Tree of the Year : *Parrotia*

The genus *Parrotia* has two species:
P. persica, familiar to dendrologists, is very variable both in the wild and in cultivation; *P. subaequalis* is much rarer.

SUSYN ANDREWS* has been researching these fascinating plants – with contributions from Colin Crosbie, Peter Del Tredici, Michael Dosmann, Gert Fortgens, Roy Lancaster and especially Mikinori Ogisu.

One of the joys of putting together the "Trees of the Year" since 1993 is that you never know what gems of information you are going to unearth, whether on a letter attached to a herbarium specimen, a little known paper in an obscure journal, an observation on an herbarium label or a chance remark by someone in passing, will lead you down a convoluted trail of discovery. The highlight for this year has been the amassing of everything I could find on the enigmatic *Parrotia subaequalis*, the discovery of which has had dendrologists champing at the bit to possess a plant, myself included!

Introduction

The Hamamelidaceae is one of the key areas for palaeobotanists and taxonomists to study the evolutionary history of the Hamamelids, especially the higher taxa. In his account of the family, H. Harms (1930) provided a comprehensive suprageneric classification for the Hamamelidaceae, recognising five subfamilies, Disanthoideae (1 genus), Hamamelidoideae (16 genera), Rhodoleioideae (1 genus), Bucklandioideae (1 genus) and Liquidambaroideae (2 genera). Although a shorter treatment was published by Schulze-Menze (1964), most workers still followed Harms. Since the mid-1960s, however, much new knowledge on the family has been amassed and this has led to new thinking on the intrafamilial relationships. Also, several new genera were described. All this led Peter Endress (1989a) to create a new suprageneric system of the family.

Endress recognised four subfamilies only: Hamamelidoideae (22 genera), Rhodoleiodeae (1 genus), Exbucklandioideae (4 genera) and Altingioideae (3 genera). He felt that the latter three subfamilies did not need dividing any further. However, the much larger Hamamelidoideae had been subdivided by Harms (1930) into five tribes: Hamamelideae, Eustigmatae, Corylopsideae, Fothergilleae and Distylieae. Endress reduced this to four and sunk Distylieae into the Fothergilleae.

Within the now enlarged tribe Fothergilleae were eight genera including

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Fothergilla, *Parrotiopsis*, *Parrotia*, *Sycopsis*, *Distyliopsis* and *Distylium*. The characters they all shared were:

> "Flowers bisexual or male, apetalous (in few genera also asepalous), number of sepals and stamens highly variable."
>
> (Endress 1989a)

In (1989b) Endress expanded his ideas on the phylogenetic relationships within the subfamily Hamamelidoideae. Zhang & Lu (1995) analysed the systematic position of the whole family, the modern distribution pattern of the genera, as well as their fossil history. They acknowledged that Hamamelidaceae were widely distributed throughout the Northern Hemisphere during the Upper Cretaceous and early Tertiary periods, that is when the climate was warmer. This indicated that most taxa became extinct at the higher and middle latitudes due to changes in the climate by the late Tertiary but particularly during the Quarternary glaciation.

> "The Caucasus region and eastern Asia (especially the tropical and subtropical mountains), are usually considered to have been refuges during the glacial period. For example, *Disanthus, Rhodoleia, Corylopsis* and *Parrotia*, which were widely distributed in Europe and the United States, occur now only in Southern China and the Caucasus region."
>
> (Zhang & Lu 1995)

The Hamamelidaceae has a rather disjunct distribution, ranging from eastern North America to Venezuela, Central America, the eastern Mediterranean, Ethiopia to South Africa, Madagascar, temperate western Asia and eastern Asia to Indo-Malaysia, Oceania and northern Australia (Zhang & Lu 1995, Heywood *et al.* 2007). Disjunctions between the Caucasus and China are relatively common and the recent recognition of *P. subaequalis* in eastern China, joining the previously thought monotypic *P. persica* provides yet another example.

The genus *Parrotia* in the Hamamelidaceae was described by C.A. Meyer in 1831. It was named after Dr J.J.F.W. Parrot (1792-1841), a German-born physician and botanist, educated in Dorpat (now Tartu in Estonia). He travelled to the Crimea and the Caucasus in 1811-1812 and was a military physician with the Russian army in 1815. However, his main claim to fame was that he made the first ascent of Mount Ararat in September 1829 (Stafleu & Cowan 1983).

Mount Ararat is an extinct volcanic massif on the Turkish-Iranian border. Some 40 km in diameter, Ararat consists of two peaks. Great Ararat at 5185 m is the highest peak in Turkey, while Little Ararat stands at 3925 m. Traditionally Great Ararat is said to be the resting place of Noah's Ark after the Flood (Anon. 1974).

Parrotia persica (DC.) C.A. Mey.

(*Hamamelis persica* DC.)

Common names: Persian ironwood, iron tree, Persian parrotia, parrotia de

Three different specimens of *Parrotia persica* growing at the Royal Botanic Gardens, Kew, showing the variation in habit of the species.

Above *P. persica* (1969.14111) near Kew Palace with, **below**, a close up of self-grafting branches on the same plant.

Far right, *P. persica* (1969.14115) near King William's Temple with **right**, a detail of its trunk.

Above right, *P. persica* (1978.16) *COBH* 11 flowering in winter.

Perse, bois de fer, arbre de fer de Perse, Persiche parrotie, eisenholz, vlamboom, Temir-Agatsch and Aiyile/Aujill (Iran).

A deciduous tree or shrub to 9-12(-25)m in the wild. Bark of trunk and main branches smooth, flaking and peeling "to reveal a mosaic of cream and grey." Branches can be erect, hanging or spreading, becoming stout and often enmeshed and interlaced leading to natural grafting, young twigs initially with stellate hairs. Stipules large, lanceolate, early-falling. Leaves 6-10(-14) x 4-8cm, alternate, broadly oblong-elliptic to obovate, almost glabrous above, some stellate hairs below, lateral veins 6-8 on each side; base rounded or tapering, asymmetrical; margins wavy and shallowly toothed, apex rounded to obtuse; glossy bright green, leathery, in autumn turning orange and yellow in the shade, orange flushed with purple and crimson with shades of pink in the sun, young growths "beautifully plaited (like beech leaves) in vernation", often flushed pinkish bronze during the growing season; petiole 2-6mm long, downy. Flowers appearing before the leaves, bisexual, in dense globular heads *c*. 1.2cm across, surrounded by large bracts *c*. 1cm long, dark brown to black and hairy outside, pale green within; sepals 5-7 lobed, *c*. 5mm long, variable; petals absent; stamens 8-15, spreading; anthers sealing-wax red, conspicuous in January-March. Ovary semi-inferior; styles 2, long recurved. Fruits a 2-celled woody, horned capsule, opening above; seeds to 9mm long, bright brown, pointed at one end.

Native to **northern Iran** and FSU (Former Soviet Union) (**Azerbaijan**), along the Caspian Sea; at s.l.–500m and from (800-)1200-1400m. The Hyrcanian Province, a phytogeographic region, consists of northern Iran (Gilan, Mazandaran, Gorgan, north-west Khurasan) and Talish in Azerbaijan. Browicz (1982) has an excellent map of its distribution.

Parrotia persica occurs in the moist, deciduous forest region south and south-west of the Caspian Sea, where it was formerly considered as the only endemic tree in the Hyrcanian forest region, from the Talish Mountains, Azerbaijan in the west to Gorgan province, northern Iran in the east. Until it was found more recently in the forests south-east of the Great Caucasus (Browicz 1982).

