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# CROP PROCESSING AND EARLY MEDIEVAL SETTLEMENT: THE EVIDENCE FOR BAYVIL, PEMBROKESHIRE

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## Introduction

In 2019, a MSRG research grant allowed radiocarbon dates to be obtained for a corn-drying kiln at Bayvil (SN1016040620, 130m AOD), a small parish near Nevern (SN0831039950) on north Pembrokeshire's rolling coastal plateau. The kiln, found in a field next to Bayvil church, was thought to be high or late medieval, and the intention was to clarify this so that it could be understood in the context of nearby medieval settlement and agricultural activity. The two radiocarbon dates obtained for its charred cereal contents were, however, much earlier than anticipated and centred on the fifth to sixth centuries AD. This report therefore considers the kiln's relationship to early medieval activity in this area, drawing on a separately published review and gazetteer of Welsh corn-drying kilns (Comeau and Burrow 2021).[2]

## Historical background

Bayvil's medieval setting is useful to note since it has some bearing on the interpretation of the early medieval context of the corn-drying kiln. Medieval records commence with a 1273 charter of tenants' mill duties, market rights and commutation of services, and allow reconstruction of a thirteenth- to sixteenth-century pattern of a network of small hamlets scattered along the junction of infield and outfield zones (Comeau 2014; 2020, 60–64, 95–99, 300, Tables 5.7, 5.8). The largest was around Bayvil church and inhabited mainly by the dependent tenants (including Welsh bondmen) of the marcher Lord of Cemais. There are no Domesday records, as is normal in Wales, and earlier records consist of a single entry in *Annales Cambriae* that notes the death of the otherwise unknown Cian/Cynan of Nanhyfer (Nevern) in AD 865 (Morris 1980, 48, 89). Nevern is also the setting for the *Life* of St Brynach, a twelfth-century account of a sixth-century Irish ecclesiast whose principal church was at Nevern, with an estate extending into Bayvil (Comeau 2020, 160, 307–309; Wade-Evans 1944).

The area's pre-Norman function is indicated by an abundance of medieval 'Henllys' place-names a kilometre or so to the south of the church (Comeau 2020, 148–149). These refer to an old or former *llys*, the pre-Norman court or hall which – together with its supporting hamlet of bondmen (the *maerdref*) – marked the central place of each *cantref* (hundred) of a pre-Norman kingdom, and was used by the kingdom's ruler on his periodic circuits. Bayvil represents the *maerdref* for the *llys* of the *cantref* of Cemais, which comprised the Preseli hills and north-eastern coast of Pembrokeshire (Comeau 2020). With the advent of the Anglo-Normans, this *llys* (whose exact location is uncertain) lost its role as central place in favour of the castles of Nevern and Newport (SN0578038920), although in 1542 Henllys regained significance as the home of new Welsh Lords of Cemais (Charles 1973, 16–19).

It is to one of these new Lords, the Elizabethan antiquary George Owen, that we owe detailed descriptions of longstanding Welsh agricultural practices: he notes spring-sown crops in manured infields (including an unidentified spring-sown variety of wheat) and periodic cultivation of outfield (Owen 1994, 63–65, 175; Comeau 2019, 135–139, 145). Similar practices are mentioned in twelfth- and thirteenth-century Welsh law (Comeau op. cit.) and it had originally been hoped that radiocarbon dating of the kiln contents would elucidate these references, medieval agriculture in Wales being, like Welsh medieval settlement, distinctly under-researched (Comeau and Seaman 2019).

## Archaeological background

Understanding of the contemporary, early medieval, archaeological setting for Bayvil's corn-drying kiln is limited, although there have been multiple investigations of the locality's prehistoric archaeology. These show a concentration of sites, some of them clearly of high status, on the light, well-drained sandy and loamy soils that make up much of the valley-side plateau on which Bayvil lies. These soils are notably more productive than most in the surrounding countryside, and are also favoured by later medieval settlement. Some of these archaeological sites, although recorded as prehistoric, may contain as yet unidentified early medieval activity, so it will be helpful to mention them here. Letters in parentheses refer to Figure 1, which gives site names and RCAHMW record numbers.

