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The Old Mint House, High Street, Pevensey, East Sussex

Tree-ring Dating of Oak Timbers

Martin Bridge

Scientific Dating

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Summary

Four main areas of this building were sampled, along with a few other individual timbers, making a total of 43 timbers in all. The hall and kitchen were found to be more or less coeval, but low levels of similarity between the ring-width series from the timbers from each area could suggest a short period between the construction of the two elements. Leaving out one timber that dated well individually against site chronologies from further afield and which was slightly earlier than the rest of the timbers, the likely felling date for the hall and kitchen timbers is in the mid-AD 1520s or early AD 1530s. The cross-wing and connecting range also appear to be coeval with each other, both using timber felled in the late AD 1560s or early 1570s.

Contributors

Martin Bridge.

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Front cover image

The Old Mint House [Photograph: Martin Bridge]

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Historic environment record

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Introduction

The Old Mint House (List Entry Number 1284471 https://historicengland.org.uk/listing/the-list/list-entry/1284471) is situated about 100m north-west of the parish church on the northern side of the High Street, opposite the east gate of the castle (Fig 1). The overall plan of the structure (Fig 2) is of a hall parallel to the street with a cross-wing at the eastern end and what was originally a detached service block behind, now joined to the rest of the building by a connecting range. The service block is one of the largest to survive in the county. The hall and detached service block (kitchen) are thought to be the oldest constructed elements. The roof over the main (hall) range contains medieval smoke-blackened timbers that are thought to have been reused from the castle.

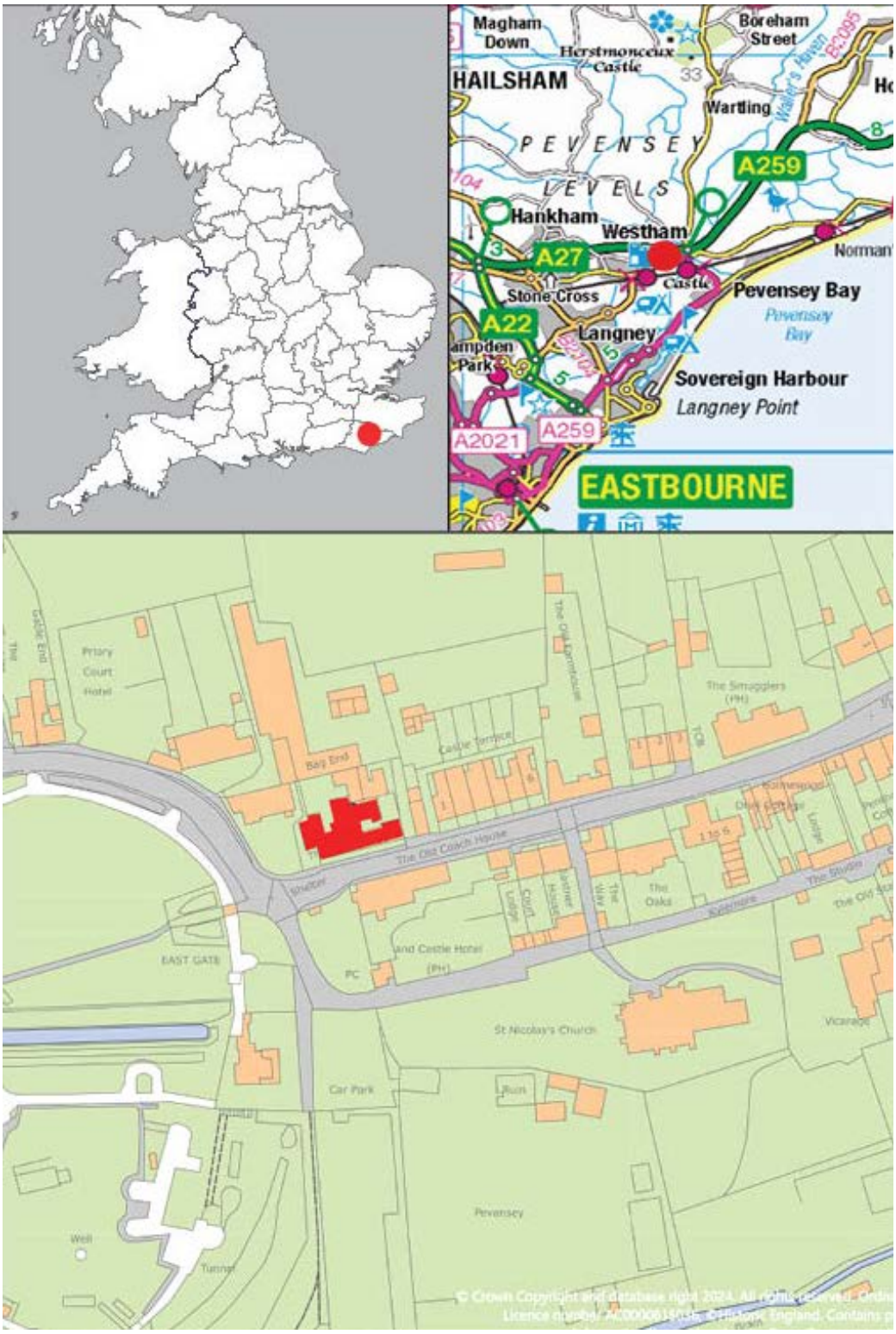

Figure 1: Maps to show the location of The Old Mint House, Pevensey in East Sussex. Top left on map of England; top right on map at scale 1:105,000; bottom on street map scale 1:1,500 [© Crown Copyright and database right 2024. All rights reserved. Ordnance Survey Licence number 100024900].

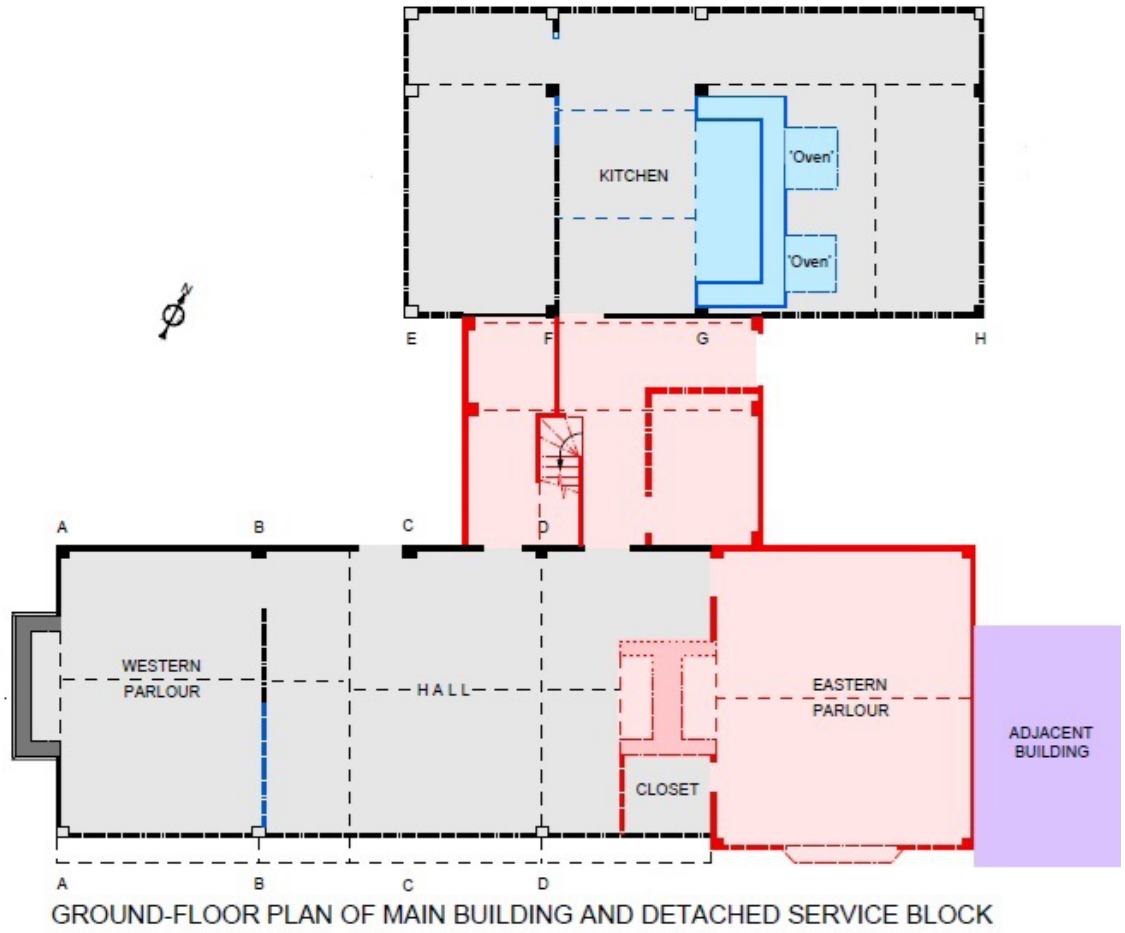

Figure 2: Overall plan of the building [© Barbara Martin from Martin and Martin (2018)]

Methodology

An initial assessment of the timbers for dendrochronological potential sought accessible timbers with more than 50 rings and where possible traces of sapwood, although slightly shorter sequences are sometimes sampled if little other material is available. Initial assessment suggested that most timbers were considered marginal in terms of the number of rings available. Those timbers judged to be potentially most useful were cored on several visits in 2023 and early 2024, using a 16mm auger attached to an electric drill. The cores were labelled and stored for subsequent analysis.