> "[*Parrotia*] *persica* grows mainly on low lying plains and mountain foothills. The optimal conditions for its growth, however, are in stations from 250-400m. Here it forms pure stands (*Parrotietum*) or mixed ones with such species in the main storey of the forest as *Quercus castaneifolia* C.A. Mey., *Carpinus betulus* L., and *Zelkova carpinifolia* (Pall.) C. Koch, and in undergrowth with *Mespilus germanica* L., *Crataegus microphylla* C. Koch, *Ruscus hyrcanus* Woronow and *Buxus hyrcana* Pojark. The number of *P. persica* in the latter forests decreases gradually with increasing altitude and from 1200 (Talish) – 1400m (Iran) only solitary specimens of the tree are found."
>
> (Browicz 1982)

Nicholson (1989) studied the distribution within Azerbaijan, and noted it grew in a restricted area of the south eastern Caucasus Mountains in the Talysh

(Talish) forest. The northern-most locality that he could find was the town of Masally, *c*. 40 miles north of the Iranian border. He also commented that the Alborz (Elburz) Mountains in Iran rise to 5600m and thus they formed an effective barrier, hence this region is extremely wet. The annual rainfall can reach 200cm in places.

Browicz (1982) noted that *P. persica* is a slow-growing tree, which can grow to 20-25m high and the diameter of the trunk is 25-40cm at 100 years old. Wright (1992) described how it can form immense thickets of stout branches, grafting themselves onto each other, or wherever they touch the ground self-layering. Could the definition of a *P. persica* be David Wright's "much inarching of contiguous branches"? Wendelbo (1968) pointed out the great age of these forests, which had probably survived the ice ages of the Pleistocene.

Wright (1982) claimed *P. persica* prefers an open, dry, sunny site, providing the soil is not starved and shallow or light woodland. However, in the wild, Browicz (1982) regarded this taxon as "rather shade-loving, needing wet, deep and fertile soils." Also, although it can grow in shallow and quite dry soils, it will not achieve any great height under these conditions. Marshy or very dry salty soils are unsuitable. *Parrotia* has the reputation of being one of the most lime-tolerant genera in the Hamamelidaceae (Wright 1982).

Miss Nancy Lindsay collecting in Iran in 1937, noted on *N. Lindsay* 779 (K!) that it was:

> "... very common as jungle scrub all over the foothills of Guilan. It is only in the higher forest where it attains tree-size that it flowers and fruits ..... Hill jungle, Guilan up to a fair elevation, does not extend to Yehlah."

Professor T.F. Hewer (1971) and his party spent six months travelling throughout Iran and Afghanistan in 1969. They particularly noted the magnificent *P. persica*, while driving through the Gulestan Forest, 110 miles west of Bojnurd, many of which were covered with *Viscum album* or mistletoe. *Hewer* 1484 (K!) was collected there and he noted that the parrotias were second in density only to the oaks at 395m.

Some years later, in December 1972, Roy Lancaster paid a memorable visit to Iran. One of his personal highlights was a two day visit to the Elburz Mountains and the Caspian Forest in the north of the country, in which he described many of the plant treasures that he came across. In the Khair Rud Forest he saw that:

> "*Parrotia persica* was indeed plentiful and reached heights of 60 feet, with single or multiple piebald trunks soaring skywards. Not once did we see the wide-spreading "squashed" specimens of cultivation. All were real trees, with ascending stems and branches well clothed with gold leaves and occasionally supporting clumps of mistletoe."
>
> (Lancaster 1974)

The flowering branches of *Parrotia persica* (1978.16) *COBH*11 with a close up of the flowers taken at RBG, Kew in late January 2008.

Later that day, on the coast road by the Caspian Sea, he noticed:

> "Nearby, a large grove of *Parrotia* contained numerous examples of natural grafting, with branches and trunks forming strange and sometimes bizarre shapes."
>
> (Lancaster 1974)

In the autumn of 1977, John Simmons, then the Curator of RBG Kew and his colleague Hans Fliegner made a seed collection trip with the staff of the National Botanical Garden of Iran. One of the areas they visited was to the northern Alborz (Elburz) Mountains, whose:

> "... northern side, facing the Caspian Sea, holds the dense and extraordinarily species rich Caspian forests. It is estimated that these forests cover over 3.4 million hectares (8.398 million acres) and contains 50 species of trees and 60 species of shrubs."
>
> (Simmons 1984)

From one of their base camps, they could descend down through "through a natural arboretum" all in glorious autumn colour.

> "But we were not disappointed by the parrotias which formed unique stands. To go amongst these unexpectedly massive trees was to step back in time. Great flecked trunks, the size of beech with aged specimens grafting boughs where they touched, and all festooned with dripping mosses..... The violent reds and yellows of the parrotias autumn foliage have an almost unreal quality and happily too the seedlings from this ancient forest are now showing this inheritance at Kew – though, as hoped, each small tree is different, some more red, others yellow, so increasing the diversity for gardens."
>
> (Simmons 1984)

In spring 2002, an IDS tour visited Iran, where they saw *P. persica* a number of times. Before and after Rudbar, they passed through mixed broad-leaved forest containing various relict elements. At Asalem Pass, it was the main species on the lower slopes, regenerating by root suckers and coppice shoots in areas where there was enough light. The party particularly noticed some reddish young foliage on the parrotias, something they had not seen before. The forest before their hotel at Chalus was comprised mainly of *Parrotia.* At the Mira Kuchickham forest in the valleys above Nur, *Parrotia*, *Pterocarya* and *Quercus* predominated (Miles 2003).

Parrotia persica in cultivation: Europe

John Loudon (1838) listed *Hamamelis persica* under "Other species, not yet introduced", when he discussed what woody plants were grown in Britain and noted that it was "a native of Persia of which very little is known". Finally, on 15 September 1846 (not 1840/1841 as is usually stated), two small pot plants of *Parrotia persica* arrived at the Royal Botanic Gardens, Kew. They were part of a consignment of plants of 22 taxa, which had been sent by Dr F.E.L. von Fischer, the director of the Imperial Garden at St Petersburg (RBG Kew, 1828-1847). He had collected *P. persica* in the Lenkoran region in Russia, as seen by one of his dried specimens (K!). By 1868, one of the Kew plants was trained against a west-facing wall, while the other planted in the open, stood 2.7 m high and flowered in March of that year. J.D. Hooker stated that it was one of the rarest trees in cultivation and was illustrated (tab. 5744) for the first time, showing flowers and fruit (Hooker 1868). Dried specimens from the latter plant, made by Hooker in 1867 can be seen in the Kew Herbarium. Also in the herbaria of Kew and Edinburgh are flowering and fruiting specimens collected by George Nicholson at Kew in 1882, 1884 and 1888; perhaps these are from the Lenkoran plants?

Anon. (1884a) illustrated examples of foliage and flowers, accompanied by a short note, thus showing them to a wider public. He/she also mentioned that the flowers were rarely seen and indeed the author had only seen them once before. This had been at an RHS Show on 12 February 1884, where they had been exhibited by Messrs, W. Paul & Son of Waltham Cross. Fig. 89 (Anon. 1884a) of the flowers had been drawn from this exhibit. A First Class Certificate (FCC) had then been awarded by the RHS.

> "A First-class Certificate was awarded to a bunch of flowering shoots of the rare hardy tree *Parrotia persica*, valuable in early spring for the colour displayed by the bunches of dark red inconspicuous flower buds, but more especially for the magnificent coloration assumed by the leaves in autumn."
>
> (Anon. 1884b)

Among the other interesting specimens in the Kew Herbarium is a sheet with only a cluster of mature fruits sent by Surgeon-Major J.E.T. Aitchison (1836-1898), who had served in western Afghanistan and north-east Persia with the H.M. Bengal Army from 1879-1885. The fruits were collected in the dense forests at Asterabad, Persia, from abundant trees 15-21m high and had arrived in Kew in 1885. The latter remark made me think that a packet of fruits must have been sent to Kew and a cluster was sent to the Herbarium as a reference. After searching through the relevant Inwards Books and Plant Lists, I did indeed find that he had sent large consignments of seeds to Kew at that time in the name of the Afghan Delimitation Commission. Batch 214 *Parrotia persica* arrived at Kew on 27 November 1885. There is also confirmation that the seeds did germinate as they were passed to William Binder, the foreman of the Temperate House (RBG Kew Inwards Book 1884-1887, Kew Inwards Book Plant Lists 1879-1885). So some of the older plants now at Kew could have come from this source.