In the fields around the corn-drying kiln (A) there are a large, palisaded enclosure with pits containing Early Neolithic material (G; Timothy Darvill pers. comm.), a cupmarked Neolithic chambered tomb (B), crop-marked round barrows (C, G), and a number of univallate enclosed settlements ('defended enclosures', D, E, F, H) and cropmarked enclosures (G, I, J) of late prehistoric and occasionally Romano-British or early medieval attribution. Beyond them, 2.5 km east of Bayvil church, is the complex Iron Age multivallate enclosure of Crugiau Cemais (K) which partly encloses a Bronze Age barrow cemetery and has been suggested as a possible late prehistoric or early medieval inauguration site, one of a number of assembly areas in Bayvil (Comeau 2014; 2020, 124–127, 133, 156; Murphy and Murphy

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[2] See Archaeology Data Service (ADS) archive *Corn-Drying Kilns in Wales*. https://doi.org/10.5284/1085018.

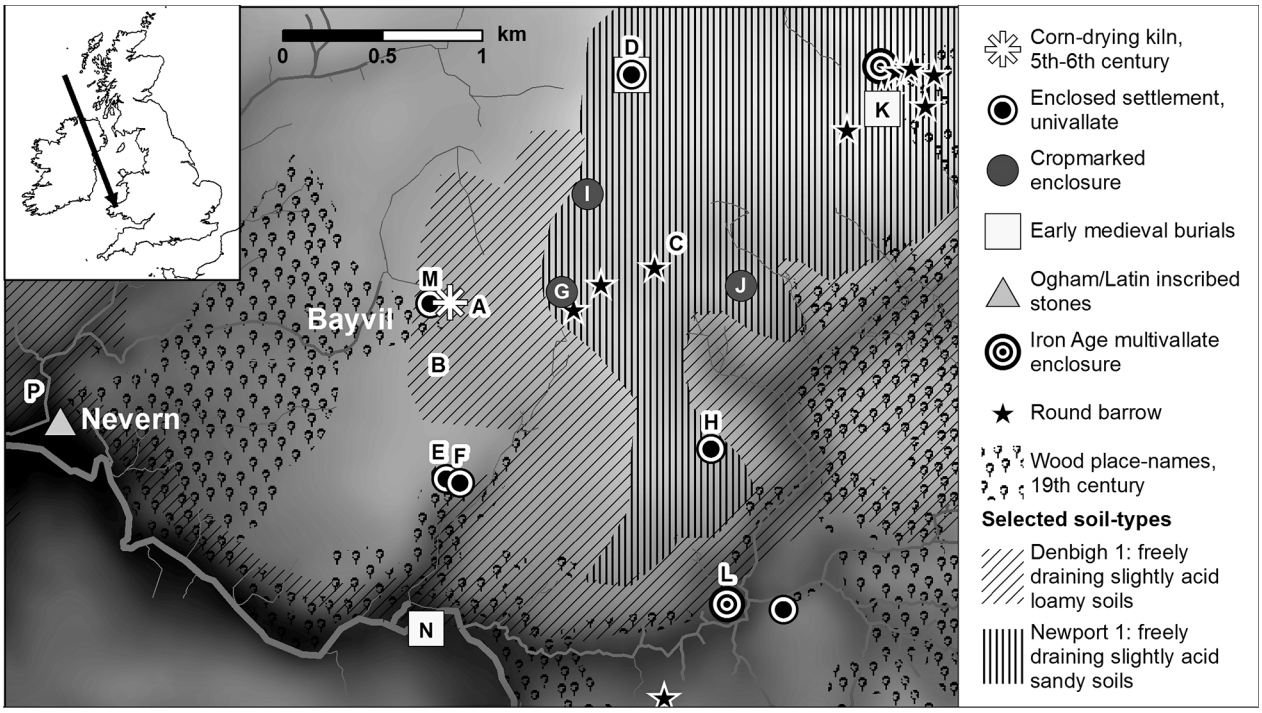


*Figure 1 Location map of Bayvil, showing corn-drying kiln, archaeological sites mentioned in text, and selected soil types from Soil Survey Map of England and Wales 1983.*

