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Romano-British Environmental Background

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7.1 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 Romano-British 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 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 Roman period saw the introduction and more widespread presence of exotic food plants such as fruits, herbs and spices. A wider range of arable weeds is also found, though Robinson (2007, 360) noted that weeds of Mediterranean origin such as corn cockle (*Agrostemma githago*) arrived shortly before the Roman conquest. Many of these plants have since become part of the British flora. An example from Claydon Pike (upper Thames valley) is given below, but there are many other examples from the region. The review of plant macrofossils noted above (Campbell in prep.) will be a useful source for this information.

The introduction to the Late Bronze Age and Iron Age section (on page 103) includes a summary of sources of evidence and conditions for preservation which are not repeated here, but are equally relevant for this period, apart from site-specific references.

There are fewer studies of off-site sequences than for earlier periods, though some upland and lowland wetland sequences do cover the Roman period and have the potential to give information on the local or wider environment, depending on the catchment size.

7.2 Area reviews

A brief summary of present knowledge is given for each of the physiographic sub-regions in the South West.

7.2.1 Chalk downland, heaths (Wiltshire and Dorset)

There are very few studies from this area that cover the Roman period. Molluscs from a colluvial and alluvial terrace sequence at Winterbourne in the Kennet valley, *c.*300m to the north east of Silbury Hill, provided local information for an area with evidence of settlement and farming (Allen 1996). The floodplain vegetation was open pasture with possible cultivation on valley slopes. Plant macrofossils and molluscs suggest mixed farming, the arable principally being cultivation of spelt wheat. As the excavation was along

a pipe trench, the animal assemblages are too small for meaningful interpretation.

A change in local land use between the 1st and late 3rd to early 4th centuries AD was demonstrated by mollusc studies at Dorchester (County Hall site). By the later phase, the Early Roman pasture and arable adjacent to the Roman town had become a more semi-urban farm or garden environment with localised patches of unkempt grass and walls (Allen in RJC Smith 1994, 71–3).

7.2.2 Jurassic and Carboniferous uplands (Cotswolds and Mendip)

The few studies of Roman vegetation and environment from the Cotswolds indicate the use of grassland; both managed and for grazing, though arable must also have been important to supply the villa estates. There are no pollen studies and information comes from insects and plant macrofossils.

The plant macrofossils from below a construction layer for Ermin Street, to the south of Cirencester, give an idea of the local landscape prior to road construction. In this area, the road was built over open damp grassland, with a wet marshy area. There are also species such as chickweed, stinging nettle, fat hen and henbane which suggest some soil enrichment and disturbance (Pelling 1999, 475).

Insects indicative of pastureland were recovered from a well at Barnsley Park villa (Coope and Osborne 1967). Mineral-replaced seeds and arthropods from the fills of a late Roman latrine pit in the ritual complex on West Hill, Uley were largely the remains of animal fodder in the form of cut hay from managed grassland, of a type similar to unimproved hay meadow. Whether the hay was grown locally or brought from some distance is not known. The most likely use for this was as feed for the goats and sheep associated with the cult of Mercury around which the complex was centred (Girling and Straker 1993). The mineral-replacement of the un-charred seeds and arthropods took place in short-lived semi-liquid conditions rich in calcium and phosphate, which preserved evidence that would not have survived otherwise.

The largely limestone soils and sediments of the Mendip Hills afford few opportunities for palaeovegetation studies, but a shallow basin fen peat on dolomitic conglomerate was sampled at Rowberrow Hill, Shipham (Scaife 1998; forthcoming). This is undated but a Roman or later date is postulated for the open herbaceous environment which is strongly arable with some pasture. The site is located near the Roman villa at Star. Studies on the effect of Roman lead mining are noted below.

7.2.3 Upper Thames valley

Most of the insect evidence for the Roman period in South West England comes from the Cotswold Water Park area (the hinterland to the south and south east of Cirencester). The integrated insect and plant macrofossil evidence has allowed detailed reconstruction of local environmental conditions for some settlements.