Another specimen at Kew is a sheet with a fruiting branch collected at Osborne on the Isle of Wight by W. Watson, then an Assistant Curator at Kew, in October 1890. This plant was subsequently cited by W.J. Bean (1914). Cannon Ellacombe had a plant in his garden at Bitton, near Bristol and Bean collected flowering specimens there in 1904 and 1914. He also obtained fruiting material from E.H. Pember of Vicar's Mill, Lymington, Hants. Attached to the latter sheet, is a letter dated 18 September 1900, from Mr Pember to the Director of Kew, Sir William Thiselton-Dyer informing him that his *Parrotia* had fruited for the first time.

William Dallimore (1904) still considered *P. persica* a rare plant in cultivation and mentioned that there was a specimen near the Main Gate at Kew. Could this be 1969.14113, which is on the left near *Cornus* 'Ormonde' and before the *Taxodium distichum* var. *imbricarium* 'Nutans'? Since the hurricane of 1987, this poor ironwood has been bent backwards permanently!

According to Wright (1982) the autumn colour can be unreliable but when it is good it is absolutely stunning. De Spoelberch (2004) raised an interesting issue regarding whether the country of origin played a part in this.

> "Plusieurs plantes de *Parrotia persica* récoltées par Dominique Duhaut en Ajerbaïdjan sont poupre foncé avec des tons lumineux qui justifieraient une sélection. Nous avons d'ailleurs, en décembre, coupé les plantes à coloration jaune or pour ne laisser que celles qui coloraient pourpre; on pensera sans doute que toutes les plantes originaires d'Ajerbaïdjan colorent différemment de celles d'Iran – erreur fatale des sélections horticoles, qui deviennent atypiques de la population d'origine."

The emerging young leaves can have a colourful appearance too. Nicholson (1989) compared them to the colour of "gamey meat"! *R.C. Warren* 89 collected at Lissar, north of Bandar, Iran on 17 August 1966 (E!), shows a spray of small, almost copper beech coloured leaves. Perhaps IDS members could note how their trees perform. In his fascinating account on non-green flush colours in foliage, Barrie Juniper (1994) gave *P. persica* as one example of having uniformly distributed flush leaves on any one tree.

In 1993, *P. persica* was awarded an Award of Garden Merit (AGM) by the Royal Horticultural Society, not in 2002 as stated in Hillier & Coombes (2002) (N. Lancaster & R. Sanford *pers. comm.*).

Parrotia persica in cultivation: North America

The Harvard Botanic Garden in Cambridge, Mass. was established in 1801. The first specimen of *P. persica* to arrive in the New World was sent there in 1880 from an unknown source. Cuttings were taken and one was planted at the Arnold Arboretum in 1881, some nine years after the latter arboretum was started in Jamaica Plain, Boston. #2230 was planted in the Centre Street Area of the Arboretum.

> "In its 108 years, it has attained a breadth of 23 meters (75ft) and a height of 18 meters (60ft), and developed a thickly leafed, broadly domed canopy. It is multiple-trunked with eight main trunks, two of which are almost a meter and a half (5ft) in circumference near their bases. It is quite possibly the largest specimen in North America and certainly one of the largest in cultivation anywhere."
>
> (Nicholson 1989)

Weaver (1976) considered this magnificent tree to be one of the finest specimens in the Arnold Arboretum. It is highly probable that most of the older specimens of *P. persica* in North America trace their lineage back to this particular plant. He also thought that it was still a rare tree. However, it is puzzling that Spongberg (1990) made no mention of #2230! According to Nicholson (1989), it was used in a number of research projects as well as a source of propagation, e.g. by Professor A.L. Bogle in his comparative studies of floral morphology and vascular anatomy in the Hamamelidaceae. He was also supplied with material from the trees at RBG Kew in 1963.

Bogle (1970) mentioned that in certain instances the sepals of *P. persica* can become quite leaf-like in appearance, i.e. with a petiole and short leaf blade. His fig. 9a illustrates this.

Michael Dosmann, the Curator of the Living Collections at the Arnold reports that three of the eight trunks of #2230 have been removed in recent years. Of the five that remain, several are showing signs of stress as does the tree itself. There is, however, a good deal of basal sprouting and perhaps some can be selected for future replacements (M. Dosmann *pers. comm.*).

The collection of parrotias at the Arnold Arboretum consists of a number of accessions of differing ages. More recent acquisitions came in as seed from

the Botanic Garden in Tehran in the 1970s. #541-75A was collected in Nouhahr, while #490-77A came from Sinangan, Mazandaran Province. There is also a grafted scion from #2230, now 32 years old (Nicholson 1989).

According to Nicholson (1989), *P. persica* flowers as early as March in the Philadelphia area but the display in the US is not nearly as effective as in Europe.

> "British writers describe these flowers as producing a hazy red effect en masse, but I have never seen this display in the United States and suspect either that they are growing different strains or that their climate maximises flower production."

Cultivars

Photographs of several of the cultivars mentioned below, can be seen at: http://www.esveld.nl/dialijsten/dialistgParrotia.html

'Bella' – a new tree-forming clone, with wine-red young foliage and good autumn colour. Originated as a seedling from the northern Caucasus. Sent in for trial by Chris van der Wurff Tree Nursery, Heeze. 'Bella' was awarded a Gold Medal from the Royal Boskoop Horticultural Society in September 2007 (Gert Fortgens *pers comm.*).

'Biltmore' – introduced *c.* 1994 by Earth Shade Nursery, Warne, North Carolina (Jacobson 1996).

'Burgundy' – young growths strongly flushed with purple, with stunning autumn colour; low branching. Introduced by PMA Plant Specialists near Taunton, Somerset in the mid 1990s (Karen Junker *pers. comm.*).

'Felicie' – striking, dark red foliage, which colours up from the summer onwards. One of several seedlings selected from a Russian source by the Dominique Duhaut Nursery, Aalter, Belgium. Scions were taken *c.* 2000 by Mark Bulk of Boskoop. Named after Dominique's daughter Felicie. Karen Junker considers this to be a winner! (G. Fortgens & Micha Wieland *pers. comms.*).

'Het Plantsoen' ('Her Plantsoen') – spreading habit, growing 1 m high in ten years. Flowers red. According to Cor van Gelderen, this is named after a park in Leiden, near where he used to live. Cor noticed this low-growing *Parrotia* with a very broad habit (2 x 10m), which had been planted *c.* 1900. Scions were obtained and 'Het Plantsoen' was introduced by the Esveld Nursery, Boskoop in 1992.

'Jodrell Bank' – a small, erect tree with superb autumn colour. Raised at the Jodrell Bank Arboretum, near Manchester.

'Lamplighter' ('Variegata') – a medium-sized to large shrub with leaves

broadly and irregularly margined with cream, pale and dark green in the centre, flushing purple in the autumn. Karen Junker says the variegation can be reduced during strong growth. It is a difficult plant to establish, owing to its lack of chlorophyll but as it becomes more established this is less of a problem. Careful siting is essential, i.e. a shady spot but avoid over-watering.

This cultivar was given to PMA Plant Specialists by the late Stephen Taffler in the early 1990s. Karen considers this "a real Wow plant". Hirose & Yokoi (1998) illustrated it under the heading of "white yellow-margined", mentioning that it was distributed by the late Sir Harold Hillier. Houtman (2004) has a good close-up of 'Lamplighter' and noted that the odd green branch would need removing.

'Pendula' – a form with weeping branches, which slowly develops into a dome-shaped mound, 1.8(-3)m high and 3m across. Excellent autumn colours. The bark on the unbranched trunk is particularly striking as can be seen on both of the Kew specimens.

It was selected from a batch of seedlings at RBG Kew in 1934 by Propagator-Foreman Charles Coates. The original tree (1969.12301) can still be seen near King William's Temple and has a girth of 80cm. Hillier & Sons also propagated from this plant and 1975.6214 in the *Rhododendron* species collection off the Pagoda Vista was donated by that firm (Brown 1977a). Today it has a girth of 60cm.

