

SHERBORNE HOUSE, NEWLAND, SHERBORNE, DORSET TREE-RING ANALYSIS OF TIMBERS FROM THE TUDOR WING

SCIENTIFIC DATING REPORT

Martin Bridge



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SHERBORNE HOUSE,
NEWLAND, SHERBORNE,
DORSET

TREE-RING ANALYSIS OF TIMBERS FROM THE TUDOR
WING

Martin Bridge

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SUMMARY

A small number of samples were obtained from the 'Tudor Wing' of Sherborne House. The ring series from two heavily moulded ceiling beams were dated, one of which retained the heartwood-sapwood boundary, giving a likely felling date range for these timbers of AD 1468–1500. A further four timbers; three tiebeams and an unmoulded ceiling beam, were also dated. One tiebeam retained complete sapwood, and was found to have come from a tree felled in spring AD 1671, and the likely felling date ranges for the other tiebeams and the unmoulded ceiling beam give likely felling date ranges that would suggest these timbers form a single batch, most likely felled at the same time, or within a few years of each other. This suggests that this wing used ceiling timbers from trees felled in the period AD 1468–1500, but it is not clear whether this represents the date of the primary construction of this wing, or whether these timbers were perhaps reused. The west-end ground-floor ceiling, and the tiebeams, were inserted in AD 1671 or very soon thereafter.

CONTRIBUTORS

Dr M C Bridge

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INTRODUCTION

Sherborne House is a Grade 1 listed building which is on the Heritage at Risk register. Situated in the middle of the town of Sherborne (Fig 1), this three-storey early Georgian mansion built in *c* AD 1720 incorporates an earlier structure of which one wing survives at the intersection between two ranges, with an additional wing and outbuildings (Fig 2), that has been the subject of a survey by Rodwell (2009).



Figure 1: Map of Sherborne showing the location within the town of Sherborne House. © Crown Copyright and database right 2014. All rights reserved. Ordnance Survey Licence number 100024900

The grand, early eighteenth-century, main part of the house was undergoing renovation in late 2012 which revealed the remains of an earlier timber-framed wall that had become incorporated into the fabric of the later building. This discovery provided the initial impetus for Jenny Chesher to request dendrochronological input in order to inform the historical development of the building.

METHODOLOGY

Fieldwork for the present study was carried out in November 2012. In the initial assessment, accessible oak timbers with more than 50 rings and where possible traces of sapwood were sought, although slightly shorter sequences are sometimes sampled if little other material is available. Those timbers judged to be potentially useful were cored using a 15mm auger attached to an electric drill. The cores were glued to wooden laths, 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 combination of visual matching and a process of qualified statistical comparison by computer. 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 -value ranges 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 matches 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, ie if it has only the spring vessels or early wood formed, or the latewood or 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 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.

RESULTS AND DISCUSSION

During the assessment of the timbers in the main house wall, in the area designated *c* AD 1720 in Figure 2, it became apparent that none of these timbers were suitable for dendrochronology as they failed to contain sufficient numbers of rings. Assessment of other parts of the building complex did however identify several oak timbers in the western wing of the building, known as the Tudor Wing, as good candidates for dating. Following further discussion it was decided that these should be sampled as any dates they yielded would also give valuable information about the development of the site.

Basic information about the samples taken is given in Table 1. There were two areas sampled, a set of three tiebeams at first-floor level (Fig 3), and a ceiling to the ground floor (Figs 2 and 4) which consisted of a number of intersecting moulded beams, with unmoulded (plain) beams at the west end. The roof timbers above the tiebeams were of quite a different character, being of fast-grown oak with few rings. This and the nature of the principal rafter and collar roof suggested that these replaced the earlier roof with which the tiebeams were probably associated.

All seven samples were measured in spite of shtw06 having only 44 rings. The data for the tree-ring series are given in the Appendix. Sample shtw01, from the east tiebeam, had very distorted inner rings, and the first 41 rings were discarded from subsequent analysis. Cross-matching between this series and the other two tiebeams (shtw02, shtw03) is shown in Table 2. Although the match between shtw01 and shtw03 was reasonable, that for shtw02 is poor (Table 2). However independent dating of each individual series did indicate that these three series were coeval, and they were therefore combined to form a 131-year site chronology. Subsequently, it was found that a fourth timber (shtw05), a plain (unmoulded) beam from the west end of the ground-floor ceiling, also matched these series (Table 2), and this was added to form the site series SHERHO1, which was dated to the period AD 1540–1670. The dating evidence is shown in Table 3a. One timber, the east tiebeam, retained complete sapwood, and was found to have been from a tree felled in spring AD 1671, the other two tiebeams had felling date ranges which incorporated this date, as did the ceiling timber from the floor below. The relative positions of overlap and felling dates of these timbers are shown in Figure 5.



