# Newsletter

*For Friends of the Christchurch Botanic Gardens Inc*
*To Promote, Protect, & Preserve*

*No 80, Autumn 2010*

## President's Report

What's in it for me? The typical response is "You get out what you put in" and, you've guessed it, that is significantly what the "Friends" are about.

But the opportunities to "put in" have been somewhat limited – the guiding team has healthy numbers, well able to cope with the current demands. The propagating teams too are in good shape as demonstrated by their abundant production area and healthy sales.

Your Committee has thus decided to promote and coordinate another "avenue of service" - volunteers in the gardens themselves. This is has been discussed with the management and curators of the Gardens and a pilot programme is being launched, right now.

Applications are thus invited for one or more volunteers in the section that includes the herbaceous border under the guidance of Section Curator, David Barwick. The concept is that the volunteer would work alongside the gardens staff for around four hours a week with flexibility to suit all parties. The position could be "job shared" by two or more people, either week about or as a team.

This is a wonderful opportunity to work and learn with experts. The concept of volunteerism in botanic gardens is well established around the world, especially in the U.S. Not only does it help the staff achieve better results but it widens the "ownership" of the gardens in the community. As noted, this is a pilot programme, and the experience will be used to develop opportunities in other sections.

If you would like to find out more, contact David Moyle; Phone 358 8914. Email dandamoyle@xtra.co.nz

This is an exciting time to be involved with the Gardens. The Visitors' Centre is going through the fine-tuning stage on paper and the Gondwana Garden is moving steadily forward in the planning stage. Our (still) new Curator, Dr John Clemens, is doing a wonderful job keeping the Committee informed and involved with these and other developments.

However "putting in" is not the only way to be involved. Take a look at the programme of talks and walks coming up, and remember that the plant sale on March 6, and anytime from the plant barrow at the Information Centre, all contribute to work of the "Friends".

Alan Morgan

**Editor's note**

We distribute the Newsletter by email to those members who have given us their email addresses and who have not requested otherwise. If you would prefer to receive the Newsletter by mail, rather than electronically, please contact Philippa Graham – phone 348 5896 or email philippa.graham@gmail.com

INSIDE



FCBG
PO Box 2553
Christchurch

# Gardens' News

**From Curator John Clemens**

Being still new to the job, certainly in terms of seeing a full seasonal cycle, I am amazed by the way the staff of the Christchurch Botanic Gardens repeatedly and enthusiastically achieve miracles of transformation to dismantle one display in preparation for the next event: Townend House has gone from a unique design for Christmas through various stages to the tuberous begonias, which are as popular as ever. The beds and borders have also been in transition from their first summer flushes to mature crowns of leaves and peaks of flowering.

We have been very busy keeping up with the maintenance of the collections during their rapid growth, and making sure we set the scene for the many events over the warmer months. The 21st Festival of Flowers *burst* upon Christchurch this week, with Eyes Spy and Bitten Again featured within the Botanic Gardens. We can also expect many visitors during the Ellerslie International Flower Show, which as I write is only a few days away. These major events follow on from regular favourites; the Anthony Harper Lawyers Summer Theatre, Sunday Bandstand and The Breeze Lazy Sundays, in addition to Tree Magic for youngsters and their families. A successful Kitchen Garden Workshop built around the Curator's House garden was attended by an enthusiastic group of 25 people of all ages, to be followed shortly by a Waterwise Gardening workshop on successful gardening and water conservation. Congratulations to all those behind the scenes from the staff, the Friends and other outside helpers who have made this possible!

Also in transition, albeit on a slower timeframe but with greater ultimate permanence, is planning for what I have been calling the Southern Hemisphere Garden – The Gondwana Project. This has been reinvigorated and strongly supported by the Friends of the Christchurch Botanic Gardens. It is the story of the origin and evolution of the New Zealand flora within our small emergent piece of the Zealandia landmass, as an important player in the theatre of the tectonic movements of the Southern Hemisphere continental fragments.