> ".... at Kew Gardens there is an 8 to 10′ high, 12 to 15′ wide, stiffly weeping form of superlative beauty, the habit of which is akin to a large umbrella with a long handle with the ribs extending to the ground. The trunk is 14 to 18″ in diameter and exfoliates like the species."
>
> (Dirr 1990)

More & White (2003) made an interesting comment that stemless old trees in the west of England were originally this cultivar. However, with age some have grown to 7m and spread even further in width. Your views, please, IDS members in this region.

Jacobson (1996) noted that although the Arnold Arboretum imported stock from the UK in 1966, most North American plants date from 1986 onwards. Nicholson (1989), however, stated that 'Pendula' probably only arrived in the US in the 1980s, as both the Arnold and North Carolina State University imported plants.

'Vanessa' ('Select') - a tree-forming clone, suitable as a street tree. It has a good trunk, an upright, arching habit, shiny red shoots, blood-red anthers and the young lime-green leaves have a noticeable bronzy-red margin. In autumn, the glossy foliage turns a stunning mixture of predominately plum-purple and orange. Although de Spoelberch (2004) has found that 'Vanessa' "est décevant (comme toujours)" at Herkenrode, Belgium.

A seedling selected by Alphons van der Bom, Oudenbosch, Holland in 1975 and named 'Select'. It was awarded a Silver Medal at the Herfstweelde Show in 1983 and renamed by van der Bom as 'Vanessa' (van de Laar 1984). Named for the large genus of brushfooted butterflies, *Vanessa*, e.g. the Red Admiral or the Painted Lady (G. Fortgens & Henk Beentje *pers. comms.*).

As 'Select', it was introduced into the United States *c.* 1993-4 by Buchholz & Buchholz Nursery, Gaston, Ohio (Jacobson 1996) and appears to be better known there under that name.

Parrotia subaequalis (H.T. Chang) R.M. Hao & H.T. Wei

(*Hamamelis subaequalis* H.T. Chang, *Shaniodendron subaequale* (H.T. Chang) M.B. Deng *et al.*)

Common name: yin lu mei

Deciduous shrubby trees up to 4-10(-12)m in height; bark of trunk and branches smooth, flaking and peeling; young branches slender, lightly stellate pubescent, dark brown. Stipules narrowly lanceolate. Leaves 4-6.5 × 2-4.5cm, obovate, narrowly ovate or elliptic, upper surfaces glossy green, stellate pubescent only along veins, lower surfaces stellate pubescent with pale brown hairs; lateral veins 4-5 on each side, prominent beneath, the basal two without tertiary veins; base rounded, truncate or subcordate, symmetrical or less often asymmetrical; margins irregularly dentate (in cultivation) or wavy and younger leaves have a pronounced dark red to purple marginal band, apex acute; petiole 5-7mm, stellate pubescent. Inflorescences in capitate (head-like) spikes; peduncle *c.* 1cm long. Floral bracts large, ovate or broadly ovate, subglabrous above, densely stellate pubescent beneath. Lowermost 1 or 2 flowers male, floral cup indistinct, stamens 3-10. Bisexual flowers 4 or 5, floral cup short, margin irregularly toothed, persistent. Sepals *c.* 3mm long, ovate. Stamens 5-15, erect in bud, pendent at pollination, filaments 15-18(-20)mm in length, anthers 4-4.5mm long, oblong, bright orange to bright red; connectives elongated into a short sharp terminal point. Ovary semi-inferior; styles *c.* 2mm; stigmas decurrent (extending downwards). Capsules 8-9mm in diam., woody, densely stellate pubescent with yellow hairs, subglobose, dehiscing by 2 valves, persistent floral cup *c.* 2.5mm; styles persistent. Seeds 6-7mm long, glossy brown, base and apex acute. Flowering March-April. Fruiting September -October. (adapted from Zhang *et al.*, 2003, Li *et al.*, 1997, M. Ogisu & R. Lancaster *pers. comm.* and other observations).

Native to E. China: **Anhui** (Jinzhai Xian, Jixi Xian, Shucheng Xian); **S. Jiangsu** (Yixing Xian) and **N. Zhejiang** (Anji Xian). Occuring in montane forests in the eastern ranges of the Dabie Mountains and the northern parts of the Tianma (Tian Mu Shan) Mountains at 600-700m asl. Known associates include *Pinus massoniana, Celtis sinensis, Quercus acutissima, Ilex purpurea, Ligustrum*

lucidum, L. quihoui, Styrax confusus, Pterostyrax corymbosum, Cornus controversa, Stewartia rostrata, S. sinensis, Phyllostachys nidularia, Pleioblastus yixingensis, Rosa multiflora var. *cathayensis, Lonicera fragrantissma, Thalictrum fortunei, Tulipa edulis, Asarum forbesii* (P. Del Tredici & M. Ogisu *pers. comms.*).

The description of *Hamamelis subaequalis* as a new species by H.T. Chang (1960) was based on *C. Chen* 958 from Yixing (Jiangsu), which was collected on 28 September 1935. No other specimens were cited in that paper.

It was during an investigation of rare and endangered Chinese plants that M.B. Deng, H.T. Wei and X.Q. Wang (1992) discovered that *H. subaequalis* was apetalous and thus could not belong to *Hamamelis*, a member of the tribe Hamamelideae, all of which have bisexual flowers and showy linear petals. In 1992, they described a new genus *Shaniodendron*, which fell into the tribe Fothergilleae. The genera within this tribe all have bisexual or male apetalous flowers (see pp 3-4). It was named in honour of the late Professor Ren Hwa Shan (1909-1986).

Hao, Wei & Liu (1996) examined the floral morphology of this new genus in detail and in summing up came to the conclusion that:

> "In comparison with other apetalous genera, *Shaniodendron* is very similar to *Parrotia* in floral morophology. It is very important to elucidate phylogenetic relationships in Hamamelidoideae."

The latter was carried out by J.H. Li *et al*. (1997), whose ITS-based phylogeny confirmed the close relationship between *Shaniodendron* and *Parrotia.* Also, the

CHARACTERS	*Shaniodendron*	*Fothergilla*	*Parrotia*	*Parrotiopsis*
Habit	*tree*	*shrub*	*small tree*	*small tree*
Leaf margins	*simple-serrate*	*simple-serrate*	*simple-serrate*	*double-serrate*
Stipules	*narrow-lanceolate*	*very small*	*broad and large*	*oblique-ovate*
Inflorescences	*apparently terminal capitulum*	*terminal spike*	*terminal capitulum*	*terminal capitulum*
Bracts	*medium-sized, drab*	*small*	*medium-sized, drab*	*large, white*
Filaments	*pendulous, long-setuliform*	*erect, long-setuliform*	*setuliform*	*setuliform*
Anthers	*long*	*long*	——	——

Table 1. The comparison of the principal characters in *Shaniodendron, Fothergilla, Parrotia* and *Parrotiopsis* (adapted from Deng, Wei & Wang 1992).

estimated divergence time between both genera was *c.* 14 Mya, which is in the late Miocene. The fossil record indicated that *Parrotia* was growing in both SE and W Asia in the middle Miocene, while *Shaniodendron* was present at least in N China during the Miocene. Therefore, the estimated divergence time between the two is well within the range of the fossil record.

Finally in 1998, R.T. Hao and H.T. Wei made the combination of *Parrotia subaequalis* (H.T. Chang.) R.M. Hao & H.T. Wei *comb. nov.*, thus reducing *Shaniodendron subaequale* (H.T. Chang) M.B. Deng, H.T. Wei & X.Q. Wei to synonymy (Hao & Wei 1998). The following herbarium specimens were also cited: at NAS - *J. Shen* 958 (type) and *R.M. Hao* 953001, both collected at Yixing, Jiangsu; and from Anhui at AAUB - *Anhui Agri. Univ.* 1172 from Jixi, *X.P. Tong* 0892 from Quianshan, *N. Li* 25531 from Jinzhai, and at NAS – *R-M. Hao & H.T. Wei* 951002 from Shucheng. Note that the type specimen cited in Chang (1960) was spelled as *C. Chen* 958 and that it was named after Professor Shan, so some confusion here!