Robinson (2007, 360) comments that at Claydon Pike, one of the principal sites in the Cotswold Water Park, Phase 2 extended into the 1st century AD and remained essentially Iron Age in character. Evidence for landscape character associated with the 2nd- and 3rd-century AD settlement (Phase 3) has the benefit of good preservation of a range of waterlogged and charred environmental remains (particularly insects, pollen and plant macrofossils). The insect assemblage is of a fully "Roman" character with an increase in synanthropic beetles which Robinson (2007) relates to a greater intensity of occupation. Ditched boundaries, necessary because of the raised water table, were lined with trees and shrubs including osier and ash. The grassland flora was species-rich hay meadow, which in wetter areas graded into fen meadow. Specialised grassland management for hay, would have provided nutritious winter fodder for stock. The hay meadow plants included meadow buttercup (*Ranunculus* cf. *acris*), yellow rattle (*Rhinanthus* sp), knapweed (*Centaurea nigra*) and ox-eye daisy (*Leucanthemum vulgare*). The beetles included species that feed on vetches (*Vicia* spp), clovers (*Trifolium* spp) and plantains (*Plantago* spp.). Overall, the evidence was indicative of the presence of some domestic animals in a settlement surrounded by a large area of hay meadow. Robinson (2007, 361) speculates whether the scale of production could also have been to supply needs outside the settlement. Unlike in the Iron Age, the crop repertoire of hulled wheat and barley included flax and introduced horticultural crops providing fruit, flavourings and spices such as coriander, celery, dill, and pear. The meat and fish component of the diet was also more varied.

The Late Roman (4th century AD) environment in the Cotswold Water Park area experienced more extensive flooding than earlier centuries. The background presence of ancient woodland remained low, and although the cultivated plants remained as diverse as in the previous two centuries, more grassland around the settlement was grazed with less evidence of managed hay meadows (Robinson 2007, 362).

Lambrick (1992) considered the increase in floodplain alluvium in the upper Thames valley during the Roman period to be evidence for erosion on the valley sides due to arable intensification in the Late Iron Age and Roman periods.

7.2.4 Coastal lowlands (Somerset, Severn and Avon Levels)

For Somerset, the regional picture from pollen analysis shows that, by the Roman period, the dense oak-hazel woodland with lime, elm and other species, which had established on the higher ground from the Middle Mesolithic, was much reduced.

Radiocarbon dates on peat in various places show that peat was still growing in the Roman and Medieval periods, however, later peat cutting, combined with peat wastage has largely removed it (AG Brown *et al.* 2003a; Housley *et al.* in press). The raised bog on Shapwick, Meare and Ashcott heaths in the Brue valley extended as far west as the bridge over the Huntspill at Woolavington. Further west, the coastal floodplain supported saltmarsh (Tinsley 2003). The wetland environment of other parts of the inland areas varied, with alder and sedge swamp in the Glastonbury area, for example (Brunning *et al.* 1995; Housley 1988; 1995; Housley *et al.* 1999).

Excavation on the banks of the Huntspill river showed that peat accumulated until at least the end of the Iron Age. A saltern was constructed on the surface of the raised bog which had replaced earlier fen woodland. The top of the peat bed was truncated due to erosion associated either with the Roman use of the saltern, or to later inundation. Salt marsh communities developed during the period of use and after abandonment (J Jones 2003; Tinsley 2003). Early Roman salt production at Puxton Dolemoor took place on a high intertidal salt marsh and was followed by a ditched enclosure system (see below on the current page and Rippon 2006). Raised bog peat was used as fuel for brine evaporation at East Huntspill (Leech *et al.* 1983).

In the Axe valley, salt marsh developed on the marine clay which accumulated on top of prehistoric peat. Studies including measurement of chemostratigraphic markers such as lead showed that at Nyland Hill, the salt marsh was reclaimed during the Romano-British period (Haslett *et al.* 1997a). Macklin (1985) examined the effects of mining on Mendip by studying the heavy metal chemistry of sediments in the Axe catchment downstream of the hills. High levels of lead in the alluvial silts were correlated with Roman or earlier mining.

Romano-British reclamation has also been noted at several sites in Gloucestershire (for example by Allen and Fulford 1990), but the chronology of the changing environmental conditions has been studied in most detail on Puxton Dolemoor, Banwell and Kenn Moor in North Somerset (Rippon 2006). A detailed discussion of Romano-British reclamation in the North Somerset Levels and its wider context was published by Rippon (2006); some elements are summarised below.

Rippon (2006) reports the specialist analyses of pollen (Tinsley), plant macrofossils (Jones), molluscs (Davies), diatoms (Cameron) and foraminifera (Kreiser) from the ditches of an Early Roman enclosure system at Puxton Dolemoor, which was dug into the top of the pre-existing high salt marsh. The micro and macrofossils show that the waters of the drainage system were tidal, and the reclaimed saltmarsh included sea blite (*Suaeda maritima*), glassworts (*Salicornia* spp.), oraches (*Atriplex* spp.) and probably also sea aster (*Solidago virgaurea* type). The later Roman (mid 3rd century AD) reclamation on Banwell and Kenn Moors was on a larger scale and the ditches contained freshwater, as did the later ditch fills at Puxton (Rippon 2006, 33). The fields supported wheat and barley, and the grazing of cattle and sheep. However further to the south, the lower Brue valley remained unreclaimed and, as noted above, salt production continued. The reclaimed Roman landscape of the North Somerset Levels did not survive beyond the later 4th century AD, when higher saltmarsh vegetation colonised the alluvial silts that accumulated for a few more centuries.

