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**From Iron Age to Early Medieval: Detecting the Ecological Impact of the Romans on the Landscape of South-East Wales.** Alex Brown writes: The character of the vegetation environment and cultural landscape of Britain during the late first millennium B.C. and first millennium A.D. have long been the subject of debate. Discussion has focused on the extent to which Roman rule, and particularly the role of the army, resulted in the widespread removal of woodland across Britain, and also the evidence for continuity or decline in established patterns of land-use into the early medieval period.<sup>11</sup> Existing pollen evidence suggests that the majority of England and Wales had already witnessed widespread clearance of woodland and the development of a predominantly agricultural landscape before the Roman conquest. The picture at the end of Roman rule is less clear, but is characterised in some areas by woodland regeneration and in others by continuity in land-use. One of the difficulties with this picture is the uneven coverage of pollen studies, which to date have focused on north Wales, north-west and northern England,<sup>12</sup> with south Wales — an area containing abundant Iron Age and Romano-British activity — comparatively poorly represented.<sup>13</sup> There are numerous late Iron Age hillforts, promontory forts and enclosed settlements across the Vale of Glamorgan and Monmouthshire with several settlements and activity sites located on the coastal wetlands of the Gwent Levels.<sup>14</sup> Rural settlements, including several high status villas, are likewise numerous during the Romano-British period in south-east Wales, where there are also important military and urban centres, including the *civitas*-capital at Caerwent and the legionary fortress and *canabae* at Caerleon.<sup>15</sup> Widespread embanking of the Gwent Levels also took place from the first century A.D.<sup>16</sup> The south-east was evidentially the most Romanised part of Wales. The initial centuries (fifth to seventh) of the early medieval period are characterised by an extreme paucity of settlement evidence, with little indication for the continued use of Romano-British urban or rural sites beyond the fifth century.<sup>17</sup>

Despite the rich archaeological record, associated palaeoenvironmental research has tended to focus on the extensive prehistoric deposits within the Gwent Levels and earthwork and lithic scatter evidence from upland south-east Wales.<sup>18</sup> Of almost 100 pollen sequences from south Wales, no more than a dozen date to the first millennium B.C./A.D. (FIG. 3). The majority of these sequences (ten from five sites) are located in upland areas away from the main focus of settlement, and although significant numbers of sequences are available from the Welsh Severn Estuary Levels (c. 50 sequences from 20 sites), only three are of Romano-British date.

The pollen study presented here from the Wentwood, therefore, provides an important wider landscape context for well-documented Romano-British activity identified from the adjacent lowlands of south-east Wales. Located to the north-east of Newport (FIG. 3), the Wentwood comprises over 400 ha of continuous woodland, including remnant ancient woodland that today forms part of the largest block of surviving semi-natural and planted ancient woodland in Wales (ancient woodland is defined as land wooded since

<sup>11</sup> Dark 2000, 115–29, 150–6, table 4.1; Dumayne 1994; Hanson 1996.

<sup>12</sup> Dark 2005; Dumayne 1994; Dumayne and Barber 1994.

<sup>13</sup> Caseldine 2010; Dark 2000; Davies 2011.

<sup>14</sup> Allen 1999; Bell *et al.* 2000, 106–35; Locock 1999; Lynch *et al.* 2000, 144–72.

<sup>15</sup> Arnold and Davies 2000; Evans 2000.

<sup>16</sup> Fulford *et al.* 1992; Rippon 1996.

<sup>17</sup> Edwards *et al.* 2010, 2; Evans 2000; Meddens and Beasley 2001.

<sup>18</sup> Bell *et al.* 2000; Locock 2000.

