Changing history: new techniques to further inform The Vyne's story

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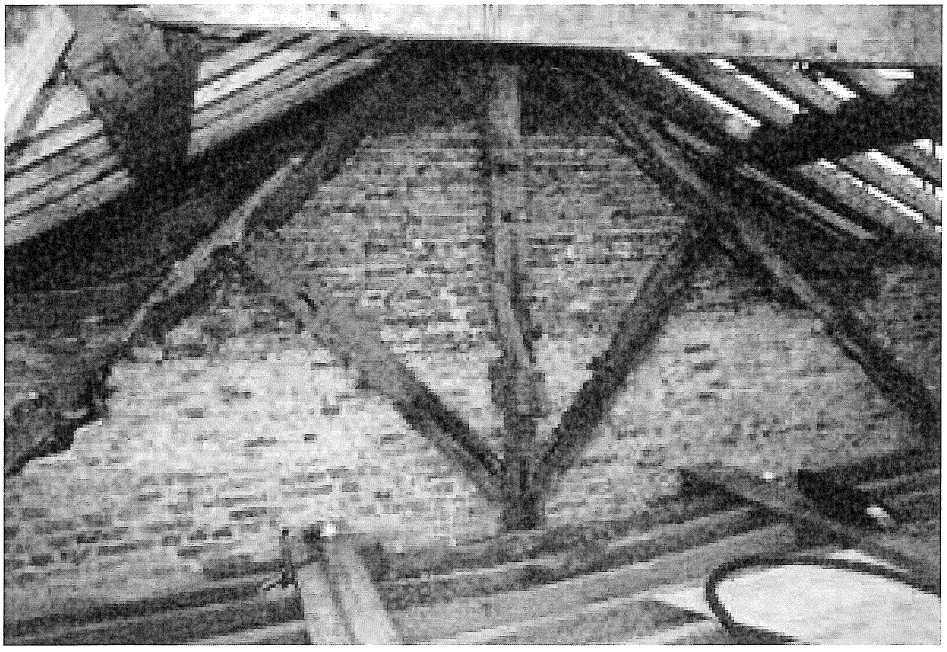
In 1998 The Vyne in Hampshire was undergoing major internal re-servicing works, and a series of dendrochronology samples were taken from various areas of the house. One element of particular interest to the National Trust was the north-front portico, attributed to John Webb, which documentary evidence suggested was the earliest classical portico applied to an English country house. Although some of the samples taken inside the house in the south range dated to the early spring of 1654, two samples from the portico itself failed to match either each other or with the reference chronologies as they were fast-grown and showed little year-to-year variability in their ring widths. It was therefore not possible to confirm that the present portico was original and dated to the mid-seventeenth century.

During more recent works to re-roof The Vyne in 2017, it was suggested by the Oxford Dendrochronology Laboratory[1] that the two undated samples from 1998 be submitted to the UK Oak Project[2] in an attempt to date them using a new technique 'stable isotope dendrochronology'. The UK Oak Project is an inter-disciplinary project investigating the physical and chemical properties of oak tree-rings to advance dendrochronology, science-based dating in archaeology and the study of past climate. Funded by the Leverhulme Trust and Natural Environment Research Council, the research team brings together scientists from the Department of Geography at Swansea University and the

View of the north front of The Vyne, Hampshire.

Ross Cook of the Oxford Dendrochronology Laboratory sampling roof timbers at The Vyne; this roof is over the Oak Gallery. © National Trust/Gary Marshall



The north-end roof truss of the portico roof, from where samples were taken. © National Trust/Gary Marshall

University of Oxford's Research Laboratory for Archaeology and the History of Art.

The new dating technique studies the chemistry of the wood, specifically the stable (non-radioactive) isotopes of carbon and oxygen. The carbon isotopes vary mainly in response to the amount of summer sunshine and the oxygen isotopes to summer rainfall. The isotopic match between trees is much stronger than for ring widths and importantly the trees do not need to be physiologically stressed to record a dating signal. This means that it is possible, for regions of low climatic stress such as the UK, to date the short and invariant samples that might normally be considered unsuitable for ring-width dendrochronology.

The two Vyne samples were compared with the oxygen isotope master chronology for south-central England. The results were spectacularly successful. The first sample, from the west lower principal rafter in the portico roof, had 73 growth rings, and a second sample, from the east upper principal rafter, had 86 rings. Both were complete to the bark edge and both were unequivocally found to have been felled in the winter of 1655/6 (t=7.47, 1/p >1 million). This date confirms that the structure of the portico was indeed built using primary rather than recycled timbers, and was constructed shortly after the winter of 1655/6. Three surviving contracts held by the Hampshire Record Office document works undertaken by mason Edward Marshall on the portico in 1655. The timbers felled would probably have been used 'green', i.e. unseasoned, so a completion date for the portico roof of 1656 can now be assumed.

References

1. UK Oak Project: www.oak-research.co.uk
2. Oxford Dendrochronology Laboratory: www.oxford-dendrolab.com
3. Loader *et al.* (2019) 'Tree Ring Dating Using Oxygen Isotopes: A Master Chronology for Central England', *Journal of Quaternary Science*. DOI: 10.1002/jqs.3115

About the authors

Dr Dan Miles works in the Research Laboratory for Archaeology and the History of Art and is also a partner in the Oxford Dendrochronology Laboratory, an independent laboratory linked to Oxford University. Professor Neil Loader teaches geography at Swansea University and leads the UK Oak Project. The UK Oak Project would be pleased to discuss wider applications across the Trust's remit.