Kenn Moor also provides the only evidence so far from the Severn levels, for the management of grassland to produce hay (Jones in Rippon 2000). Unusually, the evidence comes from charred plant macrofossils, rather than insects or waterlogged macrofossils. Typical hay meadow dicotyledon-rich grassland taxa were recovered from a farmstead complex. Charcoal rich lenses in ditch fills associated with an adjacent corn drier preserved charred cereal remains with evidence for the parching of barley and spelt wheat spikelets (Jones in Rippon 2000). A mixed farming system with both arable cultivation and management of meadows for hay and fodder production is evident. Hay meadows would have been carefully managed to provide vital sources of nutritious winter fodder.

Further north in the Severn levels, glimpses of the former Roman landscape have been provided by many evaluations and excavations in Bristol and South Gloucestershire. The works associated with the Second Severn Crossing, for example, afforded opportunities to study the late prehistoric and Roman environment (Lawler *et al.* 1992; JP Gardiner *et al.* 2002). The Seabank pipeline provided stratigraphic sections through the floodplain south eastwards from Seabank power station and north eastwards parallel to the break of slope (Carter *et al.* 2003; Masser *et al.* 2005).

Masser *et al.* (2005) summarise the evidence from 1st and 2nd century AD sites on or beside the Severn floodplain on the Avonmouth levels. They consider that on the basis of present evidence for Late Iron Age and Early Roman sites, land use may have been more settled than JP Gardiner *et al.* (2002) postulated, as the evidence for abandonment due to increasingly severe flooding in the later 2nd century AD is not universal.

Indeed, at Farm Lane, deposits containing Roman pottery were immediately below the modern topsoil at +6.1m OD and Masser *et al.* (2005) comment that here there is no evidence for any significant sediment accretion in historic times. The ditched field system at Crook's Marsh Farm, the only site on the alluvium yet known to have been occupied in the late 4th century AD, shows occasional incursions of sea water. This suggests that a piecemeal reclamation strategy was sufficient to allow farming to continue and that occasional marine flooding did not result in abandonment (Masser *et al.* 2005). The settlement may have been situated on a coastal levee and been at a slightly higher altitude than locations further inland. Masser *et al.* (2005) note that a major episode of reclamation and colonisation is evident in the Late Roman period for other areas on the Severn floodplain.

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

Most information from south Somerset comes from on-site contexts producing ample evidence for mixed farming with cultivation of hulled barley and particularly spelt wheat. The settlements at Fosse Lane, Shepton Mallet and Ilchester are especially rich in this regard (Leach and Evans 2001; Leach 1982; 1994). The only insect remains studied are from Catsgore and indicate local pasture (Girling 1984). Hillman (in Leech 1982a) interpreted the large charred grain assemblage from Catsgore as evidence of spelt kilning.

Three military sites in south Devon have provided some evidence for aspects of living conditions, the local environment and use of local resources. The flora and fauna (plant macrofossils, insects and ostracods) in the 1st-century AD fortress ditch at Friernhay Street in Exeter were wetland species living in the increasingly wet conditions in the ditch, but seeds and beetles also indicated the proximity or arable and pasture. The presence of woodworm presumably relates to timber buildings inside the fortress (Straker *et al.* 1984).

At Woodbury Great Close near Axminster, pollen and plant macrofossils (Straker and Jones 1993), beetles (D Smith 1993) and ostracods (Robinson 1993) preserved in the anoxic sediments in the 1st-century AD fort ditch, demonstrated that open ground, devoted to both pasture and/or meadowland and arable, was close nearby. It was not possible to say whether any pasture for grazing of horses, for example, existed inside the precinct. The ditch contained standing water, at least in its lower levels, which supported a varied aquatic flora and fauna.

The sections of ditch examined both at Woodbury Great Close and at Exeter give an overall impression of an environment more in keeping with rural Roman sites than large urban centres. It would, however, be instructive to examine further sections of both fort ditches for spatial variation.