The cores were polished on a belt sander using 80 to 400 grit abrasive paper to allow the ring boundaries to be clearly distinguished. The samples had their tree-ring sequences measured to an accuracy of 0.01mm, using a specially constructed system utilising a binocular microscope with the sample mounted on a travelling stage with a linear transducer linked to a PC, which recorded the ring widths into a dataset. The software used in measuring and subsequent analysis was written by Ian Tyers (2004). Cross-matching was attempted by a process of qualified statistical comparison by computer, supported by visual checks. The ring-width series were compared for statistical cross-matching, using a variant of the Belfast CROS program (Baillie and Pilcher 1973). Ring sequences were plotted on the computer monitor to allow visual comparisons to be made between sequences. This method provides a measure of quality control in identifying any potential errors in the measurements when the samples cross-match.

In comparing one sample or site master against other samples or chronologies, *t*-values over 3.5 are considered significant, although in reality it is common to find demonstrably spurious *t*-values of 4 and 5 because more than one matching position is indicated. For this reason, dendrochronologists prefer to see some *t*-values in the range of 5, 6, and higher, and for these to be well replicated from different, independent chronologies with both local and regional chronologies well represented, except where imported timbers are identified. Where two individual samples match together with a *t*-value of 10 or above, and visually exhibit exceptionally similar ring patterns, they may have originated from the same parent tree. Same-tree derivation can also be identified through the external characteristics of the timber itself, such as knots and shake patterns. Lower *t*-values, however, do not preclude same tree derivation.

Ascribing felling dates and date ranges

Once a tree-ring sequence has been firmly dated in time, a felling date, or date range, is ascribed where possible. With samples which have sapwood complete to the underside of,

or including bark, this process is relatively straightforward. Depending on the completeness of the final ring (i.e. if it has only the spring vessels/earlywood formed, or the latewood/summer growth) a precise felling date and season can be given. If the sapwood is partially missing, or if only a heartwood/sapwood transition boundary survives, then an estimated felling date range can be given for each sample. The number of sapwood rings can be estimated by using an empirically derived sapwood estimate with a given confidence limit. If no sapwood or heartwood/sapwood boundary survives then the minimum number of sapwood rings from the appropriate sapwood estimate is added to the last measured ring to give a *terminus post quem* (tpq) or felled-after date.

A review of the geographical distribution of dated sapwood data from historic timbers has shown that a sapwood estimate relevant to the region of origin should be used in interpretation, which for oak in this area is 9–41 rings (Miles 1997). It must be emphasised that dendrochronology can only date when a tree has been felled, not when the timber was used to construct the structure or object under study.

An alternative method of estimating felling date ranges, however, has been developed by Miles (2005a) and implemented in OxCal (Bronk Ramsey 2009; Miles 2006). Following the methodology set out by Millard (2002), Bayesian statistical models are used to produce individual sapwood estimates for samples using the variables of number of heartwood rings present, the mean ring width of those heartwood rings, the heartwood/sapwood boundary date, and the number of any surviving sapwood rings (including those that can only be counted rather than measured, or those lost in sampling). These individual probability distributions for the felling dates (expressed at the 95% probability level) may then be combined to produce a highest probability density estimate for the *combined felling date range*. Miles (2005a) suggests several such models, of which the one that has been deemed appropriate to apply to the timbers in this case is that for ‘England and Wales AD’. This model is based on timbers from throughout Britain, with a bias to those in the most densely-dated counties of Shropshire, Somerset, Hampshire, Oxfordshire, and Kent.

Results

Details of the samples taken are shown in Table 1, with the positions in the building illustrated in Figures 3–5. The four main areas of interest, namely the hall, kitchen, cross-wing, and connecting range were sampled, along with a couple of samples of the smoke-blackened roof timbers thought to have been re-used from the Castle, and a timber in the outshot by the north-west corner of the hall, uncovered during the last visit to the site. These rafters had very few rings but were sampled as possible candidates for other complementary scientific dating techniques, should this be deemed appropriate. Two timbers were sampled twice to get maximum information in terms of sapwood and ring numbers (designated ‘a’ and ‘b’), while six others broke and were designated ‘i’ for the inner rings, and ‘ii’ for the outer rings. Overall, 24 of the 45 samples (taken from 43 timbers) had fewer than 50 rings or fragments with fewer than 50 rings (53%). One core, pevm27, disintegrated during sampling and could not be measured, but all other core, or core fragments, were measured. The raw ring-width data are given in Appendix 1.

Comparison of all the individual ring-width series identified a number of cross-matches that, along with comparison of these individual series and the various sub-site chronologies formed of cross-matched groups of samples with the database of reference chronologies, resulted in the secure dating of 15 timbers.

Cross-matching suggested that the timbers represented by samples pevm04 and pevm06 from the kitchen may have been derived from the same tree (t = 13.7 with 93 years overlap; Table 2) and so these ring-width series were combined for subsequent analysis. Cross-matching between the five dated timbers from the kitchen was generally good (Table 2), other than for sample pevm05. The dating evidence for samples pevm01, pevm64m and pevm09 combined is shown in Table 3a, with sample pevm05 dating well independently (Table 3b). Sample pevm12, which cross-matches with two other samples from the hall range but not strongly, matches the four combined kitchen timbers (t = 4.2 with 68 years overlap) and has some independent matches at this position e.g. t = 5.4 with Wysdom Hall, Burford (Bridge and Miles 2011) and t = 5.4 with Gunns Mill, Abenhall (Howard et al. 2001)). Cross-matching between the remaining three dated timbers from the hall range was generally weak, and the series did not match well against the kitchen samples (Table 2), but individual timbers dated well against the database (Tables 3c–e).

Some cross-matching was identified between samples from the cross-wing and connecting range (Table 2). Samples pevm26 and pevm28 did not match well against the others (Table 2) and were dated independently (Tables 3f and 3g). The others matched

reasonably well and were combined into a sub-site chronology, pevm30367 (containing samples pevm30, pevm33, pevm36, and pevm37), which dated to the period AD 1438–1565, the strongest matches being shown in Table 3h.

All 15 dated timbers were combined into a single site chronology, PEVENSEY, which spans the period AD 1379–1565 and for which some of the strongest matches are shown in Table 3i.

Table 1: Details of tree-ring samples taken from The Old Mint House, High Street, Pevensey, East Sussex

Sample No	Location	No rings	Date of measured sequence (AD)	Sapwood	Mean ring width (mm)	Mean sensitivity	Felling date range (AD)
Kitchen							
pevm01	South principal rafter	91	1415–1505	h/s	1.30	0.16	1514–46
pevm02	NE corner post	84	-	h/s	1.29	0.21	-
pevm03	Re-used timber as tiebeam in central truss	39	-	1	2.14	0.15	-
pevm04	North post, central truss	130	1379–1508	h/s	1.45	0.25	1517–49
pevm05	West tiebeam	80	1409–88	2	1.45	0.19	1495–1527
pevm06	Ground floor – north internal post	96	1416–1511	h/s	1.68	0.28	1520–52
pevm07i	Ground floor – south post (door jamb) – inner rings	8	-	-	5.87	0.15	-
pevm07ii	Ground floor – south post (door jamb) – outer rings	15	-	-	3.26	0.18	-
pevm08	Ground floor – south internal post	38	-	-	3.07	0.19	-
pevm09	West mid-rail	58	1451–1508	h/s	1.49	0.19	1517–49
pevm14i	SE corner post – inner rings	25	-	-	1.89	0.18	-
pevm14ii	SE corner post – outer rings	15	-	-	1.48	0.14	-
Hall							
pevm10	West central post	61	-	-	1.91	0.17	-
pevm10a	*ditto*	61	-	-	1.91	0.18	-
pevm10bi	*ditto* – inner rings	16	-	-	2.03	0.16	-
pevm10bii	*ditto* – outer rings	32	-	-	1.77	0.15	-
pevm11	North sill beam, west side	26	-	-	2.96	0.15	-
pevm12	North post, east side of door (opposite main entrance)	68	1442–1509	h/s	1.32	0.17	1518–50
pevm13	North sill beam, east side	19	-	-	3.09	0.15	-
pevm15	Westmost tiebeam (truss A)	31	-	h/s	2.29	0.15	-
pevm16	South post, truss B	31	-	-	3.36	0.28	-
pevm16a	*ditto*	31	-	-	3.46	0.30	-
pevm16b	*ditto*	17	-	-	3.07	0.26	-
pevm17i	South wallplate, bay A-B – inner rings	60	1408–67	-	1.19	0.20	after 1495
pevm17ii	South wallplate, bay A-B – outer rings	19	-	-	2.69	0.13	-
pevm18	North wallplate, bay A-B	68	1443–1510	h/s	1.50	0.16	1519–51
pevm19	Tiebeam B (painted beam)	61	-	17¼C	1.94	0.15	-
pevm20	South wallplate (2nd room from west)	32	-	?h/s	3.53	0.20	-

