

VOLUME 22 NO. 1 WINTER 2013



Institute of
Horticulture
Uniting a Growing Profession

The Horticulturist

THE JOURNAL OF THE INSTITUTE OF HORTICULTURE



THE LONGEST AVENUE IN THE WORLD

HORTICULTURE IS HOT!
URBAN STREET TREE CHOICES

PLUS
AGM AND CONFERENCE REPORT
YOUNG HORTICULTURIST OF THE YEAR 2013

Getting people to care

I am delighted to be writing my first introduction to *The Horticulturist* and in this issue I want to focus on the Institute and why I believe it is a 'no-brainer' for others to join...

In October I was asked to deliver the David Robinson Memorial Lecture at Glasnevin Botanic Garden. This prestigious annual event is designed to not only remember the contributions of the late David Robinson, but also to provide an opportunity for horticultural students from colleges in the north and south of Ireland to come together to hear a talk by an invited speaker. My lecture was entitled #HorticultureisCool (if you don't tweet, you will not understand the # I'm afraid) and, after I'd defined my perception of 'cool' (aided by a picture of Steve McQueen – the 'King of Cool') I gave examples of what I believe is 'cool horticulture'.

This ranged from amazing gardens such as Singapore's Gardens by the Bay, the London Olympic Park, the Eden Project and the New York High Line, landscaping on the film sets of Harry Potter and being a premier league groundsman, to how horticulture can help save the world through promoting healthy eating, green space, hi-tech food production and plant conservation.

The lecture theatre at Glasnevin holds 150 people and I delivered my talk twice to two full houses of enthusiastic audiences. I also highlighted the IoH and the Grow Careers initiative and my message to the audience, as people entering the horticulture profession, was 'How can you not be a member of the professional organisation for your industry?'

This organisation recognises the professional status of horticulture and leads the way in terms of horticultural advocacy, training and education, and careers promotion and guidance. On hearing this over half the audience (150+) signed up immediately for the six month free IoH membership and many of them came to speak to me afterwards enthusing about the IoH and wondering why they'd never heard of it before?

My take-home message from this experience is that people will certainly join us if we can be effective in getting our message to them. We are THE industry body for all of horticulture and I ask and encourage you all to promote this at every possible opportunity to any horticulturists who are not already members. When they understand what we are, what we do and what we represent, how can they not join? Let's get more people to care!



Leigh Morris FI Hort, President



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Cover The dawn redwood avenue in Pizhou City, viewed from the canal. Mike Browell of Weddle Landscape Design, tells its story (pages 10-14).

Photo: Mike Browell

The Horticulturist

ISSN 0964 8992

Incorporating *Scientific Horticulture*, *Professional Horticulture* and *IoH News*, is published by Hall-McCartney on behalf of The Institute of Horticulture.

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Subscriptions

£100 (UK & Ireland)

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£137 or US\$221 (rest of the world).

