

PARRS COTTAGE, CHURCH STREET, BINGHAM, NOTTINGHAMSHIRE; TREE-RING ANALYSIS OF TIMBERS

A J R N O L D
R E H O W A R D

SUMMARY

Analysis by dendrochronology of four of the five samples obtained from timbers within this building (one sample having insufficient rings for reliable dating) has resulted in the production of two site chronologies, each site chronology comprising two samples.

The first site chronology comprises the two samples from the common joists of the kitchen ceiling, this having an overall length of 64 rings. Unfortunately, this site chronology does not cross-match with any of the reference data and the timbers cannot be dated.

The second site chronology comprises the two samples from the purlins of the main roof. This site chronology has an overall length of 139 rings, these rings dated as spanning the years 1171.1309. Interpretation of the sapwood on these samples would indicate that both timbers were cut at the same time as each other in 1309.

Introduction

Externally, Parrs Cottage on Church Street, in Bingham, Nottinghamshire (SK 706 399, Figs 1a/b), would appear to be a relatively modern brick-built, two-storey house of two bays beneath a pantile roof. It appears to have a central, through-passage, entry with a chimney stack at each gable end. Within, there is a small amount of timberwork forming the ceiling of the ground floor kitchen as a single main beam with smaller common joists off, with the roof containing two timbers, clearly re-used in their present positions as purling, but perhaps originally designed as wall plates. There are no other timbers to walls, floors or ceilings.

Sampling

Core samples were obtained from a small 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 construction and development of the house. These timbers were to be found only to the kitchen ceiling and to the roof of the house.

Each sample was given the code BNG-E (for Bingham – site 'E'), and numbered 01–05. 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 north onto the garden, the front to be facing south onto Church Street. Plans can be found in the accompanying House History report.

Table 1: Details of tree-ring samples from Parrs Cottage, Church Street, Bingham, Nottinghamshire

Sample number	Sample location	Total rings	Sapwood rings*	First measured ring date (AD)	Heart/sap boundary (AD)	Last measured ring date (AD)
BNG-E01	Main beam to ground floor ceiling of kitchen	nm	---	----	----	----
BNG-E02	North joist 5, kitchen ceiling	58	13	----	----	----
BNG-E03	North joist 2, kitchen ceiling	54	4	----	----	----
BNG-E04	Northeast purlin to main roof	99	no h/s	1171	----	1269
BNG-E05	Northwest purlin to main roof	129	17C	1181	1292	1309

*h/s = the sample has the heartwood/sapwood boundary, ie, only the sapwood rings are missing

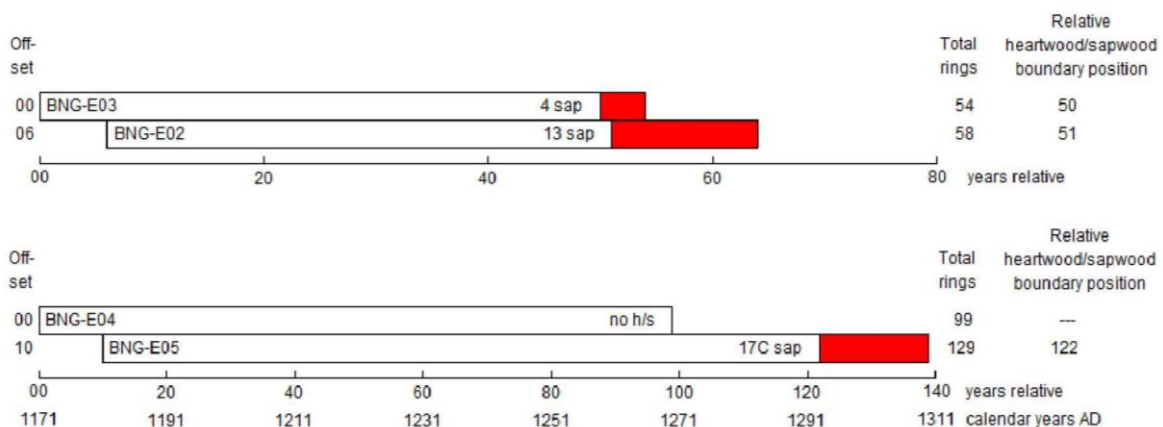
C = complete sapwood is retained on the sample; the last measured ring date is the felling date of the tree represented

nm = sample not measured

Analysis

Each of the five samples obtained from the various timbers of this building was prepared by sanding and polishing. It was seen at this time that one of these samples, BNG-E01 from the main beam of the kitchen ceiling, had less than the minimum of 50 rings deemed necessary for reliable dating, and it was rejected from this programme of analysis. The annual growth ring widths of the remaining four samples were, however, measured and the data then compared with each other as described in the notes above. By this process two groups of cross-matching samples could be formed, each group comprising two samples.

