

Newsletter

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

No 77, Winter 2009

President's Report

It has been a wonderful autumn, especially with the many sunny days we have been able to enjoy plus the glorious autumn hues provided by exotic trees and shrubs growing throughout the city and in the Botanic Gardens.

It also reminds me just how valuable trees are in the urban landscape and especially in our city parks and gardens. Today, most of us are urban dwellers, with about four out of five New Zealanders living in cities or towns. Most of us feel it is important that our urban areas are pleasant and attractive, have variety, function well and are good places to live. Trees throughout Christchurch certainly make a significant impact and contribute to our well-being and enjoyment of city life.

During April a large Monterey cypress adjacent to Townend House and the fernery split apart due to decay and had to be removed. It was estimated to be over 100 years old. This brings home the need that it is so essential to have a long term plan of maintenance, removal and replacement of trees throughout the Botanic Gardens. The City Council last year approved of a management and development plan for the Botanic Gardens and Hagley Park and, included in this document, is a tree replacement programme to ensure aging trees are replaced over the long term.

The 'Friends' are most fortunate to have an excellent and knowledgeable group of dedicated guides. These volunteer guides are not only involved in doing daily guiding (1.30pm) from September to May each year, but also have a programme of guided walks throughout the year focusing on a particular topic or seasonal theme. These are normally advertised to take place at 2pm on a Saturday afternoon. Likewise, the guided walks given by Botanic Gardens staff throughout the year, usually scheduled for midday on a Tuesday, also need to be well supported. I urge all members to attend these activities whenever possible, as a lot of time and effort goes into the research and preparation of the programmed walks.

Don Bell

Editor's note

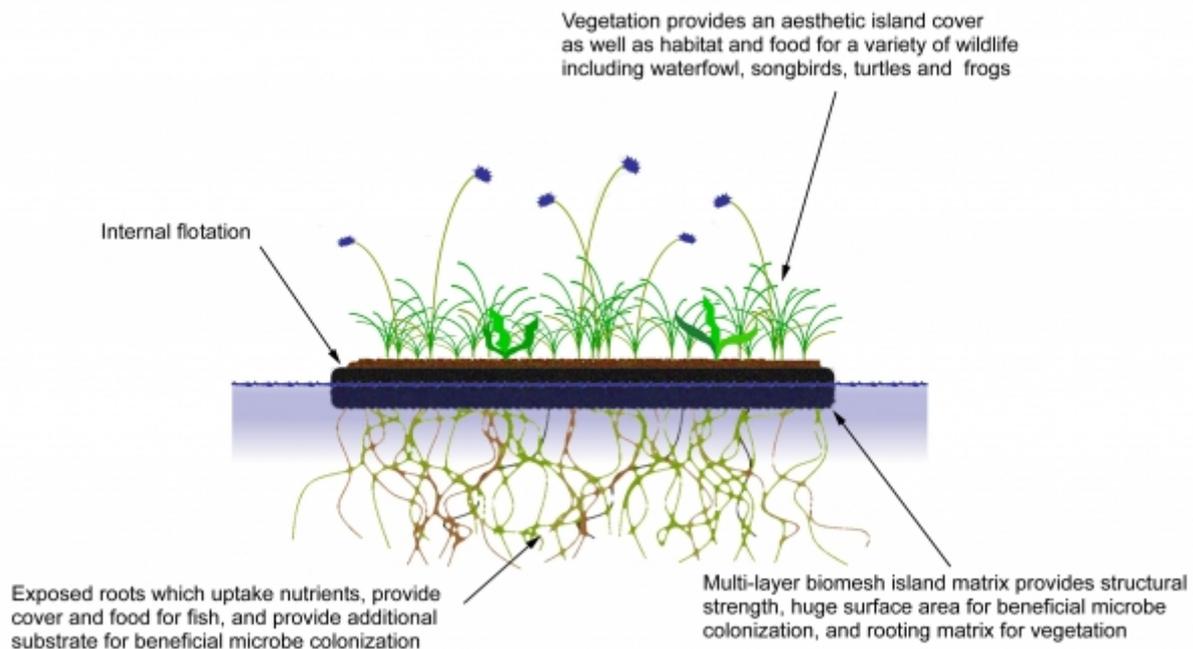
We distribute the Newsletter by email to those members who have given us their email addresses and who have not requested otherwise. If you would prefer to receive the Newsletter by mail, rather than electronically, please contact Bill Whitmore – phone 339 8356 or billpauline@ihug.co.nz