2015). Castell Henllys, a bivallate enclosure with Iron Age radiocarbon dates, abandoned in the late Iron Age in favour of an extramural Romano-British farmstead (Mytum 2013), lies 2 km to the south-east (L).

Possible evidence of the medieval hamlet of Bayvil was suggested in 2014 by a geophysical survey of the field around the corn-drying kiln, conducted prior to the excavation of a Late Bronze Age enclosed settlement ('ringfort', M) that also revealed the kiln (Parker Pearson *et al*. 2018, 115). Evidence comprised a line of contiguous small rectilinear enclosures and possible drainage gullies, 10–25m across, extending across a 160m x 50m zone to the south of the lane between the church and Bayvil Farm. Similarities were noted to twelfth- and thirteenth-century burgage plots at the north Pembrokeshire Anglo-Norman plantation town of Newport. Fieldwalking also revealed medieval pottery (Mike Parker Pearson pers. comm.).

Identification of early medieval settlement activity at Bayvil is constrained by a number of factors common to other areas of Wales (Comeau 2020, 16 for discussion). Surviving material culture is scant: coins are not used between the fifth to eleventh centuries AD, and neither is pottery, apart from at a few high-status fifth- to seventh-century sites where imported pottery from the Mediterranean and western France is found. Post-Roman burials are unfurnished. Widespread acid soils and low levels of developer-funded excavation add further restrictions to archaeological visibility of activity. These factors give extra significance to the radiocarbon dating of charred cereal deposits (typically from corn-drying kilns) which may present the only firm evidence of early medieval activity at a site.

At Bayvil, although early medieval inscribed stones provide broader indications of a significant early medieval presence (see below), habitative evidence for the period is limited to some slight indications of fifth- to sixth-century activity at enclosed settlements near Castell Henllys. At one of these, the small inland promontory fort of Cwmgloyne West (E), a fourth- to sixth-century date[3] was obtained for a posthole, the only other dating evidence being a stone spindle whorl of Iron Age type (Mytum and Webster 2001).

Post-Roman occupation is also possible at the nearby small univallate enclosure of Henllys Top Field (H), where excavation produced a loom weight of a type found at fifth- to sixth-century sites elsewhere, though a Romano-British date is also possible and would be consistent with a second- to fourth-century AD radiocarbon date[4] obtained from a posthole (Mytum and Webster 2001, 96–97). The site's other radiocarbon date indicates late prehistoric activity in a pre-enclosure context. Other finds consisted of a worked stone object (perhaps an incomplete bracelet), part of another possible

[3] Cwmgloyne west: CAR-1382: 1610 ± 60: cal. AD 261–277 (2.1%), 341–587 (93.4%). All radiocarbon dates cited in this paper have been recalibrated at 2 sigma using IntCal20 (Reimer *et al*. 2020) and OxCal 4.4.2 (Bronk Ramsey 2009).

[4] Henllys Top Field: CAR-1383: 1810 ± 60, cal. AD 85–94 (1.0%), 117–402 (94.5%).

loom weight, a stone spindle whorl and a whetstone. No clear structural forms could be discerned among the multiple postholes revealed by trenching at either Cwmgloyne or Henllys Top Field, but the excavators suggest that roundhouses and four-poster structures (possible grain stores) might be expected (Mytum and Webster 2001, 97, 106). A recent review of early medieval habitation evidence in Wales also notes the post-Roman use of rectilinear buildings (Hopewell and Edwards 2017, 232–236). At Nevern itself (P), an early medieval site under the castle has been hypothesised though no evidence of one was found in recent extensive excavations (Murphy 2018; cf. Mytum 2013, 19).