pevm21	South post, truss D	45	-	-	2.20	0.19	-
pevm22	Inserted tie C	23	-	-	2.82	0.19	-
pevm23	Inserted North post C	63	1442–1504	h/s	2.31	0.26	1513–45
pevm29	North post truss D	86	-	h/s	2.93	0.18	-
pevm38i	North common rafter 4th west of stack (smoke blackened, re-used) – inner rings	10	-	-	2.34	0.16	-
pevm38ii	*ditto* – outer rings	23	-	?h/s	1.64	0.21	-
pevm39i	North common rafter 3rd west of stack (smoke blackened, re-used) – inner rings	11	-	-	2.66	0.09	-
pevm39ii	*ditto* – outer rings	32	-	h/s	1.94	0.15	-
pevm43	Beam into rear outshot at west end	70	-	?h/s	1.53	0.20	-
Cross-wing							
pevm24	North tiebeam, King Edward VI bedroom	36	-	?h/s	2.52	0.30	-
pevm25	7th ceiling joist from east, north section of ceiling	50	-	2	2.03	0.31	-
pevm26	Doorhead to Oak Room entrance	73	1418–90	-	1.29	0.22	after 1499
pevm27	North-west corner post (core disintegrated, but had few rings)	NM	-	-	-	-	-
pevm28	Central E-W ceiling beam (grd flr)	108	1445–1552	h/s	1.60	0.21	1561–93
pevm34	West principal rafter, south gable end	38	-	-	2.33	0.18	-
pevm35	East common rafter, 2nd from south gable end	29	-	7	3.99	0.20	-
pevm36	East raking queen strut	63	1500–1562	26 +2-3mmNMC	1.92	0.24	*c.* 1562–67
pevm37	West raking queen strut	120	1438–1557	26 +10NMC	1.61	0.23	*c.* 1567–72
pevm40	North-east corner post, ground floor	32	-	h/s	4.79	0.18	-
pevm41	Sill beam north wall	37	-	h/s	3.79	0.19	-
pevm42	Girding beam, north wall	43	-	8?C	3.44	0.30	-
Connecting range							
pevm30	West principal rafter, middle truss	81	1485–1565	14 +1NM	1.42	0.17	*c.* 1566–71
pevm31	West common rafter, 1st from north	36	-	14	2.29	0.35	-
pevm32	East common rafter middle of central bay (re-used wallplate?)	124	-	h/s	1.05	0.14	-
pevm33	Collar to south truss	51	1503–53	h/s	2.10	0.24	1562–94

Key: ¼C = complete sapwood, felled the following spring; ?C = possible complete sapwood; h/s = heartwood/sapwood boundary; ?h/s = possible heartwood/sapwood boundary; NM = not measured

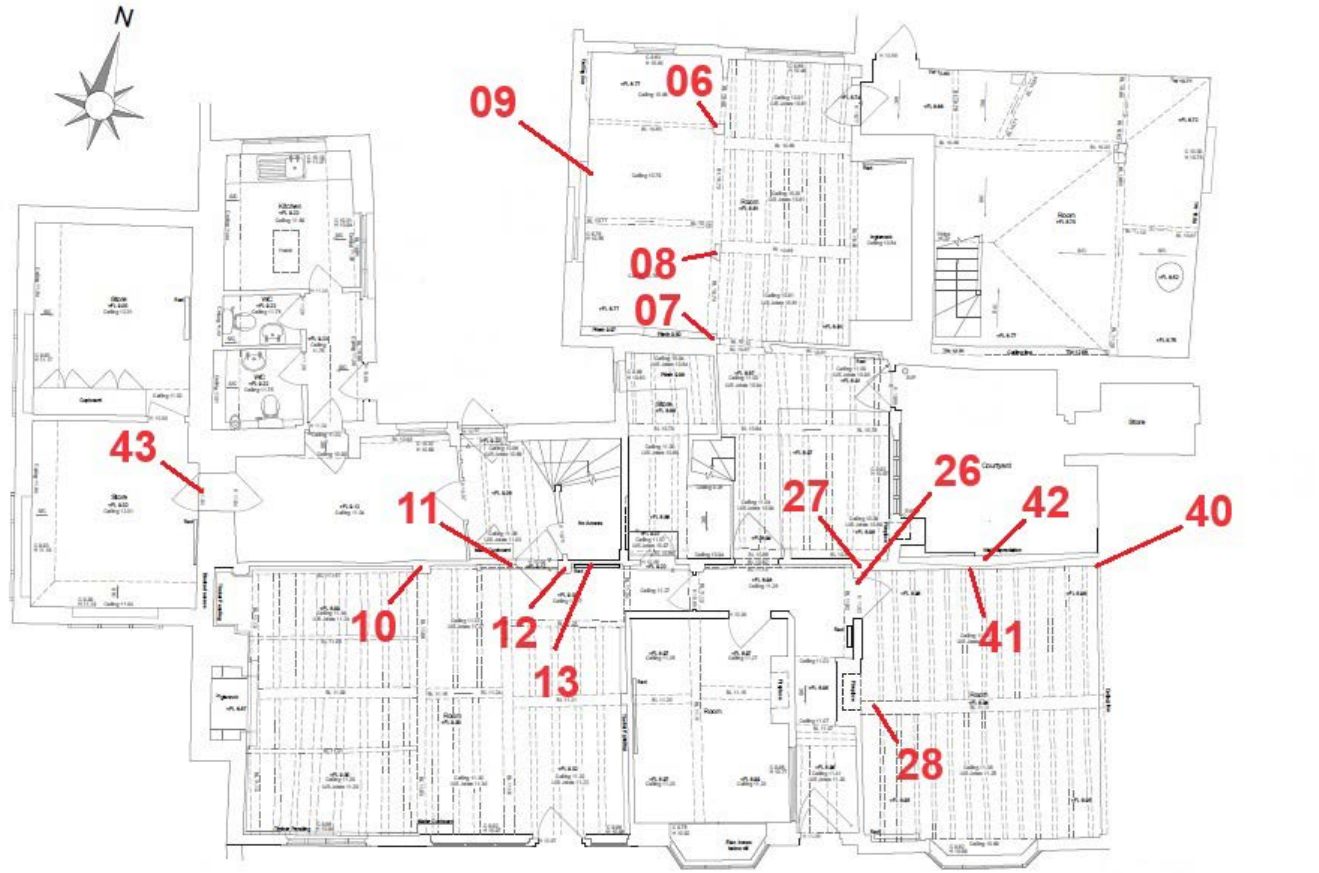

Figure 3: Plan of the ground floor showing the positions of the timbers sampled for dendrochronology [© owner; adapted from an original drawing by BES Geomatics]

Figure 4: Plan of the first floor showing the positions of the timbers sampled for dendrochronology [© owner; adapted from an original drawing by BES Geomatics]