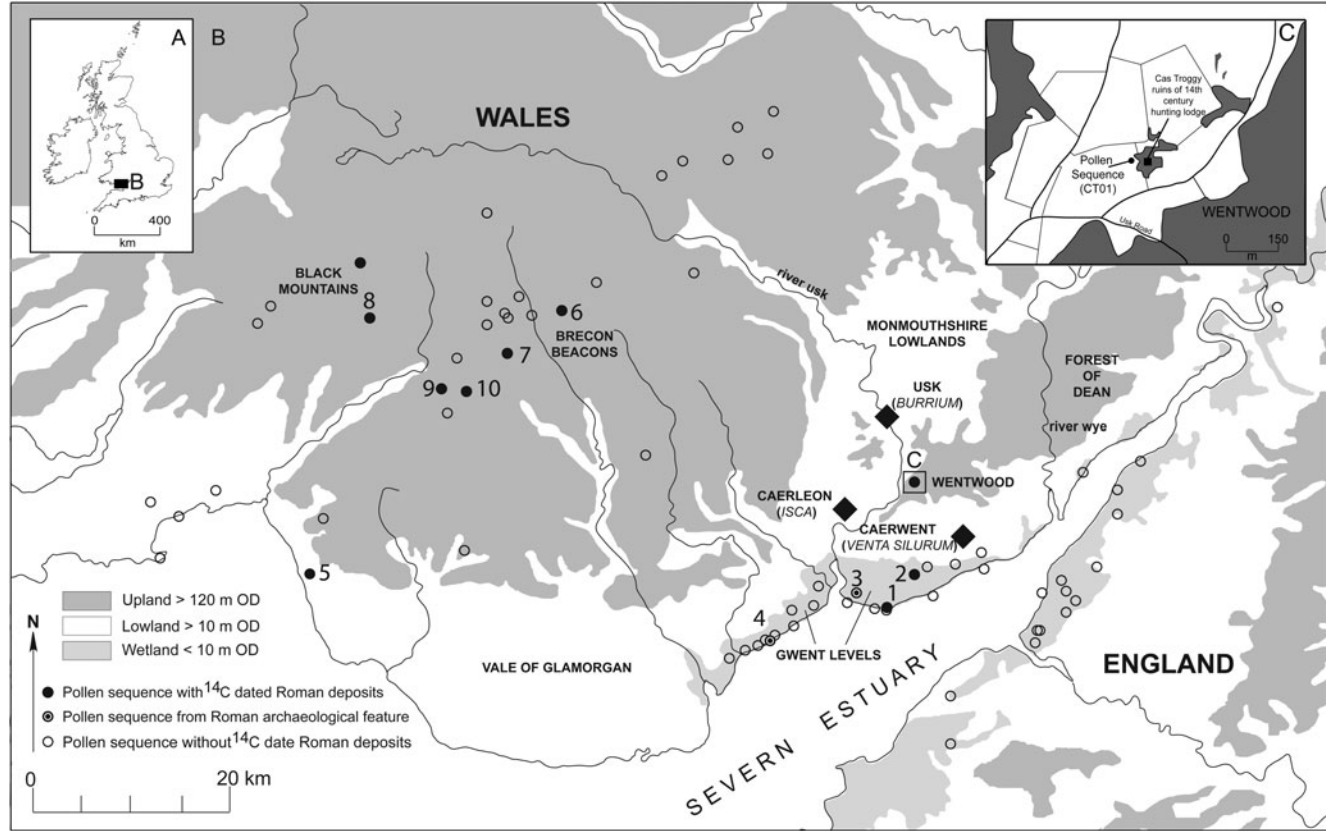


FIG. 3. Map showing: (a) Location of that part of south-east Wales shown in (b); (b) South-east Wales showing the location of pollen studies mentioned in text; (c) Detailed map showing location of sequence CT01.  
 Pollen studies: 1. Goldcliff (Bell *et al.* 2000); 2. Barland's Farm (Nayling and McGrail 2004); 3. Nash Waste Water Treatment Works (Meddens and Beasley 2001); 4. Wentlooge (Fulford *et al.* 1992); 5. Crymlyn Bog (Hughes and Dumayne-Peaty 2002); 6. Brecon Beacons (Chambers 1982; Chambers and Blackford 2001); 7. Coed Taf (Chambers 1983); 8. Nant Helen (Chambers *et al.* 1990); 9. Cefn Fford (Chambers 1982); 10. Cefn Glas (Smith and Green 1995).

