

NOTTINGHAM UNIVERSITY TREE-RING DATING LABORATORY
DENDRO SAMPLE RECORD AND SUMMARY

SITE INFORMATION

Address Worksop Priory Gatehouse
Worksop
Nottinghamshire
Grid Reference SK590789
Site type Principal rafter roof
and arch braced undercroft
Commissioned by Tree-ring Dating Laboratory
14 Century Timber Project

SAMPLE INFORMATION

Number of Samples 20
Sample type(s) Cores
Sampling date 9 & 20 May 1995
Sampling & analysis R Howard

SAMPLE No.	SAMPLE LOCATION	TOTAL RINGS	SAP RINGS	*		
				FMR DATE	LHR DATE	LMR DATE
WSP-A01	W purlin bay 1	56	HS	1367	1422	1422
WSP-A02	E purlin bay 1	62	HS	1371	1432	1432
WSP-A03	E purlin bay 2	46	HS	1386	1431	1431
WSP-A04	W purlin bay 2	60	HS	1379	1438	1438
WSP-A05	Common rafter W3 bay 1	50	HS	1378	1427	1427
WSP-A06	Common rafter W4 bay 1	40	HS	1390	1429	1429
WSP-A07	Common rafter W2 bay 1	70	HS	1370	1439	1439
WSP-A08	Common rafter E3 bay 2	44	HS	1394	1437	1437
WSP-A09	Common rafter E1 bay 2	97	HS	1341	1437	1437
WSP-A10	E extension tie beam	152	26C	1510	1635	1661
WSP-A11	W extension tie beam	144	19c	1511	1635	1654
WSP-A12	E strut truss 4	176	33C	1491	1633	1666
WSP-A13	E post truss 2	20	00	----	----	----
WSP-A14	W brace of E post truss 2	26	HS	----	----	----
WSP-A15	E brace of W post truss 3	99	HS	1261	1359	1359
WSP-A16	W post truss 3	10	00	----	----	----
WSP-A17	N brace of W post truss 4	126	00	1207	----	1332
WSP-A18	E brace of W post truss 4	12	HS	----	----	----
WSP-A19	S brace of E post truss 1	37	HS	----	----	----
WSP-A20	W brace of E post truss 1	25	HS	----	----	----

* For notes & abbreviations, see key at end of report

Nottingham University Tree-ring Dating Laboratory

TREE-RING ANALYSIS OF TIMBERS FROM WORKSOP PRIORY
GATEHOUSE, WORKSOP, NOTTINGHAMSHIRE
JUNE, 1995.

SUMMARY

A total of twenty samples from this site were analysed. Nine of these, all from the main roof, were dated giving a felling date in the range 1448 to 1483 with the likely felling date estimated as being Ca 1463. *(re-wood)*

Two samples from the undercroft dated with a felling date in the range 1374 to 1409 with the likely felling date estimated as being Ca 1389 *(date of construction?)*

Two other samples, from an extension of the main ^{roof} were dated. One of these had complete sapwood, giving a felling date of 1661. Finally a single sample from a strut to a main truss of the main roof, with complete sapwood was dated. This gave a felling date of late 1666 to early 1667.

alteration of 12-wooding

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ANALYSIS.

Core samples were obtained from twenty different oak timbers at this site. Ten samples, WSP-A01 - 09 and WSP-A12, were taken from the timbers of the main roof. Two samples WSP-A10 & 11 were obtained from timbers of the extension or wing of the main roof, to the south-west side. A further eight, WSP-A13 - 20, were obtained from the posts and arched braces of the gateway.

wall-posts

All samples were polished and the annual growth ring-widths measured, these being compared with each other by the Litton/Zainodin grouping procedure (see Laxton, Litton and Zainodin, 1988 and Laxton and Litton, 1988, Ch.1). At the t-value level of $t=4.5$ three groups of samples formed. The first, consisting of five samples, all from the main roof, cross-matched as shown in the bar diagram on page 6. The ring-widths from these five samples were averaged at these offsets to form WSPASQ01, a sequence of 99 rings (ibid, section 1.6 and Fig 1.9).