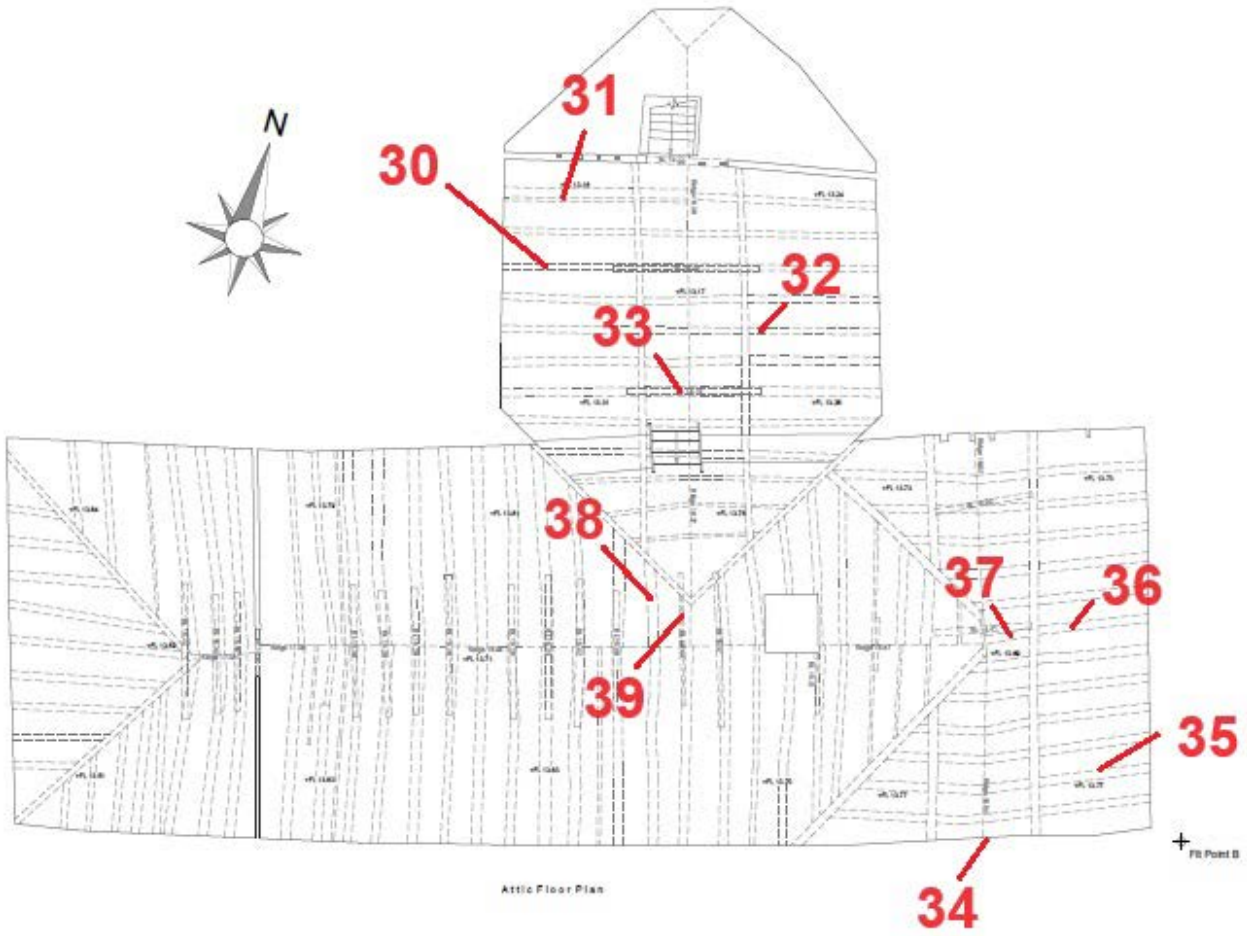

Figure 5: Plan of the attics showing the positions of the timbers sampled for dendrochronology [[© owner; adapted from an original drawing by BES Geomatics]

Table 2: Cross-matching between dated samples from the kitchen (shaded orange), hall (shaded green), cross-wing (shaded blue), and connecting range (shaded pink). Values of *t* above 3.5 are significant (\ indicates overlap <20 years, not calculated; - indicates *t*-values less than 0.0)

Sample No	pevm04	pevm05	pevm06	pevm09	pevm12	pevm17i	pevm18	pevm23	pevm26	pevm28	pevm36	pevm37	pevm30	pevm33
pevm01	6.0	0.3	5.4	5.7	2.8	1.1	3.9	0.9	3.5	2.6	\	1.6	1.21	\
pevm04		1.3	13.7	4.1	2.9	2.8	3.9	2.2	1.3	3.4	\	1.6	1.8	\
pevm05			2.3	-	1.6	3.5	-	0.6	1.4	0.8	\	-	\	\
pevm06				4.1	3.6	2.1	4.9	2.8	1.8	2.8	\	2.0	1.3	\
pevm09					2.4	\	2.5	2.3	1.2	1.7	\	1.5	2.1	\
pevm12						0.7	3.7	4.7	2.7	2.9	\	1.9	0.9	\
pevm17i							-	0.1	1.8	-	\	1.2	\	\
pevm18								1.9	0.5	3.3	\	1.0	3.3	\
pevm23									4.8	2.4	\	2.8	1.4	\
pevm26										1.4	\	5.8	\	\
pevm28											-	1.3	2.9	1.2
pevm36												4.2	0.8	3.3
pevm37													1.9	4.5
pwvm30														5.8

Table 3a: Dating evidence for series pevm64m0109, dated AD 1379–1511

Source region	Chronology:	Publication reference:	Filename:	Span of chronology (AD)	Overlap (years)	*t*-value
East Sussex	Hillside, Brede	Miles and Bridge 2012	BREDE	1438–1506	69	6.7
Somerset	Manor Court House, Chard	Arnold et al. 2004	SMCASQ01	1409–1517	103	6.6
Kent	Westenhanger Manor Barn	Arnold and Howard 2009a	WHBASQ01	1433–1581	79	6.2
Surrey	Vann, Hambledon	Miles et al. 2000	VANN	1404–1593	108	5.4
Hampshire	Bere Farm, Soberton	Bridge et al. 2011	SOBERTON	1384–1480	97	5.3
Kent	Old Leigh Place, North Leigh	Miles et al. 2007a	OLP68m	1411–1533	101	5.3
Brittany	Beaumanoir	Meirion-Jones pers. comm.	BMN	1421–1560	91	5.2
Brittany	Le Plessis Josso	Meirion-Jones pers. comm.	LPJMEAN	1315–1661	133	5.2
Hampshire	Tudor Cottage, Romsey	Bridge et al. 2010	TCROMSEY	1426–1523	86	5.1
East Sussex	Chiddingly Place	Arnold and Litton 2003	CHDESQ01	1324–1576	133	5.1

Table 3b: Dating evidence for sample pevm05, dated AD 1409–88

Source region	Chronology:	Publication reference:	Filename:	Span of chronology (AD)	Overlap (years)	*t*-value
Shropshire	Old Hall Farm, All Stretton	Miles and Haddon-Reece 1996	OLDHLLFM	1379–1630	80	6.0
Hampshire	Godbegot, Winchester	Miles and Worthington 2002a	GODBEGOT	1321–1462	54	5.7
Shropshire	Bromfield Church	Nayling 2000	BROMt6	1359–1588	80	5.3
Warwickshire	Stoneleigh Abbey	Howard et al. 2000	STOISQ01	1387–1658	80	5.2
W. Yorkshire	Barns at Headley Hall Farm	Tyers 2001	HEADLEY1	1381–1604	80	5.2
N. Yorkshire	West Hall, Nesfield	Hillam 1983	NESFIELD	1407–80	72	5.1
Warwickshire	Bell Cottages, Tanworth	Miles and Worthington 2000	TANWRTH2	1352–1560	80	4.9
W. Yorkshire	Calverley Hall	Hillam 1981	CALVER	1261–1480	72	4.9
W. Yorkshire	Elland Old Hall	Hillam 1984	ELLAND	1372–1574	80	4.8
Wiltshire	Salisbury Cathedral	Miles 2005b	SARUM11	1409–1541	80	4.8

Table 3c: Dating evidence for sample pevm17, dated AD 1408–67

Source region	Chronology:	Publication reference:	Filename:	Span of chronology (AD)	Overlap (years)	*t*-value
Hampshire	King's Somborne Manor	Miles et al. 1999a	KNGSMBRN	1273–1503	60	7.4
Warwickshire	Pedagogue's House, Stratford	Arnold et al. 2006a	SUABSQ02	1377–1502	60	7.3
Worcestershire	The Commandery, Worcester	Arnold et al. 2006b	WORDSQ01	1284–1473	60	6.9
West Midlands	Primrose Hill, King's Norton	Arnold and Howard 2008	KGNBSQ01	1354–1593	60	6.5
Worcestershire	The Raven Hotel, Droitwich	Bridge and Miles 2022	RAVENt15	1280–1535	60	6.5
Worcestershire	Church House, Areley Kings	Miles et al. 2003	ARELEY	1365–1535	60	6.3
Warwickshire	Gorcott Hall	Nayling 2006	GORC_T17	1385–1531	60	6.2
Warwickshire	36 High Street, Stratford	Bridge and Tyers 2022	SA36HGHt5	1353–1455	48	6.2
Herefordshire	Kings Pyon Barn	Groves and Hillam 1993	KINGPYON	1346–1480	60	6.2
Worcestershire	Hartlebury Castle Saloon Roof	Tyers 2008	HARTSALN	1339–1608	60	5.8

