

90 minutes

A short paper on dendrochronology.

Alison C Armstrong, (Vernacular buildings recorder). September 2006

**Tree-ring dating: pushing back the dates on agricultural buildings**

Agricultural buildings are an important feature of the Dales landscape with unique field barns scattered in walled fields and the larger laithes (dual-purpose barns), usually placed nearer the farmhouse, with characteristic large cart entrances. Building surveys by members of the Yorkshire Vernacular Buildings Study Group (YVBSG) confirm a period of rebuilding of many field barns and laithes, generally in the 18/19<sup>th</sup> centuries. Many field barns and laithes stand on medieval sites and incorporate older stone walling and old timber re-cut in their roof trusses. This predates the 18<sup>th</sup> century but is of uncertain age. Documents give some clues; in 1605 for instance the fifty-three tenants in Kettlewell already had eighty-one field barns (1).

Can other dating methods be used to discover what this rebuilding tells us about the buildings before 1700? Can we give more precise dates to the older structures as well as to the rebuilding periods? Are there clues as to when and how land use changed from medieval tenements with open arable fields to the one of enclosed fields with field barns and a pastoral economy?

Two kinds of projects would be helpful to vernacular buildings recorders. Firstly, working more closely with landscape historians, archaeologists and other historians may better explain the sites of these buildings and any continuous building history. Secondly tree-ring dating of selected timber may help date re-used timber found in a number of barns as well as the new timber used in the rebuilding periods. It may also reveal information about sources of timber and building trades and the impact of past climate changes.

Tree-ring dating or dendrochronology is a technique for dating timber (currently oak) by measuring the ring growth and matching these figures against an existing master curve. The degree of matching is expressed statistically as a "t" value; the greater the match the more confident the result. A Yorkshire buildings curve was developed in pioneering work several

decades ago and some master curves for the Sheffield area were published in 1977 & 1980 (2).

Research on methods and chronologies continues.

Tree-ring dates for buildings in Britain have been published annually in "Vernacular Architecture" (the journal of the Vernacular Architecture Group) since 1980. The distribution map shows no work at all has been done in the Dales area. Agricultural buildings are virtually excluded (3). The Great Barn at Bolton Abbey - one of the few standing timber-framed medieval buildings in the region- was however successfully sampled in 2006 and dated to 1517/18.

Reasons for the lack of work in the northern Pennines are a paucity of timber buildings (which dendrochronologists prefer) and an amount of re-used timber that is considered confusing. There is a lack of post 1650 timber available for sampling to create master curves for later centuries.

Tree-ring dating presents many problems. There are practicalities from funding to site access and power supply and a shortage of dendrochronology laboratories for this increasingly used method for dating standing buildings. A local master curve chronology for the extreme climate of the upper Dales may be required in order to obtain worthwhile confident dates. The timber itself may prove unsuitable for sampling with too few rings, no sapwood to give a felling date, too irregular in growth and use of other tree species, particularly common ash which replaces oak trees in the limestone areas of the Dales.

Building surveys are a prerequisite of tree-ring dating selection and have already been completed for some barns in upper Wharfedale. Although laithes and field barns are under-recorded there is now a growing body of detailed information. For instance no cruck remains were recorded in Ribblesdale until barns around Horton in Ribblesdale were surveyed by the YVBSG in 1995(4). YVBSG survey reports, which include measured drawings and written interpretation, are lodged at the YAS and the national Sites and Monuments Record Centre. Summaries appear annually in "Yorkshire Buildings", the YVBSG journal.

Survey work in the Dales has concentrated recently on looking at buildings in the wider landscape setting and has involved other experts (5). Using landscape historians certainly gave an added

insight into buildings linked to a timber-framed manor house at High Bradley near Skipton (6). In the medieval village of Starbotton it was noted that long crofts behind houses were arranged around a former green, which began to be built upon from the 17<sup>th</sup> century. This tied in with house date stones (7). The six Back Lane laithes at the bottom of the medieval crofts show much alteration and rebuilding which is difficult to explain or date (8). A contrasting survey was isolated Lower Winskill in Ribblesdale, a former monastic livestock farm situated near the 1000 feet (310m) contour, where surveys revealed evidence of two farmhouses mentioned in 1591 and splendid oak cruck blades and purlins re-used in the heightened 18<sup>th</sup> century barn. The roof still retains the carpenter's red marking-out lines for making the new truss, giving a rare survival of how carpenters worked.

Groups of field barns that overlie earthworks formerly associated with arable farming, have been recorded near Arncliffe, Starbotton and Cove Lane in Grassington. Again there is rebuilding evidence and some re-cut cruck timber complete with carpenter's red chalk setting out lines.