Although there is still much to learn from the fossil record, books such as *Ghosts of Gondwana* by George Gibbs, and *In Search of Ancient New Zealand* by Hamish Campbell & Gerard Hutching, along with numerous science papers covering the palaeobotany of the different Gondwanan fragments produced in recent decades, allow us to visualise the environments we would have experienced had we been there over the aeons: the gymnosperm-dominated forests at the close of the Jurassic as Zealandia emerged from the ocean; the arrival and Late Cretaceous explosion of the flowering plants, including ancestral southern beech and rainforest Proteaceae; the warm palm forests of New Zealand in the Miocene (and contrasting conditions in Australia and Antarctica); and the results of recent upheavals and glaciations that led us to today's diverse and unique flora.

It is a wonderful story and one that has captured the imagination of scholars over the years. I went looking for "Gondawana" in our early publications and found the 1921 paper by Professor James Park on *The birth and development of New Zealand*, which poetically captures the tumultuous changes that have occurred. Park writes about the "hypothetical Gondwanaland of the South Pacific", and the fact that "…the early Cretaceous witnessed the birth of the new land [New Zealand]". Writing in 1923, Benson supported the view that the landmass that was to include New Zealand was part of Gondwana, although submerged "up till near the close of the Secondary period". Benson acknowledges that the great James Hector had written about the origin of New Zealand as far back as 1879 in the Journal and Proceedings of the Royal Society of New South Wales. The name Gondwana, of course, derives from the people and a province in India, but its application in a geological sense goes back only to reports of surveys conducted in India leading up to the 1870s.

In the coming weeks we will be progressing the rebirth of the flora, pinpointing points in time when we will be able to see, touch, hear and feel some of our past. Coming right up to the present time, it was a timely reminder to hear Matt McGlone talking on the radio about a recent paper of his and co-workers on our tree flora. Although, for our size, we have many tree species in New Zealand, they tend to be of small stature by world standards. This might be a result of our archaepelagic past. Small, at least not giant, tree stature will certainly help when fitting over

a 100 million years of floral diversification into a small space!

[1] Park, J. (1921). The birth and development of New Zealand. *Transactions of the New Zealand Institute 53*: 73-76.
[2] Benson, W.N. (1923). Palaeozoic and Mesozoic seas in Australasia. *Transactions of the New Zealand Institute 54*: 1-62.
[3] McGlone, M.S., Richardson, S.J., Jordan, G.J. (2010). Comparative biogeography of New Zealand trees: species richness, height, leaf traits and range sizes. *New Zealand Journal of Ecology 34*: 137-151.

## Events in the Gardens.

Coming events include:

**Sunday Bandstand.** Free outdoor concerts by the city's finest brass and pipe bands.
Sundays from 7 to 28 March, 1-2 pm. On the Weather Station lawn.

**Bitten Again - Return of the Killer Plants.** Back by popular demand, an entertaining display of animal-eating plants for all ages in the Cuningham House Conservatory.
Monday 1 to Sunday 14 March, 10 am to 4 pm.

**Festival of Flowers – Eyes Spy.** A self-guided short trail of animal sculptures in the New Zealand native gardens.
Story-telling daily, 10.45 - 11.15 am Monday 1 to Sunday 14 March (cancelled if wet). Signposted from both the Armagh St entrance and the children's playground.

**Discovery trail - Ngai Tahu's ancestral use of native plants.** In this school holiday discovery trail participants take on the role of children in pre-European times searching for plants for food, tools and gifts. (Designed to run as a complement to Mō Tātou: Te Hokinga Mai, the Canterbury Museum and Ngai Tahu Whanui exhibition of taonga running at the Robert McDougall Gallery from Feb 20th to June 20th.)
Saturday 3 April to Sunday 18 April.

**Kitchen Garden Workshop.** A practical workshop for home gardening in preparation for winter. Tutors are Sustainable Living educator Rhys Taylor and Botanic Gardens staff. Based at the Curator's House demonstration garden.
Bookings essential. $20.00. Ph. 941 7590 or email: Christchurchbotanicgardens@ccc.govt.nz
Saturday 24 April, 1.00pm - 4.00pm.