Table 3d: Dating evidence for sample pevm18, dated AD 1443–1510

Source region	Chronology:	Publication reference:	Filename:	Span of chronology (AD)	Overlap (years)	*t*-value
East Sussex	Hillside, Brede	Miles and Bridge 2012	BREDE	1438–1506	64	6.0
Hampshire	4-5 Hinton Hill, Hinton Ampner	Bridge et al. 2020	HNTNAMPR	1398–1576	68	5.4
East Sussex	Falmer Court Barn	Howard et al. 1998a	FALASQ01	1386–1497	55	5.4
Gloucestershire	Naas House, Lydney	Howard et al. 1998b	NAAS2	1360–1591	68	5.4
London	Hampton Court Palace	Miles and Bridge 2013	HMPTNCT6	1351–1533	68	5.4
Lincolnshire	Fenton Church	Arnold et al. 2005	FENASQ02	1434–1617	68	5.1
Hampshire	Barn, St Leonard's Grange	Bridge 2005	STLENBL1	1433–1550	68	4.9
Somerset	Viaduct View, Pensford	Miles et al.1999b	PENSFORD	1362–1511	68	4.9
Devon	Yarde Farmhouse, Malborough	Arnold and Howard 2009b	YRDFSQ01	1432–1603	68	4.8

Table 3e: Dating evidence for sample pevm23, dated AD 1442–1504

Source region	Chronology:	Publication reference:	Filename:	Span of chronology (AD)	Overlap (years)	*t*-value
East Sussex	Chiddingly Place	Arnold and Litton 2003	CHDESQ01	1324–1576	63	6.4
Hampshire	Straw Barn, Boarhunt Manor	Miles et al. 2006	BOARHNT1	1412–1551	63	6.3
Hampshire	Tudor House, Southampton	Miles et al. 2009	TUDORHS1	1331–1492	51	6.1
Norfolk	St Nicholas Church, Potter Heigham	Arnold and Howard 2013	PTHASQ02	1456–1520	49	5.7
Hampshire	Southwick Barn	Miles and Worthington 1998	SWKBARN	1362–1493	52	5.7
Somerset	Wigborough Manor, South Petherton	Miles et al. 1997a	WIGBORO	1447–1584	58	5.6
Hampshire	Barn, Homestead, Hartley Wintney	Bridge et al. 2012	HARTLEYW	1440–1540	63	5.6
Essex	Eastbury Manor, Barking	Tyers 1997	EASTBURY	1250–1565	63	5.3
Hampshire	10 Bridge Street, Wickham	Bridge et al. 2016	WICKBRCK	1381–1494	53	5.1
Dorset	Winterborne Clenston Barn	Bridge 2013	WINTCLEN	1339–1515	63	5.0

Table 3f: Dating evidence for sample pevm26, dated AD 1418–90

Source region	Chronology:	Publication reference:	Filename:	Span of chronology (AD)	Overlap (years)	*t*-value
Hampshire	Chawton House	Miles et al. 1998	CHAWTON3	1446–1582	73	5.8
East Sussex	Hempstead House, Framfield	Bridge and Miles 2016	HMPSTDHO	1373–1501	73	5.6
Hampshire	Abbots Barton	Miles et al. 1998	ABTSBRTN	1387–1559	73	5.6
Hampshire	Winchester College	Miles et al. 1996	WNCHSTR2	1403–1537	73	5.5
Hampshire	Pilgrims Hall, Winchester	Miles et al. 2009	PILGRIM2	1245–1478	61	5.4
Hampshire	Mottisfont Abbey	Miles 1996	MOTISFNT	1388–1538	73	5.4
Hampshire	Straw Barn, Boarhunt Manor	Miles et al. 2006	BOARHNT1	1412–1551	73	5.4
Hampshire	Chawton House	Miles and Worthington 2002a	CHAWTON6	1289–1589	73	5.3
Somerset	Upper Row Farm, Hemington	Miles and Worthington 2002b	HEMINGTN	1300–1490	73	5.2
Hampshire	St Olaf's Pond Cottage, Wonston	Miles et al. 1997b	STOLAFS	1376–1535	73	5.2

Table 3g: Dating evidence for sample pevm28, dated AD 1445–1552

Source region	Chronology:	Publication reference:	Filename:	Span of chronology (AD)	Overlap (years)	*t*-value
Hampshire	Corner Cottage, Baughurst	Miles et al. 2009	BAUGHRST	1424–1580	108	6.2
Hampshire	Bere Farmhouse, North Boarhunt	Miles et al. 2006	BEREFHNB	1394–1587	108	5.9
East Sussex	Chiddingly Place	Arnold and Litton 2003	CHDESQ01	1324–1576	108	5.3
Hampshire	4–5 Hinton Hill, Hinton Ampner	Bridge et al. 2020	HNTNAMPR	1398–1576	108	5.2
Hampshire	Beaulieu Abbey Domus	Hillam and Groves 1992	BEAULIE2	1494-1594	59	5.2
Hampshire	The Donkey Cart, Petersfield	Miles et al. 1997a	DONKYCRT	1447–1533	87	5.0
West Sussex	44–8 High Street, Crawley	Bridge et al. 2020	CRAWLEY3	1412–1564	108	5.0
Surrey	Reigate Priory	Bridge 2003	REIGPRY	1384–1545	101	4.9
Brittany	Beaumanoir	Meirion-Jones pers. comm.	BMN	1421–1560	108	4.8
Surrey	Apple Tree Cottage, Elstead	Tyers 2000	ELSTEAD	1396–1591	108	4.8

Table 3h: Dating evidence for sub-site chronology, pevm30367, dated AD 1438–1565

Source region	Chronology:	Publication reference:	Filename:	Span of chronology (AD)	Overlap (years)	*t*-value
Oxfordshire	166–8 The Hill, Burford	Miles et al. 2014	BURFRD11	1454–1537	84	7.3
Buckinghamshire	Chenies Manor	Miles et al. 2004	CHENIES1	1370–1551	114	7.2
Hampshire	St Olaf's Pond Cottage, Wonston	Miles et al. 1997b	STOLAFS	1376–1535	98	7.1
West Sussex	Gaskyns, Slinfold	Miles and Worthington 2002b	GASKYNS2	1440–1555	116	7.0
Hertfordshire	Priory Barn, Little Wymondley	Bridge 2001	LWYMON2	1450–1540	91	6.8
Oxfordshire	35–6 Observatory Close, Benson	Miles and Bridge 2015	OCB	1424–1538	101	6.6
West Sussex	Danny House, Hurstpierpoint	Miles and Bridge 2010	DANNY1	1389–1589	128	6.6
East Sussex	Plumpton Place	Bridge et al. 2021	PLUMPTON	1463–1589	103	6.4
Norfolk	Fundenhall Church	Bridge 2009	FUNDNHL1	1503–1614	63	6.4
London	Queen's House, Tower of London	Bridge and Miles 2016	TOLQHS1	1353–1538	101	6.2

Table 3i: Strongest matches for site chronology, PEVENSEY, dated AD 1379–1565

Source region	Chronology:	Publication reference:	Filename:	Span of chronology (AD)	Overlap (years)	*t*-value
Hampshire	St Michael's Cottage, Chilbolton	Miles et al. 2007b	CHLBLTN1	1421–1554	134	8.7
West Sussex	Gaskyns, Slinfold	Miles and Worthington 2002b	GASKYNS2	1440–1555	116	8.3
East Sussex	Mottynsden Manor, Burwash	Bridge and Miles 2023	MOTYNSDN	1464–1540	77	7.9
Wiltshire	Salisbury Cathedral	Miles 2005b	SARUM11	1409–1541	133	7.9
Hampshire	Exton Barn	Miles and Haddon-Reece 1995	EXTON	1376–1546	168	7.8
Hampshire	Winchester College painted panels	Miles and Haddon-Reece 1996	WNCHSTR2	1403–1537	135	7.8
Hampshire	Straw Barn, Boarhunt Manor	Miles et al. 2006	BOARHNT1	1412–1551	140	7.7
Hampshire	Chawton House	Miles et al. 1998	CHAWTON3	1446–1582	160	7.6
East Sussex	Chiddingly Place	Arnold and Litton 2003	CHDESQ01	1324–1576	187	7.5
Somerset	Wigborough Manor, S. Petherton	Miles and Worthington 1997	WIGBORO	1447–1584	119	7.4

Interpretation and Discussion

The kitchen and hall ranges appear to be more or less coeval (Fig. 6), although the weak cross-matching between the two groups of timbers suggests that different sources of timber may have been used, which in turn suggests there could have been a short period between the construction of these two elements. The mean heartwood/sapwood boundary date for the seven samples with heartwood/sapwood boundary, omitting pevm05, which appears to be an earlier, possibly reused timber, is AD 1508, giving a likely felling date range of AD 1517–49. However, this can be further refined, using the methodology described above as implemented in OxCal v4.4 (Bronk Ramsey 2009). Sapwood estimates were produced for each of the seven dated series with heartwood/sapwood boundary present with these being combined in order to derive the posterior density estimate for the *combined felling date distribution* (Fig. 7; Appendix 2). The distributions have good agreement with the interpretation that these timbers represent a single felling episode (Acomb: 169.0, An: 26.7, n: 7). It is estimated that this felling episode occurred in *AD 1524–34* (*95.4% probability; MintHo*; Fig. 7). Sample pevm05 is potentially slightly earlier with an empirically derived individual felling date range of AD 1495–1527 or, again using the methodology as implemented in OxCal 4.4, *AD 1496–1525* (*95.4% probability*)*; sapwood pevm05,* Fig. 8; Appendix 2).