Most re-used timber appears to be from pre 1600 cruck-constructed buildings. This survives because it had been re-cut and used again as barns were altered later. Managed woodlands and suitable large trees were undoubtedly in short supply (9). The 1605 survey of estates in Wensleydale and Upper Wharfedale notes that there were no woods or trees except in Bishopdale and Raydale but there was hedgerow ash, hazel and holly. Crucks are mentioned in documents from Kirkby Malham in 1454/5 whilst surveys of Cracoe in 1557 and 1586 (10) show that houses and barns were still being built with crucks of oak or ash timber and thatched. Tree-ring measurements from timber slices off re-used crucks in S Craven gave possible felling dates in the 1590s when compared to published curves and thus the last phase of cruck building.

Professional dating would confirm this. Data collected from measuring re-used cruck blades and purlins has enabled some reconstruction of the form and size of the lost cruck buildings. (11)

2)

The late 16<sup>th</sup> century was a period when land was changing hands following the Dissolution. Tenants in Conistone for instance had opportunity to buy their own land in 1584 and date stones suggest that by the 1630s they were able to rebuild with improved laithes and houses.

18<sup>th</sup> century rebuilding is revealed from documents relating to Appletreewick where a fine laithe dated 1737 still stands and is full of re-used cruck timber. Surviving accounts describe rebuilding of the old ling-thatched barn reusing old interior timber to save costs (12).

Another type of re-used timber that requires dating is the long, wide rafters characterised by having redundant lap joint halvings or mortices cut into them. This suggests a former collar-rafter type of roof or some kind of diagonal bracing and could be medieval. In a barn dated 1635 near Renshaw Farm, Conistone, and in Cove Lane, Grassington, both medieval sites, such timbers retain scratched on carpenter's assembly marks.

An alternative project for tree-ring dating might be to sample the few buildings where standing medieval and early post medieval timber structures survive. This might include the gable end of a large medieval barn at Bolton Abbey and a timbered medieval hall, c 1500, encased inside the 17<sup>th</sup> century Fold Farmhouse at Kettlewell and once the property of Coverham Abbey (13). At a more vernacular level there is a cruck barn at Drebley and upper crucks of uncertain date in houses in Drebley and Conistone.

Candidates for tree-ring dating could therefore be selected from groups of buildings already recorded, perhaps with priority to the most threatened. It should be remembered that all these buildings are private property and require permission to visit.

Projects involving tree-ring dating and work with other specialists could be illuminating, aiding the historical interpretation and understanding of this remarkable area for the benefit of historians, conservation /planning management, residents and visitors. New information may even generate funding for threatened buildings. The time may be right to consider a much needed tree-ring dating project for the Dales area.

## References

1. T.S. Willan (ed), *Three Seventeenth-Century Yorkshire Surveys*, YAS Record series, vol C1V, (1941).
2. R Morgan, *Dendrochronological dating of a Yorkshire timber building*,  
Vernacular Architecture 8, (1977)  
J Hillam and P Ryder, *Tree-ring dating of vernacular building*, Vernacular Architecture 11, (1980)
3. S. Pearson, *Tree-ring dating; a review*, Vernacular Architecture 28(1997) p25.  
S Pearson, *The chronological distribution of tree-ring dates; 1980-2001; an update*,  
Vernacular Architecture 32 (2001) p68.
4. A. Pacey, *Horton Barns*. Yorkshire Buildings 24 (1996). p35
5. A. Pacey, *Buildings and the Archaeology of Landscape*, Yorkshire Buildings 31 (2003).
6. A Armstrong and A Pacey, *High Bradley; Architecture and History*, (2001) Pioneer press.
7. A Pacey, *Selected Starbotten buildings*, Yorkshire Buildings 32. (2004).
8. " *Stamp collecting in Starbotten*, Yorkshire Buildings 32 (.2004).
9. Crook and Pacey, *From Starbotten to Kettlewell*, Yorkshire Buildings 31 (.2003).
10. A C Armstrong. *The Oak and the Ash; on wood and timber types*, Yorkshire Buildings 26. (1998)
11. Skipton Castle Clifford papers in Yorkshire Archaeological Society (Y.A.S.)
12. Heather Beaumont; personal communication.
13. A Pacey, *Cruck buildings of the central Pennines*. Yorkshire Buildings 28. (2000)
13. I. Goodall, *Fold Farmhouse, Kettlewell*. Vernacular Architecture 27. (1996)

(Captions for illustrations; -Copyright YVBSG)

Oak cruck blades re-cut for the 18<sup>th</sup> century barn roof. Lower Winskill, *Longcliffe*  
Barns showing *complex* several phases of pre-18<sup>th</sup> *century built in 17<sup>th</sup> c or earlier* re-building. Back Lane, Starbotten

-----

END