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.

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.

TREE-RING DATING OF
FFRIDD-ISAF,
RHYD-DDU, BETWS GARMON,
CAERNARFONSHIRE.
(SH 5752 5280)

1 SUMMARY

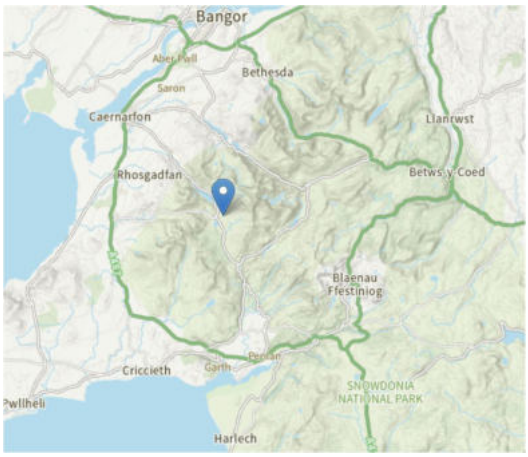
Fridd-isaf is a classic stone-built Snowdonian farm house that now forms the rear wing of a nineteenth-century farmhouse (to the right in the above photo). It was built in or very shortly after 1600 and is tucked into the mountain side at 200m above O.D., and has a mountain stream nearby. A later leat and waterwheel still exist. The name *ffridd* reflects its isolated position on moorland and rough pasture. Field patterns indicate that the area around was farmed in medieval times. The house is associated with a seventeenth-century barn and two cowhouses. The holding was part of an area of upland pasture called Llwyn Llinor, held by the Welsh princes, later passing to the English crown. In the sixteenth century it was granted to royal favourites who then assigned it to local gentry. It is recommended that readers refer to the full house history (by Margaret Dunn) which provides valuable background although, to date, it has not been possible to identify the builder of Ffridd-isaf.

The old house (rear range) is of two-unit plan-type with a cross-passage and gable-end chimney. It may originally have been half storeyed and half open to the roof in the manner of a *croglofft*. The massive end fireplace has slate-stone voussoirs to a wide segmental arch and a partly reconstructed bread oven. There is an original heavy cross-beam with repositioned joists and a reconstructed plank and muntin screen, of which only the head-beam is original: this marks the position of a former cross-passage running parallel with the back wall of the

nineteenth-century part of the house. The screen may originally have supported a loft, accessed by a ladder stair, with the remainder of the seventeenth-century range being open to the roof; now the first floor is continuous. The roof structure is of three bays with two massive A-frame trusses. The principal rafters and purlins, which are primary, provided the tree-ring dates.

The felling dates are **Spring 1598 and Winter 1599/1600**, making construction likely in 1600, or within a year or two after this date.

Of the associated farm buildings, the four-bay barn has a 1612 date stone and one of the cowhouses bears the inscription: EJ.CWMFEDW/ 1847. These latter buildings had fast-grown timbers, yielding too few tree rings, and were not sampled.



The above map is reproduced with the permission of the National Library of Scotland.

2 TECHNICAL DATA

The following summary of technical data regarding Fridd-isaf is taken from *Vernacular Architecture* 37 (2006), 130 https://doi.org/10.1179/174962906X158309. 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), spring (¼C) and summer (½C), referring approximately to October to February, March to May and June to September respectively; 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.

Principal rafters 1597(45¼C, 36¼C); Purlins 1599(38C, 30C), 1584(15); Transverse beam (0/1). *Site Master* 1423–1599 BDGLRT1 (*t* = 5.6 CLIVEHS; 5.4 ALCASTON; 5.3 CEFNCAR1)

3 BACKGROUND TO DENDROCHRONOLOGY (Dan Miles)

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.

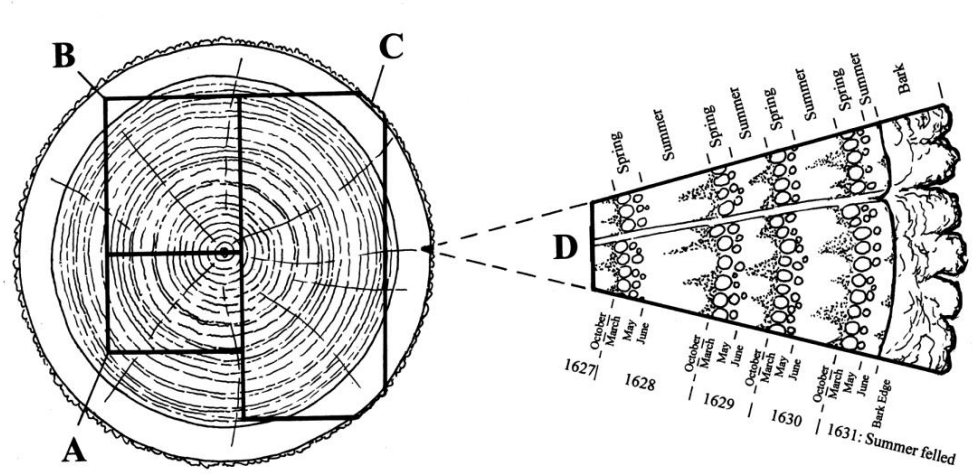
One can develop long reference chronologies by cross-matching the innermost rings of modern timbers with the outermost rings of older timbers successively back in time, adding data from numerous sites. Data now exist covering many thousands of years and it is, in theory, possible to match a sequence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

4 ACKNOWLEDGEMENTS

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), commissioned by Cymdeithas Hanes Beddgelert in association with the Royal Commission on the Ancient and Historic Monuments of Wales (RCAHMW). Further research and interpretation were undertaken by Margaret Dunn (who wrote the house history) and Richard Suggett. Some material was derived from the statutory list descriptions and Coflein (the online catalogue of archaeology, buildings, industrial and maritime heritage in Wales curated by the RCAHMW) at https://coflein.gov.uk/en/search/?term=fridd+isaf .

.