**Home gardening demonstration - Design and care of succulent plants.** Staff from award winning Texture Plants will demonstrate the principles of garden design using succulent plants as well as tips for caring and growing these favourite plants now firmly back in fashion.
Saturday 1 May, 2 - 3.30pm

**Festival of Flowers**. Activities within the Gardens will include a range of performances and activities for families.
19 February - 14 March.

# Articles

**The Huntington Garden**
by Patricia Carr

*(The first part of the article was in the last Newsletter. This is the second and concluding part. 'The Huntington', with its library, art collection and garden, lies in the San Gabriel Valley north-east of Los Angeles and was founded by Henry Huntington).*

*The Rose Garden*

In 1909, the enormous three acre rose garden was begun. It is one of the Huntington themed gardens, along with the Shakespeare, herb, and Japanese gardens. The garden displays nearly 1,200 species and cultivars in forty beds**.** A walk through it reveals rose history from ancient to modern times over the past two and a half millennia. It has a very romantic 18th century Temple of Love, designed for Versailles, with a statue of 'Love the Captive of Youth' inside. Beautiful floribunda roses, 'French Lace', surround it.

*The Herb Garden*

The Herb Garden, on a half acre site, is one of the latest to be planted. It was re-opened after much work, in its present form, in 1976. There is a lovely 18th century German wrought-iron wellhead in the centre. The beds group plants by use; culinary, salad herbs, teas, liqueur, medicinal, perfume and cosmetic, dye, potpourri and sachet and nosegays. Other beds hold such specialities as rosemary, rugosa, sweetbrier roses, and lavender. Like the Shakespeare garden, there are living references to plant material recorded in the Library's collection of rare 16th and 17th century. herbals. Amongst the many plants is *Anemopsis californica*,'Yerba mansa'. The root was used by the California Indians to treat pleurisy, stomach ulcers, chest congestion, colds and open sores.

*The Australian Area*

This was begun in 1964. Like the palms, Eucalyptus early on became a California tradition. They drastically altered the face of the state. Henry put in only a few in his gardens, more interested in selective planting. After his death, however, garden-superintendent Hertrich installed some rare and interesting Eucalyptus. Many other plants have also been added such as acacias, callistemons, cassias, grevilleas and some New Zealand plants.

*TheJapanese garden*

The Japanese nine acre garden was completed in 1912 and is today one of the most popular sections. It is one of the oldest, most elaborate of America's Japanese gardens and is of major importance. Japanese things were very fashionable in 1912. Huntingdon bought a failing Japanese tea garden, moved all the plants to his garden and dismantled and reassembled the tea house. By WWII it had all fallen into disrepair but by 1958 it was restored and opened.

Part of the Japanese garden mystique is that the colour green should be dominant, to induce a restful effect. That happens here though there is colour with for example wisteria, maples, lilies, Koi azaleas and flowering cherries. Pines are important to Japanese gardens.

The garden alternates open with intimate passages, structures and accessories with skill. It projects tranquillity. It has three parts, the main area being laid out as a stroll garden with a traditional house. In 1984 a zigzag bridge (reputed to thwart pursuit by evil spirits who are known to travel only in straight lines) was built, and leads into a beautiful walled compound containing a *karesansui* (dry landscape garden) and in front of this a bonsai court. Later, in 1970, an informal 3 acre garden of Asian plants, among them groves of golden and black bamboos, was added.

*The Chinese Garden* - Liu Fang Yuan/Garden of Flowing Fragrance.

This is the newest garden and is in process of creation. It was only opened in Spring 2008. It has a man-made lake, where water naturally collects after heavy rains on the site, various bridges, beautiful Chinese architecture, and a tea house.

