Wilson's photo of Wa Shan. "The fog prevented my view of the wild and savage scenery for which this stretch is famed. I was very disappointed as I was keen on getting some photos" (*Wilson's diary 18 September, 1908*); "the Mt. covered in dense cloud all day" (*19 September*); "Mt. Wa was clear, and I took 3 photos from different positions" (*20 September*).

Wilson's controversial magnolia and the mysterious Wa Shan

As is so often the case, what was expected to be a leisurely pursuit of magnolia study in the tranquil atmosphere of the Australian Bicentennial Arboretum, turned out to be an exciting adventure into the wilderness of China's remote and elusive Wa Shan, a mountain shrouded in mist and mystery. This is such a tale when **CHRIS CALLAGHAN** and **SK PNG** went searching for Wilson's controversial *Magnolia sargentiana* var. *robusta* in a quest to shed further light on its botanical status and ended up rediscovering a mountain potentially richer in flora than Emei Shan!

While researching the identity of what was found to be probably the first recorded hybrid of *Magnolia sargentiana* var. *sargentiana* (see 'Bicentennial' – a new hybrid magnolia cultivar, in the 2008 IDS Yearbook, pp. 53-61), I became aware of a controversy surrounding the botanical status of *Magnolia sargentiana* var. *robusta*, the few plants of which were discovered by Ernest Wilson in woodlands and open country on Wa Shan in Sichuan province,

Da-tien Chi at base of Wa Shan in October 2009. Mist spilling over the lower plateau at 2590m obscures the upper reaches of the mountain towering to 3236m. "There is a small lake in the centre of the valley, altogether a charming spot" (*Wilson's diary 30 June, 1903*).

western China in September 1908, during his first collecting trip for the Arnold Arboretum, at Boston, USA.

Since its consecutive naming by Rehder and Wilson in 1913 as a variety of their newly described species *Magnolia sargentiana* (Sargent 1913), various botanical and horticultural authorities have questioned its validity, some placing it in synonymy with the type species, with others suggesting that there are sufficient grounds for raising it to specific status.

Among those doubting its validity was James E. Dandy of the British Museum of Natural History, a world renowned authority on the Magnoliaceae, who took the view that "in Rehder and Wilson's variety *robusta*, the leaves are rather larger and more elongated and the fruit somewhat bigger than in the type as they delimited it, but these differences are only such as may be expected to exist between individuals of a species and do not justify varietal rank" (Dandy 1928).

Dorothy Callaway, a former official registrar for magnolia cultivars, stated in her book *The World of Magnolias* that Dandy reported that the variety *robusta* was based only on a single specimen from within the range of typical *Magnolia sargentiana,* and had written that he "cannot accept that this single plant represents a botanical taxon" (Callaway 1994). Callaway felt that "until more

is known about all the plants involved, over the full range of the species, this form is best left as a variety of *M. sargentiana*".

Callaway also mentioned how two previous authors of books on magnolias (Johnstone 1955 and Treseder 1978) had "each commented extensively on the differences between this variety and the type species, with both authors maintaining the variety sufficiently different from *M. sargentiana* to warrant specific status".

Reading Callaway's book during my early research into the parentage of the

FEATURE	*M. sargentiana var. robusta*	*M. sargentiana*
Habit	Spreading bushy tree with stout branches from the base (*see footnote)	Tall, slender tree with whippy branches.
Young shoots	Stout, apple green turning yellowish-brown, later ash grey.	Slender and darker.
Leaves	Oblong obovate, usually emarginate at apex on adult trees, 14-20.5cm by 5.5-8cm wide (longer and narrower than for *M. sargentiana*)	Obovate, 15 by 6+cm, occasionally emarginate at apex, otherwise abruptly pointed (smaller, paler green than var. *robusta*)
Flower buds	Prolific down to ground level, large, curved (6+cm, sickle- shaped – Johnstone 1950a, 1950b), 4 or 5 perules, innermost seamed down both sides.	Sparsely produced and usually at height, smaller, more symmetrically ovoid, perules densely pubescent, seamed down one side.
Flowers	Very large and abundant, to ground level, 23 – 30.5cm across, 10-16 broad tepals not curling when fully expanded. Poise nodding.	Smaller and sparsely borne on uppermost branches, to 20.5cm across, 10 -14 narrow tepals, outer ones curled. Poise erect to pendent.
Fruit cones	Large, stout oblong 18-20.5cm with 12mm long scarlet seeds (seed set plentiful – Johnstone 1955).	Slender, elongated, 12.5cm. Seeds bright orange (seed set sparse – Johnstone 1955).
Age to flowering	11-15 years (10-12 years – Johnstone).	*ca.* 25 years.
Time of flowering	Early to mid-spring (Hillier).	Mid to late spring (RHS A-Z Encyclopedia of Garden Plants).
Frost & wind tolerance	Intolerant (Gardiner 2000).	Relatively tolerant (Gardiner 2000).

* The tree of *Magnolia sargentiana* var. *robusta* on Wa Shan from which Wilson collected specimens and seeds under No.923a in September 1908, was then 12m tall. Plants in cultivation had reached 20m at Borde Hill, Sussex by 1983, and 24.4m at Seattle's Washington Park Arboretum by 2005, planted 1953 (Arthur Lee Jacobson, pers. comm.). Variously described in the literature as a small spreading or bushy tree, or arborescent shrub, these heights indicate that var. *robusta* is capable of equalling or surpassing the height of *M. sargentiana* var. *sargentiana,* which at 25m Wilson in correspondence described as "growing to a greater size than any other Chinese magnolia" (Millais 1927).

hybrid *M.* 'Bicentennial' at the Australian Bicentennial Arboretum, I naturally sought out both Johnstone's and Treseder's long out-of-print magnolia books.