TABLE 1. AMS RADIOCARBON DATES, PROFILE CT01

Lab. no. (Beta-)	Sample no. <sup>§</sup>	Depth (cm)	Age (BP)	$\delta^{13}\text{C}$ (‰)	Age range* (cal AD)
229371	CT01-D	42–43	1390 ± 40	–28.3	600–680
238646	CT01-C	60–61	1680 ± 40	–27.2	250–430
238647	CT01-B	90–91	1900 ± 40	–29.3	20–220
229370	CT01-A	111–112	1910 ± 40	–27.9	10–220

<sup>§</sup> Material dated: peat; \*2 $\sigma$  range

A.D. 1600 in England and Wales<sup>19</sup>). Although there are no known Iron Age or Romano-British sites within the Wentwood, the study lies in close proximity to the intensively settled fertile coastal plain, 6 km from Usk (*Burrium*), 8 km from Caerleon (*Isca*) and 7 km from Caerwent (*Venta Silurum*). There are also several villas located within a c. 8 km radius of the southern edge of the Wentwood. Off-site palaeoenvironmental studies are important, nonetheless, in being able to set the specific evidence from archaeological sites in a broader temporal and spatial context. The expectation is that the impact of Roman military, urban and industrial activity on the landscape of south-east Wales will be apparent in the palaeoenvironmental record, most obviously with decreases in pollen of trees and shrubs, and increases in pollen of herbaceous plants strongly associated with anthropogenic activity (e.g. arable, grazed and disturbed land).

When considered in the context of floral and faunal data from sites across south-east Wales, the pollen data from the Wentwood provide a broader picture of environment and land-use, testing key hypotheses about the dating and extent of landscape change, including: (1) is woodland clearance in the pollen record attributable to changes in land-use following the Roman conquest or was an already largely cleared agricultural landscape established during the Iron Age, as is suggested elsewhere, and (2) to what extent is the transition from the Romano-British to early medieval periods characterised by continuity or decline in established patterns of land-use?

## RESULTS AND DISCUSSION

Only the basal portion of the pollen diagram CT01 from the Wentwood is presented here (FIG. 4). The complete diagram and pollen methodology is presented in an earlier publication that investigated the contribution of pollen analysis to planted ancient woodland restoration.<sup>20</sup> This paper focuses specifically on the palaeoenvironmental evidence for landscape transformation in south Wales during the Romano-British period. The radiocarbon AMS dates suggest the moss-rich peat layers (112–66 and 63–42 cm) and intervening silts (66–63 cm) formed over a period of as little as 380 years to 670 years between cal AD 10–680 (Table 1). Pollen and microscopic charcoal data are described in the context of three local pollen assemblage zones (LPAZ), showing only the key plant taxa associated with human activity.

The radiocarbon date of 1910 ± 40 BP (Beta-229370, cal AD 10–220) suggests that peat formation commenced between the early first and third centuries A.D., although a subsequent date of 1900 ± 40 BP (Beta-238647, cal AD 20–220) implies an extremely rapid accumulation rate (Table 1). It is, therefore, equally possible that the sediments underlying the peat (zone LPAZ C-1, 124–114 cm) are of late Iron Age or early Romano-British date. At this time the Wentwood was characterised by a semi-wooded landscape, comprising mixed broadleaved woodland dominated by oak (*Quercus*) and hazel (*Corylus avellana*-type), with alder (*Alnus glutinosa*) growing on wetter soils. Areas of cultivated, grazed and disturbed ground are suggested in the vicinity by pollen of ribwort plantain (*Plantago lanceolata*), buttercups (*Ranunculus*-type), goosefoots (Chenopodiaceae), dandelions (Lactuceae) and cereal-type pollen of oat-wheat (*Avena-Triticum*) and barley (*Hordeum*), although the latter may equally derive from wild grasses as well as cultivars.

The Wentwood is significant in retaining substantial woodland. Numerous pollen studies from the Gwent Levels, Brecon Beacons and Black Mountains (FIG. 3) show substantial woodland clearance from the early to

<sup>19</sup> Peterken 1993.

<sup>20</sup> Brown 2010.

middle Bronze Age, with both upland and lowland landscapes remaining largely open into the Romano-British period.<sup>21</sup> The presence of several Bronze Age monument types typical of open environments within and along the edges of the Wentwood implies that the area was also not heavily wooded during the Bronze Age, but experienced subsequent regeneration into the Iron Age.<sup>22</sup> The absence of both Iron Age and Romano-British sites along the Trellech–Wentwood plateau suggests this area, including the Wentwood, may have been peripheral to the main settled areas within the adjoining coastal plain. However, the presence of cereal-type pollen and taxa indicative of grazed and disturbed ground could suggest otherwise.