The cross-wing and connecting range also appear to be coeval with each other. Three of this group of six timbers retained complete sapwood, although this was detached in all cases. However, few if any, rings were thought to have been lost from these samples, allowing a narrow five-year felling date range to be estimated for these timbers (Fig. 6). It seems likely therefore that the cross-wing and connecting range were constructed in the late AD 1560s or early 1570s.

Reused smoke blackened rafters in the hall roof had short ring sequences, but in the future may be suitable for analysis by other complementary scientific dating methods, such as radiocarbon wiggle-matching or oxygen isotope dendrochronology.

Other than sample pevm05, the trees used seem likely to have been grown relatively locally, but the poor cross-matching suggests they may have come from several sources, perhaps not surprising in what was at the time a thriving port town, where perhaps timbers were imported from the hinterland for export by sea.

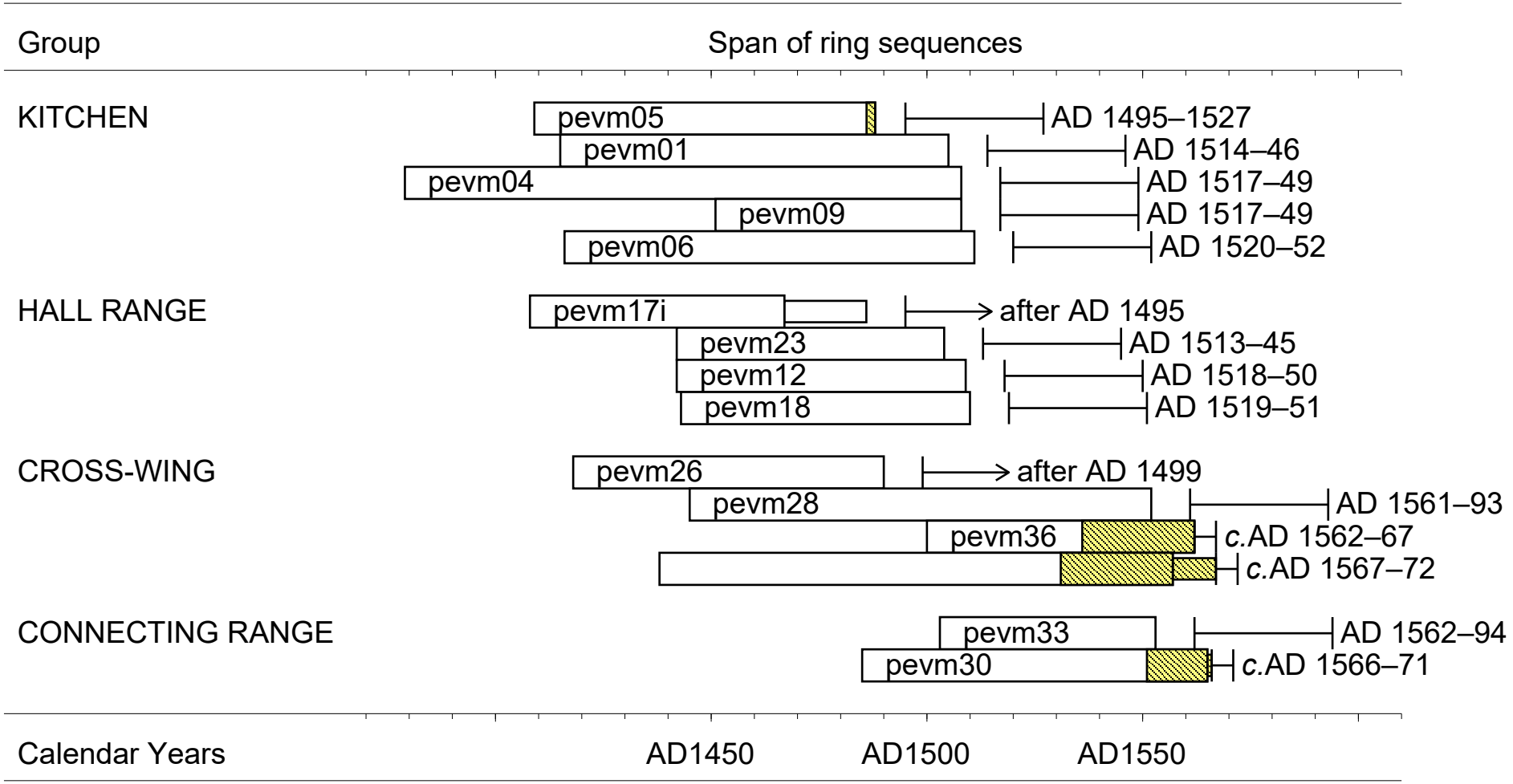

Figure 6: Bar diagram showing the relative positions of overlap of the dated ring sequences and their individual felling date ranges. White bars represent measured heartwood rings, hatched yellow sections represent sapwood rings, and narrow sections represent unmeasured additional rings

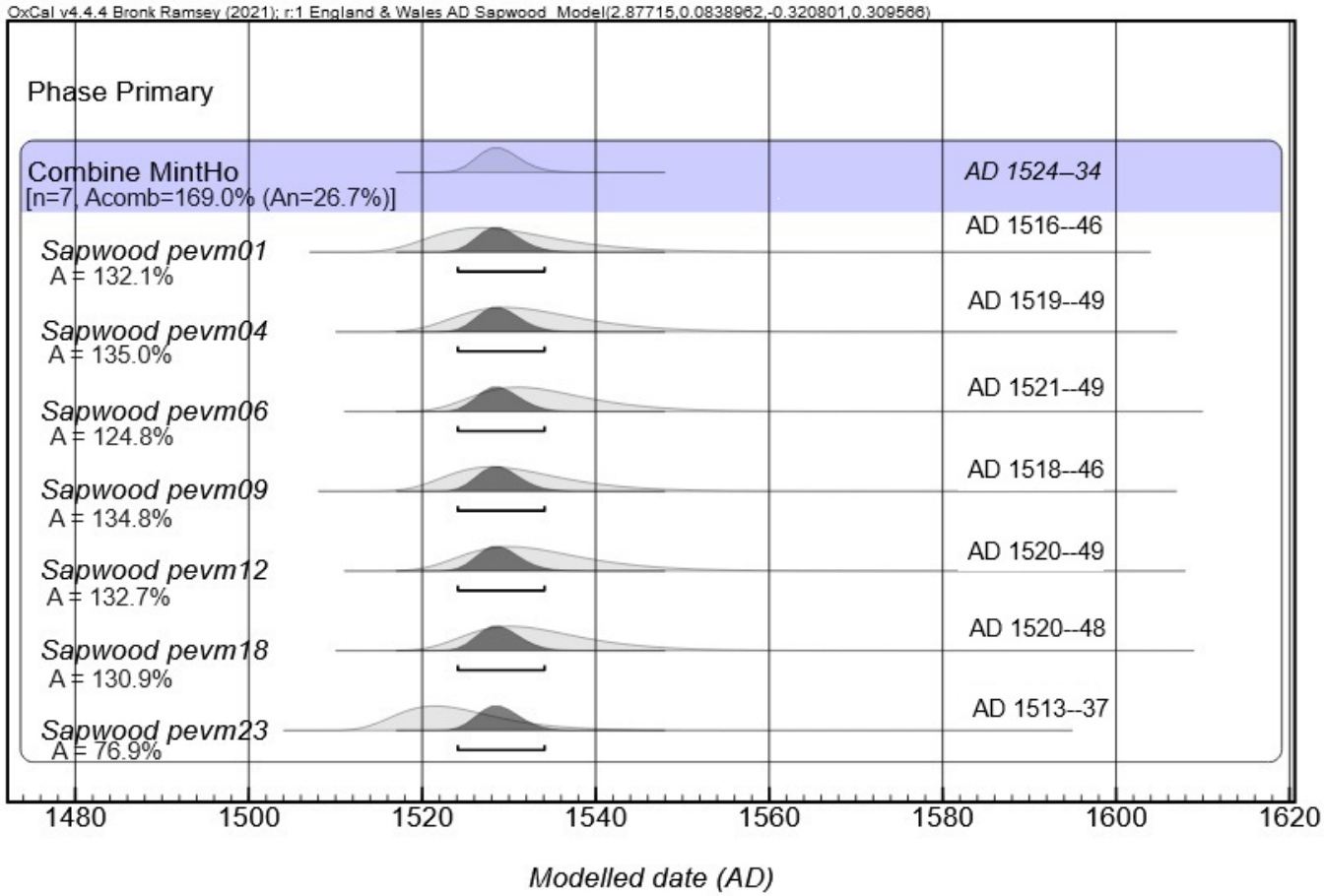

Figure 7. Old Mint House, Pevensey: combined felling date range and individual felling date distributions for timbers dated from the kitchen and hall (except pevm05). Individual felling date distributions are shown in outline and the 95.4% probability individual felling dates ranges are listed. The 95.4% probability combined felling date range is shown in black and italic text