At Castell Henllys, the previously abandoned Iron Age enclosed settlement shows signs of late or post-Roman activity, with the construction of a new stone entrance, and renewal and repair of its surrounding ditch and bank arrangements, around the time that its Romano-British farmstead was abandoned. This phase was short-lived, with the ditch soon silting up, and no new interior structures were identified. Artefacts in the ditch are of Roman date but may be 'heirlooms' of the post-Roman builders of the bank, since there are no other Roman-period finds within the hillfort (Mytum 2013, 17–19).

There are also three early medieval burial areas within 2.5 km of Bayvil, all reusing earlier enclosures. Crugiau Cemais has, within its banks, a small square ditched funerary enclosure or barrow of probable fifth- to ninth-century AD date; style and location suggest high status (Murphy and Murphy 2015, 48–49, 55; Comeau 2020, 124). Caer Bayvil (D), a small univallate enclosed settlement of uncertain date, was reused for oriented dug and stone-lined ('long cist') burials, one with a seventh- to ninth-century AD radiocarbon date[5] (James 1987, 59). At Felindre Farchog (N), under the Cwmgloyne and Henllys hillsides, a third undated burial ground of early medieval type was excavated in 2015; its oriented dug and stone-lined graves focus on a natural mound within a circular enclosure (Casswell *et al*. 2017).

Indications of the area's early medieval significance are provided by carved stones at Nevern church, 2km west of the corn-drying kiln: a tenth- or early eleventh-century freestanding cross with interlace decoration, and two stones with fifth- or early sixth-century bilingual Ogham and Latin inscriptions (Edwards 2007, 390–394; 396–401). The latter attest to the late or post-Roman presence of the Deisi, an Irish people or tribe who may perhaps be linked to the new entrance and repaired fortifications at Castell Henllys (Charles-Edwards 2013, 157; Comeau 2020, 7; Mytum 2013, 19). The stones carry the names of high-status Latin-speaking individuals of Irish descent and may have functioned as multi-purpose 'stone charters', combining the functions of burial markers, boundary stones and recorders of title to land (Charles-Edwards 2013; Edwards 2007, 34; Handley 1998, 344–352). Cemais has eleven of these Ogham/Latin inscribed stones, all lying either on the periphery of the *cantref* or (as in the case of the two stones at Nevern) in its central zone (Comeau 2020, 134–137, 241).

In summary, then, a rich and complex archaeological milieu is indicated, albeit one that is sketchy on specific early medieval excavated data. A number of small, enclosed settlements of late prehistoric to early medieval date cluster on well-drained soils around two Iron Age multivallate enclosures in an area also marked by Neolithic and Bronze Age funerary activity. One of the multivallate enclosures had an extra-mural Romano-British settlement and is near a pre-Norman royal residence (*llys*). The other contains a high-status early medieval burial and part of a Bronze Age barrow cemetery, and may have been an inauguration site. This high-status burial site, together with two other nearby cemeteries and the settlement locations indicated by enclosed sites and medieval records, constitute a zone of early medieval polyfocal site patterning which also includes the area of *llys* place-names, possible assembly areas, and (on its edge) the cult centre of St Brynach with its early medieval inscribed stones. Similar groups of elements are seen at early medieval central zones elsewhere in north-west Europe (Comeau 2014, 280; 2020, 25, Figure 6.28), and their central zone identity forms a crucial context for the interpretation of the kiln.