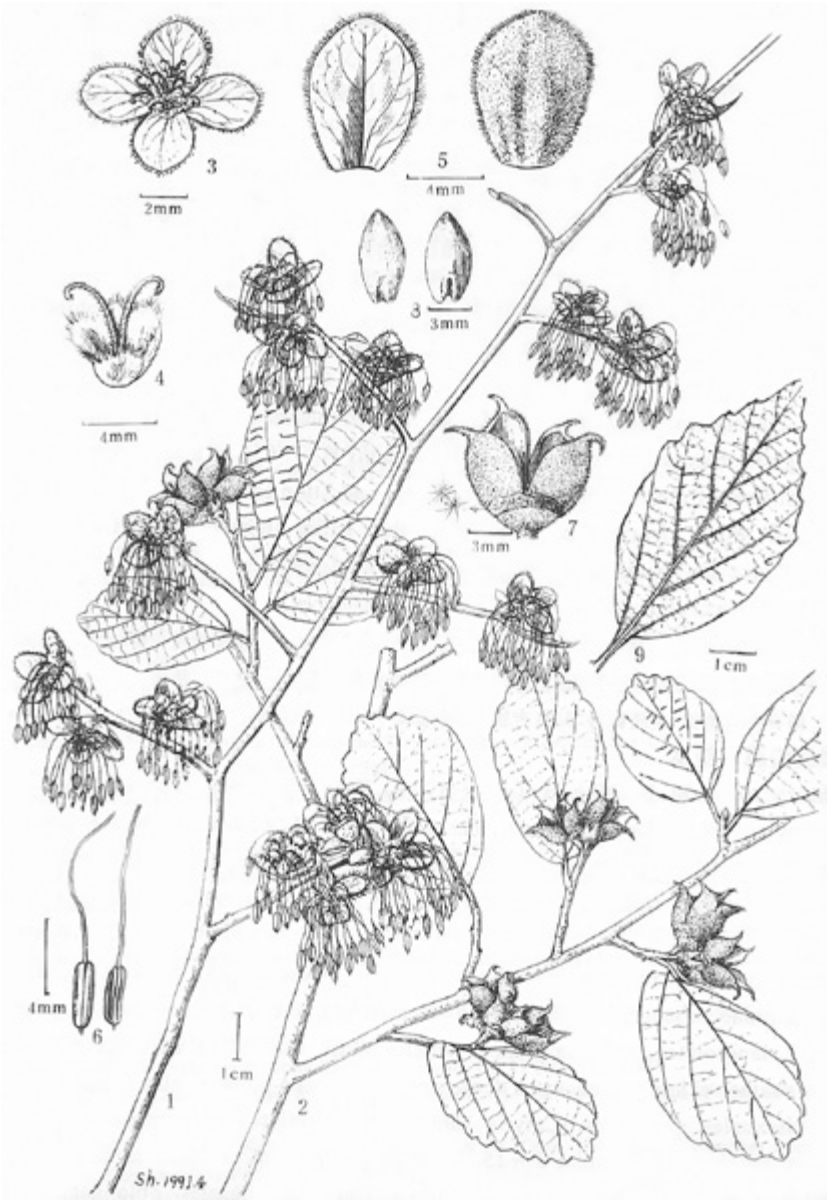
Zhang *et al.* (2003) mentioned that as *Shaniodendron subaequale*, this taxon was listed as critically endangered by IUCN. Li *et al.* (1997) had noted that due to its rarity *S. subaequale* had been added to the list of the most endangered plant species in China. Unable to find any mention of this in IUCN publications, the author consulted Dr Craig Hilton-Taylor, Manager of the Red List Unit, IUCN Species Programme at Cambridge. His response was as follows:

> "I have checked all the names and can confirm that this taxon has never appeared on any of the IUCN Red Lists – this is simply because it is a taxon that we have not yet assessed."
>
> "I also checked a submission from our China Plants Specialist Group (those assessments have not yet been included on the IUCN Red List for various reasons) and see that they did not include this taxon in their list. However, I see that in the "Chinese Species Red List. Vol. 1 Red List" edited by Wang Sung & Xie Yan in 2004, there is an assessment for *Hamamelis subaequalis* as **Endangered (EN B2ab(ii))** and a comment that it is endemic to China – no other details are provided.....
>
> http://www.chinabiodiversity.com./redlist/search/indexe.shtm
> Click on Latin name."

Another indication of the rarity of this taxon, is the complete lack of herbarium material at RBG Kew and RBG Edinburgh!

Having noticed with great disappointment that there was no illustration of *P. subaequalis* in the accompanying *Flora of China Illustrations* vol. 9, published in 2004 and no reference to one in Zhang *et al.* (2003); I was much relieved to find two b/w illustrations, in Deng, Wei & Wang (1992) see p. 21, and Hao, Wei & Liu (1996).

As one of the few people I know to have seen mature plants in the wild, the following observations of Mikinori Ogisu from Jiangsu Province in 2000 are particularly pertinent. Their habit is upright but not fastigiate. Compared to *P. persica*, the bark of *P. subaequalis* is much brighter and more striking, rather like



Parrotia subaequalis (Shaniodendron subaequale):
1. flowering branch; 2. fruiting branch; 3. inflorescence (stamens removed);
4. flower (stamens removed); 5. bracts; 6. stamens; 7. capsule; 8. seeds;
9. lower surface of leaf. Ex Deng, Wei & Wang (1992).

that of *Pinus bungeana* and this includes the main branches as well as the trunk. Also, the anthers are much more brightly coloured than those of *P. persica*. This taxon does not flower regularly even in the wild and it definitely has off years. Thus it will probably be a while before the young plants in cultivation begin to flower. Some populations can be found in limestone country, growing on humus above the limestone and in general the plants are upright growing but not fastigiate and not as spreading as are the older specimens of *P. persica* in cultivation (M. Ogisu *pers. comm.*).

Peter Del Tredici and other colleagues, visited two sites in September 2004 hoping to see *P. subaequalis*. One was the Yixing Caves Tourist area, near Tai Lake, *c.* 120km southwest of Nanjing, Jiangsu Provence.

> "After paying the admission fee and entering the site, we immediately saw a large specimen of *Parrotia subaequalis* growing on a steep slope near the edge of a small pond. The plant was hard to miss because it was identified with a massive sign with a color photograph of the plant in bloom. The tree, which was about 4 meters tall, had two main trunks, each about 30 cm diameter. The bark appeared to be at the peak of its exfoliation, leaving patches of fresh green/white bark showing where patches of old bark had sloughed off. A second plant was growing about 30m away, on a slope with bamboo and other trees. We noted at least two instances of exposed roots producing vigorous young suckers, which was extremely interesting to me."
>
> (Del Tredici *pers. comm.*)

The party then drove to Anji Xian, in northern Zhejiang Province, some 90 km from Tai Lake.

> "In the morning we hiked partway up the mountain with our guide to about 600 meters elevation and located two specimens growing near the side of a stream, among a pile of boulders. The larger of the two was about 5m tall and had a trunk that was 38cm in DBH and its bark was exfoliating beautifully in shades of green, beige and black. The second plant had two trunks that were not exfoliating as dramatically."

Parrotia subaequalis in cultivation

The introduction of *P. subaequalis* into Europe was by two routes. Here in the UK, Roy Lancaster was given two small seedlings by Mikinori Ogisu in February 2001. Roy presented one plant to the nursery at Westonbirt Arboretum, where it died in late 2002 (P. Jones *pers. comm.*). The second seedling Roy placed in the Bagshot sand of his Hampshire garden.

> "It has now reached 155cm in height, on a single stem with numerous slender ascending branches arranged almost in distichous fashion. The buds are tiny and dark brown, hairy. So far, no flowers! But the leaves, smaller than those of *P. persica* have produced brilliant crimson autumn tints. It looks set to develop into a small to medium-sized tree with slender, ascending branches."