A Chinese garden often is compared to a work of art: a scroll painting composed of carefully arranged scenes. As you stroll through its pathways and pavilions, new vistas are revealed as if a scroll were being slowly unrolled. Architecture, water, rocks and plants are all key elements. Weathered limestone rocks from Lake Tai in China line the water's edge. Bamboo, pine and plum blossom are all three very important in Chinese literature: they represent perseverance, courage and endurance, because they flourish in the cold season. These are depicted on the ceiling of one of the Pavilions.

*The Children's Garden*

This garden, begun in 2004, is a wonderland for children. The Rainbow Room is one of the garden's nine kinetic 'sculptures'. Youngsters walk through mist released every fifteen minutes from overhead sprinklers and see a rainbow, even when it's not raining. In fact, it only works on sunny days! Another feature is crawling through a tunnel hidden by plants: in the centre, shafts of refracted light appear in the darkened chamber. Playful plant choices, and topiary animals generate a storybook atmosphere that combines elements of fantasy with the wonders of nature: there is a house of creeping plants growing up a frame. It is geared for children aged from two to seven years old and is the only children's garden of its kind in the USA.

*The Conservatory*

In 1909 there was a greenhouse for tropical plants, but the present one which is new has a steel frame covered by glass panels that provides 50% shade for the plants inside. More than 50 interactive exhibits offer a rare opportunity to study a wide range of plants from all over the world. It is divided into 4 galleries: tropical rain forest, misty mountain forest, mossy wetland and a plant laboratory providing an introduction to botany, where you can touch, smell, measure and observe flowers, spores, seeds, stems, leaves and roots.

*Shakespeare Garden*

The first version of a Shakespeare garden at the Huntington failed, as only plants mentioned in Shakespeare were grown, but many did not survive the most un-English climate. In 1984 the third and final version mixes plants mentioned with those growing in the Elizabethan era in England and elsewhere; and to look like a naturalistic English dell, with a bridge, lawn and planting beds. The plants have quotes from Shakespeare beside them, for instance with *Lonicera periclymenum* (woodbine) there is 'I know a bank where the wild thyme blows/ where oxlips and the nodding violet grows/ quite overcanopied with luscious woodbine/ with sweet musk-roses and with eglantine.' (A Midsummer Night's Dream.)

*The North Vista*

Created in 1911, this is the grandest of the Huntington's gardens, though little more than an acre in size. This grass allee is 600 feet long and focuses on an early baroque fountain backed by greenery and a spectacular wall of mountains.

Another key feature is a straight row of graceful fountain palms *Livistona australis* on either side of the 75 ft wide lawn. Arranged architecturally against native oaks, their trunks form a living colonnade that directs the eye toward the fountain. Sometime after the palms were planted, eleven 18$^{th}$ century Italian stone figures were added, and later still, camellias filled in between palms and azaleas between statues. There is also an Italian tempietto (small temple) holding a 19$^{th}$ century sculpture.

*1912 Camellia Collection*

Through the native oak woodland on three sides of the North Vista, pathways wind among plantings of camellias and azaleas of many kinds for twelve acres.

The International Camellia Society has named the Huntington as an International Camellia Garden of Excellence, one of five such gardens in the world. It is the USA's largest collection of camellias today. There are sixty species and 1,200 cultivars with others continually being added.

Hertrich made the collection notable. He began growing camellias from seed in 1912. The Huntington has made some notable introductions through

the years. Forty two years later he published the results of his work through the years in his three volume work 'Camellias in the Huntington Gardens'.

I visited the Huntington twice and could have spent a lot more time there, but was filled with delight at what I did see. It is somewhere I would love to go back to again and again if possible.

Bibliography: 'The Botanical Gardens at the Huntington'.

### Herbaceous Borders and the New World

*On Saturday 16 January 2010 Alan Hart led a Friends' guided walk to the Garden's herbaceous border. It was a most informative and interesting walk and, judging by the large number of people that turned up, Alan had obviously tapped into a subject of great interest. The following article reproduces some of Alan's commentary.*

As Christmas comes and goes, and summer settles over the Botanic Gardens, one of the most vivid, colourful beds in the gardens is the herbaceous border. Herbaceous borders are considered to be one of the high points of British flower gardening but the colour is often provided by plants originating in North America. The appreciation of herbaceous borders and the selection of plants to grow in them did not happen by chance; herbaceous borders have an interesting gardening and cultural history which encompasses the Old and New Worlds.