Large-scale clearance of woodland, with evidence for arable and pastoral activity (LPAZ C-2, FIG. 4), is dated just prior to 1910 ± 40 BP (Beta-229370, cal AD 10–220). Oak pollen values decrease sharply whilst pollen of grasses (Poaceae) and ribwort plantain increase. Local fires are suggested by an increase in both microscopic and macroscopic charcoal within the base of the peat (c. 113 cm). Although the radiocarbon date lacks precision, the evidence for clearance can nonetheless be viewed against the background of intense military, urban, rural and industrial activity in the surrounding landscape from the first century A.D.

Timber would have been a vitally important construction material, particularly in the early decades of Roman rule in Wales before timber gave way to stone. At Caerleon, the basal parts of timber buildings and a timber-lined well were preserved *in situ* dating to the earliest phase of construction of the legionary fortress c. A.D. 74–90.<sup>23</sup> Plant macrofossils from the well, filled prior to Phase 2 c. A.D. 85–100, indicated a relatively open landscape of marsh and both damp and dry grassland.<sup>24</sup> Pollen evidence from deposits associated with Romano-British activity at Barland's Farm, 6 km south-east of Caerleon, likewise suggests an open landscape with only occasional stands of oak and hazel on the dry ground.<sup>25</sup> The Wentwood could, therefore, have provided a nearby source of suitable constructional timber, shipped the short distance (c. 5–7 km) downstream along the River Usk to Caerleon.

The military presence and growing urban and rural populations are likely to have created an increased demand for agricultural land, and appear to have had a direct impact on the landscape beyond the clearance of woodland. The importance of cereal cultivation is well established for Roman Britain, with few excavated sites in south Wales failing to produce evidence for the processing or consumption of cereals.<sup>26</sup> Animal husbandry was equally important, particularly on the coastal zone where the seasonal grazing of cattle is evident during the Iron Age.<sup>27</sup> Widespread embanking of the Gwent Levels occurs from the first century A.D.<sup>28</sup> Extensive networks of ditches were cut enclosing fields, used mostly for pasture, a picture supported by the pollen, macrobotanical remains and dominance of cattle bones from settlements at Nash and Wentlooge; beef likewise formed a major component of the diet at Caerleon.<sup>29</sup> The logistical and engineering requirements of embanking and managing the Gwent Levels, as well as the regular nature of drainage ditches on the Wentlooge Levels, have been taken to imply that work was carried out by the Roman army, a theory supported by the inscription on the Goldcliff Stone which records the work of legionaries on a linear earthwork.<sup>30</sup> The evidence for coastal embanking demonstrates that there was a need for all available land, and raises the possibility that major military and urban centres had extended hinterlands that included places such as the Wentwood. The small quantities of cereal pollen in core CT01 (FIG. 4) may suggest a largely pastoral focus to land-use in the uplands.

Timber would also have been vital for industrial processes, such as iron smelting, requiring large areas of managed woodland to produce sufficient quantities of charcoal for fuel. Intensive mining of iron ores in the nearby Forest of Dean from the early Roman period is accompanied by widespread evidence for iron-making

<sup>21</sup> Bell *et al.* 2000, 226–41; Brown 2005; Nayling and Caseldine 1997, 257–78; Chambers 1982, 454–7; 1983, 484–5; Chambers *et al.* 1990, 243–4; Walker *et al.* 1998, 75–6; Smith and Green 1995.

<sup>22</sup> Laws and Brooks 2007; Chadwick *et al.* 2003.

<sup>23</sup> Zienkiewicz 1993, 28.

<sup>24</sup> Caseldine and Busby 1993, 136–8.

<sup>25</sup> Nayling and McGrail 2004, 34–40.

<sup>26</sup> Alcock 2001; Caseldine 2010, 154–5; Jarrett and Wrathmell 1981.

<sup>27</sup> Bell *et al.* 2000, 344.

<sup>28</sup> Rippon 1996.