## The corn-drying kiln

The kiln was excavated during the 2014–15 investigation of the Bayvil church ringfort, prompted by a 'substantial' magnetic anomaly in the same geophysical survey that identified the small rectilinear enclosures (Parker Pearson *et al*. 2018, 122–123, 132–135; Figure 7). The excavated feature (SN1028840559) was cut into the mudstone bedrock that underlies the gravelly soil, and was pear-shaped, 2.85m long and 1.67m wide at its maximum width, with a wide, deep pit at the northwest end and a shallower extension to the southeast (Figure 2). A thin burnt layer (302) covered the base of the pit with, above it, a deep secondary fill (304) of charred grains, weed seeds and wood charcoal. A single sherd of unglazed medieval pottery, possibly intrusive, was found in the upper fill (301).

No radiocarbon date was obtained at the time, the kiln being assumed to be medieval because of the dominance of barley and oats in its charred grain assemblage (Parker Pearson *et al*. 2018, 132). However, given the possibility of some relationship to the bond hamlet and to medieval agricultural practice, the excavator provided permission for the author to obtain radiocarbon dating of the charred grain. Two grains (of barley and oat) from the assemblage in the secondary fill were submitted to Queen's University Belfast $^{14}$Chrono Centre in 2019, and the results were calibrated using IntCal20 (Reimer *et al*. 2020) and OxCal 4.4.2 (Bronk Ramsey 2009). The two radiocarbon dates produced by the samples did not support a connection between the kiln and the recorded medieval hamlet. Instead, they showed fifth- to mid-sixth-century dates, with calibrated date ranges of cal. AD 425–551 at 2 sigma for the barley grain (UBA-40923: 1578 ± 25bp), and cal. AD 412–539 at 2 sigma for the oat grain (UBA-40924: 1617 ± 25bp).

## Discussion

This striking result directs attention to the area's post-Roman archaeological record, and to comparative evidence elsewhere. Comparisons are facilitated by a

[5] Caer Bayvil: CAR-291: 1290 ± 60, cal. AD 649–880 (95.4%).

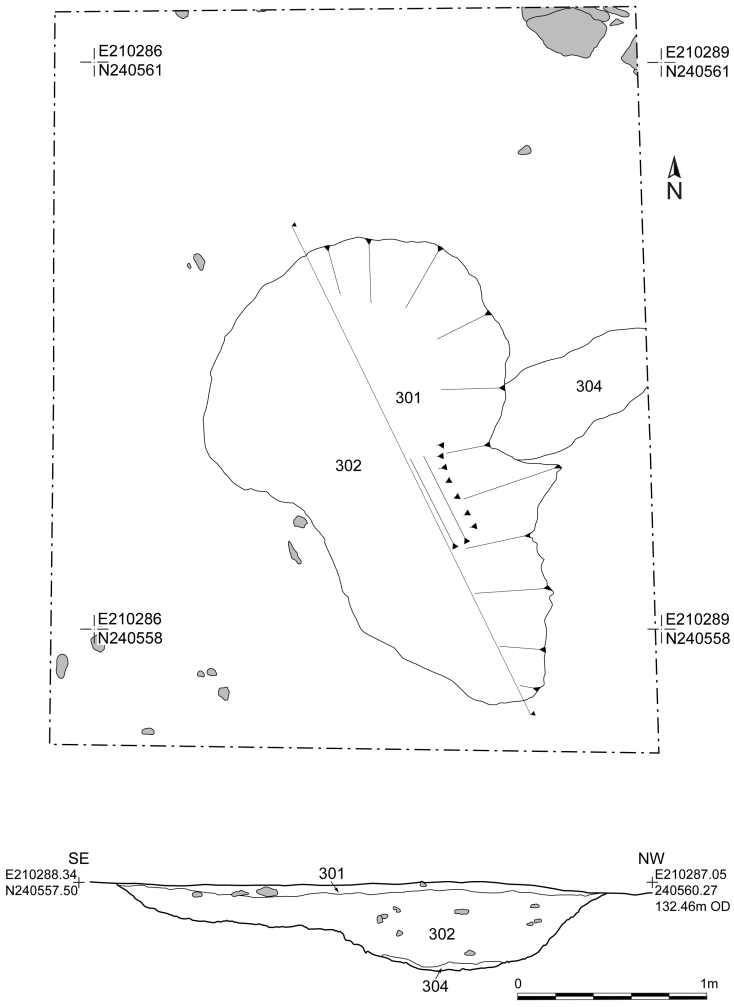


*Figure 2 Plan, section and photograph of the corn-drying kiln. Plan and section © Irene De Luis. Photograph © Mike Parker Pearson.*