After the Napoleonic wars (1799-1815), Britain was quite poor, but there was a gradual increase in prosperity up to 1914. This allowed a widespread interest in gardening to develop; there was an "explosion of gardens and gardening in the course of the 19th century"[1]. Gardening became a huge industry and very much part of Victorian and Edwardian consumerism.

Early in the nineteenth century formal garden beds were very popular. As with all fashions there was a reaction against it. One of the most important opponents of the formal garden was William Robinson (1838-1935) who was the leading proponent of "natural gardening" ie arrangement of plants as they might occur in nature, rather than in formal beds with elaborate designs which took no account of the site. He advocated the use of "hardy plants", which would grow outdoors all year round. He exerted great influence through his forceful character and publications such as his book *The English Flower Garden and Home Grounds* (1883) which went through 15 editions in his lifetime, and an illustrated pamphlet, *Garden Design and Architects' Gardens* (1892).

A contemporary of Robinson's, Gertrude Jekyll (1843-1932) was also very influential in promoting "natural" plantings of flowers. Gertrude Jekyll was a typical member of the Arts and Crafts movement - modern, artistic, upper middle class and well off (although not very rich). She regarded formal bedding as tedious and stupid.

Gertrude Jekyll was an artist and photographer with an intense interest in what she saw as rural authenticity and craftsmanship. She frequently appealed to local plants and to garden design as expressed in rural cottage gardens but it's important to realise that she took a theoretical approach to garden design, especially with regard to colour and the use of exotic plants. A notable collaborator of Jekyll was the famous British architect Edwin Lutyens (he planned New Delhi and many first world war memorials), he designing houses and she their gardens.

Out of the influence of people like Robinson and Jekyll, developed the "hardy flower border", which was the definitive feature of late Victorian and Edwardian gardens. The principal idea, especially as far as Jekyll was concerned, was that the flower border was a presentation of colour from plants growing in drifts ie in a naturalistic manner, rather than individual or massed plants in a formal bed.

Herbaceous borders were often set against a wall. Walls separated the border from more formal parts of the garden and would have acted as a passive heater. In Edwardian times, the book *The Secret Garden* (Frances Hodgson Burnett,1911) was very popular and it has been suggested that the thrilling idea of "secret gardens" contributed to the popularity of walled gardens.

It was considered quite appropriate to use exotic plants as long as they grew easily outdoors. We should bear in mind that a huge variety of plants were coming in from all parts of the British empire (New Zealand plants first became available in a British nursery before the end of the 18th century[2]) and the rest of the world, but earlier than the nineteenth century, plants from North America had been developed as horticultural varieties in Europe. Some of

these provide the colour so important to designers of herbaceous borders.

North American plants are used in the herbaceous border in the Christchurch Botanic Gardens. Among these are *Monarda, Echinacea, Rudbeckia and Phlox*.

*Monarda spp.* are members of the Lamiaceae (mint family). Flowers are tubular in form and grouped together to form a terminal flower head. The upper petal of each flower is hooded and the lower one has three lobes. The leaves may have a purple tinge and if crushed, smell of bergamot orange so the plants are sometimes referred to as bergamots. The plants are a source of thymol, an oil with antiseptic properties used in commercial mouthwashes. The original range of the genus was in scrub, grassland and woodland on the eastern side of North America. It was named by Nicolás Bautista Monardes (1493–1588), a Spanish physician and botanist. He published a book on new plants titled *Joyfull News out of the New Found World*, an English translation of which appeared in 1574.

