*Linum usitatissimum*). This was part of a mixed farming system with cattle, sheep, pigs and poultry. There is no evidence that estuarine water entered the ditches between the late 11th and 13th centuries. At Seabank on the

Severn levels north of Avonmouth, the fills of five drainage ditches dating from the 11th–18th centuries had been used for disposing of domestic rubbish as well as drainage. The microfossils included freshwater, brackish and estuarine species (J Jones in Insole 1997). Until recently it was not thought that peat growth in the Somerset peat moors continued into the Medieval period but, although it has been largely removed by peat cutting or peat wastage, it has now been established that some sequences do still survive, both north and south of the Polden Hills (AG Brown *et al.* 2003a; Housley *et al.* in press). This important wetland survival holds a record of vegetation and climate change for the surrounding area in the historic period. Documents can also assist in understanding some aspects of past land use and vegetation; this is particularly valuable where sources of palaeoenvironmental evidence are scarce or absent.

The parish of Shapwick in Somerset, was the focus of over 10 years of detailed research using many different sources of data. The Shapwick Project benefited from the survival of documentary records relating to the management of the Glastonbury Abbey lands including Shapwick's Medieval manor. The record is not comprehensive, as it does not reflect the practices and priorities of the tenants, but it gave a rare opportunity for comparison with the archaeobotanical evidence (Straker *et al.* in Gerrard and Aston forthcoming). The two records are complementary in that for example, the archaeological record identifies the types of wheat being grown and the crops grown on land farmed by tenants for their own use, which are not specified in the documents. In contrast, the documents show the importance of oats on the demesne land, which is not apparent to the same extent in the archaeological record. The documents show the extent of woodland survival better than the archaeobotanical record does as, apart from the moat at Shapwick House, there are no deposits with accumulated sediments preserving plant and animal remains. Among other things, pollen analysis of the moat sediments suggested disturbed ground and hedgerows in the vicinity of the Manor (Tinsley in Gerrard and Aston forthcoming).

11.3.4 Triassic and Devonian hills and valleys (south Somerset, Devon and east Cornwall)

No published data from south Somerset is known. New data from Devon was provided by the Community Landscapes Project (AG Brown *et al.* 2004; Hawkins 2005). On the Hartland peninsula, Medieval (*c.*AD 1000) peat formation in a valley/spring mire at Clifford may have been the result of removal of tree cover in an exposed location, but this is not certain. The vegetation record showed no evidence of woodland regeneration and, both here and at Kennerland, Medieval arable cultivation continued into the 18th century (AG Brown *et al.* 2004; Hawkins 2005). In the Clyst valley, a floodplain mire at Helling's Park covers the Late Glacial–Medieval periods and a palaeochannel at Mosshayne also covers the Medieval period. There is no-evidence of Post-Medieval woodland regeneration and a pattern of land use continuity is apparent. At Mosshayne, cultivation of wheat/oats and rye ceased in the 18th century but barley cultivation may have continued (AG Brown *et al.* 2004; Hawkins 2005). Other studies from the Rackenford area of central Devon are included in the section on Exmoor (below).

Daub from a partition from a Medieval house at Leigh Barton in Devon contained desiccated fruits and seeds of hay meadow species (J Jones in S Brown 1998, 84–88). Palaeoenvironmental studies of building materials are very rare but can produce useful results from sites which may have no other sources of contemporary data. There is little information from the Late Medieval period for the south Devon coast, but at Slapton Ley, open fields and arable cultivation were in existence by Domesday and continued after 15th century enclosure (Crabtree and Round 1967; Nichols in O'Sullivan 1996).

Turner (2006a, 85) demonstrates how Historic Landscape Characterisation (HLC) may be able to provide general information on local environments for the Medieval period and gives an example from the Tintagel area in north Cornwall. Of a 60km^2 case study area, centred round the early Medieval church at Tintagel, 37.5km^2 was thought to be Medieval farmland (the main arable and year-round grazing zone), 21km^2 rough ground (turf, furze and summer grazing) and 1.5km^2 woodland. Turner notes that this would broadly agree with the view of Herring (1999, 20) and Rackham (1986, 335) for the 11th century landscape in the area. Although the dating and nature of the landscape provided by this method are not very precise, HLC is a very useful starting point on which to base future detailed research, particularly for areas such as north Cornwall where sources of palaeoenvironmental information are scarce. In turn, palaeoenvironmental studies should be able to refine or check HLC.