George Johnstone concluded that the differing characteristics between *M. sargentiana* and its variety *robusta*, which he noted in his 1955 book *Asiatic Magnolias in Cultivation*, were such that specific rank should be accorded to var. *robusta*. He stated that var. *robusta* "differs from *M. sargentiana* in the bushy much branched habit, in the larger flowers and greater number of tepals, in the greater width of the tepals, in the different poise of the flowers, in the longer and narrower leaves, emarginate in adult specimens, in the lighter bark of the branchlets and in the shorter time in which it can be grown to flowering from seed".

I found that Dandy's previously mentioned non-acceptance of the single plant collection of var. *robusta* (from which all the cultivated plants are derived) as representing a botanical taxon, was conveyed in correspondence with Neil Treseder (Treseder 1978).

However, Treseder states in his book that he is "in full agreement with what he (Johnstone) wrote" concerning Johnstone's opinion that specific rank should be accorded to var. *robusta* and includes a comparison chart of features to distinguish this magnolia from *M. sargentiana*.

Most, if not all comparisons, made in this chart are in agreement with the different characteristics observed by Johnstone and it is useful to include here an abridged version of the more conspicuous features noted (see chart opposite).

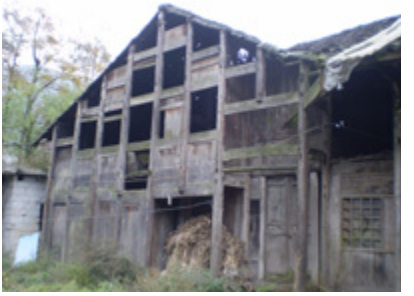
Unknown to either Johnstone, Treseder or even Wilson's close associate at the Arnold Arboretum, Alfred Rehder, with whom Wilson collaborated in determining many of the plants he collected in China, was the fact that in a manuscript on magnolias that Wilson was working on and that was unpublished at the time of his tragic death in October 1930, this arguably the greatest of all plant hunters had noted under the section dealing with *Magnolia sargentiana*, that from its seeds gathered by him in mid-September 1908 under the numbers 914, 923, 923a, a number of trees were growing in different gardens in the British Isles and France, but that none had as yet flowered.

Wilson went on to say "At one time I thought 923a, with longer leaves and stouter fruits, represented a distinct form, and in conjunction with my colleague, Alfred Rehder, named it var. *robusta*. I have long since abandoned this idea".

This unpublished manuscript was not included in the list of Wilson's publications concluding Rehder's 1930 obituary to Wilson, which incidentally included two other unrelated, yet-to-be published articles. Wilson's manuscript was posthumously published half a century later in 1980 in the Journal of the Magnolia Society (Wilson 1980).

Wilson's retraction of his and Rehder's previous determination of No 923a as a variety of *M. sargentiana* is in accord with Dandy and this position has been adopted by others including Chen and Nooteboom (1993) who stated that "*Magnolia sargentiana* var. *robusta* differs from *M. sargentiana* var. *sargentiana*

Ta-t'ien-ch'ih (Da-tien Chi) hamlet across Big Heavenly Lake (where Wilson stayed in between climbs of Wa Shan). "The village is situated in a valley shut in on all sides by hills." (*Wilson's diary 30 June, 1903*). "I regretted very much" (the spoiling of my Wa Shan photo) "as it is such a peculiarly shaped and interesting mountain". (*A.E. Pratt – To the snows of Tibet through China, 1892*)



Dilapidated village house from Wilson's time (could he have stayed here?). "I take up quarters in a large inn under the lee of majestic Mt. Wa where Baber and Pratt lodged when they visited here." (*Wilson's manuscript 30 June, 1903*).

in its larger leaves and bigger flowers and fruits. Except for this difference in size, we could not find any characters to distinguish them. The variety, therefore, is here abolished" (despite these authors finding few differences, the attention of readers is drawn to the chart included previously).

Magnolias of China (Liu 2004) and *Flora of China* (Xia et al. 2008) appear to have accepted this treatment of var. *robusta* being in synonymy with *M. sargentiana*, as neither publication acknowledges the variety.

Reading Johnstone and Treseder's arguments for raising var. *robusta* to specific status, I began to form the view that this magnolia taxon is in all probability a hybrid of *M. sargentiana*, both having been found by Wilson in 1908 on Wa Shan, the variety at 2,300 metres and the species between 1,600 and 2,000 metres.

Magnolia sargentiana had originally been found by Wilson in 1903 as a

25m tree at Yinkou, 6 miles (9.6km) west of Wa Shan, while collecting for the English nursery firm Veitch. He also found it as trees 15-20m tall 48km west of Wa Shan. It has been subsequently found by various other collectors in at least seven scattered locations in Sichuan stretching from Emei Shan to Kanding east to west, and Baoxing north of Ya-an to Ebian south-east of Wa Shan north to south, plus two or three collections in northern Yunnan.

Dandy and Wilson believed that *M. sargentiana* was first discovered in 1869 by Abbé Armand David at Mupin (now Baoxing), Sichuan and subsequently named *Magnolia conspicua* var. *emarginata* by Finet and Gagnepain (Dandy 1928, Wilson 1980). Since *M. sargentiana* is mentioned in the literature as only occasionally emarginate at the apex, David's specimen may represent var. *robusta*, since it would be pointless to name a plant with a few notched leaves var. *emarginata*. In any case, Wilson's collection of var. *robusta* remains the sole representative of this taxon in just over a century.

Surely if the variety represented an unrecognised species as suggested by Johnstone, Treseder and others, more specimens would have come to light in the 100 years since Wilson discovered it on Wa Shan?

Despite questioning its specific status, I would agree with the preceding authors that var. *robusta* represents a taxon distinct from *M. sargentiana* and would emphasise here that neither Dandy nor Wilson had the benefit of ever seeing the flower of var. *robusta*, which is quite different to the typical flower, at the time of rejecting its varietal status, since it first flowered in cultivation in Britain at Caerhays in 1931. This was about six months after Wilson died, and there is no mention to my knowledge that Dandy knew of the reported flowering in France in 1923 of seedling trees sent there by the Arnold Arboretum in 1913.

photograph © Australian Bicentennial Arboretum

H. L. Tsiang's 1953 herbarium specimen 33747 from Sichuan determined as *Magnolia sargentiana* (listed by Chen and Nooteboom as *Magnolia campbellii*!)