*Echinacea* is a genus of nine species of herbaceous plants in the family Asteraceae. They have large, showy heads of composite flowers, blooming from early to late summer. They are commonly called coneflowers. The genus name is from the Greek echino, meaning "spiny", due to the spiny central disk of the flower head. There is a picture of an *Echinacea* flower head on a current Christchurch City Council pamphlet showing a map of the Botanic Gardens. All the species are endemic to eastern and central North America, where they are found growing in moist to dry prairies and open wooded areas.

*Echinacea spp* are of interest to those with a bent for herbal remedies. The belief that extracts of *Echinacea spp* have medical merit appears to originate in the second half of the nineteenth century when a wonder cure "Meyer's Blood Purifier" based on *E. angustifolia was* marketed in the USA. This potion was the original "snake oil" as it was claimed to be a cure for snake bites.

*Rudbeckia* is another genus referred to as coneflowers. There are 25 species of *Rudbeckia* including perennials, biennials and annuals. All are native to North America and are generally found growing in the East and Midwest, though they have now naturalized throughout most of the United States and can be seen in fields and gardens from Canada to Mexico.

The *Rudbeckias* were given their Latin designation in 1740 by Carl Linnaeus. The genus name *Rudbeckia* honoured Linnaeus's botany professor, Olaf Rudbeck, and Rudbeck's father who had founded the botanical garden at Uppsala University in Sweden. Linnaeus told Rudbeck that "so long as the earth shall survive, and each spring shall see it covered with flowers, the Rudbeckia will preserve your glorious name".

Roots of a *Rudbeckia sp* were given to the British collector John Tradescant by French settlers in the New World. The plant was shared with others including John Parkinson, herbalist to Charles I, and was soon popular in English gardens, being grown in England many years before accepted by Americans as a worthy garden plant. "Black-eyed Susan", *Rudbeckia hirta,* is now the state flower of Maryland, USA.

The flowerheads of *Echinacea* and *Rudbeckia*, and other members of the Asteraceae, are called capitula. Each capitulum consists of two types of flowers, the disc florets grouped together to form the central disc and the ray florets which encircle the disc.

Large blocks of colour in the border are provided by *Phlox spp,* a genus mostly indigenous to North America, although there are some in Asia. *Phlox spp* have

a wide variety of form (compare the tall forms in the herbaceous border with the prostrate species in the rock garden). Phlox flowered profusely in large areas on the Illinois prairie. Residents and visitors in the nineteenth century marveled at their beauty. Phlox plants were first brought to England in 1745 by John Bartram. Bartram was an American botanist honoured as a Royal Botanist by King George III. They were improved in Europe and the garden varieties were re-introduced into the USA.

The cult of the hardy flower border continued on into the 1930's. Usage of "herbaceous border" seems to be well established by this point; it is a solid mass of flowers with no gaps. The particular design and plants used reflect the personality of the designer or gardener, but above all herbaceous borders are controlled to give a pleasing mid-range view.

The popularity of herbaceous borders has continued to the present day; an English author has said they remain a "national horticultural obsession"[3]. In December 2009, the guest designer at the 2010 Ellerslie Flower Show, Chris Beardshaw, said of English gardens "They are very rich in herbaceous plants, very floriferous, very soft, very sensuous. If you love plants, love garden experiences of being absorbed, wrapped up in a garden, then an English one is for you. The English garden is a tapestry" (Christchurch Press 12 Dec 2009).

Step onto the Archery Lawn and look at the herbaceous border in the Christchurch Botanic Gardens from a distance.

References
1. Quest-Ritson, C. (2003) *The English Garden, A social history*. Penguin Books
2. Hobhouse, P. (1992) *Gardening Through the Ages: An Illustrated History of Plants and their Influence on Garden Styles - from Ancient Egypt to the Present Day.* Simon & Schuster.
3. Richardson, T. (2005) *English Gardens in the Twentieth Century*. From the Archives of Country Life. Aurum Press.

Alan Hart

## Trees and fire

As our world is becoming evermore crowded with people, the incidence of devastating fires has also increased. Natural and man-made fires have always been a hazard to plantlife. During the millions of years plant life has evolved, many species inhabiting arid, fire-prone areas developed adaptations which enabled them not only to tolerate and survive the occasional fire, but in many cases had learned to "exploit" the incidence of fires to promote the survival chances of the species.