He goes on to say that it could be a good choice for the smaller garden and appears perfectly hardy. However, Roy has no idea how it would perform on alkaline soils, especially dry ones. From his photograph in Lancaster (2005), the leaves appear to turn a brilliant orange-red, but this is only their final stage as they turn from green to wine-red, then orange and finally orange-red. A stunning display.

In her report on Expédition Ginkgo, Ariella de Kergorlay (1998) remarked that during a visit that same year by the Association des Parcs Botaniques de France (APBF) to the Sun Yat Sen Botanical Garden at Nanjing (Nanking), the most remarkable sight that the group had seen were young plants of *P. subaequalis*. The dark green, wavy-edged leaves had striking irregular purple margins. Needless to say, the whole party just stood around, looking at these plants, salivating and thinking that perhaps one day.....!!

In 2000 Olivier Colin reported excitedly on the arrival of *P. subaequalis* in Europe. In spite of much pleading, the APBF in 1998 had been unable to persuade the staff at Nanjing to release some material to them. Now, it appeared that a Belgium nurseryman, Antoine Bultinck-Meuleman, who used to run a nursery called De Ceder in Vlierzele had managed to obtain four young bare-rooted plants in February 2000, after a long and obviously persuasive correspondence with the Botanical Garden. He propagated them and as an *esprit de corps* sent material to Jacky Pousse, an APBF member and expert propagator (Colin 2001). For services rendered to dendrology, I hope that M. Bultinck-Meuleman has been made a honorary life-member of the APBF! According to Marc Libert, *via* Colin Crosbie *pers. comm.*, M. Bultinck-Meuleman also sold 30 plants to a Dutch nurseryman. Any idea who this was?

At the October Flower Show at Courson in 2001, the first French introduction was exhibited in a container by Monsieur Colin. It was awarded a Certificat Botanique (Roy Lancaster *pers. comm.*). Now, by 2008, there must be several other young plants around in cultivation. At Knightshayes Court in Devon, a specimen ex Courson was planted out in late 2007; it has also been propagated, one of which has gone to Westonbirt. Hergest Croft Gardens in Herefordshire obtained their plant from Franklin Picard some years ago. One was presented to the Savill Garden in the Windsor Great Park, Berkshire by Olivier Colin and Jacky Pousse when they visited in the summer of 2006 and planted out that autumn. It has a forked leader. Franklin Picard presented a specimen to the Sir Harold Hillier Gardens and Arboretum in 2003 and this was planted out in December 2005 (John Lanyon, Penny Jones, Mark Flanagan, Allen Coombes, Lawrence Banks *pers. comms.*). See the relevant table below for measurements.

There is also a plant at the Arboretum de Vilmorin, Verrières-le-Buisson, just south of Paris (Carnaghan 2007).

Philippe de Spoelberch *pers. comm.*, mentioned that the curator of his Arboretum Wespelaar, Dr Koen Camelbeke had obtained their plant from

the Dutch Dendrological Society in the autumn of 2007. They had taken propagation material from the plant in Roy Lancaster's garden. The Ghent Botanic Garden received a plant from Jackie Pousse in 2001 and it is still in the nursery. The intention is that this will be planted out in February 2008. Cuttings were taken at various stages but nothing took. However, now they will try root cuttings as that is the easiest way to propagate this intriguing plant (M. Libert, *via* C. Crosbie *pers. comm.*).

I would be extremely interested to hear from anyone else who is growing this exciting introduction and how it is faring in cultivation. Has it reached North America or Australasia yet?

Economic uses

Hooker (1868) noted that the wood of *P. persica* was "excessively hard and durable". Browicz (1982) called it "remarkably hard, heavy, dense and durable wood" and this is why it is called the iron tree. Charcoal made from this tree is highly valued. The wood is also used by wood turners and for weaving shuttles (Talish) or telephone poles (Iran).

It is also puzzling that Surgeon-Major J.E.T. Aitchison made no mention of *P. persica* in his fascinating account concerning the natural products of western Afghanistan and north-east Persia (Aitchison 1891).

Pests and diseases

Dirr (1990) noted that *P. persica* did not seem to be attacked by pests. However, he had noticed Japanese beetle damage in the southern United States.

Propagation

According to Bean (1976), *P. persica* is usually propagated by layers or by grafting onto *Hamamelis virginiana* but cuttings should also take under mist. Wright (1982) mentioned that it can also be raised from imported seeds but this can be unreliable and that germination does not often occur before the second year. The low spreading habit of the plant in cultivation, however, "lends itself to layering". Wijnands (1995) recommended greenwood cuttings. Browicz (1982) noted seeds and "vegetatively from root off-shoots".

Dirr (1990) suggested that the seeds should be stratified for five months in warm fluctuating temperatures and then for three months at 41°F. He claimed 100% success with cuttings taken in June-July, treating them with 1000ppm IBA/50% alcohol and then put under mist. Once they have rooted, they must be left in the medium, so that they can undergo dormancy. After they have gone through an artificial or natural cold period new growth resumes, only then should they be potted on. If the cuttings are taken in May-June (Athens, Georgia, USA), they will usually produce a flush of growth, especially if they are lightly fertilised.

Pruning

Brown (1977) noted that once branching begins, even in the nursery, the head opens up and the leader is lost. Thus the plant becomes a large shrub without any trunk. He recommended a standard on a good leg of at least 1.8m which has been selected and trained in the nursery.

As the branches often have a spreading habit and many are horizontal or pendulous, care must be taken not to spoil its natural beauty. Allow it to grow unrestricted and care must be taken when mowing around its perimeter.

Interesting trees and measurement tables of *Parrotia* specimens

There are several good specimens at RBG Kew of various sizes and age spread around the gardens. One of the most interesting to my mind, lies between Kew Palace and White Peaks. 1969.14111 is a huge specimen with several large branches self-layering so that it looks like two plants from a certain angle. It is puzzling that George Brown (1977) did not mention this striking plant as it is just behind his house near Kew Palace. Stewart Henchie who now lives there (at No. 1 Kew Cottage) could throw no light on the age of this plant either (S. Henchie *pers. comm.*).

The grounds around Kew Palace were handed over to RBG Kew piecemeal in 1895, 1902 and 1905. The boundary fence that separated the Palace from the Gardens was only removed in 1905 (Bean 1908). This fence and a low ?holly hedge surrounding the back gardens of Kew Cottage and the Kew Palace Flats (now staff accommodation) can be clearly seen in a postcard view (no. 9), which was published by *Cassells Magazine* in 1904. The postcard (no. 8) on the opposite page shows a more wooded view taken further back in 1927 (Lewis 1989, Kewensia Picture Index).

Sometime between 1905 and *c.* 1927, W.J. Bean planted many fastigiate plants in this area, of which a few still remain, e.g. *Populus nigra* 'Italica', *P. alba* 'Pyramidalis' and *Koelreuteria paniculata* 'Fastigiata'. These three are in a bed directly behind Kew Cottage and all are undated. In their midst, lurks 1969.14111 and it is not until you stand at the edge of the bed that you see how large this plant is. At 16.7m in width, this is the widest-growing *Parrotia* in Kew. It has one trunk with a girth of 1.2m at 1m. The first branch is at 1.2m; it goes down to the ground, layers and rises up again in a complete tangle of branches. The main branches have girths between 48-75cm and there is much natural grafting. It is a truly amazing plant. (See photos pp. 8-9.)

Between the *Syringa* Collection and the Broad Walk lies 1969.14112. This has a good trunk with a girth of 1.36m at 1m and the first branch at 1.7m. Growing not far from the Main Gate, 1969.14113 has been mentioned already on p. 14. In Anon. (1912) this plant was referred to as "a small Persian tree (*Parrotia*)...". Another fine specimen 1969.14114 is in the Duke's Garden. A.D. Cotton (1942) wrote about this plant in his history of the Cambridge Cottage Garden as it was then known.

