DYDDIO HEN DAI CYMREIG | DATING OLD WELSH HOUSES

PROSIECT DENDROCRONOLEG GOGLEDD ORLLEWIN CYMRU | NORTH WEST WALES DENDROCHRONOLOGY PROJECT

Oxford Dendrochronology Laboratory
Report 2010/44

THE TREE-RING DATING OF

THE GEORGE & DRAGON

**Church Street, BEAUMARIS,
ANGLESEY
(SH 605 761)
1536**

Houses Description

An important timber-framed and jettied range on a corner site. The wall-framing has been lost and it is difficult to establish if this impressive range had a commercial function. The upper floor was not sampled; it is noted for wall paintings dated 1610.

Published account RCAHMW, Anglesey Inventory (1937), p. 15; a detailed survey (2010) commissioned by NWWDP is available in the NMRW.

Richard Suggett. RCAHMW.

The present list includes sampling commissioned by the North-West Wales Dendrochronology Project (in association with RCAHMW). The North-West Wales Dendrochronology Project (NWWDP) is a community-based project which aims to date historic houses throughout the historic counties of north-west Wales Sampling in Gwynedd (Merioneth and Caernarfomshire) is often difficult because of fast-grown timber, but cross-matching has also suggested that Irish timber may have been imported for building in treeless Anglesey.
Medieval houses dating from before 1400 remain elusive. Hallhouses that have been dated are within the ranges already established for gentry and peasant halls. The apparently coeval fireplace and hall-truss at Tyn-llan suggests that some hallhouses may have had enclosed fireplaces in the early sixteenth century. The first generation of storeyed houses of Snowdonian type are surprisingly early, pre-dating the general insertion of fireplaces in hallhouses from about 1575. Several C15th and C16th town-houses were dated in Beaumaris, Caernarfon and Conway, and are a very useful addition to our knowledge of urban buildings. Detailed surveys of many of the houses sampled are available in the National Monuments Record of Wales (NMRW), the public archive of the Royal Commission.
Daniel Miles, Michael Worthington, Martin Bridge, Richard Suggett, and Margaret Dunn

Authors: Dr M. C. Bridge FSA and Dr D. W. H. Miles FSA
Oxford Dendrochronology Laboratory
Mill Farm
Mapledurham
Oxfordshire
RG4 7TX

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The Tree-Ring Dating of BRANAS UCHAF Llandrillo, (Edeyrnion, Merioneth) Denbighsire. (SJ 011 372)

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 these 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 data sets 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 (Miles 1997a).

Church Street, BEAUMARIS, ANGLESEY (SH 605 761)

Felling dates: **Winter 1536/7, Winter 1539/40, Winter 1540/41, and Spring 1541**
Axial beam 1540(22¼C), 1536(17C); Transverse beam 1539(32C); Joists 1540(31C), 1539(41C, 34C), 1534(21).

Site Master 1437-1540 ANGLSY1 (*t* = 8.6 PLASMAWR; 7.7 SOUTH; 7.6 WALES97).

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