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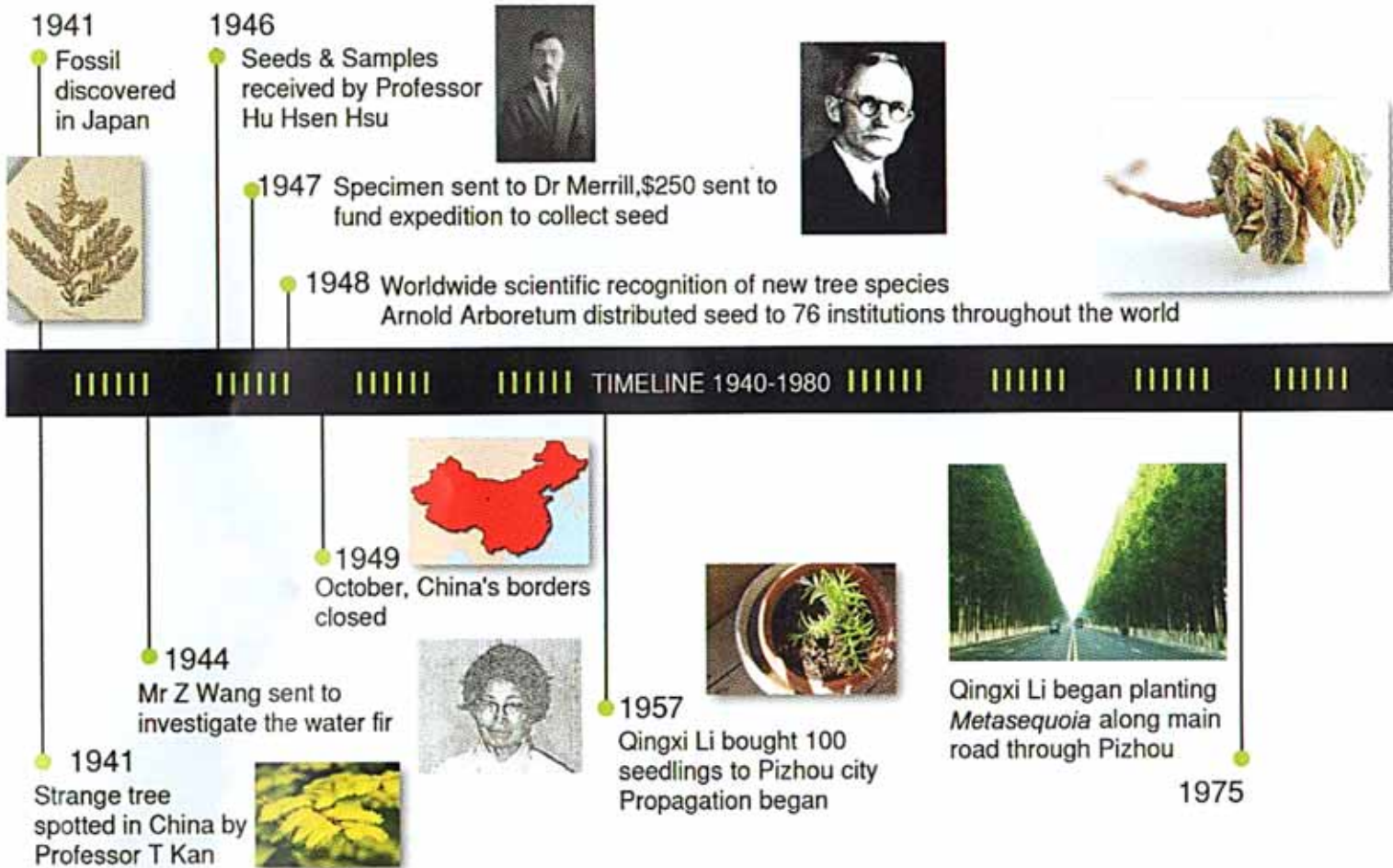
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Leading & Growing Professions





Timeline of discovery of *Metasequoia*.

propagated seedling *M. glyptostrobooides* trees, and planted them along new roads within the Nanjing campus in the 1950s, making these the oldest *Metasequoia* avenues in the world.

In 1957, a far-sighted Chinese horticulturalist, Qingxi Li, brought 100 of these seedlings from Nanjing Forestry College to the city of Pizhou, Jiangsu Province. In his position as Pizhou Parks Manager he had a unique opportunity to transform Pizhou's landscape. He had a grand vision of new *Metasequoia* avenues, knowing of their success in Nanjing. He began to propagate seedlings in 1957. The trees and successive generations of seedlings grew well over the following 18 years, but very few trees were planted in China during the Cultural Revolution, a period when many cities cut down their street trees.

Towards the end of Chairman Mao's regime the anti-tree policy was relaxed and in 1975 Qingxi Li began planting the world's longest *Metasequoia* avenue along the main road through Pizhou County, 60km long. There were no restrictions to tree planting, no objections from landowners, and no restrictions of underground services. Qingxi Li had a clear run. A million trees later, his task was complete. This *M. glyptostrobooides* avenue will eventually reach 40m in height, so this colossal landmark will continue to astonish visitors for hundreds of years to come.

ACKNOWLEDGEMENTS

The author would like to thank the officials of the City of Pizhou for their assistance in preparing this paper, particularly Mayor Wang Qiang, Deputy Mayor Sui Qiang, Wu Zuoli and Guo Yunfu of Tourism and Park Bureau and Lu Xiumei of Planning Bureau.