review of Welsh corn-drying kilns recently undertaken by the author in conjunction with Steve Burrow (National Museum of Wales), which was instigated by the need to find a comparative context for the Bayvil kiln's radiocarbon dates (Comeau and Burrow 2021). This shows that 'pear-shaped' kilns, with firing evidence in their deeper bowl portions, were the most common type of kiln in the early medieval period, although oval/circular and dumb-bell/figure-of-eight-shaped kilns are also common. All essentially comprise a drying chamber – a pit in the ground with a timber rack above it for drying or parching grains or other crops – and an adjacent fire to supply warm air, either in its own pit (usually deeper than the drying chamber and possibly separated from it by a short flue) or underneath the drying crops. Overall lengths of pear-shaped kilns range from 0.8m to 6.7m, with a median dimension of 2.93m (average 3.06m; n = 22), making the Bayvil kiln a typical instance of this form of kiln. There is little evidence for use of stone linings. Many probably had no roofs, given twelfth-/thirteenth-century references to both open and roofed kilns, as well as nineteenth-century descriptions of unroofed kilns; the stepped sides and postholes found in the shallower elements of some kilns probably represent drying racks rather than more elaborate superstructures (Comeau and Burrow 2021).[6]

*The Bayvil kiln in agricultural context*

The kiln's contents, too, are typical of the period. The archaeobotanical report for the excavation notes large amounts of carbonised hulled barley, some identifiable as hulled six-row barley (Simmons 2018, 132). Oats were also present in significant but smaller amounts, and although the only specific identification was a couple of wild oat grains, the increasing oat presence at post-Roman and early medieval sites elsewhere in Wales (which leads to a dominance of oats in kiln assemblages by the seventh century AD) suggests that this was probably a cultivated crop (Comeau and Burrow 2021). No free-threshing wheat was positively identified, but small amounts of spelt and an intermediate spelt/free-threshing type were present. Similar patterns of kiln contents are found across Wales where, in the fifth and sixth centuries AD, barley takes over from wheat as the dominant cereal, with oats then dominating from the seventh century AD until the end of the medieval period (Comeau and Burrow 2021). Wheat, having dominated assemblages of the Romano-British period (mainly as spelt), is a minor component of early medieval assemblages compared to oats and barley, but becomes more common again after the eleventh century. Rye is either absent or found only in trace amounts until the eleventh century, after which its incidence increases slightly.

Some particular agricultural practices can be inferred from the kiln contents. Barley and oats are typically spring-sown crops, and this seasonal patterning was also seen in the weed seeds found in the Bayvil kiln, which included taxa associated with spring sowing: redshank/pale persicaria (*Persicaria maculosa/lapathifolia*), fat hen (*Chenopodium album*), black bindweed (*Fallopia convolvulus*) and wild radish (*Raphanus raphanistrum*). The presence of fat hen and oraches (*Atriplex*), weeds that prefer nitrogen-enriched soils, suggest the use of manured land (Simmons 2018, 134).[7] We can therefore envisage the fifth-/sixth-century cultivation of spring-sown cereals in winter-manured infields, the same practice that is recorded in twelfth-century Welsh law and also locally in the sixteenth century. These infields were presumably on the well-drained sandy and loamy soils around Crugiau Cemais and Henllys which are used for arable infields in the late medieval period, Bayvil hamlet itself being on their junction with less permeable seasonally wet soils (Figure 1; Comeau 2020, Figure 5.3b). Spelt, usually regarded as an autumn-sown crop, may not have been part of this spring-sown infield regime, and it is therefore interesting to note George Owen's sixteenth-century reference to the growing of wheat (albeit the local spring-sown variety) on temporarily enclosed (folded) areas of outfield – i.e. long ley husbandry, a technique identifiable in Roman sources (Comeau 2019, 136; Owen 1994, 64–65).

