

THE MANOR HOUSE, MARKET PLACE, BINGHAM, NOTTINGHAMSHIRE; TREE-RING ANALYSIS OF TIMBERS

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SUMMARY

Analysis by dendrochronology of nine samples obtained from timbers within this building has resulted in the production of a single dated site chronology. This site chronology, composed of samples from two roof timbers, a sample from a ground floor ceiling beam, and a sample from the ground floor fireplace bressumer beam, is 108 rings long, these rings dated as spanning the years 1645–1752. Interpretation of the sapwood on these samples would indicate that the four trees represented were probably all cut as part of a single episode of felling in 1752. The final two measured individual samples remain undated.

INTRODUCTION

The Manor House, on Market Square, Bingham, Nottinghamshire (SK 705 399, Figs 1a/b), would appear to be of two bays, with short extensions to both the northern end and to the rear, and is of two storeys with attics. Externally, the brick-built building would appear to be of relatively modern, probably nineteenth century date, yet within, it contains a modest amount of timber, this comprising purlins to the roof and ceiling beams to the ground and first floors. There is also a timber fireplace lintel, and a timber wall beam. Detailed plans can be found in the accompanying house history report

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 as well as to the roof. 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

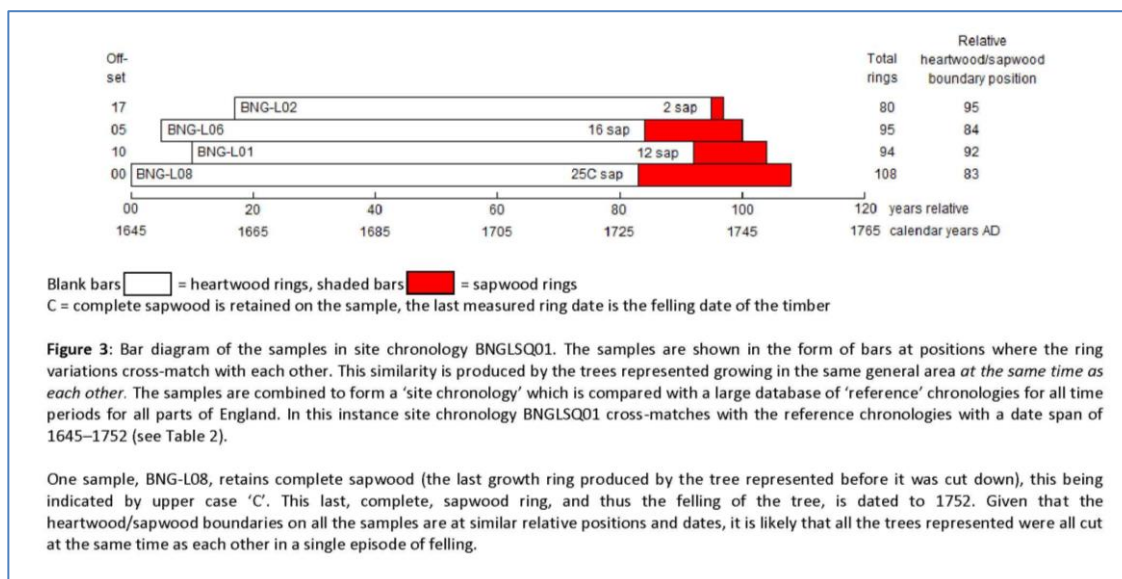
Details of the samples are given in Table 1, including the timber sampled and its location, the total number of rings each sample has, and how many of these, if any, are sapwood rings. The individual date span of each dated sample is also given. In this Table the rear of the building is taken to be facing east onto the rear yard or garden, the front to be facing west onto Market Square.

Sample number	Sample location	Total rings	Sapwood rings*	First measured ring date (AD)	Heart/sap boundary (AD)	Last measured ring date (AD)
BNG-L01	North-east purlin	94	12	1655	1736	1748
BNG-L02	North-west purlin	80	2	1662	1739	1741
BNG-L03	South-east purlin	55	13	-----	-----	-----
BNG-L04	South-west purlin	43	7	-----	-----	-----
BNG-L05	East-west ceiling beam, first floor	60	11	-----	-----	-----
BNG-L06	Eastern north-south beam, ground floor	95	16	1650	1728	1744
BNG-L07	North-south beam to middle ground floor room	52	15	-----	-----	-----
BNG-L08	Fireplace bressumer middle ground floor room	125	25C	1645	1727	1752
BNG-L09	East-west bressumer to ground floor	88	25C	-----	-----	-----

C = complete sapwood is retained on the sample; the last measured ring date is the felling date of the tree represented

Analysis

Each of the nine 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 four cross-matching samples could be formed, the four samples cross-matching with each other at the positions indicated in the bar diagram Figure 3.



The four cross-matching samples were combined at their indicated off-set positions to form BNGLSQ01, a site chronology with an overall length of 108 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 1645 to 1752. The evidence for this dating is given in the *t*-values of Table 2.

One of the dated samples, BNG-L08, from the fireplace bressumer, retains complete sapwood (this is indicated by upper case 'C' in Table 1 and the bar diagram). This means that it retains the last growth ring produced by the tree it represents before it was felled. In this case this last, complete, sapwood ring, and thus the felling of the tree, is dated to 1752.

Given the relative position and date of the heartwood/sapwood boundary on the other three samples in site chronology BNGLSQ01 (BNG-L01, L02, and L06, which is very similar to that on the sample from the tree known to have been felled in 1752), and the amount of sapwood on them, it is very probable that the trees they represent were felled in 1752 as well.

Site chronology BNGLSQ01 was then compared with the five remaining measured but ungrouped samples. There was however, no further satisfactory cross-matching. Each of these five remaining samples was, therefore, compared individually with the full corpus of reference material for oak. There was, however, no further cross-matching and these samples must, therefore, remain undated for the moment.

CONCLUSION

It would appear, therefore, that although the building might externally appear to be of nineteenth century date, it does in fact contain timbers felled in the mid-eighteenth century. Given that there is no indication of reuse for these dated timbers, it would seem likely that this determines the original construction date of the building.

Undated samples

While it is very common in tree-ring analysis to find that a few samples remain ungrouped and undated, at the Manor House the undated proportion, at 55%, is slightly higher than is normally the case. None of the undated samples shows any peculiarities, such as compression or distortion, which might make cross-matching difficult, though, as may be seen from Table 1, two of

the undated sample have less than the usual minimum number of rings (50) required for reliable dating. It is also possible that the undated timbers represent timbers felled at different times 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 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.

Table 2: Results of the cross-matching of site chronology BNGLSQ01 and the reference chronologies when the first ring date is 1645 and the last ring date is 1752

Reference chronology	t-value	
Sarehole Mill, Hall Green, Birmingham	7.8	(Howard <i>et al</i> 1990)
Apethorpe Hall, Northants	7.1	(Arnold and Howard forthcoming)
Green's Mill, Snenton, Nottm	7.1	(Laxton <i>et al</i> 1982)
East Midlands Master Chronology	6.9	(Laxton and Litton 1988)
Post Mill, Kibworth Harcourt, Leics	6.1	(Arnold <i>et al</i> 2004)
Castle House, Melbourne, Derbys	5.9	(Arnold and Howard 2009 unpubl)
Pitchforks, Norwell, Notts	5.3	(Hurford <i>et al</i> 2010)
Dovecote, Shenton, Staffs	5.1	(Arnold <i>et al</i> 2008)

Site chronology BNGLSQ01 is a composite of the data of the four 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 any one 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 site chronology dating only at the time span indicated.