Selection of fire-tolerant adaptations has become a feature of the vegetation in many arid landscapes, where fires are of frequent occurrence. Adaptations promoting tolerance to fires are many and varied.

Many trees have a thick and insulating bark, which protects the living tissue underneath from overheating The barks of the Redwoods, *Sequoia* and *Sequoiadendron* of California as well as the corkoak, *Quercus suber,* of Portugal, are good examples of this.

Eucalypts in Australia possess special (epicormic) buds under their bark, so that when the leafy crown of the tree is destroyed by fire, fresh growth can start all along the trunk, provided of course that the fire did not incinerate the entire tree.

In central Australia shrub-like acacias and eucalypts produce underground woody rootstocks called ligno tubers which contain food reserves, some water and many dormant buds capable of withstanding the hottest fires. After the ashes have cooled down these buds will send up new stems.

Many plants are killed by fire and depend on seed for their replacements. Seeds scattered over the years by such plants form a seedbank. Much of this seed is dormant, but remain viable for many years. Only when conditions for germination become suitable, will some seed germinate. The presence of sufficient water is one of the primary conditions for successful germination.

In many such plants, and this applies especially to many legumes such as *Acacia* species, the seed possesses a hard, thick seed coat, which does not allow the entry of water into the seed. In these cases it is often necessary that the seed-coat is damaged by fire to allow the absorption of water and seed-germination.

Some North-American pines hold their seeds within tightly closed cones, held on the tree for up to 20-30 years . Such cones will not release their seed until a fire has passed through the forest. Well known examples are the Jackpine *Pinus banksiana* and the Lodge-pole pine *Pinus contorta* of Canada.

In Australia many species of *Banksia* possess cone-like seed heads and produce woody fruits called follicles which tightly enclose the the seeds. These will not be released until a fire has passed through a grove of such shrubs; see *Banksia integrifolia* in the Australian border.

The most amazing of these fire-tolerant trees in Australia are the grass-trees, belonging to the genus *Xanthorrhoea*. There are about 15 species of this genus. Their occurrence is widespread and form a conspicuous feature of the landscape. Grass-trees are very slow-growing and long-lived herbaceous perennials with a rhizomatous root-stock.

They are generally depicted as possessing a large tuft of grasslike leaves on top of a short palmlike trunk. The smaller ones resemble a well-developed *Carex secta,* a New Zealand sedge. Not all grass-trees produce a trunk. The tree we have in the Christchurch Botanic Gardens is a rare species from Kangaroo Island, south-east of Adelaide. It is labelled *Xanthorrhoea tateana* and in time is capable of producing a 1.4 meter trunk. It is a young specimen and no trunk has formed as yet. It is growing in the Australian border behind two wooden seats.

Some grass-trees take up to 20 years or more to form a trunk. The core of the trunk is not wood but fibre and what seems to be bark is in fact the tightly compacted bases of the up to one meter long linear leaves, which are annually shed from the crown. These leaf-bases are glued together by a generous flow of gum-resin and form a most effective heat insulation. With each fire the trunks are blackened and the spreading crown of the long narrow leaves are burned down to their bases, such that the trees look completely dead. But it is not long before a new crop of leaves emerges along with inflorescences (flower spikes).

In *Xanthorrhoea* the upright, long and narrow inflorescences arise singly from the crown of leaves. The upper part bears small, closely packed, sweet-scented white flowers that later form the seed capsules. Seed is not released until conditions for germination are favourable again. Old grass-trees may have survived dozens of fires during their long life up to 600 years.

In Western Australia, home of *Xanthorrhoea preisii*, which at maturity can form a trunk of 5-6 metres, grass-trees are commonly called “blackboys”, because after a bushfire the blackened trunks and flower spikes resemble an Aboriginal with a spear held up right. However this term is offensive to the aboriginal people and is now banned in Australia.