I began to suspect the possibility of var. *robusta* being a hybrid of *Magnolia sargentiana* not only because no further specimens have been found since Wilson's collection in 1908, but because of the apparent variations in plants grown from seed collected from a single tree.

I found there was an extreme variation in the time taken for the first seed-grown trees of var. *robusta* to reach maturity and flower, *ca.*

14 years in France compared to *ca*. 22 years in Britain in 1931, (where even *M. sargentiana*, which takes 20 to 25 years to flower in cultivation, first flowered at Nymans in April 1932, a year after the variety). Since then, trees of the variety have reached flowering age in as little as ten to 12 years or less, even if seed grown (Johnstone 1955, et al), and only six to eight years when grafted.

Some of the plants raised from the original seed have remained relatively small and shrubby while others have made sizeable trees, the vigorous habit of growth (mentioned by Johnstone) possibly due to hybrid vigour, and there has been variation in the flower size and colour.

In my view, the comparison chart from Treseder included earlier listing the more prominent differences of var. *robusta* compared to *M. sargentiana*, shows these to be too numerous to have arisen by chance mutation(s), but more likely to have been inherited as a result of hybridization, with some of the features seeming to have been contributed by *M. campbellii* subsp. *mollicomata* as the seed parent. e.g. the exceptionally long flower buds, the much larger flowers with a greater number of broader tepals, the length of the fruit cones containing a greater seed set, the normally considerably less time taken to flower from seed, and the coinciding of the time of flowering with subsp. *mollicomata* in most years.

What came close to convincing me that var. *robusta* was the result of hybridization between *M. sargentiana* (the only other closely related magnolia known to occur on Wa Shan), and *M. campbellii* subsp. *mollicomata*, was the observation by Neil Treseder that "in artificial light, the surface of the tepals (of var. *robusta*) glisten, as if they were frozen, or dusted with a very fine artificial powdered glitter of the type used on Christmas decorations".

I immediately realised that this glistening of the tepals in artificial light would be as a result of the reflection of minute silver hairs, similar to those that I had observed reflecting in bright sunlight on the surface of the tepals of *M.* 'Bicentennial' during last year's research, and had then subsequently learnt of their occurrence on the tepals of *M. campbellii* (Polunin & Stainton 1999), and presumably its subsp. *mollicomata*? The existence of these hairs on the tepals of *M. campbellii* has been confirmed by Natalie Papworth and James Woods at the Royal Tasmanian Botanic Gardens in Hobart, and we are presently awaiting the outcome for var. *robusta,* the tepals of which were not then available.

For this presumed hybridization to have occurred would require the presence of *M. campbellii* subsp. *mollicomata* in close proximity with *M. sargentiana* on Wa Shan, and hence within Sichuan province. Was there any record of a collection of *M. campbellii* subsp. *mollicomata* from western Sichuan?

A thorough search of the literature revealed two possible records for it in Sichuan, the first by H.L. Tsiang , as *M. campbellii* (obviously subsp. *mollicomata* in synonymy with typical *M. campbellii* which occurs further west in the Himalayas), collection no. 33747 (Chen & Nooteboom 1993). Andrews (2006) also listed its distribution as possibly in Sichuan, but without collection

details. Could it have been found on, or in the vicinity of Wa Shan, and where was Tsiang's collection now?

While planning a trip for last October to see the Cathay silver firs at Huaping Nature Reserve where they were first found and collected, and for which we had gained rarely granted permission, I and my arboretum colleague S.K. Png decided on a side trip to see if we could locate the herbarium specimens of Tsiang's magnolia and also climb Wa Shan to try and find the population *of M. sargentiana* var. *robusta* that Wilson had discovered a century before during his first collecting trip for the Arnold Arboretum. (Note: while many authors mention that Wilson found only a single tree of this magnolia, Wilson's field notes alludes to the fact that a number of trees were found, as he describes its habitat as "woodlands and open country" in *Plantae Wilsonianae* (Sargent 1988). Hence it appears that in 1908 only one of these trees was in fruit, since Wilson made only a single collection).

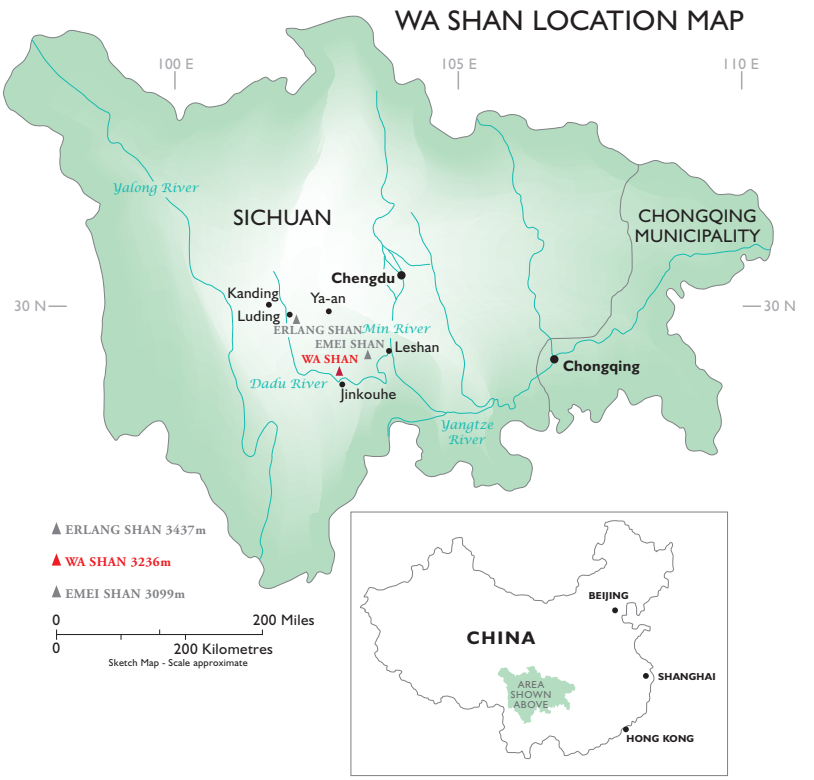
Finding the specimen proved relatively easy, as I presumed that most botanical collections made in Sichuan would be deposited at Sichuan University herbarium. This proved correct and with the help of Ms Qiao Xue and Wang Jiayuan , under the direction of Professor Tang Ya, Tsiang's specimen No. 33747 was found misfiled after a thorough search (see photo on page 57).