REFERENCES

- Mayhew C (2012). Avenues part I: The case against and Avenues part II: Disappearing avenues – living features in a changing landscape *Arboricultural Journal*, Vol 34, No 1 March 2012 pp4-16
- Hu H H (1948). How *Metasequoia*, the 'Living Fossil,' was discovered in China. *Journal of the New York Botanical Garden* Vol 49, No. 585 September 1948 pp201-207
- Kuser J (1999). *Metasequoia glyptostrobooides*: Fifty Years of Growth in North America. *Arnoldia* 58/4 & 59/1 pp76-80
- Madsen K (1999). A guide to *Metasequoia* at the Arnold Arboretum *Arnoldia* 58/4 & 59/1 pp76-80
- Langlois, Gaytha A (2005). 'A conservation plan for *Metasequoia* in China', in LePage, Ben A, Williams, Christopher James, Yang, Hong The geobiology and ecology of *Metasequoia*, Volume 22 of *Topics in Geobiology*, Springer pp369

WEBSITES

- www.metasequoia.org
- www.redwoodworld.co.uk
- www.dawntredwood.org website of Crescent Ridge Dawn Redwoods Preserve (CRDRP)
- <http://www.nationaltrust.org.uk/what-we-do/news/view-page/item561806/>
- www.skidmore.edu/gps/research/metasequoia

LONGEST AVENUES IN THE WORLD

Length	Location	Tree Species	Date
47km	Pizhou, Jiangsu Province, China Longest in world	<i>M. glyptostrobooides</i> Two parts	1975
35km	Nikko, Tochigi Prefecture, Japan Thought to be longest in world	<i>Cryptomeria spp.</i> Three parts	1625
4km	Clumber Park, Worksop Nottinghamshire Longest in Europe	<i>Tilia spp.</i>	1840
4km	Marine Parade, Napier, New Zealand	<i>Araucaria heterophylla</i>	1931
4km	Damyang, Gwangju, South Korea	<i>M. glyptostrobooides</i>	1970s
2.5km	Takashima, Shiga, Japan	<i>M. glyptostrobooides</i>	1970s



ALL PHOTOS: SASK INDIAN/WILD&E LANDSCAPE

CULTIVATION

Cultivation requirements of *Metasequoia glyptostroboides*

Aspect	Full sun preferred
Soil	Deep well-drained acidic soil preferred
Temperature	-15°C to 35°C
Water	Abundance of ground water Well-drained preferred
Growth rate	Up to 2m per year
Habit	Pyramidal at start, spreading in some individuals later
Height	40+m
Spread	30+m

The type tree in Mou-tao-chi, is at least 38m tall, 33m spread, 2.3m dbh, estimated to be approximately 400-years-old. Another specimen, growing at Lubeiba, Hubei of similar age is 40m tall.

Kan of the Department of Forestry of the National Central University in Nanjing. At Moudao, (also known as Modaoqi, Modaoxi and Mou-tao-chi), Hubei Province, Professor Kan noticed a large deciduous tree by the roadside adjacent to a small temple. The locals referred to the tree as shui-sa (water fir), and revered it as housing a god. Being winter, there were no seeds or foliage to collect, so he asked an academic colleague to collect some the following year. These were either lost or never collected, but the mystery of shui-sa remained.

Finally in 1944, Mr T Wang from the National Bureau of Forest Research was going to visit forests in a nearby area and was asked to investigate the water fir. He returned with samples of seeds, leaves, branches and cones of the water fir, some of which he gave to Mr Wu and Professor W C Cheng, both of the Forestry Department of the National Central University in Nanjing. Professor Cheng sent his assistant Mr C H Hsieh twice to Moudao in February and May 1946, and it was some of the samples collected on these occasions that were given to Professor Hu, who was familiar with Shigeru Miki's paper describing the *Metasequoia* fossil.

Professor Hu had already recognised similarities between the fossil *Metasequoia* and another fossil erroneously identified as a *Sequoia*, so when presented with the herbarium samples from the water fir, he immediately recognised the characteristics identifying the source tree as a living specimen of that which had previously only been known as a *Metasequoia* fossil. Professor Hu named the living species *M. glyptostroboides* after *Glyptostrobus*, the Chinese swamp cypress. It had taken five years between finding this rare tree, and identifying it against a backdrop of World War II, and Chinese post-revolution physical and political upheaval.

Professor Hu shared his findings with Professor Ralph Chaney of the Department of Palaeontology at the University of California, and Dr Elmer Merrill, Director of the Harvard University Arnold Arboretum in Boston. In 1947 Professor Cheng sent a

specimen to Dr Merrill who agreed to send \$250 to fund an expedition by Mr C T Hwa to collect more seed from the water fir. Large quantities of the collected seed were sent to interested institutions and individuals around the world in 1948, in an effort to preserve the species and research its tolerance for various growing conditions.

Dr Merrill of the Arnold Arboretum distributed it to 76 institutions. Between 1948 and 1955, over 100 specimens were planted in botanical collections throughout the US. These are now approximately 60 years old and the heights range from 20-40m.

