

We should like to thank Paul McCartney for his continued generosity in sponsoring our newsletter.

As a member you will receive one printed copy through the post.
Additional copies are available for £1 including P&P.
For overseas members outside the British Isles there may be an additional postage charge.

Report from the Chairman - Colin Hall

Landmark publication for the Tree Register

The highlight of the year was undoubtedly the publication of *Champion Trees of Britain and Ireland*. Bringing together in one volume the champion tree data from our records and representing the culmination of several years work, the book is a landmark for the Tree Register. Hilliers Arboretum kindly invited us to their new visitor centre for the launch of the book, following which several members enjoyed guided tours of the gardens led by Roy Lancaster and Allen Coombes.

Tribute to Alan Mitchell and Vicky Schilling

The book follows in the great tradition set by the forefathers of today's tree measurers, Evelyn, Loudon, Elwes and Henry and, of course, Alan Mitchell himself. It is also a tribute to Alan and Vicky Schilling for their foresight in setting up the Tree Register some 15 years ago. Congratulations and our sincerest thanks are due to Dr. Owen Johnson for his tremendous hard work and attention to detail that has earned the book such praise already. Our thanks are also due to everyone else who helped with the book.



Tony Kirkham, Head of Arboretum at Kew, with their most recent champion, a Liquidambar acalacyna (Tree Register)

If you do not already have your copy of the book, order it now from Pamela Stevenson, our Secretary, or on our website.

John Workman OBE retires

John Workman, one of our founder trustees, retired this year, having reached his 80th birthday. We will miss John's wise counsel and owe him much thanks for his valuable contribution over the last 15 years.

Ancient Tree Hunt

Our joint project with the Woodland Trust to produce a database of ancient and veteran trees moves forward with the launch of the Ancient Tree Hunt website.

The Tree Register is, however, not just concerned with champion and ancient trees. Keep looking out for these but also for any unusual and rare trees and let us know about them!

MBE for Big Tree Hunter

The 2004 New Years honours list saw James Paterson awarded the MBE for his tireless work promoting Scottish heritage and raising awareness of his countries arboreal treasures. Jim receives his MBE from Her Majesty the Queen at the Palace of Holyroodhouse on 29th June 2004. Congratulations Jim from everyone at the Tree Register. Keep finding the big and tall trees of Scotland!

Jim Paterson MBE and the champion Noble Fir (*Abies procera*) he discovered along the River Findhorn, Morayshire.



Report from the Registrar - David Alderman

Mapping a future for ancient trees

The past year has been especially busy for those of us who volunteer our time to meet the aims and needs of the Tree Register. At times our long suffering Honorary Secretary Pamela Stevenson found herself literally swamped in copies of the Champion Tree Book, as her bungalow became a rival to Amazon.com. Fortunately the local post lady was very supportive, backing her van down the drive to collect the packaged books, after spotting Pamela wheel-barrowing an assignment along the road to the post box!

Important data

Volunteer measurers, our "Tapers", have also been busy and for fear of missing someone out I would like to pass on grateful thanks to anyone who took the time to carefully record and send details of trees, either new or updates. Only with your input can the Tree Register continue to maintain such a unique record. To illustrate how important this is, we supplied specific data to Brooklyn Botanic Gardens USA and had a wonderful reply stating the information of planting dates, measurements and data to assist growth rate analysis was the best they had received from anywhere in the world.

Ancient Tree Hunt

The Tree Register partnership with the Woodland Trust has also gained momentum and this year will see the first stages of mapping our ancient trees appear on the web site www.ancient-tree.org.uk. I am very pleased that this project will be extended across all Ireland and funding is currently being sought to achieve this. Tree Register supporters and members of the public have been quick to respond, reporting their favourite trees. There have been some wonderful stories received relating to special trees and some of these can be seen on the Ancient Tree Forum web site. You can find both this and the Ancient Tree Hunt by following links from the Woodland Trust web site www.woodlandtrust.org.uk

Ancient trees – securing their future

At Windsor Great Park on 29th April 2004 The Woodland Trust and Ancient Tree Forum launched their Call for Action for Ancient trees - securing their future. Actress Prunella Scales addressed 100 specially invited guests, lending her support to the project. David Kidney MP, Chair of the Parliamentary All Party Conservation and Wildlife Group, promised to improve protection of our ancient tree heritage through parliament. The Tree Register were represented by our Chairman of Trustees, Colin Hall. Trustee Thomas Pakenham gave a passionate plea for support on BBC Radio 4 earlier in the day. Ted Green led the party to a particularly old and hollow Oak tree where many sheltered from the rain.

Elm Map

Veteran elm discovered along a public footpath.

The Tree Register is now including the Elm Map information gathered by the Natural History Museum and Ramblers' Association as part of an initiative to map our surviving mature elm trees. During 2003 approximately 800 people took part in 43 organised walks collecting 441 elm records of which more than 25% were categorised as large trees (those too big to hug!) Of these, some have proved to be nationally notable and an important record on the Tree Register. Elm Map is ongoing and for 2004 the Ramblers' Association have Elm Map walks from 18-26 September as part of Welcome to Walking Week. Contact the RA on 020 7339 8536 for details.



Congratulations

I cannot close without adding to our Chairman's congratulations to Jim Paterson being awarded the MBE.

Well deserved Jim, I can't wait for the next expedition!

The ArborBolt System

Ben Fuest

Lightning conductors for trees

Lightning damage to trees can be spectacular and fatal. The number of trees struck annually in the UK is generally under-estimated. There are no national figures of trees struck but a company called EA Technology monitor cloud to ground strokes. Their data has shown the number of potentially damaging strikes recorded on a site is far greater than owners notice.

