



Dear Members,

Firstly, may I welcome two new members to S.T.T., who despite our restricted programme have decided to join us. They are Mr and Mrs Cooper of Broseley. We hope to be able to welcome them in person in the not too distant future.

The Government's announcement following the Cabinet Meeting on 25th May included no lifting of restrictions that would allow our visit to April Lay's farm on 13th June to go ahead.

However, after a socially distanced meeting today (26th) with John Tuer we two have decided to offer members the chance to visit the second half of Telford's trees on 13th June **in pairs 2m apart**. This visit was to have been on 10th May. John has agreed to prepare a hand-out which will allow two members to self guide round the trees. Unfortunately there would be no tea and cake afterwards!

Would any member interested in attending please reply using the Editor's email address or phone me on 01743 357252.

Members should meet outside Dothill Primary School on Severn Drive, Wellington, Telford, TF1 3JB in time for a 2pm start. Please do not congregate but stay 2m apart. John will hand out his self-guided tour at that time.

Directions on how to get there. (see end of newsletter)

Conscious that members are not getting full value this year for their membership fee, in a first ever on-line Zoom meeting your Committee has decided to pay for entry fees to one or more places we are hoping to visit either this year or next (we decided also to carry over any missed visits and lectures into next year's programme). In light of the financial resources we have it would not support a year without membership income and that would be very complicated to sort out.

Oak Resilience Meeting. In February I was invited to attend as an active ObservaTree volunteer, a meeting organised by Forest Research on this subject. It was a follow-up to a similar meeting in 2019 which I also attended. I was asked to prepare a report of the two meetings which is attached to this Newsletter. It was not

an easy task to summarise 26 presentations into a language non-scientists can understand! It is four and a half pages long and will NOT be printed out for those members receiving the Newsletter by post. **However, if any member would like a printed copy, please contact the editor or myself.**

A similar meeting on Oak resilience was also held earlier in the year at the Birmingham Institute of Forest Research (BIFOR), a part of which S.T.T. visited two years ago at Norbury, near Market Drayton. A rather more complete and scientific summary of this meeting has recently been made available through the Royal Forestry Society's Newsletter and is worth a read.

Xylella. In the latest R.F.S. Newsletter, the news that another 37 species of plants have been added to the list of those affected by *Xylella fastidiosa* is not such good news. However the French Ministry of Agriculture Official website shows that the natural spread of the disease has not extended beyond a thin coastal strip round the Cote d'Azur and Corsica. It spread like wild-fire from Puglia throughout Italy three years ago which in my mind suggests that the northward spread is limited by temperature. The disease originated on Citrus plants in the West Indies. Cases have been reported in Belgium, Northern Germany and Holland but these have all been found to have been on bought-in plants! Caveat emptor! **Andy Gordon, Chair**

Tall Trees Again

We are scheduled to visit The Hurst for our July visit. The likelihood of us going there, as I write, is low but, perhaps, there is just a chance that things might change and we shall all be able to get out again. (Did you see those pigs flying past?). However, if not this year, then I'm sure the Hurst will allow us to visit in 2021. So I write this with that visit in mind and to whet your appetite.

The Hurst, situated between Clunton and Clun, has a particular arboricultural feature that not many know about and that is something I shall come to in a minute. Yes, it is related to 'tall trees', so let me take you back first to our visit to the Leighton Redwoods last year. Those of you who came along will remember that the Redwood Grove is owned by the Royal Forestry Society and its warden, David Williams, described its history as we walked around. He told us that the redwoods there were Coast Redwoods (*Sequoia sempervirens*) and that the original grove of 33 trees was planted in 1857. Only 14 years after the first introduction of this species into Britain, these 33 trees were brought from California on the deck of a sailing ship. Their native home is in the Coast Range of mountains (hence their common name) in California between the Pacific Ocean and the great Central Californian Valley. It is here that we find Hyperion, the tallest tree in the world that I mentioned last month, itself a Coast Redwood and standing at 381 feet tall.