Disappointingly, this proved to have been initially misidentified or perhaps misquoted as *M. campbellii*, for it turned out to be *M. sargentiana*, and not from Wa Shan as hoped, but from Erlang Shan, situated south-east of Luding and its famous suspension bridge. Both this mountain and bridge we crossed over in 1997 on our way to Kanding, formerly Tachien-lu, one of Wilson's botanising bases and the gateway to Tibet.

Next we turned our attention to a botanical reconnaissance of Mount Wa. Prior to leaving Australia we had found that Wa Shan was omitted from most modern maps, foreign and Chinese, while lesser mountains are shown.

Wilson's map at the back of *A Naturalist in Western China* (Wilson 1913, 1986) gave a rough idea of its location, but thankfully this book led to the much more detailed map in Baber (1882). Both these showed the mountain north of the Tung or Dadu River, not on its south side as shown on map 3 in the book 'Chinese' Wilson (Briggs 1993)–refer to location map in the present article, page 60.

Edward Colborne Baber was the first western traveller to climb both Emei Shan in 1877 and Wa Shan in 1878. The next ascent of Wa Shan was by the English naturalist Antwerp E. Pratt accompanied by an assistant German collector Kricheldorff in 1889. Despite leaving their Chinese collectors behind at Wa Shan for much of the summer while they pushed on to Tachien-lu (Kanding), Euan H.M. Cox comments that "it is odd that no records exist of any plants having been collected in this neighbourhood (Wa Shan) with such an extremely rich flora (Cox 1945, reprint 1986). It is equally odd that no plants seem to have been collected since Wilson last collected on the mountain.



Hiring a driver and guide, we set out from Wa Shan's famous sister mountain, Emei Shan, and after an uneventful drive alongside the swift flowing Dadu River, (see photo opposite), the route to Wa Shan included a lengthy detour with a motorcycle escort showing the way to avoid a four-hour delay at a large landslide across the road (the same problem, we learnt on our return from China, that prevented Flanagan & Kirkham from reaching Wa Shan when researching their recently published book *Wilson's China: A Century On*–Tony Kirkham, pers. comm.).

We arrived early afternoon 24 October at the little remote village of Datien Chi, known as Ta-t'ien-ch'ih in Wilson's time, and sandwiched at about 1860(?) metres between its namesake, Big Heaven Lake and the foot of Wa Shan. See photo on page 56, which shows the scene little changed since Wilson's time except for some additional modern homes to the right. The four other lakes in the 'Five Lake District' draining from the Wa Shan range are Top Lake, Dry Lake, Fish Lake and Little Heaven Lake.

Ta-t'ien-ch'ih is the scattered hamlet where Wilson stayed between climbs of Wa Shan during his four ascents of the mountain. We immediately set

photograph © Australian Bicentennial Arboretum

Diminutive trees on massive rocks in untamed Dadu River. "I was told that the Lolos" (a then independent race on the south side of the river, from where this photo was taken in 2009) "make frequent raids hereabouts, carry off captives and sell them for slaves." (*Wilson's diary 29 June, 1903*).

about searching in the hope of finding the inn where Wilson resided during his sojourns. Since none of the villagers survive from Wilson's time, it proved impossible to determine whether the inn still existed, although numerous very old dwellings were seen.

We showed the villagers photos of the flowers of magnolias including *M. sargentiana* and *M.* var. *robusta* plus *M. campbellii* subsp. *mollicomata*. Their response was that they had planted trees with similar flowers to *M. sargentiana* in or near the village, but had cut them down when they had failed to flower in well over a decade. They were unsure about the other two magnolias.

Next we undertook an initial hurried climb of the mountain led by a village elder, grandfather Yang, a veteran of many climbs in his 72 years, ably assisted by his 15 year-old grandson Yang Tse Poh, with our guide from Emei Shan tagging along.

It was soon apparent that the lower slopes had not recovered from the earlier clearings mentioned by Wilson after his 1903 climb and were still blanketed in the dense weeds and shrubs he described , with very few trees in evidence, and certainly no magnolias that we could detect. After climbing to

roughly mid-elevation on the mountain, at 2700m according to our altimeter reading, we reached the half-mile wide (804m) plateau described by Wilson and had been encountering familiar cool temperate trees and shrubs for some hundreds of metres now, but could only pay them a cursory glance in our efforts to keep up with our two younger guides attempting to conquer the mountain (refer to Wilson's appended list for trees and shrubs he encountered between Ta-t'ien-ch'ih at around 1860m and Wa Shan's summit).

With the light failing and the risk of being stranded on the forbidding precipitous slopes of the mountain, we descended at near break-neck speed to our lodgings at Datien Chi which we fortunately reached as night closed in.

Buoyed by our good fortune at having at last set foot on Wa Shan and following a refreshing sleep, we set out early next morning to retrace our steps up the mountain and hopefully reach the summit with its remnant forest of *Abies fabri*, seen and thought by Wilson to be *Abies delavayi*, ever on the lookout for the elusive magnolias!