Arborbolt Ltd. was founded for the purpose of developing lightning protection systems specifically designed to be fitted into trees. Coming from backgrounds in arboriculture and silviculture, our initial concern was to enable important and intrinsically valuable trees to be protected from damage resulting from lightning strikes. However, it quickly became apparent that the protection of nearby structures and buildings that might be liable to collateral damage in the event of a strike was of equal significance.

Arboricultural constraints

Our research showed that on those occasions where lightning protection had been installed in trees, the systems employed had been based upon designs originally intended for use on buildings and other essentially non-dynamic, man-made structures. The particular problems of installing the necessary hardware into living and growing trees did not appear to have been adequately addressed. Current best practice in the UK is set out in BS6651:1999, but although lightning protection in trees is addressed in this document, its treatment is brief and it fails to take account of arboricultural constraints. Thus the direct effects on the tree of the installation of the required hardware is not factored in, with the result that trees are actually likely to be caused some degree of long-term harm in the very process of attempting to protect them. One of our most pressing concerns was the unsatisfactory nature of the fixings that have traditionally been used in such installations: These are essentially varieties of nails or screws that are driven into the tree to support cable clips, air terminals etc. These may provide adequate mechanical support but they make no allowance for the continued growth of the tree and will require refitting at intervals to prevent the conductor and fixings being engulfed by its progressive incremental growth.

Sympathetic interface

Our response has been to design an entirely new fixing device, known as the ArborBolt, the design of which is intended to create a more sympathetic interface between the mechanical and the biological elements. The need for the system to remain functional over many years means that the fixings must remain securely attached to the fabric of the tree. As such they must remain to some degree invasive. However the unique design of the ArborBolt accommodates indefinite growth without the need for periodic removal and re-fitting. It thus ensures that the disruption of living tissues is minimal and lessens over time, rather than becoming more pronounced, as is the case with traditional, non-dynamic fixings, with their need for periodic removal and/or refitting.



Lightning protection fitted to a 43m tall *Abies procera* at Eastnor Castle, Herefordshire

Total protection system

However the ArborBolt itself is only one element of the total protection system: This essentially comprises the air terminal, the network of conductors and their fixings, and the earth. As every tree is unique in its form and in its situation relative to other potential targets, and as environmental conditions can vary widely from tree to tree, the systems must be individually tailored to accommodate all of these factors.

Electrically effective

A lightning protection system is only as effective as its earth. However here once again there is the possibility of conflict between engineering and plant physiology: It is necessary to install hardware in the soil capable of safely conducting away the enormous currents generated in a lightning strike. However also present in the soil around the tree is a potentially vulnerable network of living, growing roots. The earth system must therefore be carefully designed to ensure that it is electrically effective whilst at the same time avoiding being unnecessarily disruptive to the roots of the tree.



Effective lightning protection.

Improve efficiency

One of the first stages in designing a system is the investigation of the electrical properties of the soil at each proposed installation site. This will enable the earth terminal(s) to be specified in such a way as to ensure that they are capable of safely discharging lightning strokes to earth, while avoiding over-specification which might otherwise lead to unnecessary disruptive activity in the root zone. In order to improve the earth's efficiency further, biologically inert mineral agents ("soil conditioners") may be used to increase conductivity at the interface of the earth-terminal and the soil.

Non obtrusive

The aesthetic benefits of amenity trees are one of the primary reasons that they likely to be considered worthy of protection. It is therefore a high priority that the installation of the conductors should be in full sympathy with the subject tree as a landscape feature. While the fitting of cables and an air terminal must have some visual impact, through carefully considered positioning of the system the result should not be obtrusive. The design of the air terminal is of particular importance in this regard: In recent years, certain designs have been developed incorporating features intended to increase their capacity to divert lightning strokes away from the structure being protected, towards the conductor. Once again, however, these have been primarily developed for installation on built structures. They tend to be large, obtrusive and generally visually inappropriate when fixed within or above a tree canopy. Their increased size also means that they are likely to require more substantial, and hence more invasive fixing techniques. In any event, a review of current research indicates that serious doubts have been raised as to the efficacy of these devices.

Reduced visual impact

We have concluded that a much smaller and more discreet form of air terminal is not only wholly adequate for its purpose but is considerably better in terms of its reduced visual impact. It is also capable of simple adaptation to accommodate future vertical growth of the tree.

Highly specified

The ArborBolt system is, as far as we are aware, the first serious attempt to integrate lightning protection into an arboricultural context: The Arborbolt itself is a unique design incorporating sophisticated manufacturing techniques and using materials of the highest quality. All of the other materials used in the system are similarly highly specified. They are all specifically designed for use in lightning protection to ensure that the product is strong and reliable. The British Standard requires a projected functional lifespan of at least thirty years and we believe that the Arborbolt system is capable of achieving that with a minimum of maintenance. The Arborbolt system is the result of wide-ranging research and of consultations with specialists in many fields. Our proposals have been submitted to the relevant committee of the British Standards Institute, which has confirmed that the specification of materials and the earthing procedures proposed are in compliance with current best practice.

For further information or advice on lightning conductors for trees contact

Ben Fuest,
3 Falcon Cottages,
Brockhampton,
Herefordshire
HR1 4TQ
E-mail: [Ben Fuest](mailto:Ben.Fuest@arborbolt.co.uk)



A fuse placed in the system can be checked after a storm to assess whether the system has earthed a lightning stroke.

Web site development

The past few months has seen our own web site develop to incorporate on-line membership joining and renewals, making it possible for people to join and gain immediate access to the members only areas and updated champion tree database.

Hopefully it will reduce the administration required from Pamela and our Membership Secretary Philippa Allen.