In the 1930s, the Leighton Estate was bought by a Major Charles Ackers and it was he who, in 1934, planted a second redwood grove adjacent to the first. He planted the trees at 24 feet spacing but in a mix of Ash, European Larch and Douglas Fir. By 1975, the Redwoods in this second grove, which had become known as the Charles Ackers Grove, were smothered by the other species and, as Ackers had

laid down that 'No redwoods should be felled', it was thought necessary to fell all these other species to protect this second grove.

Hence the thinning of this second grove took place from 1975 under the R.F.S. director, Esmond Harris. He felt it necessary to do this to save these 1934 redwoods. Removal of these other species found the redwoods that were left behind to be thin and spindly, some bending over almost touching the ground. Had Harris made the right decision? He was alarmed. But he need not have been because it didn't take long for these redwoods to put on girth and strength and stand erect once again.

These are remarkable trees. They are one of the very few species of conifer that can be coppiced. Cut them down to the ground and they shoot up again with multiple stems. Only two other species of conifer can do this. These Coast Redwoods can also withstand fire. In his book 'The Wild Trees', Richard Preston says 'If a redwood is burned in a fire to a blackened skeleton, it can come back to life, as long as its root system remains intact'. I do have personal experience of this. I live in Much Wenlock and along a corner of the road to Broseley stand three trees of this species. A few years ago, a car crashed into these trees, its engine set on fire and burned for some considerable time before fire assistance came. The trees were badly scorched, blackened on their road sides around much of their girths. Today, you would never know this. They have recovered so well, there is no indication that they had ever suffered in this way.

I said that these are remarkable trees and I refer to Richard Preston again. The trees in their native habitat are so tall that it can take over two weeks for water to pass from their roots to their tips. But, being in California where the fogs move inland from the Pacific, help is at hand: Todd Dawson, a biologist at Berkeley, University of California, has discovered that a redwood that is bathed in fog can take moisture in through its needles and send the water downwards into their trunks. No other species of tree is known to be able to do this and certainly our 'local' Leighton Redwoods have no need, even if they were exposed to regular fogs, for their heights are yet nowhere near those of their Californian cousins.

The Redwoods in the second grove at Leighton, amazingly, put on considerable height and volume since the removal of the other species had allowed room for their expansion, so much so that, despite Ackers' order that none should be removed, it was felt by 1990 that something should be done to relieve imminent congestion. So Harris initiated the first thinning of these 1934 trees in 1990 and they have been thinned on occasions since.

This year, 2020, will be the year of their seventh thinning and, over a period of 18 months, 73 trees will be removed, being all redwoods from the second planting. More space is needed for the remaining trees to grow taller and wider. The largest to be felled is 41 metres tall with a diameter at breast height (D.B.H.) of 1.3 metres. It is almost 40 tonnes in weight.

Are you alarmed? I am not at all surprised if you are but, remember, the original 1857 trees remain untouched and the number of trees in the second grove can stand this number being taken out. There are just so many Coast Redwoods on the site..

So what will happen to the trees being removed? As I say, they are large, very large, and there are very few sawmills in the country of the size necessary to be able to handle them. Upper Elms Sawmill, near Worcester, has a large enough facility and, from there, the timber will be go to local builders and landscapers. This timber is naturally durable. Its innate tannins and chemicals, which as we have seen act as a flame retardant, also resist insect attack so it makes excellent building cladding.....and very attractive it is too. Wendy Nekar, writing in the RFS Quarterly Journal, says that the timber has no loose knots, does not split when green, doesn't shrink or twist and holds its profile when water is absorbed. Nor does it need treating. What a wonderful timber. I have always felt that Western Red Cedar matched these qualities, but I'm not sure that it is quite as good a replacement.

So what has all this to do with our visit to The Hurst? Well, although Leighton has the largest Coast Redwood plantation in Europe, The Hurst has its very own, but not-so-large, plantation. Yes, really. Not many people know this, but there are many Coast Redwoods at The Hurst planted in a similar type of grove. How old are they? Who planted them? How did they arrive from America? All questions to be asked when we go there, but I'm not sure that the present occupiers of the estate know these answers. If any of you wish to do any research into this before we go, either this year or next, please do. I, for one, would be thrilled to know. **John Tuer**

Sources:

Article: 'Learning from Leighton' by Wendy Nekar. RFS Quarterly Journal. January 2020.