Upon reaching the plateau of the previous day, we immediately plunged into what can best be described as a quagmire, which we negotiated, often more than ankle deep, for the next three hours, being repeatedly assured by our guides that this was the way to the summit, although I couldn't help having my doubts.

Now a thick mist fell and enveloped us, adding to our woes, yet every cloud has a silver lining! With every step through the quagmire we encountered a veritable treasure-trove of woody plants of the cool-temperate zone, including numerous rhododendrons, some flowering their hearts out in autumn (see page 65: this phenomenon is explained on-line by B. Rosie Lerner, 2005). This display was not to be outdone by the bright splashes of colour provided by such genera as *Enkianthus, Malus, Sorbus, Viburnum*, etc., and many taxa of *Acer*, in fact more maples than found by Wilson on either Wa Shan or Emei Shan, *Acer campbellii* subsp. *flabellatum* (?) and *Acer pectinatum* subsp. *laxiflorum* being two of those we've tentatively identified.

While Wilson found more rhododendrons on Wa Shan than just about anywhere else on his Chinese travels, encountering about 26 taxa in all, the previous spring they had not been too floriferous, as evidenced by the scarcity of seed capsules hanging from their branches. Fallen leaves proved to be from now naked dove trees (*Davidia*), the tree which had first brought Wilson to China.

The mist began to thicken markedly, and it was obvious that the two local guides had become unsure of the way to the summit and would soon become unsure of the return route, so at the risk of becoming totally disorientated and completely lost or wandering off a precipice, with heavy hearts, (at least SK and I!), we turned to retrace our steps back to civilisation and the 4 o'clock deadline for leaving the village, as our driver had advised that he could not negotiate the high passes, hairpin bends and cliff-hanging roads in the pitch-black misty night.

Descending by a slightly different route, we encountered *Acer longipes* and other *Acer* taxa, *Cornus kousa* var. *chinensis*, *Betula potaninii*, *Buddleja nivea*, and a magnoliaceous species (not a *Magnolia* s.s.), plus other familiar genera generally too high on the cliff faces to positively identify. We could console ourselves that despite the hurried nature of our climb, and our failure to find the magnolia of our quest, we had perhaps been the first foreigners since Wilson to at least climb to the mid-elevation plateau of Wa Shan and behold an undoubted small percentage of the mountain's floral splendour.

In hindsight, we regretted not having allocated more days to exploring Mount Wa, but we still had a further four Chinese mountains to climb in the remaining weeks of our trip, plus our much anticipated meeting with the wild *Cathaya argyrophylla* trees at Huaping.

Later in Chengdu we managed to acquire a copy of *Sichuan Sheng Dituji* (Atlas of Sichuan Province–Lei 2001), which, while in Chinese, showed not only the exact location of Wa Shan, or more correctly Ta Wa Shan (Big Tiled Mountain), but gave its altitude at 3236m compared to Wilson's reading of 11,250 feet (3429m), still well above Emei Shan's 3099m. The altitude reading of 10,545 feet (3214m) by E. Colbourne Baber, during the first ascent of Wa Shan in June, 1878, was therefore nearer the mark than Wilson's reading.

It was Baber who thought the slightly undulating summit plateau of Wa Shan, praised by Wilson as "this magnificent mountain", was "the most charming natural park in the world". The lofty 10,000 foot (3048m) spur of the mountain that Wilson also mentioned climbing and botanising on in 1903 is known today as Xiao Wa Shan (Little Tiled Mountain), being actually 3064m and 7km south-east of Ta Wa Shan and straddling a 2km deep Kunming-Chengdu railway line tunnel under its southern flanks.

Wilson collected more than 220 species in four days of botanising on Wa Shan in the summer of 1903 and attributed to the charcoal-burning industry the marked absence of beech and hornbeam, and near absence of oak, the last two of which he found plentiful in number and with two species each on Emei Shan. This would be due to the entire Emei Shan then being the property of, and hence protected by, the nearly 70 Buddhist monasteries scattered over its summit and flanks, a protection Wa Shan did not enjoy with its single monastery on the summit.

Wilson also noted trunks of around 150 feet (45m) in length of individual trees of long-ago felled silver fir forest which once covered the upper reaches of Wa Shan. These were twice the size of the living trees of this fir that he saw on Emei Shan three months later. Wilson thought this fir the most handsome conifer in the Far East, but unfortunately we didn't reach the fir zone to see the remnant population of these magnificent giant trees 100 years on.

Wilson concluded his chapter on Wa Shan in *A Naturalist in Western China* by saying he had "climbed and botanised on many mountains in different parts of China, some much higher than this, but **none have I found richer**

photographs © Australian Bicentennial Arboretum

The author and colleague SK Png with Grandfather Yang (72 years) and grandson Yang Tse Poh (15 years), our ernest guides on Wa Shan.

Magnificent maples provided a splash of colour in the quagmire of Wa Shan (here *Acer campbellii* subsp. *flabellatum*)

Purple-black canes of *Fargesia nitida* (Wilson's *Arundinaria nitida*), giant panda's preferred food – could they still roam Wa Shan's wilderness? White Bear village on the west side of Wa Shan indicates pandas are (or were) once here.

in cool-temperate plants and especially flowering shrubs." (Wilson 1913, 1986.) This in western China, whose flora even back then Wilson recognised as "the richest temperate flora in the world."

This appreciation of the richness of Wa Shan's flora caused Wilson and/or his collectors to botanise on this mountain on at least five occasions between

Wild cattle followed us about relentlessly in the hope we knew a way out of the quagmire.

A budding dendrologist collects a rhododendron for his home garden.

Rhododendron concinnum flowering out of season in autumn (tentative identification by Maurice Kupsch, Emu Valley Rhododendron Gardens)

Cornus kousa var. *chinensis*, described by Bean as "a beautiful flowering tree which should be in every garden".