The grass-tree was important to Aboriginals. They especially used the resin to glue stone blades to the shafts of their hunting spears. European settlers harvested the resinous gum to make varnishes, lacquers and sealing wax.

The flowering of grass-trees is irregular, but usually takes place after a bushfire. It seems that flowering is triggered by the heat of the flames since those that grow near inhabited areas where fires are more frequent, flower more often than their relatives in the wild. However new evidence suggests that it is the smoke of the fire rather than its heat that is the trig-

ger for flower initiation. A most remarkable group of plants.

References
Dawson, John & Lucas, Rob. *The Nature of Plants.*
Audas, J. W. *Native Trees of Australia.*
Harlow & Harrar. *Textbook of Dendrology.*
White, Mary E. *The Greening of Gondwana.*
Pakenham,Thomas. *In Search of Remarkable Trees.*
*Nature's Masterpieces.* Reader's Digest.

Max Visch

## Art in the Gardens

### Oak leaves – autumn.

This much admired sculpture is found by the Alpine House. It is one of four "seasonal" works of art in the Gardens.

It was created by Raymond Herber who owns a business in Amberley called "Iron in the Fire". Other works by him include the ornate gates and palms within the Cathedral Junction site.

Barbara Brailsford and Faye Fleming.

## Look at that tree – *Koelreuteria paniculata* (**goldenrain tree**, p**ride of India**, **varnish tree**, **China tree**)

Goldenrain tree is popularly grown as an ornamental tree in temperate regions all across the world because of the aesthetic appeal of its flowers, leaves and seed pods. It develops into a medium sized tree (up to 17 m) forming a broad crown (to 15 m).

The tree originates in China where it was traditionally planted over the graves of scholars. It is drought resistant.

The leaves are pinnate in form 15-40 cm long with a deeply serrated margin. The flowers are yellow with four petals. They appear in abundance in late summer growing in large terminal panicles 20-40 cm long. Known in China as *luan,* the flowers are used both as a yellow dye and in traditional medicine.

The inflated capsular fruit are wind-blown, and they ultimately shatter in order to disseminate the seeds. The fruit is a three-parted inflated bladder-like pod 3-6 cm long and 2-4 cm broad containing several dark brown to black seeds 5-8 mm diameter. Apparently the seeds are edible when roasted, but not commonly consumed.

The generic name comes from Joseph Gottlieb Koelreuter (1733-1806), professor of natural history at Karlsruhe, a pioneer experimental investigator of plant hybridisation.

You will find not one but three goldenrain trees in the Christchurch Botanic Gardens, located alongside the meterological recording station. They are growing quite closely together so that their tops grow together in a single mass.

Bill Whitmore

Contact Numbers

*Committee*

| | | |
|---|---|---|
| President | Alan Morgan | 384-9976 |
| Vice President | Charles Graham | 348-5896 |
| Immediate Past President | Don Bell | 343-6699 |
| Treasurer | Gwenda Murfitt | 981 3124 |
| Membership Secretary | Ruby Coleman | 355-8811 |
| Minutes Secretary | Alan Hart | 332-6120 |
| Other Committee Members | David Moyle | 358-8914 |
| | Diane Percy | 385-6769 |
| | Des Riach | 352-9803 |
| Ex Officio | John Clemens | |

*Helpers*

| | | |
|---|---|---|
| Plant Sale | Helen Constable | 980-9358 |
| Membership database | Philippa Graham | 348-5896 |
| Newsletter Editor | Bill Whitmore | 339-8356 |
| Newsletter formatting | Maria Adamski | |
| Newsletter mail out | Glenys Foster | 376-5417 |
| New media contact | Jim Crook | 358-5845 |
| Botanist | Bill Sykes | 366-3844 |
| Guide Co-ordinator | Pat Whitman | 384-3475 |

*Enquiries* Info Centre 941-6840 x 7590

Christchurch Botanic Gardens Inc
PO Box 2553
Christchurch
or friendsofthegardens@gmail.com