Letter: 'Leighton Redwoods' From Esmond Harris. RFS Quarterly Journal. April 2020.

Notes: 'The Charles Ackers Redwood Grove at Leighton' – Notes from the Royal Forestry Society by David Williams. June 2007.

Book: 'The Wild Trees' by Richard Preston. Penguin Books. 2007.



Above- Why a Redwood Tree is called a redwood tree.

Right- Within the 1857 Redwood Grove – the famous 'nurse tree'.

The scent of Katsura foliage

A few days back after being awoken as normal this time of year by a singing blackbird on a wire (4.15 a.m. he begins, though it will be even earlier in a few weeks when he's replaced by the cock swallow chunnering away whilst enjoying the radiated stored heat of house walls) I went outside to the vaguely familiar smell of candyfloss. Rarely at my sharpest before sunrise, or indeed ever, it took me a few minutes to realise that it was the unmistakable scent of Katsura foliage so distinctive in autumn, but never before in spring. Like so much else this season, the two samples here (grown for their fine timber) had been blasted by the late frost. But they were 150 yards away and there was not a breath of wind. Air currents are such endlessly mystifying phenomena, for a few hours that day the air was full of burnt sugar.

The late spring frosts have done even more damage than has become normal in the last few years. So much emerging foliage has been completely blitzed probably as a result of yet another very mild winter not reducing soil temperatures enough and therefore stimulating premature early spring growth. Many early varieties of walnut have completely lost their foliage, thankfully the later varieties show no signs of bud break yet. All but three of the many ash have been severely affected, even young growth on the beech hedge around the garden has been killed. The main principle of agroforestry strategies around the world is to employ late-leafing species so that the crop beneath has fully grown and all it has to do is ripen once the canopy has set. Should we be propagating from trees resistant to late frosts, i.e. those which leaf out later as it takes so much energy to leaf-out twice? Even after the cold winter of 2010-2011 when frosts lasted here until the end of May, there was less damage because soil temperatures were so low and leafing was much later than normal.

For various moral, economic and environmental reasons I stopped flying a quarter of a century back, mainly because I was horrified at the coalescing effect of vapour trails on morning sunlight levels. Projecting that image into the future was very disconcerting. Indeed are today's clear skies causing greater diurnal temperature ranges and therefore more spring frosts? With regard to disease transmission, the present situation with Covid-19 very much mirrors that of Bovine TB throughout my farming life. As livestock farms get ever larger, less nucleated and more dispersed, animal movements become more complicated and over greater distances. And when unhealthy and/or persistently infected animals are moved (exasperated by the stress of movement) they spread disease to other areas. There are obvious links between the emergence and management of disease in any animal or human population and the way this is transported around the globe. Once again nature is trying to tell us something but is anyone listening? **Peter Aspin**

Starting point for the second group of Telford's 50 Trees

The starting point for this visit will be outside the front of Dothill Primary School, Severn Drive, Wellington, Telford, TF1 3JB.

How to get there from Shrewsbury

Go along the M54 motorway to Junction 7. Turn left onto Holyhead Road (the old A5).

Take the 2nd left (Haygate Road) just before the Old Orleton Inn.

Continue along this road to its end at a cross roads with an Indian Restaurant opposite.

Turn left onto Bridge Road and continue through traffic lights and over a railway bridge to a roundabout outside Morrison's Supermarket.

Take 2nd left off the roundabout, signed Dothill and Admaston. Continue through traffic lights past Springhill Garage on the left and take the next right after the garage. This is signed Admaston and Bratton and is called Admaston Road.

Take the 2nd right off Admaston Road at the Captain Webb public house. This is Bagley Drive. Go to the end facing a large willow tree and turn left onto Marton Drive. Bear right with Marton Drive and continue along this road (several bends) to its T-junction with Severn Drive at a mini-roundabout. Turn left.

Go past Dothill School (on your right) to the very end – it's a cul-de-sac. Turn around and face the way you came. There are double yellow lines here so, sorry, no parking. But you can park on the right just before the road bollard and after it on the left. If you run out of space here, go a little further and you can park beside the notice board on the left.