More extensive studies have been carried out on the military base at Pomeroy Wood *c.*25km to the north east of Exeter (Fitzpatrick *et al.* 1999). These include the 1st-century AD waterlogged organic deposits in a well (3047) in the interior of the base which give insight into the local conditions. The insect remains include four species of pests of stored grain and one of beans and, in particular, beetles characteristic of stable manure and dung. Robinson (1999a) concluded that the waste material dumped in the well is consistent with stable waste of horses given infested grain amongst their fodder. One of the grain pests, *Sitophilous granarious*, was also found in the 1st-century AD fortress ditch in Exeter (Straker *et al.* 1984). Robinson (1999a) comments that these grain pests tend to be found in military contexts where large amounts of cleaned grain were stored and vulnerable to attack. They are not usually found in rural settlements. Beetles typical of pasture and ungrazed grassland including clover and vetches also found their way into the well. The plant macrofossils (Clapham 1999) support this interpretation and include cereal chaff and weeds of short and probably well grazed grassland, as does the pollen (Scaife 1999b). The well was likely to have been close to where horses grazed and were housed. A later Roman well (3791) relating to the civilian settlement, contained a very different insect fauna with no grain pests and showed proximity to a timber building infested with woodworm and grazed pasture, a fauna considered by Robinson (1999a) to be typical of low-status rural Roman settlements.

The extent of local and regional woodland is addressed by the pollen analysis from well 3047, which concluded that oak and hazel were the principal elements of the local and regional growth, with occasional ash and beech, but due to the complex taphonomy of the well fill, the extent of the woodland was unclear (Scaife 1999b). Charred plant macrofossils and a lot of charcoal were also discarded in the well. The charcoal amplifies the pollen evidence for availability of woody plants, though it cannot be assumed that it was all growing locally. Charcoal from the well was mainly oak and hazel roundwood, but ash, alder, birch and Pomoidae (hawthorn group) were also present. Extensive charcoal analyses from other contexts represented the three main phases but although the site became a civilian settlement in the 2nd century AD, Gale (1999) comments that the character and type of fuel remained similar and were supplied from managed woodland, with a greater range of species than found in the well alone. Heathland species (bracken, cross-leaved heath and ling) were preserved as both charcoal and charred seeds; Clapham (1999) speculated that the heathland plants

could have been collected from local habitats or been collected from the Blackdown Hills to the north or heathlands to the south. The resource was therefore readily available.

Recent research into the past environments of the Blackdown Hills was carried out as part of the Community Landscapes Project (2000–2004), funded by the Heritage Lottery Fund, Exeter University and Devon County Council. Peat deposits from several valley or spring mires span the Roman period and at Bywood Farm extend to the Post-Medieval period. Woodland persisted throughout the Holocene, probably on steeper slopes and under management. The fact that oak and hazel woodland remained significant components of the landscape after the Iron Age may be related to iron working and related woodland management and/or the maintenance of wood pasture. There is continuation of the arable cultivation first noted in the Iron Age with no discernable change in activity in the Roman period (A G Brown pers. comm.; AG Brown *et al.* 2004; Hawkins 2005).

In central Devon, four local sequences from Knowstone and Rackenford Moors span the Roman period (Fyfe *et al.* 2004). These are from Lobb's Bog, Hare's Down, North Middle Combe and Windmill Rough. All show that the land use remained as pasture throughout Roman period.

Few Roman rural industrial sites have been excavated in the South West, other than those concerned with iron smelting or smithing. One such was excavated close to the present beach at Duckpool, near Morwenstow on the north Cornwall coast. The industrial activity included casting of lead, pewter and possibly also copper-alloy objects and the extraction of purple dye from dog whelk shells (Ratcliffe 1995). Light (1995) described the oblique clipping of the shells in order to extract soft body parts for dye extraction. The Duckpool evidence is the only known incidence of this practice in Roman Britain. The terrestrial molluscs suggest that the landscape setting of the industries was similar to the present day dry open environment of short-turfed grassland (Robinson 1995). The main difference is that sea level rise and coastal erosion now places the site at the back of the present beach.

7.2.6 Moorland (west Cornwall, Bodmin, Carnmenellis, St Austell area, Dartmoor and Exmoor)

On Penwith, a buried soil beneath a boundary wall of Romano-British date at Foage, Zennor is assumed to be Roman or earlier (Herring 1993b). The local vegetation was open herbaceous grassland with bedstraw, scabious, plantains, meadowsweet, buttercups, tormentil and species in the Caryophyllaceae, Compositate and Umbelliferae families. Pollen of heathers and oak, elm, holly and birch amounted to only 5–10% total land pollen, so any scrub, hedges or heathland was very limited.