1903 and 1908. (July 1903, October 1903(?), May and October 1904, May/June/July/August 1908 and September/October/November 1908). However, I feel that due to its isolation and rugged terrain of precipitous cliffs and yawning abysses, plus the difficulty of obtaining permission to enter the area (**I'd advise against anyone of going to Wa Shan without official permission**), the surface

has hardly been scratched in respect of its floral wealth.

In view of Wilson's above comments and our own tantalisingly brief observations, Wa Shan's flora compares favourably with, or may even surpass, at least above 1800m, that of its famous World Heritage-listed sister mountain Emei Shan, which Wilson also botanised on a number of occasions and which has had an additional century to be explored and researched (see appendices).

As far as can be ascertained, there is no flora of Wa Shan equivalent to either Wen-p'ei Fang's *Icones Plantarum Omeiensium* (1942 & 1944), or more comprehensive, recently published floras of Emei Shan such as the 492-page *Plants of Mount Emei* (Li & Shi 2007). In this monumental work are listed about 200 of the 3703 plants found on Emei Shan that have been given specific, subspecific, or varietal names indicating the plant's occurrence on this mountain (eg. *emeiensis, omeiensis*), or that it 'belongs' to Emei Shan (eg. *emeishanica*), plus other similar descriptive names linking them to this mountain. One of these plants is *Rosa omeiensis*, which was also found by both Pratt and Wilson on Wa Shan.

Had the flora of Wa Shan been as thoroughly explored as has the flora of Emei Shan since Wilson's time on these two mountains, it would be expected that there would likewise be at least some newly found plants from Wa Shan given similar specific names by Chinese botanists to indicate their link with this mountain (eg. *washanensis*). It is also to be expected that a percentage of these would have been subsequently found on Emei Shan less than 50km away. These would then be listed in *Plants of Emei Shan*, yet I failed to find any plants in this book with names linking them to Wa Shan.

This to me indicates that the entire Wa Shan range appears to be in dire need of a thorough exploration of its undoubted botanical riches. To illustrate this point is the fact that we saw at least six different maples in little more than a day, yet Wilson and his Chinese collectors managed to find and collect just four maples during their five or more searches of Wa Shan over many months.

Who knows what lies hidden and awaiting discovery on this mountain shrouded in mist and mystery and which perhaps holds the key to the true status of Wilson's controversial magnolia?

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Appendix 1– A selection of woody plants collected by Wilson on Wa-Shan

The following abridged list is compiled mainly from *Plantae Wilsonianae* (Sargent 1988), wherein there are numerous plants collected in May 1904 noted 'without precise location'. Since Wilson had collections made on Wa Shan in this month, and only seven plants on my list were collected at this time, it is probable that many plants noted 'without precise location' were also collected on Wa Shan. The plant names are as given in *Plantae Wilsonianae*.

It should be mentioned that *Plantae Wilsonianae* does not list all plants collected by Wilson during the Veitch expeditions. eg. *Aesculus chinensis* var. *wilsonii* (collected as *A. sinensis* near Wa Shan on 5 July, 1903).

Many plants documented in *Plantae Wilsonianae* as occurring exclusively below 1800m on Wa Shan have been omitted below, as Wilson says the base of Wa Shan is around 1860m (?).

Unless noted, no attempt has been made to ascertain subsequent name changes. (?) = questionable elevation or date. An asterisk indicates plant not listed for Emei Shan in Li & Shi (2007).

PLANT NAME	ALTITUDE	DATE
Abies delavayi (now *A. fabri*)	Summit, 3000-3600m (?)	July 1903 and July & Oct. 1908.
Acanthopanax setchuenensis	1200-2100m	Aug. & Oct. 1908.
Acer caudatum* var. *multiserratum *	2100-2700m	June & Oct. 1908.
Acer fulvescens (now *A. longipes*) *	2100-2700m	Sept. 1908.
Acer laxiflorum (now *A. pectinatum* subsp. *laxiflorum*)	2100m	June & Oct. 1908.
Acer tetramerum* var. *elobulatum *	2100m	June 1908.
Berberis dielsiana *	1600-1800m	May 1908.
Berberis gagnepainii *	2500-3000m	Sept. & Nov. 1908.
Berberis silva-taroucana	2600m	June & Sept. 1908.
Berberis wilsonae	2000m	June 1908.
Betula luminifera	1300-2000m	June 1908.
Betula potaninii	2100-2800m	June & Oct. 1908.
Betula utilis* var. *prattii *	3600m (?)	Sept. & Oct. 1908.
Castanopsis platyacantha	1300-2400m	June & Oct. 1908.
Celastrus glaucophylla	1600-2500m	Sept. 1908.
Celastrus hookeri *	2000m	Oct. 1908.
Celastrus spiciformis* var. *laevis *	1600-2000m	June & Oct. 1908.
Cercidiphyllum japonicum* var. *sinense	1600-2600m	Sept. 1908.