We shall meet at 2.00pm beside the litter bin and railing on the green outside the school. Unless there is any change in regulations....

(Thanks for reading our latest bumper edition, we are hoping to maintain this for the present, so you get your money's worth, David M, ed.) Below for digital readers is the Oak diseases report by Andy Gordon.

The impressive UK research effort on oak diseases

by Andy Gordon, Lead Observatree Volunteer

In the last 12 months two day-long meetings have been held in Alton, Hants, near Forest Research at Alice Holt Lodge to allow research workers on Acute Oak Decline (AOD) and other diseases of oaks to report on their progress to fellow researchers, stake holders, the press and volunteers and to allow discussions and questioning to take place. Brian Jones and I, both lead Volunteers for Observatree, were invited to attend as we both have reported multiple cases of A.O.D.

The first Meeting in April 2019 was held to mark the ten years of concentrated research on A.O.D.; the second meeting in February 2020 on the Resilience of Oak was held as a follow on to the first successful meeting but also as a contribution to mark the International year of Plant Health.

Oak diseases research in the UK is spear-headed by Dr Sandra Denman of Forest Research, Principal Investigator of oak declines and Director of a multidisciplinary team carrying out research on oak declines. She has managed to attract funds from an impressive list of sources including Defra, the Forestry Commission, Woodland Heritage, Woodland Trust, National Trust, The Monument Trust, The J. Paul Getty Jr. Trust and many many more. Sandra opened and summed up both meetings as well as giving a number of presentations.

Across the two meetings 20 different researchers from as many as 12 different research establishments in England, Wales and Denmark presented their work in a total of 32 presentations. The breadth of the research was impressive and the advances in scientific techniques which have taken place since I left Forest Research as an employee made it difficult for a retired forester to follow everything!

The purpose of this paper is to bring to the attention of the Observatree family a short note of some of the interesting findings that have already been made and often published. The presentations can be classed under a number of headings, Work Above Ground, Work Below ground, Micro-organisms, *Agilus biguttatus* and other interesting work on oaks. Only the presenters name has been given even though in all cases up to six co-workers have been involved.

Work Above Ground.

Nathan Brown, now working for Woodland Heritage at Alice Holt has found that the limit of northerly spread of A.O.D. is temperature dependent and runs from approximately Liverpool to Hull. He is gathering together data on 10 years of observations from 90 plots across the UK on tree diseases. Epidemics appear to follow very dry hot summers followed by wetter years.

Jasen Finch from Aberystwyth University has developed a standard quantitative assessment of oak health based on their canopy condition and has found that symptomatic trees have a strong influence on the chemical composition of some metabolites found in phloem and sapwood.

Mary Gagen at Swansea University has shown that trees show the onset of decline in their annual growth rings long before the tree crown shows symptoms.

Work Below Ground.

Elena Vanguelova in Forest Research has shown that soil acidity leads to nutrient deficiencies and imbalances in A.O.D. symptomatic trees; in trees showing Chronic Oak Decline (C.O.D.) soils are deficient in nitrogen and phosphorus.

Greg Deakin at NIAB-EMR found that neither A.O.D. nor C.O.D. were attributable to a specific soil rhizosphere pathogen.

Laura Martinez-Suz (Kew) explained that in Britain, ectomycorrhizal fungi, which perform and improve the function of root-hairs in oaks, are different on symptomatic sites compared with oaks on continental and British sites with no symptoms. Of the 206 different mycorrhizal fungal species identified, those on oaks on symptomatic sites were less able to exploit the soil further from the roots.

Kelly Scarlett at Alice Holt is investigating the changes in forest soil nitrogen indirectly caused by farmers and the resulting changes in the N-cycle with a view to improve forest management.

Work on Micro-organisms.

Sandra Denman describing preliminary work, has not found differences in the presence of *Phytophthora* and *Pythium* fungi in the feeder roots of symptomatic and healthy roots. She has found more than 50 genera of fungi in oak feeder roots.

Carrie Brady at the University of West England (UWE) has put the bacteria associated with A.O.D. into the appropriate taxa and has formally described 2 novel genera, 14 novel species and 5 novel sub-species.