11.3.5 Moorland (West Cornwall, Bodmin, Carnmenellis, St Austell area, Dartmoor and Exmoor)

There are no major later Medieval palaeoenvironmental studies from west Cornwall. The upper parts of some of the coastal wetland sequences such as at Porthleven (Lawson-Jones 1999) and Church Cove, Gunwalloe (French 1996; 1999) do extend to the

period but have not been studied in detail. There is evidence from both Bodmin Moor and Dartmoor that a later Medieval rise in cereal pollen accompanies expansion of settlement and more intensive grazing of the moorland (Gearey *et al.* 1997; 2000b). On Bodmin Moor, studies at Rough Tor North and Tresellern Marsh show similar vegetation throughout the 1st millennium AD (Gearey *et al.* 2000b). The present moorland vegetation, regarded by some as impoverished in terms of species diversity, is not seen until the Medieval period. Gearey *et al.* (2000b, 506) note a "consistent change to a less diverse ground flora and minimum forest cover from the Medieval period onwards". The grass (Poaceae) pollen maximum at Rough Tor North C post-dates a radiocarbon date of cal AD 1160–1300 (GU-5610). The Early Medieval chapter makes mention (on page 167) of the species-rich grassland, similar to old meadow plant communities that may have been managed for the removal of a hay crop. The diagrams for Tor Royal and Tresellern Marsh identify a rise in cereal pollen and spread of local settlement (Gearey *et al.* 1997). This takes place at Tor Royal after cal AD 1010–1300 (SRR-5715) in an area previously characterised by acid grassland with Rumex species, *Potentilla*-type *Plantago lanceolata* and Asteraceae (Gearey *et al.* 1997). At Rough Tor the rise in cereal pollen starts between cal AD 1160–1300 (GU-5610). The dating is less precise for the Withey Brook valley, Dartmoor (around AD 890–1225) though at Merrivale cereals may not have been cultivated until the 17th century (Gearey *et al.* 1997). Other examples of later Medieval pollen suggestive of arable on Dartmoor and its northern fringe come from Holne Moor, Hound Tor and Okehampton (Maguire *et al.* 1983; Austin and Walker 1985; Austin *et al.* 1980). The increase in arable and pastoral indicators at Stuffle, St Neot (Bodmin Moor) may also date to the late 12th to the early 13th century, but the events are not dated directly (Walker in Austin *et al.* 1989). The setting of a small 12th–14th century Medieval hamlet at Sourton Down at an altitude of 290m, on Dartmoor's northern fringe provided some contrasts with the vegetation of the higher moorland (Straker 1997). Pollen from buried soils and a small valley mire showed varied local vegetation with species-poor grassland, heather moorland and some woodland. Although charred cereals were found in settlement contexts, the pollen record for cereals was very slight with no rye pollen present despite the presence of charred rye caryopses (which need not have been the result of a local crop). Some regeneration of alder, oak, hazel and birch in the Late Medieval period, most probably in the 15th century, is of interest (Straker 1997). There are other studies from Dartmoor, some of which extend to the Medieval period, but this was not a principle focus for the research and detailed dating for the historic period is lacking; Bell (1984) is a useful source for these references.

Studies of sediments in valleys of rivers draining Dartmoor have been used to investigate the timing of tin mining (streaming) on Dartmoor (AG Brown *et al.* 2003b; Thorndycraft *et al.* 1999; 2003; 2004). The sites were palaeochannels at Ermington, Aveton-Gifford and North Tawton, a valley mire at Taw Marsh and a terrace in the middle Teign valley. Most sites show an increase in the fine size fraction of cassiterite as a result of mining in the 11th and 12th centuries, which is in agreement with the documentary evidence.

The Medieval landscape on the western and southern side of Exmoor and the Rackenford area in central Devon to the south have been the focus of recent research (Fyfe *et al.* 2003b; Rippon *et al.* 2006). Valley/spring mires at Long Breach and Anstey's Combe on the southern side of Exmoor were still accumulating in the later Medieval period. Reconstruction of the local vegetation using pollen analysis shows the scale of variation in vegetation type. Fyfe *et al.* (2003b) found that by around AD 1100 there was a change from pastoral to mixed arable/ pastoral farming. This may have been some form of convertible husbandry with long periods of ley, which persisted well into the Post-Medieval period. Cereals cultivated were rye, with barley and oats or wheat, the pollen types of the last two not usually being distinguished. The date for the end of arable cultivation was not very clear, but Fyfe *et al.* (2003b) consider the decline in rye pollen to be broadly synchronous with the rise in pine at around AD 1750–1800, when plantations were established around the upland fringes.

Rippon *et al.* (2006) discuss the contribution of evidence from pollen analysis to the understanding of the origins and development of the Medieval landscape. They refer to Long Breach and Anstey's Combe (above) in conjunction with further sites from the fringes of Exmoor on Molland Common and Parracombe, the high moorland and the Rackenford area of central Devon. The pollen sequences are interpreted together with documentary evidence and remaining physical features of the landscape. The largely early Medieval expansion of cereal cultivation is not always seen to be consistent with pressure to expand arable from favoured land to more marginal land within reach of the pollen catchments, as there is no accompanying decline in pasture or woodland. Indeed, there is even some expansion of local heather heathland at Hare's Down, Lobb's Bog and Windmill Rough. A convertible husbandry system is proposed with most fields growing alternate grain and grass crops for possibly 2–3 years followed by a long grass ley, with a total rotation of about 10 years. Rippon *et al.* (2006) describe the system which is evident from 14th-century documentary evidence for the region. They note that the crops grown were principally oats and rye for reasons

such as high yields and local preference, not necessarily because of their tolerance of acid soils and high rainfall. Although known from later Medieval documents, the pollen record suggests that this distinctive form of husbandry came into use much earlier, possibly as early as the 7th and 8th centuries in the Rackenford area (Rippon *et al.* 2006).