Figure 2: Ground-floor plan of Sherborne House, showing the 'Tudor Wing' outlined in red (rooms G7 and G9), and the timbers sampled for dendrochronology. Adapted from an original drawing in Rodwell (2009)



Figure 3: View of the three original tiebeams at first-floor level, looking west. (Photograph Martin Bridge)

The second series from an unmoulded beam at the west-end of the ground floor ceiling only provided a 44-year ring sequence, and this could not be satisfactorily matched against the other series, or dated independently.

The two series derived from moulded ceiling beams (shtw04, shtw07) from the ground floor matched each other very well ($t = 15.5$ with 100 years overlap), suggesting that the timbers were derived from the same parent tree. These two series were therefore combined, and the resulting 142-year chronology, SHERHO2, was dated against the available reference material, the strongest matches being shown in Table 3b. One of these timbers retained the heartwood-sapwood boundary, and a felling date range of AD 1468–1500 could therefore be derived for these two beams, as shown in Figure 5.

Two phases of development of the Tudor Wing were therefore identified from this study, giving previously unknown information for this site. The tiebeams and west-end of the ground-floor ceiling were most likely inserted in AD 1671 or within a year or two after this date. The moulded ceiling beams represent an earlier phase of development of the building, having most likely been inserted, or possibly reused from a phase of building in the latter decades of the fifteenth century.



Figure 4: View of the ground-floor ceiling beams . (Photograph Martin Bridge)

Rodwell (2009) had not recognised any age division between the two sides of the room she designated as G7 (Fig 2), simply suggesting that the woodwork was *c* AD 1500 and that the room was divided into a high-quality heated living room to the east and a simpler service room to the west’.

The dating evidence for the two derived site master chronologies (Tables 3a and 3b) shows wide-spread geographical matching. This may be the result of the distribution of available chronologies representing the relevant time periods, especially in the case of the later timbers in SHERHO1. It seems likely that the timbers were derived from relatively local sources, although there is little evidence to support this view in the matches found.

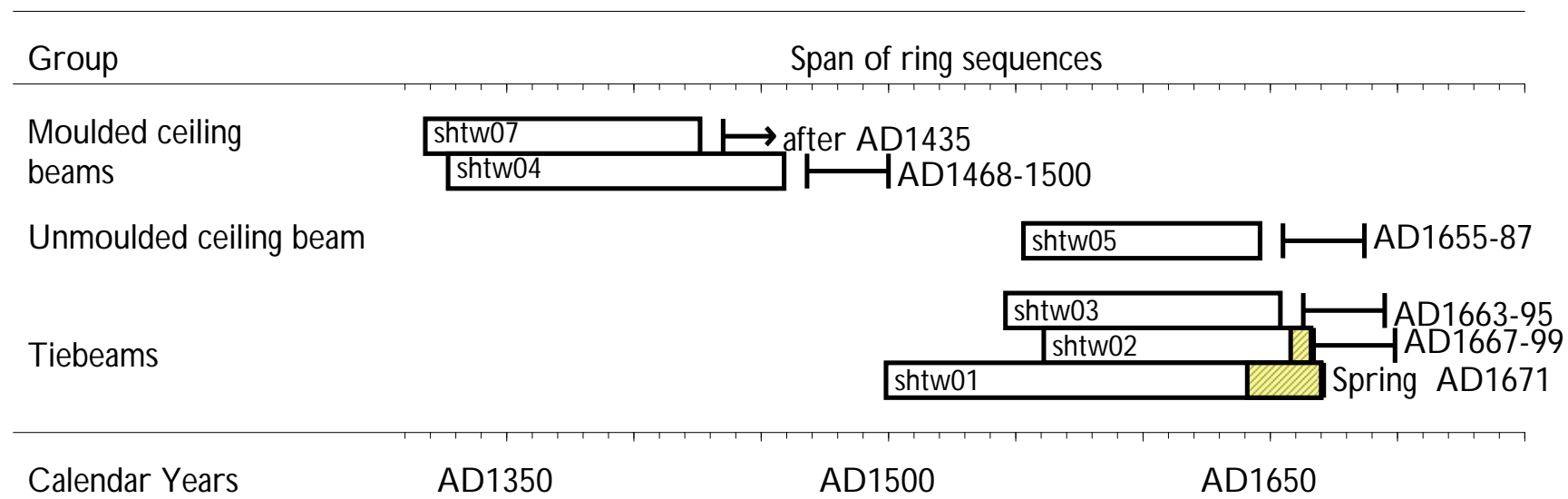


Figure 5: Bar diagram showing the relative positions of overlap of the dated timbers from the Tudor Wing, Sherborne House. White bars represent heartwood rings and hatched yellow sections represent sapwood rings