Sequence WSPASQ01 was compared with a series of National Reference Chronologies and a large number of Local Chronologies for oak. This indicated a consistent match for this sequence with several of these when the date of its first ring is 1341 and date of the last measured ring is 1439. Evidence for this dating is given in the t-value table also on page 6. Here, the highest t-values of matches with the National Chronologies, and with relevant Local Chronologies, are indicated. Full references to the Chronologies used in the analysis of this site are given at the end of the report.

Sequence WSPASQ01 was compared with the thirteen remaining ungrouped samples. This indicated cross-matches with a further four samples, again all from the main roof, as shown in the t-value/offset matrix on page 6. Although the samples are a little short, the t-values are acceptable and no alternative matching positions are indicated.

At the offsets suggested by the cross-matching of sequence WSPASQ01 with the four other samples, the relative positions of the heartwood/sapwood transition is consistent with a group of timbers having the same felling date. Because of this the nine samples were combined at the offsets shown in the first bar diagram on page 7 to form WSPASQ04, a sequence of 99 rings. Sequence WSPASQ04 was compared with a series of National Reference Chronologies and a large number of Local Chronologies for oak. This indicated a consistent match for this sequence with several of these when the date of its first ring is 1341 and date of the last measured ring is 1439. Evidence for this dating is given in the first t-value table on page 7.

The average last heartwood ring date of the samples in sequence WSPASQ04 is 1433. This gives a felling date in the range 1448 to 1483 with the likely felling date estimated as Ca 1463.

The samples of the second group to form by the Litton/Zainodin method at $t=4.5$, cross-matched as seen in the second bar diagram on page 7. These two samples were combined to form WSPASQ02, a sequence of 152 rings. Sequence WSPASQ02 was compared with the Reference Chronologies matching with several of these when the date of its first ring is 1510 and date of the last measured ring is 1661. Evidence for this dating is given in the second t-value table on page 7. One sample in this sequence, WSP-A10, has complete sapwood on it, indicating a felling date late in 1661.

The third and final group to form, consisting again of two samples, cross-matched as seen in the bar diagram on page 8. These two samples were combined to form WSPASQ03, a sequence of 153 rings. Sequence WSPASQ03 was compared with the full range of Reference Chronologies matching with several of these when the date of its first ring is 1207 and date of the last measured ring is 1359. Evidence for this dating is given in the first t-value table on page 8

WORKSOP PRIORY GATEHOUSE, WORKSOP, NOTTINGHAMSHIRE (WSP-A)

1234
5678
9101112
131415161718192021222324252627282930313233343536373839404142434445464748495051525354555657585960616263646566676869707172737475767778798081828384858687888990919293949596979899100

The last measured ring date on this sequence, 1359, is also the heartwood/sapwood transition. This gives a felling date in the range 1374 to 1409 with the likely felling date estimated as being Ca 1389.

The longest remaining ungrouped sample, WSP-A12, was compared separately with the National and Local Reference Chronologies. This indicated a cross-match with several of these when the date of its first ring is 1491 and the date of its last measured ring is 1666. Evidence for this date is given in the second t-value table on page 8. This sample also has complete sapwood, indicating a felling date between late 1666 and early 1667.

WORKSOP PRIORY GATEHOUSE. NOTTINGHAMSHIRE (WSP-A)

BAR DIAGRAM OF SAMPLES IN SEQUENCE WSPASQ01

SAMPLE NO.	OFF SET		TOTAL RINGS	SAP RINGS	RELATIVE LHR POSITION
WSP-A01	26	*****	56	HS	82
WSP-A02	30	*****	62	HS	92
WSP-A09	00	*****	97	HS	97
WSP-A04	38	*****	60	HS	98
WSP-A07	29	*****	70	HS	99