<sup>29</sup> Evans 2000; Fulford *et al.* 1992, 202–5; Meddens and Beasley 2001, 167–8.

<sup>30</sup> Rippon 1996.

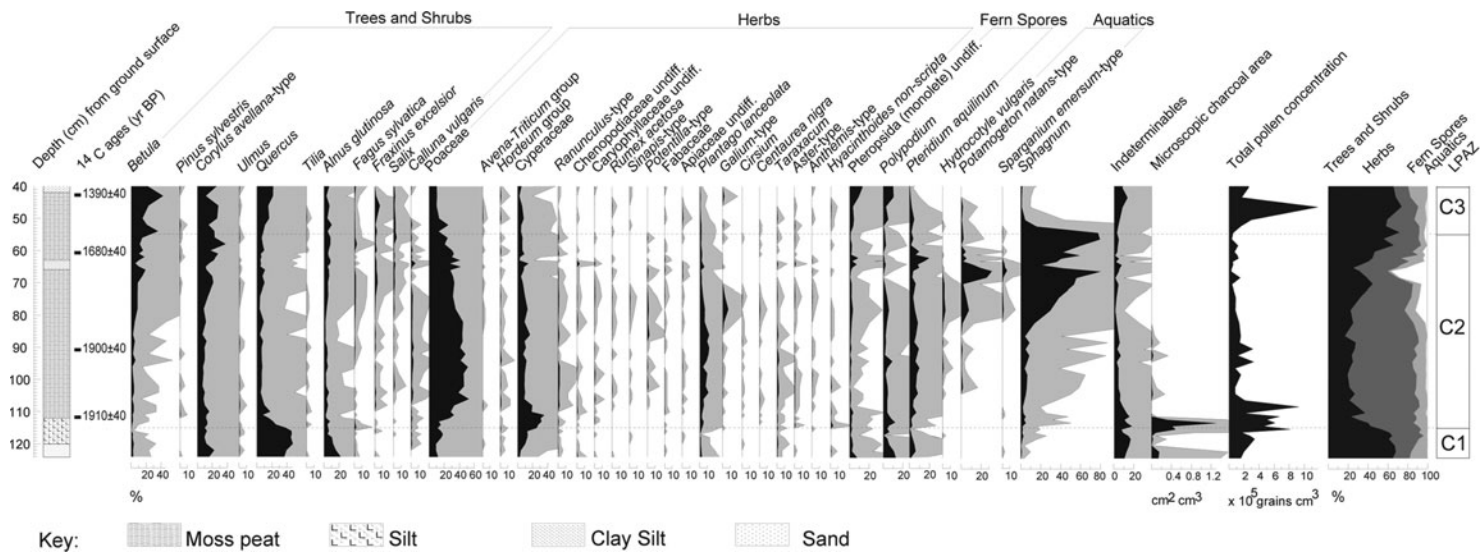


FIG. 4. Pollen percentage and microscopic charcoal area diagram, profile CT01, Cas Troggy. Silhouettes show values exaggerated  $\times 10$ .

on Romano-British sites located both on and adjacent to the Gwent Levels.<sup>31</sup> Despite the evidence for woodland clearance from the Wentwood, pollen of bluebells (*Hyacinthoides non-scripta*) and wood anemone (*Anemone nemorosa*) — both ancient woodland indicators (vascular plants showing a strong association with ancient woodland) — suggests areas of remnant woodland. Woodland survives because it is either marginal to agricultural land or has practical uses, and although there is no evidence that the Wentwood was managed, wood anemone does respond rapidly to regular coppicing.<sup>32</sup>

Woodland, mainly hazel, oak, birch (*Betula*), ash (*Fraxinus*) and beech (*Fagus*), began to regenerate in the third–fifth centuries A.D. (LPAZ C-2, FIG. 4) conceivably reflecting land-use changes related to widespread evidence for settlement abandonment at this time. Most villas and lower status sites in south-east Wales appear to have been abandoned by the mid-fourth century, including those on the Gwent Levels.<sup>33</sup> Evidence for early fifth-century activity at Caerwent and Caerleon suggests some continuity, although there is debate as to the nature and intensity of this activity.<sup>34</sup> Despite the evidence for woodland regeneration, the Wentwood was probably still only semi-wooded; the presence of occasional cereal-type pollen grains hints at continued arable activity in the vicinity (FIG. 4), whilst heather pollen (*Calluna vulgaris*) suggests patches of heathland, typically maintained through grazing activity.

