



Darganfod Hen Dai Cymreig Discovering Old Welsh Houses

Reports: Welcome to the many Discovering Old Welsh Houses Reports which are available here on our website. All the reports - House Histories, Building Reports and Tree-ring Dating reports - can be accessed - [here](#)

Discovering Old Welsh Houses studies and celebrates the traditional houses of North Wales and the lives of the people who lived in them.

The copyright of most of these reports belongs to Discovering Old Welsh Houses. Where copyright resides with others, we have made every effort to obtain their permission to reproduce reports on our site. Our policy is to allow free access to our research documents as part of the public benefit we provide as a registered charity. You are welcome to reproduce this material but if you do so, please acknowledge the source

If you find the content useful, please consider becoming a [Member](#) to access the many benefits available.



Please note that these reports are being updated as part of an ongoing programme of revision. Older reports sometimes refer to the old names of the Group. Between 2005 and 2012 also known as The Snowdonia Dendrochronology Project, then the N W Wales Dendrochronology Project and then the Dating Old Welsh Houses Group.

New reports will be added from time to time. Keep an eye on our website for updates.



©Discovering Old Welsh Houses Group

Rhif Elusen Gofrestredig: No: 1131782: Registered charity

www.discoveringoldwelshhouses.co.uk

**TREE-RING DATING OF
OERDDWR ISAF
BEDDGELERT
(CAERNARFONSHIRE)
GWYNEDD**

(NGR SH 259 345)



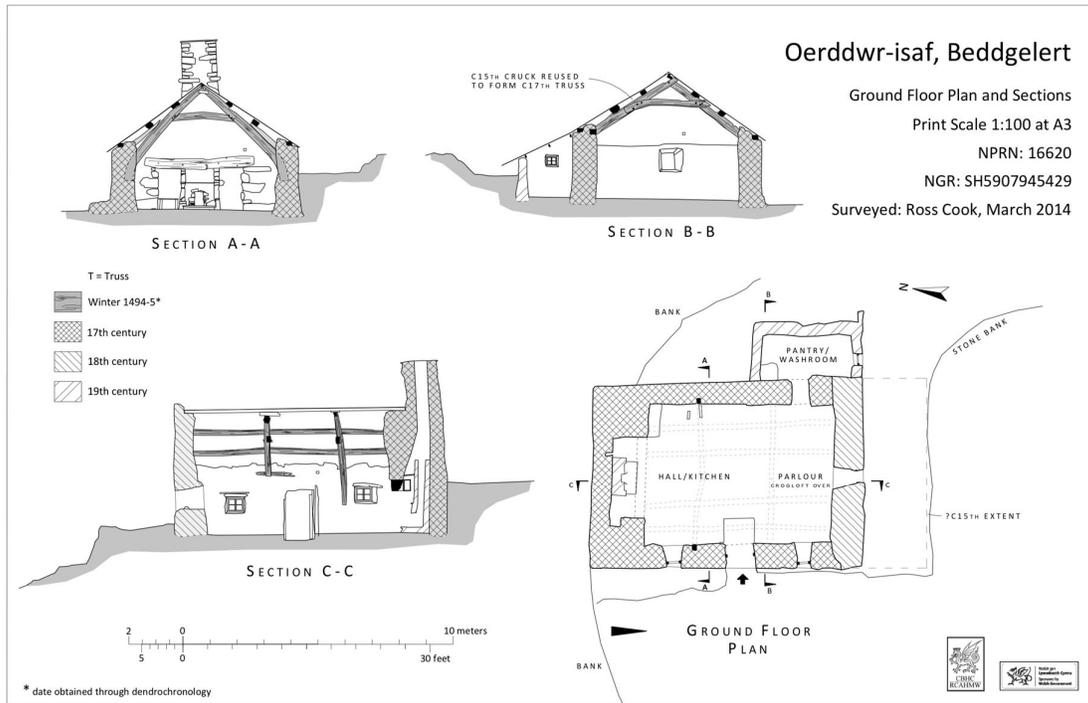
Tree-ring dating was commissioned by the Cymdeithas Hanes Beddgelert (Beddgelert History Society), as part of a project co-ordinated by Margaret Dunn aimed at dating a representative range of houses in six communities in Snowdonia in an area centred on Beddgelert. This was carried out in partnership with the Royal Commission on Ancient and Historical Monuments in Wales (RCAHMW) and Snowdonia National Park Authority. The tree-ring sampling and analysis was carried out in 2006 by the Oxford Dendrochronology Laboratory, Mill Farm, Mapledurham, Oxfordshire RG4 7TX (Dr Dan Miles).