Victoria Bueno Gonzalez (University of the West of England) has developed a rapid identification laboratory technique for A.O.D.-associated bacteria.

James Doonan (Bangor University now University of Copenhagen) has identified the genes in the two bacteria (*Brenneria goodwinii* and *Gibbsiella quercinecans*) that control the break-down of oak tissue.

Louise Gathercole (Kew and Queen Mary University London) using whole genome sequencing found that leaves taken from both symptomatic and non-symptomatic trees from five sites showed presence of the A.O.D. bacteria.

Emma Bonham (Harper Adams University) has shown that the above two A.O.D. bacteria are found on the leaves and acorns of symptomatic and non-symptomatic trees.

Bridget Crampton, Forest Research. As a bi-product of her work on the four species of bacteria *Brenneria goodwinii*, *Gibbsiella quercinecans*, *Rahnella victoriana* and *Lonsdalea britannica* associated with A.O.D., she developed a quick colorimetric test for distinguishing between roots of oak and other forest species. In her work on the four above bacterial species Bridget developed a rapid multiplex quantitative polymerase chain reaction (qPCR) assay that identifies each of them in non-invasive swab tests that allow FR to diagnose A.O.D. conclusively.

Mallory Diggins (Bangor University) has shown that a different species of *Armillaria*, *A. gallica*, rather than *A. mellea* is responsible for “honey fungus” attacks on oaks, often leading to C.O.D. symptoms and death. *A. gallica* can behave as a saprophyte as well as a parasite and work is continuing to identify the trigger for the change.

Work on *Agilus biguttatus*. (Jewel beetle)

Katy Reed who studied her PhD through Harper Adams University and FR but is now based at FR has studied the effect of A.O.D. on the annual growth rings of oak (dendrochronology). Preliminary results suggest that trees with long-term A.O.D. symptoms have grown more slowly throughout their life.

Emma Bonham (Harper Adams) has not been able to isolate the A.O.D. associated bacteria from the Jewel Beetle which is associated with almost all A.O.D. infected trees.

James Doonan has shown that about 400 genes are active in oak break-down but when *Agilus biguttatus* is present over 4000 genes are active.

Jozsef Vuts (Rothamsted) has found naturally occurring behaviour modifying chemicals (volatiles) in oak leaves and bark which are attractive not only to *A. biguttatus* but also to parasitic wasps which seek out their larvae for egg laying. This offers a possible method of biological control of the Jewel beetle. The beetle was also attracted to volatiles given off by the A.O.D. bacteria.

Other interesting work on oaks

Gabriele Nocchi (Kew and Queen Mary University London) has been using D.N.A. sequencing to differentiate between the two oak species and hybrids between them as well as to track from where oaks migrated to the UK following the last ice age. This work is particularly interesting to me wearing my hat as a verifier for the Ancient Tree Inventory. Gabriele showed that most of the oaks in the UK originated from a refugium in the west of Spain whereas a minority came from a Balkan refugium.

Bridget Crampton described the work she was doing on two stem cankers of oak. One on mature and maturing oaks was characterised by bark cracking, outer bark flaking off with callusing lesions; the other on younger oaks up to 45 years of age showed basal cracking and stem bleeding from which *Phytophthora cambivora*, *Brenneria goodwinii* and *Gibbsiella quercinecans* were isolated. The causal agents of these two diseases have not yet been confirmed.

Daegan Inward at Forest Research, described the action that had been taken to identify and destroy the caterpillars in the infestations of Oak Processionary Moth (OPM) in the UK. He also mentioned two other threats to British oaks, the Oak Lace bug *Corythuca arcuate* and the Polyphagous shot hole borer *Euwallacea fornicates* which has spread widely throughout the world and has a very high host range including oak. He asked participants to be on the look out for these pests during their visits to forests.

Observatree:	https://www.forestresearch.gov.uk/tools-and-resources/observatree/
Tree Alert:	https://www.forestresearch.gov.uk/tools-and-resources/tree-alert/
Acute Oak Decline:	https://www.forestresearch.gov.uk/tools-and-resources/pest-and-disease-resources/acute-oak-decline/