11.4 Landscape

The basic physical fabric of the landscape was in place long before the Medieval period, though in a few places there were minor adjustments. Along the softer coastlines there has been some erosion, with several hundred metres probably having been lost from the shores of the Severn Estuary (by analogy with the Welsh side of the Estuary, Rippon 1996; Allen and Rippon 1997; Allen 2002). Along the Somerset coast this was also associated with the inland migration of sand dunes, which now surround the isolated Medieval church at Berrow (Rippon 2001, fig. 3). On the granite uplands in Devon and Cornwall, and on many valleys running off the higher ground, large-scale physical transformations were wrought through streamworking for tin. These operations have left cuttings up to 15m deep and 50m wide accompanied by tell-tale patterns of dumped material (Gerrard 2000; Herring *et al.* forthcoming). There is documentary evidence of the widespread silting of rivers and estuaries, including the Fowey, Fal, Conner (Red River) and Hayle rivers, reflecting the wider impact of tinning operations on the landscape but also on some earlier ports such as Lostwithiel and Tregony. This may have been exacerbated by run-off from more intensive agricultural exploitation and it is likely that the lower reaches of many other river valleys were more markedly tidal than is now the case. The north coast, from St Ives to Crantock, was also "sore plagued" by sand blows in the Medieval period according to Leland (Gray 2000). For the Isles of Scilly, sea level change is of particular importance, specifically the chronology of the separation of the earlier land mass into a number of separate islands. Charles Thomas presented a model by which this finally occurred during the Medieval period (C Thomas 1985) but assessment of inter-tidal peats from various locations (Ratcliffe and Straker 1997) has modified this model to some extent although further work is required to confirm or modify the Thomas model. Some further modelling work on sea level change has been done in the course of a Rapid Coastal Zone Assessment for the Isles of Scilly (Johns *et al.* 2003).

Reclamation, which in many areas began in the pre-Conquest period, also transformed the mosaic of intertidal and freshwater wetlands that fringe the Severn Estuary and dominate central Somerset, creating vast tracts of new agricultural land (Williams 1970; Rippon 1997b). Most progress was made during the period of rising population and flourishing markets of the 11th to 13th centuries, which also corresponded to a period of favourable climatic conditions, though following the demographic, economic and climatic deterioration of the 14th and 15th centuries these fertile wetland areas do not appear to have seen a significant contraction of settlement (Rippon 2002), in contrast to the adjacent upland areas where a number of deserted farmsteads and hamlets were probably deserted at this time: examples include Carscliffe, Christon and Deerleap/Ramspitts on the Mendip Hills (Rippon 1997b; Pattison 1991), and Houndtor, Hutholes and Dinna Clerks on Dartmoor (Beresford 1979; Allan 1994b). In Devon there are several unsynthesised published and grey literature reports (such as Allan and Langman 2002; PDE Smith *et al.* 1983 and the work of the Exeter University/Devon County Council Community Landscapes Project looking at pollen cores across the county) that provide some environmental background.

11.5 Discussion

Several themes emerge consistently from the studies summarised above.

- More attention needs to be given to ensuring that radiocarbon or other scientific dating strategies will be able to provide the precision needed to usefully interpret the results of analyses.
- Bodmin, Dartmoor, Exmoor and central Devon have all benefited from recent research, but long sequences covering the historic period are still needed for many other parts of the region.
- Climatic variation during the Medieval period is still poorly understood. Expansion of techniques where appropriate, to include testate amoebae, chironomids and other insects must be considered, along with other methods.
- The added information from integrated palaeoenvironmental and documentary studies shows the importance of making use of these complementary approaches whenever possible.
- The hinterland of Medieval towns is not well understood. More attention should be paid to understanding the local context for urban centres from both documents and palaeoenvironmental analyses.

Acknowledgements

I am very grateful to Rob Scaife for allowing access to an early draft of his pollen review for southern England which was most useful and to Anthony Brown, Ralph Fyfe and Julie Jones for information and references.

11.6 Radiocarbon dates

Table 11.1: *Details of radiocarbon dates used in the text. Calibrated ranges are at 2σ (95.4%) and were calculated with OxCAL 3.10 (Bronk Ramsey 2005) using the probability method and the IntCal04 calibration curve (Reimer* et al. *2004).*

Lab. Ref.	^{14}C age BP	Cal AD	Site	Context	Reference
GU-5610	770±50	1160 – 1300	Rough Tor North monolith C	Peat 27.5–32.5cm	Gearey *et al.* (2000b)
NZA-9082	462±57	1310 – 1640	Stratton	Peat	Scaife (1999a)
NZA-9083	441±57	1390 – 1640	Stratton	Peat	Scaife (1999a)
SRR-5715	840±95	1010 – 1300	Tor Royal	Peat	Gearey *et al.* (1997)