

8 NEWGATE STREET, BINGHAM, NOTTINGHAMSHIRE

TREE-RING ANALYSIS OF TIMBERS

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SUMMARY

Analysis by dendrochronology of six samples obtained from timbers within this building has resulted in the production of a single site chronology comprising one sample from a beam of the kitchen ceiling and another sample from the front ceiling beam of a bedroom. This site chronology is 112 rings long, these rings dated as spanning the years 1529-1640.

Interpretation of the sapwood on these samples would indicate that the at least one timber, the beam to the bedroom ceiling, was probably felled about 1650. The other timber, to the kitchen ceiling, may also have been felled at this time, but this is not certain. Four samples remain undated.

INTRODUCTION

Number 8 Newgate Street in Bingham, Nottinghamshire, would appear to be a relatively modern two-and-a-half storey house of a main, north–south range, with further additions to the rear. Although perhaps ‘Georgianised’ the house retains a certain amount of timberwork, particularly to the kitchen ceiling, with two other beams to a first floor bedroom. There is no visible framing to any of the walls or to the roofs

SAMPLING

Core samples were obtained from a number of timbers which appeared suitable for tree-ring dating by reason of having sufficient rings for reliable analysis, and by appearing to be pertinent to the development of the house. These timbers were distributed throughout the building to ground and first floors. Although there were in theory a few other timbers available for sampling, these were derived from fast-grown trees and as such were unlikely to provide sample with the minimum number of rings, 50, here deemed necessary for reliable analysis.

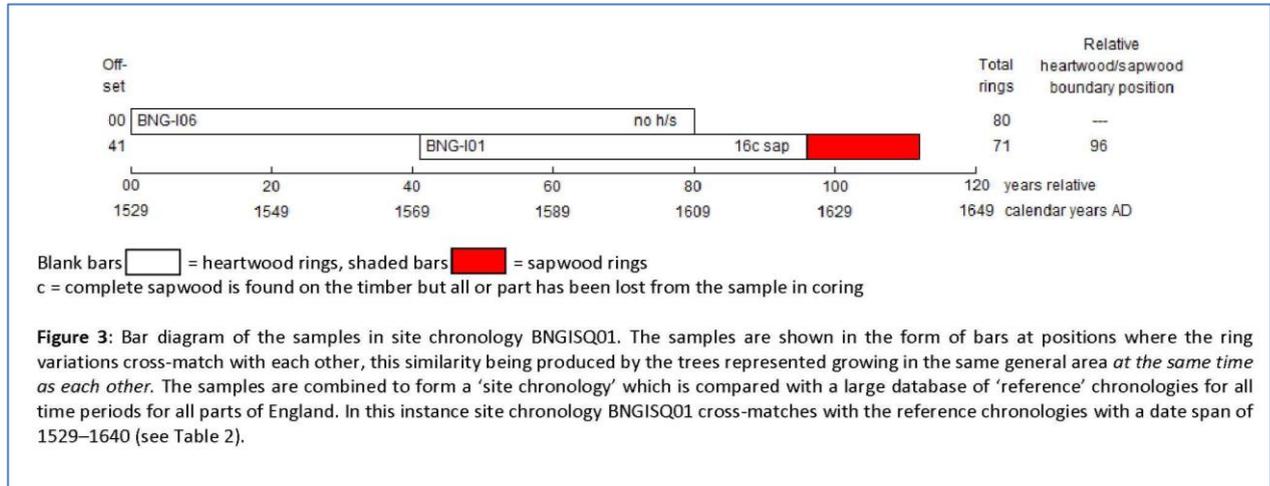
Each sample was given the code BNG-I (for Bingham – site ‘I’), and numbered 01–06. Details of the samples are given in Table 1, including the timber sampled and its location, the total number of rings each sample has, and how many of these, if any, are sapwood rings. The individual date span of each dated sample is also given. In this Table the front of the building is taken to be facing south onto Newgate Street.

Sample number	Sample location	Total rings	Sapwood rings*	First measured ring date (AD)	Heart/sap boundary (AD)	Last measured ring date (AD)
BNG-I01	Kitchen ceiling, Beam 1	71	16c	1570	1624	1640
BNG-I02	Kitchen ceiling, Beam 2	50	h/s	-----	-----	-----
BNG-I03	Kitchen ceiling, Beam 3	51	h/s	-----	-----	-----
BNG-I04	Kitchen ceiling, Beam 4	48	h/s	-----	-----	-----
BNG-I05	First floor, east front bedroom, rear ceiling beam	49	h/s	-----	-----	-----
BNG-I06	First floor, east front bedroom, front ceiling beam	80	no h/s	1529	-----	1608

*h/s = the sample has the heartwood/sapwood boundary, ie. only the sapwood rings are missing
c = complete sapwood is found on the timber but all or part has been lost from the sample in coring

ANALYSIS

Each of the six samples obtained from the various timbers of this building was prepared by sanding and polishing and the widths of their annual growth rings were measured. The data of these measurements were then compared with each other. By this process a single group of two cross-matching samples could be formed, the two samples cross-matching with each other at the positions indicated in the bar diagram Figure 3.