1 SUMMARY

Oerddwr-isaf is an upland farmstead of medieval origin sited about 120m above O.D. The building incorporates timbers from a medieval hall-house: these – cruck blades, principal rafters and purlins – gave a felling date of **winter 1494/5**, making the construction of the original house likely in that year, or within a year or two thereafter. The house platform extends beyond the present three-bay house suggesting that the original building was reduced in size; the full cruck remains *in-situ*. The altered (truncated) house was of *croglofft* (part-floored) type with an upper-end chimney, the cruck-truss central to an open hall and passage, and a re-set partition truss with a lapped collar (probably a reused section of cruck blade) replacing a morticed collar. The cottage retains a kitchen/hall, remarkably still open to the roof, with a central cruck-truss and a gable-end fireplace. The lower *croglofft* end has lost its ceiling and partition (the gable end has a ledge for the joist ends) but retains a truss with a section of cruck-blade reused as a lapped collar. The fireplace lintel, which was inserted at the time of the re-ordering, proved impossible to date by tree-ring width measurement.

The details of the early history of Oerddwr-isaf are not clear: it certainly formed part of the estate of Maredudd ap Ieuan ap Robert of Gwydir (1460-1525) and was leased out in the sixteenth century. Comparison with another of his properties (Gwastadannas, 1508-9) suggests that the modifications of the house may have been made in order to prepare it for a new tenant, but the status of the 1490s hall house remains uncertain.

The building is discussed in Richard Suggett and Margaret Dunn, *Discovering the Historic Houses of Snowdonia* (2014), 136-41 and full references may be found in the house history by Margaret Dunn.



Drawings by Ross Cook Crown Copyright: RCAHMW



Reproduced by permission of National Library of Scotland

Oerddwr-isaf is described in RCAHMW, *Caernarvonshire Inventory II* (1960), 22, no. 709: when visited in 1953 it contained an intact mullioned window with external shutters.

Many digital photographs and other material are accessible on line at the National Monuments record, <https://coflein.gov.uk/en/site/16620?term=OERDDWR%20ISAF%20>

RCAHMW National Primary Reference Number (NPRN): 16620

2 TECHNICAL DATA

The following summary of technical data regarding Oerddwr-isaf is taken from *Vernacular Architecture* 38 (2007), 134 DOI: 10.1179/174962907X248092

Key to abbreviations: Complete sapwood is indicated by 'C' and where the character of the final ring has been identified, the seasonal felling dates are given: winter C (October to February); h/s indicates the presence of the heartwood-sapwood boundary. For 't', see next section, which discusses reference chronologies (site masters) – in general, the higher the 't' value the more secure the dating.

Felling date: Winter 1494/5

Purlins 1494(22C), 1474(h/s); Principal rafters (1/2) 1494(21C); Crucks 1494(20C), 1490(15+3C NM); Inserted mantel-beam (O/I).

Site Master 1424-94 BDGLRT21 (*t* = BDGLRT10; ROYALHS3; ROYALHS1)

Note that the fireplace bressummer (lintel beam) contained too few rings for dendrochronological dating.

3 BACKGROUND TO DENDROCHRONOLOGY

The basis of dendrochronological dating is that trees of the same species, growing at the same time, in similar habitats, produce similar ring-width patterns. These patterns of varying ring-widths are unique to the period of growth. Each tree naturally has its own pattern superimposed on the basic 'signal', resulting from genetic variations in the response to external stimuli, the changing competitive regime between trees, damage, disease, management etc.

In much of Britain the major influence on the growth of a species like oak is, however, the weather conditions experienced from season to season. By taking several contemporaneous samples from a building or other timber structure, it is often possible to cross-match the ring-width patterns, and by averaging the values for the sequences, maximise the common signal between trees. The resulting 'site chronology' may then be compared with existing 'master' or 'reference' chronologies.

This process can be done by a trained dendrochronologist using plots of the ring-widths and comparing them visually, which also serves as a check on measuring procedures. It is essentially a statistical process, and therefore requires sufficiently long sequences for one to be confident in the results. There is no defined minimum length of a tree-ring series that can be confidently cross-matched, but as a working hypothesis most dendrochronologists use series longer than at least fifty years.