The key issue with the early medieval period in Wales is the near complete invisibility of settlement and lack of characteristic artefact types. The recent identification of clusters of early medieval metalwork from Monmouthshire and the Vale of Glamorgan could indicate the location of potential sites.<sup>35</sup> Some ditches on the Gwent Levels were evidently maintained at points during the early medieval period, whilst a fishtrap from Redwick, dated 1500 ± 60 BP (Beta-134641, cal AD 425–655), suggests some continuity in activity in the coastal zone.<sup>36</sup> This activity lacks an environmental context; the nearest comparable pollen sequences from Crymlyn Bog, a floodplain mire in the Lower Swansea Valley, and high-altitude blanket bogs at sites in the Brecon Beacons, indicate a largely deforested landscape from the Romano-British period into the early medieval period.<sup>37</sup> However, evidence for woodland regeneration and a reduction in agricultural activity is apparent from two pollen sequences from the Black Mountains and from Tregaron Bog in mid-Wales.<sup>38</sup> The picture is clearly variable; open conditions persisting at some sites with woodland regenerating, at least partially, at others. This is consistent with the palaeoenvironmental picture for continuity/discontinuity from south Wales, south-east England and the Midlands, but contrasts with northern England where there is significant evidence for woodland regeneration at this time.<sup>39</sup>

Today, the Wentwood forms part of a major concentration of ancient semi-natural and planted woodland in south Wales.<sup>40</sup> Written documentation on the Wentwood, extending back 800 years, demonstrates that it formed part of a much larger woodland stretching between the Usk and Wye Valley and perhaps to the Forest of Dean in Gloucestershire.<sup>41</sup> Significantly, the documentary evidence highlights that the later medieval woodland was a patchwork of different habitats, including both dense woodland, semi-open and open areas (grassland and mires). This is consistent with the picture presented here of the Wentwood during the Romano-British and early medieval periods.

#### ACKNOWLEDGEMENTS

This research was commissioned by the Woodland Trust, with grant aid from Cadw and the Forestry Commission. Access for sampling was kindly given by Mr and Mrs Thomas of Cas Troggy Farm. I am grateful to Rick Turner (Cadw), who first brought the site to the attention of the author, and to Jon

<sup>31</sup> Allen 2009, 74; Allen and Fulford 1987; Fulford *et al.* 1992; Hughes 1996.

<sup>32</sup> Peterken and Game 1984.

<sup>33</sup> Edwards *et al.* 2010; Hughes 1996; Insole 2000.

<sup>34</sup> Brewer 1997; Evans 2000.

<sup>35</sup> Edwards *et al.* 2010.

<sup>36</sup> Rippon 1996; Allen and Bell 1999.

<sup>37</sup> Chambers 1983; Chambers *et al.* 1990; Hughes and Dumayne-Peaty 2002; Smith and Green 1995.

<sup>38</sup> Hughes *et al.* 2001; Lomas-Clarke and Barber 2007; Price and Moore 1984.

<sup>39</sup> Dark 2000, 145–6.

<sup>40</sup> Spencer and Kirby 1992, fig. 1.

<sup>41</sup> Bradney 1933.



Winder (Woodland Trust Site Manager), for assistance with the project. I thank Virgil Yendell for help with fieldwork and Astrid Caseldine for access to additional published material.

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doi:10.1017/S0068113X1300024X

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**Some Evidence for Brooch Manufacture in Roman Scotland.** Fraser Hunter writes: Given the vast numbers and varieties of brooches recovered from Roman Britain, evidence for their manufacture is surprisingly sparse.<sup>42</sup> The bulk of this evidence comes from the south of the province, although distributional analysis makes it clear that the frontier zone saw a thriving tradition of brooch production.<sup>43</sup> This note draws attention to some Scottish evidence — one a recent find, the other long published but

<sup>42</sup> Bayley and Butcher 2004, 35–40, table 11.

<sup>43</sup> e.g. Collingwood 1930; Snape 1993, 8; McIntosh 2011.