> "..... is a small tree of *Parrotia persica*, recognised by its bark which is exfoliated in summer like the Plane tree. This species is always a tree of low stature and slow growth, so that the specimen, though dwarf, probably dates well back into the last century."

Its first branch is now at 1.6 m and the trunk has a girth of 1.5m at 1m. 1969.14115 is another striking plant and can be found by King William's Temple (see photos on p. 8). It's girth is 1.65m at 1m and the first branch is at 2.7m. Brown (1977) said that this was the largest of all the parrotias at Kew with a trunk *c*. 2.4m in height; it is now *c*. 2.7m. Vaucher (2003) has a good close-up of its bark.

The above specimens 1969.14112 to 1969.14115 are all very much of the same vintage. They all have the same wide-spread habit that we have come to expect from our older *Parrotia*. Some have bare trunks, others are branching from the base, so could these have originated from Surgeon-Major Aitchison's seed collected in Asterabad, Persia pre-November 1885 (see p. 14)? As you will see from the table below, the above Kew plants are at the low end of the scale compared to others. Could the poor soil and the constant pollution during the years have contributed to their lack of height? Cotton (1942) did remark on the small size of the Duke's Garden *Parrotia* (see above quote).

Unfortunately, 1922.43401 which was donated by the Rothschilds in 1922 could not be located in the area behind the first half of the Holly Walk and the Stable Yard.

1977.4134, 1977.6798 and 1977.6799 are from *FLSX* 344 collected on 7 October 1977 in the Elburz Mountains, 7 km south of Abbas Abad, Iran at 200m by John Simmons *et al.* (see p.12). Having arrived at Kew as seedlings, they were planted out in the arboretum in 1981 and are now erect growing plants between 5.4-7.3 × 6.2-8.3m. All are branching from the base and can be found between King William's Temple and the Pagoda Vista, between the Holly Walk and the Stable Yard and on the Bamboo Garden side of the Lake.

1978.16 and 1978.6241 were collected by former RBG Kew nursery manager George Cobham under *COBH* 11 on 1 January 1978, some 30km south of Shapazand, Elburz Mountains at 500m. These were also planted out in 1981 and are now a good deal broader than the *FLSX* plants mentioned above. Both are branching from the base and have sweeping and ascending branches. 1978.16 was a sight to behold in late January 2008 as it stood laden with flowers, halfway down Cedar Vista to the Lake on the right-hand side. It was by far the most floriferous *Parrotia* in Kew (see photos pp. 9 and 12). The other specimen is at the Syon House end of the Lake.

Weaver (1976) made an interesting point, when he stated that although *P. persica* could be trained to grow with a single trunk, most of the cultivated plants around the world appeared to have a multi-stemmed habit. Of the ten plants that I examined at Kew, only three had clear trunks. Comments, please!

Reports of other notable plants were sent in by IDS members and others, most of which appear on the tables below. Marigold Charrington was good enough to send me a picture of the ground-hugging specimen beside her drive in Winchfield, Hants. A large plant, it has a variable width between 11.1 and 14.6m.

Penny Jones at Westonbirt Arboretum, Gloucestershire informed me that they have 50 individual plants, 12 of which measure over 10m in height. Also, *P. persica* is a "Westonbirt signature plant"! Their champion is on Broad Drive, Silk Wood and has good autumn colour, as do the two on Holford Drive, (see p. 30).

The head gardener at Belsay Hall Gardens, near Newcastle upon Tyne, Adam Stenhouse, sent me measurements of five *P. persica* around the Quarry Garden area.

All had been purchased from Veitch's Nursery in 1911 by Sir Arthur Middleton (1838-1933) and now have girths of 1.2-1.6m. There are two slightly smaller specimens up at the Castle which probably date from around the same period (A. Stenhouse *pers. comm.*).

The well-known tree at Cambridge University Botanic Garden could have been planted any time from the 1880s onwards, according to Tim Upson *pers. comm.* It has three main trunks rising from ground-level, one consisting of two that have fused together in part, so there would have been four trunks originally. This is a flat-topped tree *c.* 9m high with several taller branches above and producing quite a few suckers. One of the reasons why this tree is much admired is the presence of numerous natural branch grafts, which can be seen, while standing beneath the crown in winter.

Hugh Johnson sent an intriguing photograph (see p. 34) of one of his trees. They were all planted at the same time in 1959 and this was before the Johnsons moved into Saling Hall in Essex. All the trees are flat-topped and spreading, with the exception of this one erect plant. 2007 was not a good year for autumn colour and instead of turning all colours of the rainbow, this tree stayed a glorious butter yellow (H. Johnson *pers. comm.*).

John Anderson, now the head gardener at Exbury Gardens, says that there are 14 specimens within the collection there. Lionel de Rothschild planted several between 1920 and 1942, while Edmund de Rothschild introduced more from the 1960s onwards.

The largest and the most impressive tree is in the glade near the main house. Their 20 year old *P. persica* 'Pendula' is planted in the park area. It has "a dense matting of weeping branches that touch the ground" and produces quite good autumn colour. They also have a young plant of 'Vanessa'. Not far away at Lees Nursery near Lymington, John noticed a particularly good specimen of 'Vanessa' growing near a building. There is another at Hythe, planted by the local council as part of a car park.

Michael Hickson brought to my attention, the several striking specimens

of *P. persica* along the avenue leading to the house at Greenway, Kingswear in South Devon. This was the former estate of Agatha Christie.

At RHS Rosemoor, the fine specimen of 'Pendula' was supplied by St Brigid's Nursery and planted in 1962. This is by the main house and has a girth of 1.5m. In the Winter Garden, 'Vanessa' was planted in 1996 and has four erect main branches. It is branching from the base (Chris Bailes *pers. comm.*).

Over in Ireland are several striking plants. At my old Alma Mater, the National Botanic Gardens, Glasnevin in Dublin was a splendid specimen pre-1930, which hit you as soon as you walked in the Main Gates. In its heyday, it stood *c.* 4 × 15m and was a plant every student knew, as it grew on the lawn opposite the lecture block. Since 1999 onwards, it has undergone a life-threatening change, when it was considerably reduced in size, especially on one side. This was to allow for the demolition of the block and the building of a new restaurant, lecture hall, etc. Although the pruning was done in stages, the tree is now growing more vigorously in height than before (Paul Maher *pers. comm.*).

At Mount Usher, Co. Wicklow, there are several old shrubs planted by either E.H. Walpole or his son Robert along the river Vartry. They withstand regular flooding and thrive in these damp conditions but they are not continuously water-logged. All are wider than high and colour up well (J. Anderson *pers. comm.*).

The large specimen at Abbeyleix in Co. Laois is planted to the side of the formal terraces and plays an important role in the overall design. Others can be seen around the lake and Pleasure Grounds and again all are wider than they are high (J. Anderson *pers. comm.*).

Hugues Vaucher (2003) has a stunning colour photograph of the bark of the trunk and branches of a tree near Bienne, Switzerland.

A large specimen was spotted on the Biltmore Estate, North Carolina during an IDS tour in May 1996. They were told that this was the largest specimen in the US. Could some North American IDS members check this out, please and let me know? Michael Dirr (1990) noted that the plants of *P. persica* he had seen in Europe tended to be more wide spreading than those in North America. Jacobson (1996) mentioned that an Ohio nurseryman has reported seeing a seedling of columnar habit; any more details?

Finally, in spite of all my researches during this paper, I still have been unable to resolve the anomaly of the flat-topped, spreading trees that we generally see in cultivation, as opposed to the erect specimens found in the wild. The fact that *P. persica* is used for telegraph poles in Iran (see p. 24) speaks for itself! It is also interesting that the two more recent collections at Kew, which were both planted out in 1981 have very different habits. The two plants of *COBH* 11 are noticeably smaller in height and broader than the three narrower specimens from *FLSX* 344. Then there is the single erect example from the 1959 plantings at Saling Hall (see p. 34). It would be fascinating to hear of any more erect trees in cultivation, as well as any explanations IDS members might have.