The two samples of the first group, BNG-E02 and E03, both from the common joists of the kitchen ceiling, were combined at their indicated off-set positions to form BNGESQ01, a site chronology with an overall length of 64 rings (Fig 3a). This site chronology was then compared to the full corpus of reference data but there was no satisfactory cross-matching at any position. These two samples must, therefore, remain undated for the moment.



Blank bars = heartwood rings, shaded bars = sapwood rings

h/s = heartwood/sapwood boundary

C = complete sapwood is retained on the sample, the last measured ring date is the felling date of the timber

Figure 3a/b: Bar diagram of the samples in site chronologies BNGESQ01 (top) and BNGESQ02 (bottom) at positions indicated by their separate grouping. The samples are shown in the form of bars at positions where the ring variations cross-match with each other. This similarity is produced by the trees represented growing in the same general area *at the same time as each other*. The samples are combined to form a 'site chronology' which is compared with a large database of 'reference' chronologies for all time periods for all parts of England. In this instance only site chronology BNGESQ02 cross-matches with the reference chronologies with a date span of 1171–1309 (see Table 2). One sample, BNG-E05, retains complete sapwood (the last growth ring produced by the tree represented before it was cut down), this being indicated by upper case 'C'. This last, complete, sapwood ring, and thus the felling of the tree, is dated to 1309. The other sample, BNG-E04, is without the heartwood/sapwood boundary and all its sapwood rings, plus an unknown number of heartwood rings as well, and its felling date cannot, thus, be reliable determined.

The two samples of the second group, BNG-E04 and E05, both from the purlins to the roof, were combined at their indicated off-set positions to form BNGESQ02, a site chronology with an overall length of 139 rings (Fig 3b). This site chronology was also compared to the full corpus of reference data giving a series of very strong cross-matches with a number of reference data with a first ring date of 1171 and a last ring date of 1309. The evidence for this dating is given in the *t*-values of Table 2.

Table 2: Results of the cross-matching of site chronology BNGESQ02 and the reference chronologies when the first ring date is 1171 and the last ring date is 1309

Reference chronology	<i>t</i> -value	
40-44 Castlegate, Newark, Notts	11.2	(Arnold <i>et al</i> 2002)
'Severns', Castle Road, Nottm	11.0	(Howard <i>et al</i> 1996)
22/4 Kirkgate, Newark, Notts	10.5	(Arnold <i>et al</i> 2002)
Southview Cottage, Norwell, Notts	10.0	(Hurford <i>et al</i> 2010)
The Hollies, Bathley, Notts	9.7	(Alcock <i>et al</i> 1991)
East Midlands Master Chronology	9.5	(Laxton and Litton 1988)
40-44 Cartergate, Newark, Notts	9.0	(Arnold <i>et al</i> 2002)

Site chronology BNGESQ02 is a composite of the data of the two cross-matching samples as seen in the bar diagram Figure 3b. 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 site chronology dating only at the time span indicated.

Interpretation

One of the dated samples, BNG-E05, from the north-west purlin to the roof, retains complete sapwood (this is indicated by upper case 'C' in Table 1 and the bar diagram). This means that the sample has the last 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 1309. Given the high degree of cross-matching between sample BHG-E05 and BNG-E04, it is very likely that the two trees were growing virtually side-by-side in the same copse or stand of woodland, and thus very probable that they were felled at the same time (it being very unlikely that two trees which had once grown adjacent to each other, but felled at different times, would eventually come to be used for identical beams in the same house).

Conclusion

It would appear, therefore, that although Parrs Cottage is itself probably of a fairly late construction date, it does re-use timbers felled in the very early years of the fourteenth century.

Undated samples

Two samples, BNG-E02 and E03, although cross-matched with each other, remain undated. Neither of these undated samples shows any peculiarities, such as compression or distortion, which might make cross-matching difficult, and, as may be seen from Table 1, both samples, though perhaps slightly short, do have sufficient rings for reliable analysis. The reason for the lack of dating is unknown

It is possible 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.