Academics agree that the fossil records indicate that *Metasequoia* once covered a very large area of landmass, and the conclusion is that it has a tolerance for a wide range of growing conditions.

Subsequent expeditions to nearby forests found that there are only approximately 1,000 *M. glyptostroboides* trees in the area, and today they have protected status.

However, despite widespread establishment under cultivation, and considered conservation policies and techniques, the only known 'wild' forest is diminishing towards extinction.

Current uses

M. glyptostroboides is still very much a specimen tree in the UK. It is not used in large-scale commercial forestry as the wood is brittle. It is most commonly seen in parks and gardens, although in the past few years it has begun to appear in city streets due to its tolerance of pollution. Sheffield has a small number of street trees that are thriving. Similarly, it can be seen in the US and Europe, where it is still mainly used as a specimen in collections.

Not so in China, where *Metasequoia* are very common in urban plantings. On a grand scale, *M. glyptostroboides* can be seen as a 47km-long avenue along the Picang Highway in Pizhou, Jiangsu Province, China. This tree avenue contains one million trees.

The next longest avenue of *M. glyptostroboides* is just 4km long, on a famous street in Danyang, Gwangju, South

Korea. To put it in perspective, the Pizhou avenue is longer than the current Guinness World record holder – a *Cryptomeria japonica* avenue in three parts in Nikko, Tochigi Prefecture, Japan. This has a recorded total length of 35.41km. Pizhou is just a notification away from being a Guinness World Record holder for the longest avenue in the world.

China's Bamboo Curtain

In October 1949, Chairman Mao Zedong launched the new People's Republic of China and closed the borders, cutting off all trade and sharing of information with the outside world. After worldwide scientific recognition of the new tree species in 1948, obtaining seeds from the originals in China became impossible.

Under the Cultural Revolution the rural landscape of China changed dramatically. Between 1949 and 1960, the 'Great Leap Forward' saw a countrywide programme of land reform, where land owned by private landlords was confiscated by the state, and country people were relocated into collective farms. The pattern of farmland changed from fragmented smallholdings into large geometric fields without boundaries. The speed of landscape change was astonishingly rapid. Whereas with the 18th-century UK agricultural revolution, led by Enclosure Acts, changes took over 100 years to complete, China recreated a new agricultural landscape in 10 years.

Trees and forests disappeared from the landscape. Major infrastructure projects were part of the reform, including the construction of more roads. Where a new road was required, it was simply a matter of drawing a straight line on the map, because all land now belonged to the state. New roads did not have new trees.

The longest avenue

The Department of Forestry of the National Central University in Nanjing successfully

WEDDLE AND PIZHOU

Weddles' current work for Pizhou involves ecological park planning to create a green network for the new city that will exceed the size of Sheffield and Rotherham combined, within 20 years.

Weddle Landscape Design has been appointed to provide a master plan for the expansion of Pizhou City. Over the next 20 years Pizhou will double in size. It was during his initial site visit that Mike Browell first saw the Picang Highway Avenue, stretching far into the distance, flanked on each side with a seemingly endless line of *M. glyptostroboides*, each approximately 15m tall. It was an impressive sight to him then, and all the more so since desk studies have so far revealed no other tree avenues of comparable length in the world.

Weddle Landscape Design
Founded: 1957 by Professor Arnold E Weddle, retired 1992. Location: Sheffield. Principal: Mike Browell. Work: masterplanning, arboricultural consultancy, interior horticultural consultancy and full range of landscape architectural services. Work locations: UK and China

T. distichum are deciduous. They are part of a very small subset of deciduous conifers.

Conifers are an ancient plant group, with the earliest species found in the fossil records of the Palaeozoic in the late Carboniferous Period, about 300million years ago. They are woody plants, mainly trees and a small number of shrubs. Conifers carry their seeds in cones, and have needles rather than leaves (with the exception of *Ginkgo*). There are 550 species, of which only 18 are deciduous (13 of these are larch). Many of the conifers existing today are recognisable in the fossil records from 60million years ago, making these particular species survivors of spectacular longevity.

Why are some conifers deciduous? Why are most conifers evergreen? The answer to both questions is that a genetic mutation has led to a successful adaptation to growing conditions. The case for being deciduous is that it allows the plant a period of dormancy during colder months, without struggling to produce the enzymes and other proteins and chemicals required to carry out photosynthesis in poor light conditions. Conversely, evergreen plants have adapted a means to continue photosynthesising in low light levels.