PLANT NAME	ALTITUDE	DATE
Cladrastis sinensis	1300-2500m	June, July & Oct. 1908.
Clerodendron trichotomum var. *fargesii* *	1500-2000m	July 1908.
Cornus chinensis	1500-2200m	Sept. 1908.
Cornus hemsleyi	2000-2600m	July 1908.
Cornus kousa (now *C.kousa* var. *chinensis*) *	1200-2200m	June & Sept. 1908.
Cotoneaster bullata var. *macrophylla* *	1900-2600m	Sept. 1908.
Cotoneaster dielsiana var. *elegans*	2300-2600m	June & Sept. 1908.
Cotoneaster glabrata	2000-2800m	July 1906(?).
Cotoneaster moupinensis	2000-2300m	June & Sept. 1908.
Daphne acutiloba	2100m	June 1908.
Davidia involucrata	1800-2300m	Sept. 1908.
Decaisnea fargesii	1600-2500m	Oct. 1908.
Deutzia longifolia	1500-1800m	June & Nov. 1908.
Deutzia rubens *	3000m	July 1903.
Enkianthus deflexus	2300-3300m	June & Oct. 1908.
Euonymus aquifolium *	2200m	Nov. 1908.
Euonymus lanceifolia *	2000m	July & Oct. 1908.
Euonymus porphyrea	1600-2600m	June 1908.
Euonymus sanguinea	1600-2600m	Sept. 1908.
Euonymus sargentiana *	1300-2000m	Oct. 1908.
Euonymus subsessilis	1600-2500m	Aug. 1908.
Euonymus subsessilis var. *latifolia* *	1600-2300m	Oct. 1908.
Fraxinus paxiana *	2600m	Sept. 1908.
Fraxinus platypoda *	1800m	Sept. 1908.
Hydrangea anomala	1800-2500m	June & Oct. 1908.
Hydrangea aspera var. *velutina* *	1800-2400m	July 1908.
Hydrangea davidii	1500-2100m	June & Nov. 1908.
Hydrangea longipes	1800-2400m	July 1908.
Hydrangea pubinervis *	1500-2250m	July 1908.
Hydrangea rosthornii	1500-2400m	July, Sept. & Nov.1908.
Hydrangea xanthoneura	1800-2600m	July & Nov. 1908.
Idesia polycarpa var. *vestita*	1600-2500m	June & Sept. 1908.
Ilex fragilis *	2400m	Sept. 15, 1908.
Juglans cathayensis	1300-2000m	June & Sept. 1908.
Juniperus squamata var. *fargesii*	1600-2500m	June 1908.
Ligustrum sinense	2000m	June 1908.
Lindera strychnifolia var. *hemsleyana* *	1800m	Oct. 1903.
Lithocarpus cleistocarpa	2000-2600m	July 1908.
Lonicera chaetocarpa *	3000m	July 1903.
Lonicera lanceolata	2100-2700m	June & Sept. 1908.
Lonicera subaequalis *	1500-1800m	June 1908.
Lonicera tangutica	2400-3300m	Aug. 1908.

PLANT NAME	ALTITUDE	DATE
Magnolia nicholsoniana (now *M. wilsonii*)	2300-2800m	June & Sept. 1908.
Magnolia sargentiana	1600-2000m	Sept. 1908.
Magnolia sargentiana* var. *robusta *	2300m	Sept. 1908.
Malus prattii	2600m	June & Oct. 1908.
Malus theifera *	1600-2000m	Oct. 1908.
Nothopanax davidii	1800-2100m	Oct. 1908.
Philadelphus wilsonii	1900-2200m	July 1903.
Picea complanata (now *P. brachytyla* var. *complanata*)	2300m	June 1903 & Sept. 1908.
Pieris ovaliflora* var. *elliptica	1300-2000m	July & Oct. 1908.
Pieris villosa	1300-2000m	June 1908.
Pinus sinensis (now *P. tabuliformis*) *	1600-2000m	Sept. 1908.
Pinus wilsonii (now *P. densata*) *	2000m	Sept. 1908.
Potentilla fruticosa	3500m (?)	July 1903.
Prunus micromeloides *	2300-2500m	June & Sept. 1908.
Prunus obtusata	1800-2100m	June 1908.
Prunus sericea* var. *batalinii *	1200-1800m	Sept. 1908.
Prunus triflora *	1600-2300m	Oct. 1908.
Pterostyrax hispidus *	2000-2500m	July & Oct. 1908.
Quercus engleriana	1600-2500m	June 1908.
Quercus oxyodon* var. *fargesii *	1300-2300m	Oct. 1908.
Quercus serrata (occurs Emei Shan 400-1200m!)	1300-2000m	Nov. 1908.
Rhamnus sargentianus	2300-3000m	June & Sept. 1908.
***Rhododendron* sp.** (*Plantae Wilsonianae 3:445*)	?	1908.
***Rhododendron* spp.** (See footnote for six more species)	Various	May 1904.
Rhododendron argyrophyllum	2300-2800m 2100-2500m	May 1904. June & Oct. 1908.
Rhododendron augustinii * (Wilson 1905, p389)	Common	July 1903.
Rhododendron calophytum	2300-3000m 2600-3000m 3000m	May 1904. June 1908 Oct 1908.
Rhododendron concinnum	1600-2300m 2000-2500m	June & Oct. 1908. June 1908.
Rhododendron faberii (now listed this as *faberi*)	2600-3000m	June 1908.
Rhododendron insigne *	2300-3000m 2300-2600m	July 1903. June & Oct. 1908.
Rhododendron longesquamatum *	2300-2600m 3000m	July 1908 Nov. 1908.
Rhododendron lutescens	2600-3000m 2000m(2600m?)	May 1904. June & Oct. 1908.
Rhododendron ochraceum *	2600-3000m	June 1908.
Rhododendron pachytrichum	2600-3300m 2500-3000m	May 1904. June & Nov. 1908.
Rhododendron polylepis	2300-2600m	May 1904 and Oct. 1908
Rhododendron sargentianum *	3300m	July 1903.
Rhododendron searsiae *	2300-2800m	June & Nov. 1908.