The dendrochronologist also uses objective statistical comparison techniques, these having the same constraints. The statistical comparison is based on programs by Baillie & Pilcher (1973, 1984) and uses the Student's t-test. The t-test compares the actual difference between two means in relation to the variation in the data, and is an established statistical technique for looking at the significance of matching between two datasets that has been adopted by dendrochronologists. The values of 't' which give an acceptable match have been the subject of some debate; originally values above 3.5 being regarded as acceptable (given at least 100 years of overlapping rings) but now 4.0 is often taken as the base value. It is possible for a random set of numbers to give an apparently acceptable statistical match against a single reference curve – although the visual analysis of plots of the two series usually shows the trained eye the reality of this match. When a series of ring-widths gives strong statistical

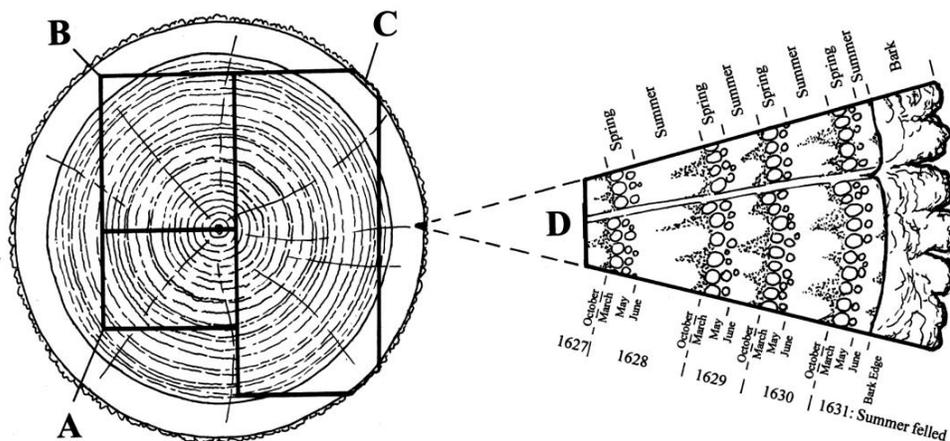
matches in the same position against a number of independent chronologies the series becomes dated with an extremely high level of confidence.

One can develop long reference chronologies by cross-matching the innermost rings of modern timbers with the outermost rings of older timbers successively back in time, adding data from numerous sites. Data now exist covering many thousands of years and it is, in theory, possible to match a sequence of unknown date to this reference material.

It follows from what has been stated above that the chances of matching a single sequence are not as great as for matching a tree-ring series derived from many individuals, since the process of aggregating individual series will remove variation unique to an individual tree, and reinforce the common signal resulting from widespread influences such as the weather. However, a single sequence can be successfully dated, particularly if it has a long ring sequence.

Growth characteristics vary over space and time, trees in south-eastern England generally growing comparatively quickly and with less year-to-year variation than in many other regions (Bridge, 1988). This means that even comparatively large timbers in this region often exhibit few annual rings and are less useful for dating by this technique.

When interpreting the information derived from the dating exercise it is important to take into account such factors as the presence or absence of sapwood on the sample(s), which indicates the outer margins of the tree. Where no sapwood is present it may not be possible to determine how much wood has been removed, and one can therefore only give a date after which the original tree must have been felled. Where the bark is still present on the timber, the year, and even the time of year of felling can be determined. In the case of incomplete sapwood, one can estimate the number of rings likely to have been on the timber by relating it to populations of living and historical timbers to give a statistically valid range of years within which the tree was felled. For this region the estimate used is that 95% of oaks will have a sapwood ring number in the range 11 – 41.



Section of tree with conversion methods showing three types of sapwood retention resulting in A terminus post quem, B a felling date range, and C a precise felling date. Enlarged area D shows the outermost rings of the sapwood with growing seasons.

Compiled by Martin Cherry, June 2022, from material generated by the North-west Wales Tree-ring Dating Project. The origins of this programme of dating lay with the Beddgelert Historical Society under the direction of Margaret Dunn (See the 'About Us' page) and was carried out in partnership with the Royal Commission on the Ancient and Historical Monuments of Wales. The report should be read in conjunction with the other reports in this section.