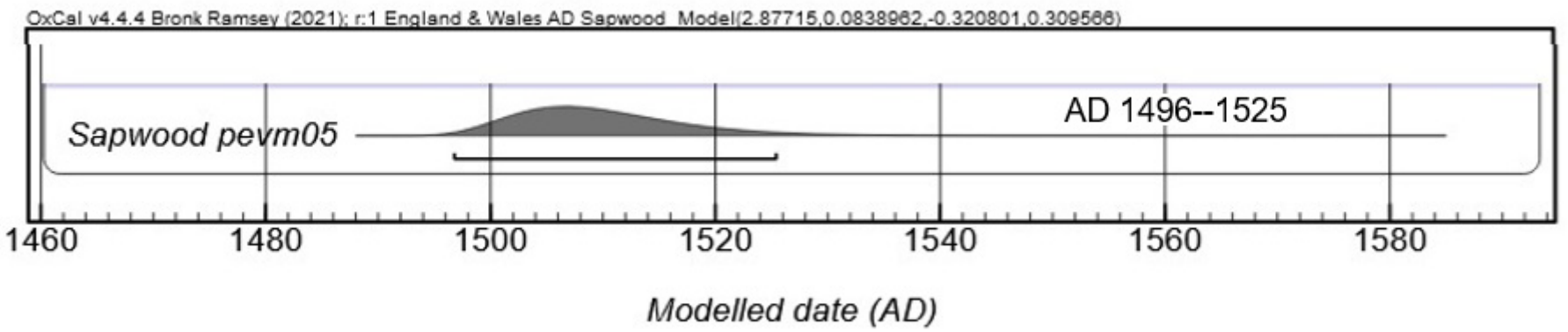

Figure 8. Old Mint House, Pevensey: Individual felling date distribution for pevm05 is shown in outline with the 95.4% probability individual felling date range listed.

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Appendix 1

Ring width values (0.01mm) for the sequences measured

pevm01

125	117	123	165	188	173	164	113	157	148
131	147	138	115	125	102	120	123	143	132
144	114	132	114	102	164	205	196	153	100
104	120	108	122	140	116	141	142	131	150
109	129	118	137	105	103	129	160	181	148
150	131	114	113	65	123	101	136	139	131
131	129	104	80	74	130	187	159	171	131
140	138	118	114	110	137	128	102	91	156
153	209	125	108	103	84	103	106	130	121
116									

pevm02

113	111	119	102	89	115	141	150	133	81
80	83	99	87	109	135	130	121	114	169
94	101	135	138	272	203	215	179	205	190
264	246	190	165	154	147	128	211	222	155
162	162	132	119	103	78	124	128	170	143
82	115	107	148	126	99	75	81	60	79
104	79	83	67	80	100	106	116	84	179
104	161	125	122	137	111	121	147	113	62
68	125	114	155						

pevm03

318	249	307	282	269	248	248	180	188	198
159	151	167	155	164	229	224	277	234	229
262	169	185	109	127	166	215	236	230	234
198	190	175	263	234	199	189	250	221	

pevm04

217	193	156	115	128	215	185	346	231	115
122	87	78	53	88	114	156	135	109	84
38	35	60	49	113	188	211	250	192	84
93	162	164	210	163	151	149	94	113	135
129	123	147	123	170	121	77	118	188	191
216	137	164	175	138	159	179	181	231	134
144	214	186	183	113	102	106	126	117	63
98	56	103	101	122	140	129	164	147	130
56	59	92	151	162	153	127	125	134	67
61	184	221	214	171	177	231	206	71	55
109	163	165	208	221	210	218	216	245	138
187	175	128	121	105	188	196	248	174	142
101	96	111	128	172	151	146	180	160	154

pevm05

249	396	344	447	495	391	387	218	191	204
140	175	140	125	169	114	85	94	83	78
69	35	41	64	59	100	125	113	70	67
59	80	72	69	113	124	127	127	142	113
161	155	150	160	130	180	164	195	164	154
143	144	129	145	109	47	56	72	141	176
159	113	108	109	128	156	156	134	115	114
122	136	109	93	111	135	122	115	128	155

pevm06

201	380	431	232	180	174	130	240	171	131
165	173	210	245	106	153	183	155	126	175
130	130	86	116	155	119	150	116	78	83
75	120	69	160	64	118	136	124	172	115
165	160	170	95	85	115	171	267	161	128
153	139	77	81	184	208	197	182	206	283
269	96	59	162	205	181	208	232	201	259
270	257	181	213	265	182	183	103	258	236
222	149	145	127	88	139	150	164	150	145
243	146	182	172	196	208				

pevm07i

507	514	622	656	761	566	455	617

pevm07ii

389	303	367	392	382	228	295	207	320	329
297	333	359	309	374					

pevm08

405	326	420	524	709	619	535	830	761	652
604	523	439	309	218	186	178	274	175	222
160	151	176	124	122	164	134	115	140	168
132	154	181	164	168	149	173	184		

pevm09

370	268	245	254	173	203	235	288	302	255
248	220	284	276	230	284	204	149	64	125
104	127	126	149	146	168	115	90	91	105
128	112	122	149	118	131	150	106	89	98
86	91	79	102	118	142	74	81	60	59
94	95	93	110	61	65	59	81		

pevm10a

309	268	176	178	180	307	341	238	208	183
173	232	222	246	224	215	147	172	147	119
147	195	187	186	203	150	229	177	150	164
157	163	259	212	168	166	179	175	155	192
202	224	166	120	87	111	131	236	214	188
157	212	159	209	202	190	185	150	139	225
222									

pevm10bi
290 279 242 164 178 200 153 189 255 185
200 175 163 203 192 176

pevm10bii
181 193 186 170 242 197 187 158 183 169
174 175 186 216 170 110 82 88 120 193
191 204 155 227 186 186 207 210 195 161
156 220

pevm11
454 449 461 322 410 378 490 376 380 312
265 272 155 114 123 171 184 278 288 250
241 284 255 262 271 258

pevm12
185 240 188 174 185 135 109 146 106 213
231 212 220 149 155 112 133 120 80 65
105 115 79 105 140 100 117 102 143 82
98 105 111 117 108 81 79 102 121 114
90 100 92 83 86 116 107 94 109 108
100 103 98 133 159 152 179 155 144 142
130 164 165 201 176 176 156 179

pevm13
210 281 363 248 298 359 315 384 387 417
341 364 320 286 283 289 250 280 196

pevm14i
221 208 250 275 190 169 224 218 282 223
131 117 126 122 179 209 217 195 219 150
166 135 122 172 196

pevm14ii
119 133 133 133 107 91 111 129 124 156
184 162 192 256 196

pevm15
320 347 357 334 291 256 335 325 335 261
274 263 184 196 203 257 336 331 195 151
127 122 129 149 148 131 124 170 112 162
166

pevm16a
545 605 585 238 350 300 336 294 248 366
297 161 244 315 274 338 481 240 358 274
434 255 435 249 337 331 262 382 435 463
288

pevm16b

340 339 438 212 261 213 352 292 420 236
296 296 226 292 328 397 276

pevm17i
423 356 293 266 271 197 160 117 77 96
132 81 107 110 103 138 131 134 119 154
150 122 92 87 118 81 64 79 49 54
49 56 83 112 77 73 106 95 73 73
52 50 71 90 89 82 63 80 89 94
109 85 129 129 153 150 94 123 116 110

pevm17ii
313 425 249 248 255 320 352 405 296 296
279 241 197 203 200 218 201 222 184