Above A close-up of *Parrotia persica* foliage at Beaufront Castle, Northumberland.
Below Foliage of *P. subaequalis* at the Savill Garden.

P. persica

* = ? still alive

LOCATION	ACC./ TREE NO.	HT. + SPREAD (m)	TRUNK DIAM. (cm) + YEAR	NOTES
Arnold Arboretum, Boston	#2230	21.1	31.5, 29.5, 41.8, 44.8, 44.5. (2008)	pl. 1881
Tacoma, WA		18	96 (1990)	ex Jacobson (1996)
Jardin des Plantes, Paris		c. 17.7 x ?	(2006)	pl. 1900
Geneva, Switzerland *		17.7 x 14.7	1.8m (c. 1967)	ex Jacobson (1996)
Flushing, New York *		?	2.6m @ 15cm (1972)	ex Jacobson (1996)
Easton Lodge, Essex		15	35 (2005)	pl. 1902-3 110cm girth
Abbotsbury, Dorset		14	40	(1986) RIP
Portland, OR *		13.8	1.4m (1989)	ex Jacobson (1996)
Westonbirt, Glos.	43.0394	13	53 @ 30 (2008)	N. Broad Drive, 167cm girth
Westonbirt, Glos.	12.0751	12.4	24 (2008)	Holford Ride
Tortworth Court, Glos.		12	54 (2005)	3m bole, 171cm girth
Nuneham Park, Oxfordshire		12 x c. 5	(2008)	bottom of ravine nr. house
Cambridge Botanic Garden		11.5 x 16.7	1.45m (2008)	pl. 1880s+
Westonbirt, Glos.	12.0097	10.8	26 (2008)	Holford Ride
Whitfield Court, nr. Hereford		10.6	85 (1995)	pl. 1934
Oxford BG	0004560	10 x 15	63 @ 55cm (2008)	
Oxford BG	0000368	10 x 13.2	48 @ 55cm (2008)	
Saling Hall, Essex	c. 10	c. 10	c. 70 (2007)	pl. 1959
Winchfield House, Hants.		9.7 x 14.6	(2007)	pl. c. 1935

P. persica (continued)

* = ? still alive

LOCATION	ACC./ TREE NO.	HT. + SPREAD (m)	TRUNK DIAM. (cm) + YEAR	NOTES
Leckhampton Corpus Christi C'ge		9.1 x 6	(1982)	ex Wright (1982)
Abbotsbury, Dorset		9 x 6	1.37m (2008)	pl. ? *c.* 1918+
RHS Wisley	W951996	8.5 x 9	(2008)	multi stemmed
Exbury Gardens, Hants.		8 x 9-10	(2008)	pl. 1920-1942.
Abbotsbury, Dorset		8 x 5	90 (2008)	pl. ? *c.* 1918+
Pinkey Court, Glos.		8	45	(1983)
Abbeyleix, Co. Laois		8	72 @ 15cm (2000)	
Biggens, Herts		8	54 @ 1.2m (2002)	On a fine short bole.
RBG Kew	1969.14114	*c.* 7.6 x 11	47 @1m (2008)	? ex Aitchison seed.
Osborne, Isle of Wight		7.5 x 7.5	27 @ 0.3m (2008)	pl. 1973
Anglesey Abbey, nr. Cambridge		7.5 x 7.5		ex Wright (1982)
RBG Kew	1977.6798	*c.* 7.3 x 7.6	(2008)	pl. 1981, *FLSX* 344
Belsay Hall Gdns, N. up. Tyne		c. 6.6 x 14.6	51 @ 61cm (2008)	pl. 1911, Quarry Garden Meadow N.
RBG Kew	1977.6799	c. 6.4 x 8.3	(2008)	pl. 1981 *FLSX* 344
RBG Kew	1969.14111	c. 6 x 16.7	(2008)	pl. 1905+
RBG Kew	1969.14115	c. 6 x 15.7	52 @ 1m (2008)	trunk 2.7 m in height. ? ex Aitchison seed.
RBG Kew	1978.6241	c. 5.5 x 7	(2008)	pl. 1981, *COBH* 11
Belsay Hall Gdns, N. up. Tyne		c. 5.4 x 13.2	47 @ 61cm (2008)	pl. 1911, Quarry Garden Meadow N.
Belsay Hall Gdns, N. up. Tyne		c. 5.4 x 12.3	44 @ 61cm (2008)	pl. 1911, West Quarry path

P. persica (continued)

* = ? still alive

LOCATION	ACC./ TREE NO.	HT. + SPREAD (m)	TRUNK DIAM. (cm) + YEAR	NOTES
RBG Kew	1969.14112	c. 5.4 x 11.2	43 @ 1m (2008)	? ex Aitchison seed
RBG Kew	1977.4134	c. 5.4 x 6.2	(2008)	pl. 1981, *FLSX* 344
National BG, Glasnevin		5 x 12	(2008)	pl. pre-1930
Belsay Hall Gdns, N. up. Tyne		c. 4.5 x 10.3	40 @ 61cm (2008)	pl. 1911, West Quarry path
Belsay Hall Gdns, N. up. Tyne		c. 4.5 x 9	40 @ 61cm (2008)	pl.1911, Quarry Garden Meadow S.
RBG Kew	1969.14113	c. 4 x 7.6	(2008)	? ex Aitchison seed.
RBG Kew	1978.16	c. 3.6 x 8.6	(2008)	pl. 1981, *COBH* 11

P. persica 'Pendula'

LOCATION	ACC./ TREE NO.	HT. + SPREAD (m)	TRUNK DIAM. (cm) + YEAR	NOTES
RBG Kew	1969-12301	3.5 x 4.2	25 @ 1m (2008)	Original plant, pl. 1930s, 80cm girth
RHS Rosemoor, N. Devon		2.8 x 7.3	29 @ 40cm (2008)	pl. 1962, 93cm girth
RBG Kew	1975-6214	2.1 x 5.5	19 @ 1m (2008)	Ex Hillier & Sons, pl. 1976, 60cm girth
Exbury Gardens, Hants.		2	(2007)	pl. c. 1988

P. persica 'Vanessa'

LOCATION	ACC./ TREE NO.	HT. + SPREAD (m)	TRUNK DIAM. (cm) + YEAR	NOTES
Lees Nursery, nr. Lymington,		7-8	(2007)	
RHS Rosemoor, N. Devon		5.5 x 4	(2008)	pl. 1996, Winter Garden
Car park, Hythe, Hants		4	(2007)	

P. subaequalis

LOCATION	ACC./ TREE NO.	HT. + SPREAD (m)	TRUNK DIAM. (cm) + YEAR	NOTES
Ghent BG, Belgium		c. 2	(2008)	pl. 2001 in nursery
Hergest Croft, Herefordshire		c. 2	(2008)	pl. c. 2003
Sir Harold Hillier Gardens	2003.1061	1.7 x 0.8	(Jan. 2008)	pl. Nov. 2005
R. Lancaster's garden, Hants		1.5 x 0.2	(2008)	pl. 2001
Savill Garden, Berks		c. 1.2	(2008)	pl. 2006, atypical, forked
Knightshayes Court, Devon		0.76	(2008)	pl. late 2007

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Left
An erect plant of *Parrotia persica* at Saling Hall in Essex which was planted in 1959.

Opposite
A specimen of *P. persica* (1977.6799) *FLSX* 344 at the Royal Botanic Gardens, Kew.

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Parrotia persica 'Pendula' growing at Exbury.

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Tree of the Year 2008:

For 2008, the chosen taxon is the monotypic *Eucommia ulmoides* Oliv. in the Eucommiaceae. This fascinating taxon is also known as the gutta percha tree and the latex produced from it has a number of uses. It is apparently no longer known in the wild.

Please send your comments, photographs and any other information (in any language) to Susyn Andrews, 86 Thompson Avenue, Kew, Richmond, Surrey TW9 4JN to arrive not later than 31 October 2008.