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TABLES

Table 1: Details of the samples taken from the Tudor Wing, Sherborne House, Sherborne, Dorset

Sample Number	Timber and position	No of rings	Mean HW ring width (mm)	Dates spanning (AD)	h/s bdry AD	Sapwood rings	Mean sensibility	Felling date ranges (AD)
First floor								
shtw01	East tiebeam	131 (+41NM at start)	0.81	1540–1670	1651	29¼C	0.24	spring 1671
shtw02	Central tiebeam	106	1.98	1561–1666	1658	8	0.26	1667–99
shtw03	West tiebeam	109	1.47	1546–1654	1654	h/s	0.27	1663–95
Ground floor								
shtw04	West moulded ceiling beam	133	1.77	1327–1459	1459	h/s	0.22	1468–1500
shtw05	North unmoulded beam at west end of room	94	1.28	1553–1646	1646	h/s	0.18	1655–87
shtw06	South unmoulded beam at west end of room	44	2.95	-	-	h/s	0.26	-
shtw07	Central moulded ceiling beam	109	2.18	1318–1426	-	-	0.21	after 1435

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

Table 2: Cross-matching between the series included in site master SHERHO1, t-values above 3.5 are considered significant

t-values			
Sample	shtw02	shtw03	shtw05
shtw01	2.8	5.7	1.7
shtw02		2.8	3.2
shtw03			4.1

Table 3a: Dating evidence for the site series SHERHO1 AD 1540–1670

Source region:	Chronology name:	Publication reference:	File name:	Span of chronology (AD)	Overlap (years)	t-value
Regional reference chronologies						
England	South Central England	(Wilson <i>et al</i> 2012)	SCENG	663–2009	131	7.6
Hampshire	Hampshire Master Chronology	(Miles 2003)	HANTS02	443–1972	131	7.6
Southern England	Southern England Master	(Bridge 1998)	SENG98	944–1790	131	7.3
France	Brittany Master Chronology	(Pilcher <i>et al pers comm.</i>)	BRIT3FRN	1082–1979	131	7.0
Oxfordshire	Oxfordshire Master Chronology	(Haddon-Reece <i>et al</i> 1993)	OXON93	632–1987	131	6.8
Individual site chronologies						
Kent	Knole	(Miles <i>et al</i> 2010)	KNOLE1	1431–1605	66	8.7
Sussex	Warhams, Rudgwick	(Miles <i>et al</i> 2009)	WARHAM3	1342–1606	67	8.6
London	White Tower, Tower of London	(Miles 2007)	WHTOWR7	1463–1616	77	8.4
Hampshire	Chawton House	(Miles and Haddon-Reece 1996)	CHAWTON1	1511–1592	53	7.8
Hampshire	Blaegrove Cottage, Up Nately	(Bridge <i>et al</i> 2011)	BLAEGROV	1347–1610	71	7.7
Somerset	Market Place, Shepton Mallet	(Miles 2002)	SHPTNMLT	1518–1677	131	7.4
Worcestershire	Mere Hall, Hanbury	(Miles <i>et al</i> 2005)	MEREHALL	1408–1610	71	7.3
Hampshire	The Vyne, Sherbourne St John	(Miles and Worthington 1998)	THEVYNE3	1543–1653	111	7.3
Buckinghamshire	Olney bellframe	(Miles <i>et al</i> 2009)	OLNEY	1472–1625	86	7.0

Table 3b: Dating evidence for the site series SHERHO2 AD 1318–1459

Source region:	Chronology name:	Publication reference:	File name:	Span of chronology (AD)	Overlap (years)	t-value
Regional reference chronologies						
Southern England	Southern England Master	(Bridge 1998)	SENG98	944–1790	142	9.1
Hampshire	Hampshire Master Chronology	(Miles 2003)	HANTS02	443–1972	142	8.6
Southern England	South Master Chronology	(Hillam and Groves 1994)	SOUTH	406–1594	142	8.6
England	South Central England	(Wilson <i>et al</i> 2012)	SCENG	663–2009	142	8.6
Somerset	Somerset Master Chronology	(Miles 2004)	SOMRST04	770–1979	142	8.1
Individual site chronologies						
Wiltshire	Saxon House, Malmsbury	(Miles <i>et al</i> 2003)	MALMSBRY	1304–1486	142	8.6
West Sussex	Field Place Barn	(Bridge 1993)	FIELDPB	1309–1465	142	8.6
Hampshire	Stables, Pilgrims Hall, Winchester	(Miles <i>et al</i> 2009)	PILGRIM2	1245–1478	142	8.4
London	White Tower, Tower of London	(Miles 2007)	WHTOWR5	1260–1489	142	8.2
Somerset	George Inn, Norton St Philip	(Miles and Worthington 1998)	GEORGIN1	1258–1457	140	8.0
Gloucestershire	Ashleworth Tithe Barn	(Bridge 2002)	ASHLEWTH	1319–1475	141	7.8
Hampshire	Summers Farm, Long Sutton	(Miles and Worthington 2002)	SMMRSFRM	1270–1440	123	7.4
Somerset	Shapwick House	(Miles and Haddon-Reece 1996)	SHAPWCK1	1268–1488	142	7.3
Worcestershire	The Commandery, Worcester	(Arnold <i>et al</i> 2006)	WORDSQ01	1284–1473	142	7.3