pevm18
247 205 161 111 126 172 183 131 181 207
230 242 146 155 129 137 134 140 122 184
173 140 224 178 188 119 120 149 137 191
158 172 167 169 114 95 140 149 163 146
146 138 151 168 205 152 138 166 126 109
125 173 179 175 144 105 120 116 111 103
116 96 126 125 135 115 110 123

pevm19
397 352 348 291 341 357 274 298 268 330
315 227 250 239 257 254 205 218 201 154
210 167 192 169 134 118 134 155 151 192
169 194 131 148 142 172 162 234 225 177
223 219 167 161 167 133 144 122 179 156
148 133 122 108 114 176 170 80 73 58
57

pevm20
295 268 170 238 431 498 643 489 412 309
536 476 596 633 631 587 336 282 280 337
363 393 343 212 228 189 149 168 206 193
183 212

pevm21
258 154 395 262 316 340 307 253 287 141
163 221 232 285 269 292 393 282 270 256
244 198 196 188 153 161 225 183 233 184
173 142 123 149 170 222 207 126 139 181
180 176 168 210 202

pevm22
406 361 353 437 346 396 407 271 239 283
459 227 337 256 210 269 210 187 166 165
169 155 184

pevm23

342	417	277	222	202	221	226	252	289	383
386	240	430	332	281	301	266	232	120	54
125	189	144	152	255	128	156	105	153	175
208	170	188	287	167	124	266	302	360	261
258	208	236	157	258	264	243	216	266	192
260	219	202	299	306	202	267	203	222	150
195	146	166							

pevm24

230	208	229	198	169	324	224	181	251	425
341	273	219	389	403	342	124	247	192	420
149	399	292	414	216	230	277	205	181	173
170	167	195	203	201	210				

pevm25

285	141	144	103	101	127	121	235	300	205
312	295	329	223	342	211	184	230	197	113
205	174	156	132	159	95	112	53	66	83
69	97	201	301	444	396	545	562	299	289
99	105	214	131	96	118	156	196	254	156

pevm26

122	111	112	90	72	122	117	136	121	91
110	87	57	87	105	94	116	105	80	176
112	117	127	142	145	143	83	107	88	95
75	69	113	207	152	120	234	214	188	215
235	173	150	86	115	129	91	106	107	87
136	107	116	97	133	119	144	173	114	95
114	115	183	251	161	142	141	134	186	159
146	145	167							

pevm28

130	87	106	118	154	89	162	172	197	299
170	144	80	84	49	38	62	111	178	209
299	328	308	298	168	149	153	258	236	304
286	252	135	149	190	203	204	223	282	292
178	185	162	164	160	126	131	111	140	175
133	259	283	160	159	137	162	182	205	177
128	167	158	180	146	151	184	194	232	217
189	195	173	183	200	193	165	206	180	199
157	180	189	158	110	59	82	99	102	70
110	138	156	118	129	109	93	57	63	48
46	60	48	78	107	97	127	112		

pevm29

642	595	651	564	735	528	594	548	528	440
645	443	358	317	336	437	399	443	407	317
266	336	343	332	236	83	150	184	260	170
149	207	198	262	237	279	272	311	315	211
311	261	232	215	244	255	274	298	274	357

294 242 250 306 200 259 206 274 250 191
211 248 203 252 278 261 205 176 146 185
201 196 226 184 178 180 202 203 226 160
179 179 203 232 233 141

pevm30
126 214 252 241 177 249 136 180 164 197
207 238 221 166 185 156 185 177 154 149
144 143 165 139 145 114 117 100 81 103
95 85 105 87 86 60 70 94 80 84
80 104 91 74 60 46 77 75 72 94
149 169 189 154 168 138 122 85 126 150
173 187 193 184 191 199 203 247 200 141
144 182 148 128 150 120 143 163 139 126
84

pevm31
262 193 224 287 502 633 396 350 400 290
166 183 140 151 226 250 140 468 293 181
204 249 182 91 143 103 280 203 136 141
196 109 111 192 80 93

pevm32
111 124 121 144 138 127 110 99 112 104
102 90 87 87 95 119 98 113 130 95
82 68 81 105 102 84 90 100 117 123
107 98 106 101 118 94 114 105 133 114
84 72 90 85 91 85 85 88 109 118
95 115 85 79 90 111 130 112 119 84
120 102 97 106 144 134 125 114 106 115
94 96 120 114 149 129 125 125 117 153
136 97 105 107 125 146 148 108 121 114
99 100 68 121 107 75 94 88 106 75
71 70 95 92 104 92 88 86 70 97
91 77 106 112 120 132 116 113 99 101
99 105 119 94

pevm33
264 237 291 370 301 218 164 193 148 178
142 196 238 170 160 165 161 93 155 227
116 201 160 203 175 191 137 120 216 148
160 232 391 293 260 223 210 221 189 106
207 166 216 211 259 244 265 217 275 315
330

pevm34
235 260 321 279 347 169 134 162 159 204
203 191 179 182 112 106 109 156 205 284
291 279 227 266 200 224 207 134 238 215
201 318 286 361 354 370 361 306

pevm35
477 385 456 379 489 357 338 272 335 539
310 321 311 328 453 524 468 419 483 639
355 466 391 383 305 252 356 410 367

pevm36
220 273 305 183 284 261 297 265 274 366
254 260 279 330 268 337 280 181 413 294
217 456 423 257 236 191 201 189 225 212
173 298 170 186 175 229 159 133 117 121
93 123 108 94 128 137 111 107 77 96
115 175 103 90 69 86 48 56 65 50
75 52 56

pevm37
215 139 125 115 117 103 63 103 80 80
98 104 191 394 341 288 381 343 349 309
246 196 206 150 146 192 120 130 140 92
146 158 246 200 223 150 168 210 192 176
229 297 294 403 321 247 351 244 193 172
176 187 190 144 130 100 156 146 174 144
150 121 115 181 216 117 116 157 203 236
186 152 246 179 189 249 211 168 171 108
193 164 101 183 162 133 146 124 169 176
144 111 95 120 103 65 83 158 99 123
86 74 61 95 75 91 60 70 70 79
106 116 80 120 57 53 51 53 47 47

pevm38i
169 236 282 261 255 322 248 206 201 156

pevm38ii
228 202 129 189 194 153 137 160 125 155
151 211 171 171 111 92 132 167 193 138
152 162 253

pevm39i
228 278 275 298 249 258 232 288 280 259
277

pevm39ii
149 191 173 184 175 176 211 183 175 187
157 146 162 164 212 191 219 232 288 182
239 211 210 243 164 147 178 155 199 204
293 201

pevm40
279 400 503 282 366 404 447 615 633 741
668 444 379 366 316 393 544 439 508 482
525 466 444 579 660 650 533 371 478 409
476 519

pevm41

386	311	328	387	409	338	550	563	512	469
544	425	411	505	467	351	630	526	528	336
308	382	357	237	226	201	295	276	196	252
262	255	298	477	319	296	422			

pevm42

219	273	479	337	251	261	271	278	221	364
343	272	398	565	641	712	582	576	762	644
261	410	179	152	421	520	369	496	293	198
299	337	302	327	213	278	134	200	165	202
256	159	179							

pevm43

314	346	291	135	169	144	153	174	218	269
338	219	199	183	189	145	251	198	189	236
193	186	89	82	68	61	60	98	119	110
106	91	139	117	101	85	96	166	209	172
193	129	152	174	143	144	104	81	92	91
81	88	102	85	99	95	150	172	178	169
115	141	178	128	187	174	142	124	158	102

Appendix 2: OxCal Code

Phase Primary (Fig. 7)

```
Options()
 {
  Resolution=1;
  Phase("Primary");
 };
 Plot()
 {
  Sapwood_Model("England & Wales AD", 2.877146, 0.0838962, -0.3208009, 0.3095663);
  Combine("MintHo")
  {
   Sapwood("pevm01", 1505, 91, 0, 1.30);
   Sapwood("pevm04", 1508, 130, 0, 1.45);
   Sapwood("pevm06", 1511, 96, 0, 1.68);
   Sapwood("pevm09", 1508, 58, 0, 1.49);
   Sapwood("pevm12", 1509, 68, 0, 1.32);
   Sapwood("pevm18", 1510, 68, 0, 1.50);
   Sapwood("pevm23", 1504, 63, 0, 2.31);
  };
 };
```

Sapwood pevm05 (Fig. 8)

```
Options()
 {
  Resolution=1;
  Phase("Primary");
 };
 Plot()
 {
  Sapwood_Model("England & Wales AD", 2.877146, 0.0838962, -0.3208009, 0.3095663);
  Combine("pevm05")
  {
   Sapwood("pevm05", 1486, 78, 2, 1.45);
  };
 };
```

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