In the far northern hemisphere, the Boreal Forest comprises predominantly evergreen conifers. The Boreal Forest extends from Alaska, covers most of Canada and part of the US northern states, Scandinavia, much of Russia and Mongolia, part of Korea and north Japan. It comprises 29% of the world's forest and spreads between latitude 50-70°N.

The 20th-century discovery of *Metasequoia* originates from 30°N, several thousand kilometres south of the Boreal Forest.

Discovery and conservation

Less than 100 years ago, no-one had seen or heard of *M. glyptostroboides*. It was first recorded in 1941 as a coal measures fossil record, when a Japanese paleobotanist named Shigeru Miki noticed a plant fossil similar to *Sequoia*, but not quite the same. The fossil record at the time indicated that this plant was growing 90million years ago at the time of the dinosaurs, but died out 1.5million years ago. When publishing his discovery, he named the new genus *Metasequoia*, which means 'like *Sequoia*'.

His paper was read by Professor Hu Hsen Hsu, Director of the Fan Memorial Institute of Biology in Beijing. He remembered it five years later in 1946, when seeds and samples of a mysterious tree were delivered to him from a seed collecting expedition. Professor Hu is one of those credited with the discovery of *M. glyptostroboides* as a living tree.

According to Hu (writing in 1948), in 1941, the same year that the fossil was first discovered in Japan, the living tree had also first been spotted in China by Professor T



Close-up of *Metasequoia* leaves.

DECIDUOUS CONIFERS

Deciduous conifers	Height	Origin
Pinaceae:		
<i>Larix</i> (larches; 13 species)	10-50m	The Boreal Forest, Japan, China, Mongolia, Himalaya, Canada, Alaska, Northern US
<i>Pseudolarix amabilis</i> (golden larch)	30-40m	Eastern China
Cupressaceae:		
<i>Taxodium distichum</i> (bald cypress)	20-40m	South East US
<i>Taxodium ascendens</i> (pond cypress)	15-18m	North America
<i>Metasequoia glyptostroboides</i> (dawn redwood)	60m	China
<i>Glyptostrobus pensilis</i> (Chinese swamp cypress)	30m	South East China
Ginkgoaceae:		
<i>Ginkgo biloba</i> (ginkgo)	20-35m	China



Left: Botanical garden specimen of *Metasequoia* showing its pyramidal shape. Right: *Metasequoia glyptostroboides* is a deciduous conifer, displaying a deeply fissured tree bole.



Metasequoia Avenue, Pizhou, Jiangsu Province, China.

The longest avenue



Mike Browell is a landscape architect, arboriculturist and horticulturist with 35 years' experience in practice, 20 years as principal of Weddle Landscape Design in Sheffield. For the past four years he has been lecturing and carrying out landscape design projects in China and is Visiting Professor at the China Institute of Mining Technology at Xuzhou. Elected a Fellow of the Landscape Institute in 2010, he specialises in landscape planning and has a number of Green Space projects throughout China. He is currently carrying out a Green Infrastructure Master Plan for the city of Pizhou where he is advising on the conservation of the world's longest *Metasequoia* Avenue.

Mike Browell tells the story of the discovery of *Metasequoia glyptostroboides* in China and how he found himself advising a Chinese city with the longest avenue in the world.

Metasequoia glyptostroboides, the dawn redwood, is the most important tree species discovered in the 20th century. Thought to have become extinct over 1.5million years ago, it was discovered growing in Hubei Province, China, in 1941, and amazed the horticultural world when it was announced to scientists in 1948. Today it is commonly seen in botanical gardens, arboreta and parks in the UK. The oldest specimens outside of China are no more than 60-years-old. The discovery of this prehistoric tree, previously only known in fossil records, is fascinating and intriguing.

Identification

M. glyptostroboides is a deciduous conifer. It has a deeply fissured tree bole and grows in a generally pyramidal habit until maturity, when it may develop a spreading canopy.

Its foliage is similar in appearance to *Taxus baccata* and *Sequoia sempervirens*, and very similar to *Taxodium distichum*. In fact, everything is similar to *T. distichum* including fissured tree boles, deciduous nature, and even tolerance of swampy/standing water conditions. The common names for *M. glyptostroboides* and *T. distichum* are water fir (also dawn redwood) and swamp cypress respectively. The main difference between the two is that *M. glyptostroboides* leaflets and leaves are arranged symmetrically in pairs, whereas *T. distichum* leaflets and leaves are arranged alternately or not quite opposite.

M. glyptostroboides originates in China and *T. distichum* in the south east United States. Both grow near water and both reach 40m in height. Most conifers are evergreen, but *M. glyptostroboides* and