T-VALUES OF THE MATCH OF WSPASQ01 AGAINST REFERENCE CHRONOLOGIES WHEN THE DATE OF THE LAST RING IS 1439

NATIONAL CHRONOLOGIES

LOCAL CHRONOLOGIES

EM080887	4.8	GAI-H5	5.7
		GAI-H3	4.7
		HAG-C1	4.2
		STNASQ01	4.0

T-VALUE/OFFSET MATRIX OF THE MATCH OF WSPASQ01 AGAINST OTHER SAMPLES

	SQ01	A03	A05	A06	A08
SQ01		45	37	49	53
A03	5.2				
A05	6.4				
A06	4.6				
A08	10.0				

WORKSOP PRIORY GATEHOUSE, NOTTINGHAMSHIRE (WSP-A)

BAR DIAGRAM OF SAMPLES IN SEQUENCE WSPASQ04

SAMPLE NO.	OFF SET		TOTAL RINGS	SAP RINGS	RELATIVE LHR POSITION
WSP-A01	26	*****]	56	HS	82
WSP-A05	37	*****]	50	HS	87
WSP-A06	49	*****]	40	HS	89
WSP-A03	45	*****]	46	HS	91
WSP-A02	30	*****]	62	HS	92
WSP-A08	53	*****]	44	HS	97
WSP-A09	00	*****]	97	HS	97
WSP-A04	38	*****]	60	HS	98
WSP-A07	29	*****]	70	HS	99

T-VALUES OF THE MATCH OF WSPASQ04 AGAINST REFERENCE CHRONOLOGIES WHEN THE DATE OF THE LAST RING IS 1439

NATIONAL CHRONOLOGIES

LOCAL CHRONOLOGIES

EM080887	4.8	GAI-H5	5.9
		GAI-H3	5.1
		HAG-C1	4.3
		STNASQ01	3.6

BAR DIAGRAM OF SAMPLES IN SEQUENCE WSPASQ02

SAMPLE NO.	OFF SET		TOTAL RINGS	SAP RINGS	RELATIVE LHR POSITION
WSP-A11	01	*****>>>>	144	19	126
WSP-A10	00	*****>>>>	152	26C	126

T-VALUES OF THE MATCH OF WSPASQ02 AGAINST REFERENCE CHRONOLOGIES WHEN THE DATE OF THE LAST RING IS 1661

NATIONAL CHRONOLOGIES

LOCAL CHRONOLOGIES

EM080887	5.9	SHE-T1	6.7
MGB-E01	5.1	LANMSQ01	6.4
		DLHMSQ01	4.8
		SRDCSQ01	5.0

WORKSOP PRIORY GATEHOUSE, NOTTINGHAMSHIRE (WSP-A)

BAR DIAGRAM OF SAMPLES IN SEQUENCE WSPASQ03

SAMPLE NO.	OFF SET		TOTAL RINGS	SAP RINGS	RELATIVE LHR POSITION
WSP-A17	00	*****	126	00	---
WSP-A15	54	*****]	99	HS	153

T-VALUES OF THE MATCH OF WSPASQ03 AGAINST REFERENCE CHRONOLOGIES WHEN THE DATE OF THE LAST RING IS 1359

NATIONAL CHRONOLOGIES

EM080887 4.3
MGB-E01 4.4

LOCAL CHRONOLOGIES

GLE-W1 5.6
NEW-I2 3.8
NOT-H1 3.8
BRNHSQ01 4.6
STNASQ01 3.6

T-VALUES OF THE MATCH OF WSP-A12 AGAINST REFERENCE CHRONOLOGIES WHEN THE DATE OF THE LAST RING IS 1666

NATIONAL CHRONOLOGIES

EM080887 6.2
MGB-E01 6.8
WWM-A01M 4.0
SFF-B01M 3.7

LOCAL CHRONOLOGIES

WOR-H1 5.6
SHE-T1 5.2
WALBSQ03 6.6
SUTCSQ10 6.9

Key for sample summary and bar diagram.