PLANT NAME	ALTITUDE	DATE
Rhododendron stamineum	1600-1800m	June 1908.
Rhododendron strigillosum	2300-3000m 2600-3300m	June 1908 Oct. 1908.
Rhododendron villosum *	2600-3150m	June & Nov. 1908.
Rhododendron williamsianum	2800m	June & Oct. 1908.
Rhododendron wiltonii *	3300m 2500m	May 1904. June & Nov. 1908.
Rhododendron yanthinum * (Wilson 1913/1986, p247)	2600-3000m	May & Oct. 1904.
Rosa brunonii *	1300-2000m	June & Oct. 1908.
Rosa davidii	1600-2600m	July 1903 and July 1908.
Rosa davidii var. *elongata*	1600-3000m	June & Oct. 1908.
Rosa longicuspis *	2000m	Nov. 1908.
Rosa moyesii f. *rosea* *	2300-3000m 3150m	Oct. 1908 July 1903.
Rosa omeiensis	2000-3600m (?)	June, July & Sept. 1908.
Rosa prattii	2600-3300m	July & Oct. 1908.
Salix cathayana	2600-3000m & 3300m	June 1908.
Salix ernesti *	2600-3000m	June 1908.
Salix hylonoma	2300-2600m	June 1908.
Salix isochroma *	3300-3800m (?)	July 1903.
Salix microphyta *	2300-3000m 3300m	June 1908 July 1903.
Salix moupinensis	2300-2700m 3000m	June 1908 July 1903.
Salix rehderiana *	2300-2600m	June 1908.
Salix wallichiana	2700m	June 1908.
Skimmia melanocarpa	1600-2600m	June & Oct. 1908.
Sorbus aestivalis *	2300-3200m	July 1908.
Sorbus aronioides	2300-3000m	June 1908.
Sorbus scalaris	2000-2600m	June & Oct. 1908.
Sorbus setschwanensis	2300-3000m	Oct.1908.
Spiraea henryi	2000-2300m	Oct. 1908.
Spiraea japonica var. *acuminata*	1700-2500m	Aug. 1908.
Spiraea japonica var. *ovalifolia*	1700-2300m	July & Sept. 1908.
Spiraea myrtilloides	2700m	July 1908.
Spiraea rosthornii	2000-2600m	June & Sept. 1908.
Spiraea schneideriana var. *amphidoxa*	2700-3000m	July 1903.
Styrax hemsleyanus	2000-2700m	June 1908.
Styrax roseus	2800m	July 1903.
Syringa komarowii var. *sargentiana* *	2100-2400m	July 1903.
Syringa sargentiana *	1500-2000m	July 1908.
Tetracentron sinense	2300-3000m	July & Oct. 1908.
Tilia intonsa *	2000-2500m	July & Oct. 1908.

PLANT NAME	ALTITUDE	DATE
Tilia nobilis	2600m 2300-2600m	July & Oct. 1903 Oct 1908.
Tsuga yunnanensis	2600-3600m (?)	June & Oct. 1908.
Ulmus bergmanniana var. *lasiophylla* *	2200m	July 1908.
Vaccinium urceolatum	2000-2600m	Oct. 1908.
Viburnum cordifolium *	Common	no date.
Viburnum dasyanthum	1800-2250m	June 1908.
Viburnum davidii	1800-2100m	Oct. 1908.
Viburnum erubescens var. *prattii* *	2400m	July 1908.

Footnote: Referring to the rhododendrons collected during his July 1903 ascent of Wa Shan, Wilson (1905) states "In the ascent I **noted** 16 species". In his later account (Wilson 1913, 1986), this changes to "In the ascent I **collected** 16 species". Since only three are catalogued for this date in *Plantae Wilsonianae*, the other 13 would appear to have been collected later during Wilson and/or his collectors' return to Wa Shan in 1904 and for some reason (possibly lost records?), 11 of these are noted "without precise location". Five of these were re-collected on Wa Shan in 1908 and are listed above. The other six are *R. monosematum* and possibly *R. ambiguum*, *R. argyrophyllum* var. *cupulare*, *R. longipes*, *R. oreodoxa* and *R. watsonii*. While the last two are noted with maximum altitudes of 3800 metres, altitude discrepancies also occur for other plants listed for Wa Shan, eg. *Salix isochroma*, and are probably due to deciphering Wilson's difficult handwriting.

Appendix 2–Comparison Chart of selected genera on Wa Shan and Emei Shan

Taxa only occurring below 1800m are excluded, as are cultivated plants. Additional taxa with unlisted altitudes are bracketed. Emei Shan taxa from Li & Shi (2007).

GENUS	WA SHAN	EMEI SHAN
Acer	4 (6+ seen in 2009)	12 (+1?)
Betula	3	5
Berberis	6*	5
Celastrus	3	3
Cornus	3	4
Cotoneaster	4	9
Deutzia	2	1
Enkianthus	1	2
Euonymus	7	13 (+1?)
Fraxinus	2	– (+1?)
Hydrangea	8*	8 (+1?)
Lindera	1	4 (+1?)
Lonicera	5*	9
Magnolia	3	4
Malus	2	2
Pinus	2	–
Prunus	4 (+1?)	10[1]
Rhododendron	26	23
Quercus	3	1 (+1?)
Rosa	7	10
Salix	8	15 (+1?)
Sorbus	4	11
Spiraea	8*	10
Styrax	3*	3
Syringa	2	– (+1?)
Tilia	2	1
Ulmus	1	–
Viburnum	4	12 (+1?)

Note 1 – reclassified in genera *Cerasus* and *Padus*. (*not all taxa are listed in Appendix 1)

In the above chart, the taxa collected on Wa Shan by Ernest Wilson during four days in 1903, and subsequently by Wilson or his collectors during an unknown

number of days in each of the previously mentioned months of 1904 and 1908, compares most favourably with the taxa collected by numerous botanists on Emei Shan during more than a century of botanical exploration. Above 1800m, the number of taxa of the following genera on Wa Shan outnumber those on Emei Shan: *Berberis, Deutzia, Fraxinus, Pinus, Quercus, Rhododendron, Syringa, Tilia* and *Ulmus*. *Celastrus, Hydrangea, Malus* and *Styrax* are equally represented, while the genera *Cornus, Enkianthus* and *Magnolia* on Wa Shan are each only 1 taxon less than for Emei Shan.

A comparison of the taxa known to occur exclusively below 1800m on both mountains, while interesting, is beyond the scope of the present work.

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Wang Jiayuan	Post-graduate student, Department of Environment, Sichuan University, China.
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James Woods	Seedbank Coordinator and researcher, Royal Tasmanian Botanic Gardens, Hobart.

* indicates IDS member