APPENDIX

Ring width values (0.01mm) for the sequences measured

shtw01

254	239	231	176	188	204	210	229	182	257
199	182	274	250	237	262	192	251	242	302
205	328	342	238	204	160	197	139	156	161
106	180	132	159	45	47	48	63	72	79
99	82	95	79	97	111	145	120	104	131
126	126	172	131	120	178	206	125	103	50
53	61	54	81	71	79	76	49	45	53
75	63	96	87	87	74	48	57	88	86
143	207	157	175	144	157	165	130	100	47
43	28	28	27	24	28	23	28	15	24
28	34	35	36	39	53	40	83	76	81
63	102	76	75	163	95	102	111	65	45
36	35	53	54	52	52	75	74	68	93
69	76	54	46	28	23	41	43	64	135
94	95	87	92	66	57	85	66	74	110
65	93	83	68	60	24	33	32	42	61
45	59	84	104	111	68	94	66	96	102
77	88								

shtw02

413	502	244	376	301	270	280	310	630	464
382	357	344	352	191	223	238	170	302	425
328	312	312	261	273	96	87	109	181	86
159	123	187	368	293	315	348	334	268	237
385	321	333	269	183	293	116	85	59	62
92	79	191	186	192	138	188	194	150	243
221	214	168	144	222	197	176	199	112	58
52	50	42	35	59	66	94	150	132	109
120	133	114	107	41	45	37	33	40	45
52	72	115	139	155	145	133	190	134	137
195	170	197	172	186	273				

shtw03

105	147	278	295	197	219	130	126	198	295
138	137	129	206	329	191	325	233	287	316
264	313	225	351	298	361	265	245	279	263
182	178	170	201	258	197	186	183	179	221
152	178	132	201	83	156	131	125	166	136
138	112	118	86	114	97	104	107	119	75
148	147	142	124	144	92	79	135	61	48
34	47	73	66	94	76	88	58	58	65
87	105	125	116	103	65	21	24	29	77
88	76	108	101	86	66	69	56	86	81
96	70	204	71	82	109	95	140	137	

shtw04

131	158	179	195	122	142	155	135	210	80
96	150	202	234	209	181	215	178	207	314
216	125	103	106	147	139	212	222	183	164
197	145	95	105	110	187	229	253	153	144
99	117	152	191	184	152	106	143	171	200
164	161	202	229	233	262	224	193	224	274
205	243	173	143	94	129	153	156	253	205
182	133	164	196	268	183	206	224	190	255
211	248	181	161	193	270	298	371	253	140
158	230	135	259	220	153	393	262	254	154
122	179	125	157	176	217	162	156	169	140
142	199	171	159	218	183	165	128	107	112
120	121	106	132	172	130	131	129	128	163
133	105	108							

shtw05

186	200	319	139	177	228	180	217	149	213
167	235	217	163	140	156	200	147	187	189
189	208	179	144	142	107	152	203	165	120
141	152	147	120	147	117	164	127	135	130
127	115	123	123	102	114	109	115	110	103
106	125	96	115	112	121	90	112	79	77
74	90	54	24	45	52	53	73	100	101
135	116	124	111	86	49	49	40	40	46
69	79	101	122	134	136	130	118	121	123
131	124	119	133						

shtw06

190	188	266	312	437	316	441	385	322	319
446	484	397	439	406	287	470	220	86	86
141	163	227	277	335	280	340	258	280	256
393	525	257	360	355	178	159	167	327	250
280	249	235	183						

shtw07

189	248	224	241	266	213	190	143	96	218
222	295	315	199	236	223	222	343	178	172
285	369	322	296	252	262	229	271	315	258
172	120	167	252	149	252	300	255	245	216
173	149	165	139	247	274	311	219	179	118
136	172	250	232	197	126	158	199	256	170
198	210	243	247	290	228	233	250	303	224
255	201	148	143	141	168	171	259	192	193
157	199	227	300	212	226	249	173	184	198
213	214	177	178	200	237	285	219	177	146
193	147	241	212	207	355	270	228	170	



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