*The kiln in social and economic context*

In addition to providing insights into agricultural practices, the presence of the corn-drying kiln is, in itself, an indicator of the area's social and economic function in the post-Roman centuries. To understand how, we need to note its potential uses. Whilst it is often assumed that corn-drying kilns were principally used to deal with wet harvests, archaeobotanical evidence does not support this and instead indicates their use for parching or drying cleaned and processed (threshed, winnowed and sieved) crops prior to storage in granaries or milling, as well as for preparing malt for ale by roasting germinated (sprouted) grain (van der Veen 1989, 303–304; 2016, 5). Medieval and early modern sources support this interpretation, and only rarely note their use for drying wet harvests, for example in famine conditions (Comeau and Burrow 2021).

These usages also vary for different grains. Spelt is said to benefit from parching before winnowing to loosen its grain (though free-threshing wheat does not require this), and drying similarly helps to loosen the husks of oats and hulled barley before milling (van der Veen 1989, 303; Wiliam 1977, 15, 17–18). Although barley is traditionally associated with malt-making, all types of grain can be used, with spelt malt found at Romano-British sites and oat malt dominating the first surviving records of malt production in Wales in the late thirteenth and early fourteenth centuries (Carr 2011, 63–64, 139; Hillman 1982, 140; Rhys 1936, 123, 163, 227).

At a domestic level, these functions can be accomplished by simple means, for instance with a pan on a hearth (Fenton 1978, 375), and the presence of a

[6] See ADS archive *Corn-Drying Kilns in Wales*. https://doi.org/10.5284/1085018.

[7] The original report suggests that the presence of scentless mayweed (*Tripleurospermum inodorum*, also known as scentless or wild chamomile) may indicate the cultivation of heavy soils. *Tripleurospermum inodorum* is actually noted for its abundance on well-drained soils of medium or light texture, and is less frequent on heavy soils (Kay 1994, 682). It is another chamomile, *Anthemis cotula*, that has a strong association with heavy clay soils (McKerracher 2019, 8, 117, 125).

corn-drying kiln indicates a scale of processing beyond the domestic (van der Veen 1989, 315–316; Monk 2019, 54). With this thought in mind, it is useful to note the patterns of corn-drying kiln use in the fifth to seventh centuries in Wales and Ireland, a peak period for corn-drying kiln use in both countries, with usage thereafter declining until the arrival of the Normans (Comeau and Burrow 2021; Monk and Power 2012, 38–39). About two thirds of Wales' early medieval kilns – or to put it another way, over half of all sites with kilns of early medieval date – fall within this period, distributed across eleven locations (some with multiple kilns) across Wales (Comeau and Burrow 2021, Figures 3, 4).[8]

The reasons suggested for this rise in kiln use are highly pertinent to interpretation of the Bayvil settlement context. Suggestions that increased use may be a response of some sort to a post-Roman climate downturn are questioned, in Ireland, by climate data that shows the increase in corn-drying kiln numbers beginning during a drought period in the third to fifth centuries AD (Coyle McClung and Plunkett 2020, 12–13, 22–23; Timpany *et al*. 2011, 80). An alternative interpretation sees the sixth-century Irish boom as a response to the tribute demands of elite groups, given the concentration of kilns around royal sites (Kinsella 2008, 106; Monk 2019, 54). In Wales, this possibility is supported by the makeup of archaeobotanical samples taken from early medieval corn-drying kilns, with processed, i.e. cleaned or semi-cleaned, crops identifiable at over half of them (22/36; Comeau and Burrow 2021).[9] This indicates that kilns were associated either with bulk storage (most likely at estate centres) or with large-scale food and drink production.