- B = bark on sample, last ring is year of felling
- b = bark on timber sampled but no bark on core
- C = core
- HS = heart/sapwood boundary
- NM = not measured (estimated)
- P = measurement from photograph of rings
- R = insitu measurement by graticule
- S = slice
- * = 5 measured heartwood rings, rounded up or down
- | = base of sap on sample, ie less than one complete sap ring
- } = between one and four complete sapwood rings measured
- > = 5 measured sapwood rings, rounded up or down
- < = 5 unmeasured sapwood rings, rounded up or down
- + = centre on sample

REFERENCE TO CHRONOLOGIES USED

EM080887. 882-1981. Laxton R R, Litton C D. An East Midlands Master Tree-ring Chronology and its use in dating vernacular buildings. (Monograph Series II, Department of Classical and Archaeological Studies, Nottingham, 1988).

MGB-E01. 404-1981. Baillie M G, Pilcher J R. 1982. Master tree-ring Chronology for England (pers comm).

SFF-B01M. 1359-1591. Morgan R A. Dendrochronological Dating of a Yorkshire timber building. VA 8, 1977, 9 - 14.

WWM-A01M. 1341-1636. Siebenlist-Kerner V. 1978. The chronology 1341 - 1636, for certain hillside oaks from Western England and Wales. In J M Fletcher (ed), Dendrochronology in Europe, BAR Int. Series 51, 157 - 61.

BRNHSQ01. 1165 - 1305. Quaintree House, Braunston, Leics. To be published. Sub sequence published in Thoroton Soc 1983.

DLHMSQ01. 1411-1618. The Manor House, Donington-le-Heath, Leics. VA 20, 1989. (6b).

GAI-H3. 1356-1462. Gainsborough Old Hall, Gainsborough, Lincs. VA 18, 1987, 2a.

GAI-H5. 1358-1446. Gainsborough Old Hall, Gainsborough, Lincs. Additional timbers. Report available on request.

HAG-C1. 1336-1533. Hagworthingham Church Tower, Lincolnshire. VA 15, 1984.

LANMSQ01. 1467-1632. Langford Manor, Langford, Notts. VA 20, 1989.

NEW-I2. 1163-1312. The Old White Hart, Newark, Notts. VA 15, 1984.

NOT-H1. 1145-1325. "Severns", Castle Rd, Nottm. VA 15, 1984.

SHE-T1. 1426-1981. See R R Laxton and C D Litton. An East Midlands Master Tree-ring Chronology, 1988.

SRDCSQ01. 1434-1614. Moor Farm Cottage (south), Shardlow, Derbys. VA 25, 1994.

STNASQ01. 1346-1445. The Thatched Cottage, Stanley, Derbys. VA 25, 1994.

SUTCSQ10. 1552-1651. 1 Soar Lane, Sutton Boington, Notts. VA 24, 1993.

WALBSQ03. 1445-1632. Spring House Farm, Walton, Derbys. To be published in VA 26, 1995.

WOR-H1. 1420-1582. Manor Lodge, Worksop, Notts. Trans. Thoroton Society, 1983.

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Baillie M G L. Tree-ring Dating in Archaeology. Croom Helm.

Eckstein D, Baillie M G L, & Egger H. Handbook for Archaeologists; No.2 - Dendrochronological Dating. European Science Foundation, Stasbourg, 1984.

Hughes M K, Milson S J and Legett P A. Sapwood estimates in the interpretation of tree-ring dates. Journal of Archaeological Science 8, 1981, 381 - 390.

Laxton R R, Litton C D. An East Midlands Master Tree-ring Chronology and its use in dating vernacular buildings. (Monograph Series II, Department of Classical and Archaeological Studies, Nottingham, 1988):-

Laxton R R, Litton C D and Zainodin H J. An objective method for forming a master ring-width sequence. Proceedings of the first European conference on Wood and Archaeology, Louvain-la-Neuve, Belgium. Ed. T Hackens, A V Munaut and C L Till. Pages 26 - 35.