The two cross-matching samples were combined at their indicated off-set positions to form BNGISQ01, a site chronology with an overall length of 111 rings. This site chronology was then satisfactorily dated by repeated and consistent cross-matching with a large number of relevant reference chronologies for oak as spanning the years 1529 to 1640. The evidence for this dating is given in the *t*-values of Table 2.

Table 2: Results of the cross-matching of site chronology BNGISQ01 and the reference chronologies when the first ring date is 1529 and the last ring date is 1640

Reference chronology	<i>t</i> -value	
Church of St Andrew, Welham, Leics	9.0	(Arnold <i>et al</i> 2005a)
Church Farm, Ockbrook, Derbys	8.7	(Arnold and Howard 2009)
Brewhouse Yard Museum, Nottm	8.1	(Howard <i>et al</i> 1994)
Riding House, Bolsover Castle, Derbys	7.9	(Arnold <i>et al</i> 2005b)
East Midlands Master Chronology	7.8	(Laxton and Litton 1988)
101 Meeting Street, Quorn, Leics	7.8	(Arnold and Howard 2008 unpubl)
Keyworth Barn, Keyworth, Notts	7.5	(Laxton <i>et al</i> 1984)
St Stephen's Church, Sneinton, Notts	7.2	(Arnold and Howard 2007)

Site chronology BNGISQ01 is a composite of the data of the two cross-matching samples as seen in the bar diagram Figure 3. This composite data produces an 'average' tree-ring pattern, where the overall climatic signal of the growth is enhanced, and the possible erratic variations of either individual sample are reduced. This 'average' site chronology is then compared with several hundred reference patterns covering every part of Britain for all time periods, the chronology dating only at the time span indicated.

One of the samples, BNG-I01, is from a timber, a kitchen ceiling beam, which appears to retain complete sapwood on it. This means that it has the last growth ring produced by the tree it represents before it was felled. However, due to the soft and fragile nature of this part of the wood, some of the sap, about 10mm, was lost from the sample in coring (this situation is denoted by lower case 'c' in Table 1 and the bar diagram). In such cases it is possible to estimate the number of rings this loss might

represent, here probably being about sapwood 10 rings. Given that the last extant, sapwood, ring on the sample is dated to 1640, such a loss would suggest that the timber was probably felled about 1650.

The exact felling date of the other timber in this site chronology, represented by sample BNG-I06 from the bedroom ceiling, cannot be determined precisely. This is because the sample does not have the heartwood/sapwood boundary, and is thus not only missing all its sapwood rings, but an unknown number of heartwood rings as well. With a last extant, heartwood, ring date of 1608, the felling date is, however, unlikely to be before about 1623 at the earliest (allowing for at least the usual minimum number of sapwood rings the tree might have had). It is thus in theory possible that this timber was also felled in 1650, but this is not certain

Conclusion

From the tree-ring analysis results obtained here, it would appear that at least some timber in this building dates to the mid-seventeenth century. It is not clear that this represents the construction date of the building, indeed the architectural style, form and the materials, would suggest that it is later. It would appear, however, that even if it is later, it reuses a number of earlier timbers.

Undated samples

Four samples, BNG-I02, I03, I04, and I05, remain ungrouped with each other and undated. None of these undated samples shows any peculiarities, such as compression or distortion, which might make cross-matching difficult, and the reason for the lack of dating is unknown. It may be noticed from Table 1, however, that all these samples have very low number of rings, all of them having just about the minimum number (50) usually required for reliable dating. It is possible that this contributes in large measure to the lack of dating.

It is also possible that the undated beams represent trees felled at different times to each other and while such samples can sometimes be dated individually it is usually more difficult. A further possibility is that the source trees were grown during a time period (the later-eighteenth, or possibly the early-nineteenth century) for which, at the moment, there is little reference data available in this region. It is only with the accumulation of data, such as that obtained as part of the Bingham Buildings project, that this gap may be filled and the presently undated samples may in due course be dated.