Sites such as Porthleven (Tinsley and Jones in Lawson-Jones 1999) and Marazion Marsh (Healey 1999) suggest that woodland persisted for longer in the Cornish coastal valleys than on the open ground. At Porthleven, the mire vegetation varied between carr woodland, open water and scrub, as water level fluctuated. The evidence for human activity in the valley increased over time and the woodland decreased from some time in the early centuries AD. The cliff-top heathland vegetation, first noted in the Late Neolithic–Early Bronze Age continues throughout the entire vegetation record.

On Bodmin Moor, pollen analyses from Rough Tor and Tresellern Marsh on North Moor show renewed woodland clearance after some regeneration at the end of the Bronze Age (Gearey *et al.* 2000b). The amount and diversity of anthropogenic indicators increased during the 1st millennium AD, suggesting that the use of the moors intensified in the later Iron Age to the Early Medieval period. Gearey *et al.* (2000b) identified a range of taxa including black knapweed (*Centaurea nigra*), dandelion type (Lactuceae), *Cirsium*-type, Rubiaceae, devil's bit scabious (*Succisa pratensis*), members of the Apiaceae family and plantains (*Plantago* spp.) typical of herb rich meadows on poor soils in the uplands. Management by cutting once or twice a year, in combination with seasonal grazing is a possibility. Gearey *et al.* (2000b) suggest that later prehistoric and Roman activity on the moor could have been more extensive and significant than is generally acknowledged on the basis of recognisable field monuments.

Data from Exmoor and a little from Dartmoor also show clearance and farming in the later 1st millennium BC and the first few hundred years of the historic period, with little or no discernible change in the environmental record during the Roman period (Merryfield and Moore 1974; Francis and Slater 1992; Fyfe 2000; Fyfe *et al.* 2003b; Fyfe and Rippon 2004; Rippon *et al.* 2006; West *et al.* 1996; West 1997). Gearey *et al.* (2000b) postulate that in some local areas human activity on the uplands could have been as intense and varied as during the Bronze Age.

Extensive evidence of Roman iron working on Exmoor has been identified by the Exmoor Iron project. Geochemical studies on sequences at Roman Lode and North Twitchen Springs are in progress to examine its impact (Ralph Fyfe pers. comm.).

The vegetation record from valley/spring mires at Long Breach (*c.*3500 BC to *c.*AD 1300), Gourt Mires (*c.*2400 BC to *c.*AD 1000) and Anstey's Combe (*c.*100 BC to *c.*AD 1500) shows the scale of variation in vegetation type around the southern fringe of Exmoor

(Fyfe *et al.* 2003b). The authors state that there is "no discernible Roman or post-Roman period impact on the vegetation, suggesting cultural stability from the Late Iron Age to the Early Medieval period". There is some increase in wetter heath at Long Breach and the question remains whether this is due to human activity or some climatic deterioration in the Roman to Medieval period.

7.3 Discussion

As for other periods, evidence for past vegetation is scarce from the Cotswolds, Mendip and chalklands. For the uplands, on Dartmoor in particular there has been little recent work covering this period.

Some pollen diagrams do span the Roman period, however high resolution analysis and dating has not generally been done on the parts of the sequences covering this period.

There is still a need for good quality multidisciplinary historic period palaeoenvironmental studies from many parts of the region. Studies from the upland areas of the west of the region are still limited principally to pollen analysis. Inclusion of insect, plant macrofossil, chironomid and testate amoebae analyses where appropriate would add much local detail to present knowledge. Inclusion of geochemical studies is also pertinent for some areas, particularly those with a mining history to better understand the impact of mineral extraction on the local landscape.

Buried soil analyses give an indication of local vegetation and land use, but should be backed up with other local analyses to establish the extent of spatial variation.

Bearing in mind the limitations of the data, a few general points can be made.

The main episodes of woodland clearance had taken place by the 1st century AD. In much of the east and central part of the region, mixed farming was widespread, with the retention of some woodland in areas, such as the Blackdown Hills and Forest of Dean, associated with iron working. Some areas are likely to have supported arable on a larger scale, notably parts of Somerset and Gloucestershire where there is a high density of Roman settlements and soils well-suited to arable. For the Cotswolds, however, the small amount of evidence presently available is for grassland. In much of Cornwall, Dartmoor and Exmoor, the land use is likely to have been principally pasture with some arable in suitable locations. Management of grassland for hay is only reported for the upper Thames valley (Cotswold Water Park), the North Somerset levels (Kenn Moor) and the Cotswolds (Uley), though may have been more widespread than the present scarce data suggests. The first evidence of coastal reclamation is found in the Roman period, notably in North Somerset in the central part of the Severn levels.

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