These activities are also indicated by charters that, from the seventh century onwards, record food rents containing large quantities of bread and ale, with estates being quantified in terms of their ale-producing capacity (Charles Edwards 2013, 27–282; Comeau 2020, 114, 219–226). Food rents were of practical and symbolic importance in the non-monetised early medieval economy, facilitating feasting and hospitality at magnate courts (Davies 1982, 51, 68–69, 165). Corn-drying kilns were fundamental to their provision, and malt-making must have been a key activity, despite limited archaeobotanical evidence for it in Wales where the only clear early medieval evidence (of late seventh- to ninth-century date) is at the South Hook corn-drying kilns near Milford Haven (Carruthers 2010).[10] The evidence for Anglo-Saxon England is similarly restricted, with only two sites, Higham Ferrers (Northants) and Sedgeford (Norfolk), presenting clear archaeobotanical indications of malting. The former has a late seventh- to early eleventh-century AD radiocarbon date,[11] while the latter is dated by pottery to the late eighth to early ninth century; both are associated with what appear to be estate centres (Hardy *et al*. 2007, 181, 193, 203–204; Faulkner and Blakelock 2020, 68, 75, 93).

8 See also 'Alternative versions of charts' in ADS archive: https://doi.org/10.5284/1085018.

9 Data in ADS archive: https://doi.org/10.5284/1085018.

10 South Hook: Beta-222370: 1250 ± 40, cal. AD 671–880 (95.4%).

11 Higham Ferrers: <1>307HFKML00: 1196 ± 85, cal. AD 665–994 (95.4%).

*The kiln in local context*

At Bayvil itself, this interpretation, which envisages the corn-drying kiln facilitating the production of food and drink for large gatherings, is consistent with its location within a polyfocal central zone which has indications of late prehistoric and early medieval assembly functions as well as a pre-Norman royal residence. The contemporary archaeological context is the post-Roman occupation of the enclosed settlement at Cwmgloyne West, the new entrance and refurbished fortifications at Castell Henllys, perhaps also the activity at Henllys Top Field, and the Ogham stones at Nevern. A pattern of small, enclosed settlements dispersed across the better soils is hinted at, which perhaps included some of the other uninvestigated enclosed settlements in the locality together with other, as yet unidentified, unenclosed settlements. The frequently observed proximity of 'defended enclosures' to medieval settlements in this area, together with the apparent similarities between local agricultural practices of the fifth to sixth centuries and the later medieval period, suggests that the early medieval settlements shared the later pattern of location at the interface of infield and outfield, a beneficial location in a farming economy with a significant pastoral element. The elite members of this early medieval society – whose feasts presumably used the bread and ale products of the corn-drying kiln – were the Latin-speaking individuals of Irish descent who erected the Ogham stones at Nevern. However, it is currently unclear where elite residences were located, given the lack of clarity for contemporary evidence of habitation.

## Conclusion

Much, therefore, is still unclear and will remain so until there is more excavation and radiocarbon dating of the enclosed settlement sites to disentangle late prehistoric from early medieval activity. Nonetheless, radiocarbon dating of the contents of the Bayvil corn-drying kiln has, by facilitating integration of diverse evidence, cast some light on the nature of early medieval settlement in a hitherto poorly understood area. This small dating project has also had an unanticipated secondary outcome, with the unexpectedly early dates of the kiln prompting a national-level overview and gazetteer that will provide comparative evidence for other sites elsewhere. The kiln's fifth- to sixth-century date, at first sight rather remarkable, turns out to be not at all unusual, and it is possible that other Welsh corn-drying kiln sites of the same period may similarly be associated with focal zones (Comeau in prep.). Later medieval settlement evidence at Bayvil and the rectilinear enclosures near the kiln remain uninvestigated, and await further research.

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