Gardens' News

Jeremy Hawker reports –

Water issues within the gardens are topical. The sustainability of plantings requiring excess amounts of water to keep them in optimum health points to possible changes in the management of collections. Australian Botanic Gardens are looking at their collections growing appropriate plants for the climate. These water issues were highlighted at the recent conference in Cromwell of the New Zealand Gardens Trust. Two different approaches to dealing with plants in an extreme temperature low rainfall area were described; on one hand, artificial water supplies through diversions or ground water to supply the garden and to grow plants that would not naturally survive; and on the other, only planting plants that can grow and survive in the climate. Increasingly water conservation issues will be a focus for the Gardens as we move to in-ground irrigation. We will also be reviewing the demand and usage to minimise waste, and looking at sustainable plantings as part of the collection and for education.

Another issue is the water quality both in Hagley Park and the Gardens. The lakes and ponds are often poor in water quality due for the most part to the high population of bird species that are resident on and around them. Efforts to improve water quality are being made and currently two floating islands are being trialed in the kiosk lake. Representing a concentrated wetland effect the islands require a smaller area than riparian plantings to achieve similar results. Microbial processes facilitated by plants and organic matter, allow as much water as possible to the beneficial activity of the wetland.



The Botanic Gardens will look at the effectiveness of this process and will, if beneficial, look at placing some of our collection within the lake environment; in the kiosk lake in line with the current management plan North American plantings, while in Victoria Lake New Zealand native plants will be grown.

(For more information on floating islands go to <http://www.floatingislandinternational.com>)

Ellerslie Flower Show

Gold & Supreme Awards at Ellerslie

Most of you will know by now that we received a Gold Award and the Supreme Award for Horticultural Excellence for our exhibit of carnivorous plants at the Ellerslie International Flower Show recently.

The three of us that put it together, David Moyle, Darren Tillett and myself, had agreed when planning it, that aiming for an award was not our objective. I think in retrospect that we might have been kidding ourselves, or protecting ourselves from dis-

appointment. I know that we were all overjoyed when we received the gold award - I was certainly on cloud nine. The Supreme Award for Horticulture that we received was beyond our wildest expectations, and it was pure chance that I happened to be at the award ceremony when it was announced that we had achieved this level of recognition.

conference in Borneo on *Nepenthes*. Since then Darren has given a number of talks on *Nepenthes* and other carnivorous plants. Darren's interest became the inspiration for our display at Ellerslie. Darren came up with the concept plan, and it did not alter very much throughout the development. The idea was to create an impression of a rain forest environment, in which many of the tropical species of carnivorous plants live.

The sphagnum moss that was packed around the plants helped create an authentic environment for these plants that survive in nutrient free material. One of the hiccups we had with the display was that



the fresh sphagnum moss we bought was not as green as we had expected, and it was not growing, so it did not provide the living environment that we had envisaged. Darren experimented with dyeing some of the moss, eventually getting a good enough colour for our needs. Did you notice? I don't think the judges did.

Our main objective in putting this display on at Ellerslie was to promote The Friends of the Christchurch Botanic Gardens and possibly attract a few members too. I think that there is little doubt that we achieved the goal of achieving a greater awareness; only time will tell us if we have attracted more members.

The backing material was originally going to be a screen printed landscape of a tropical rain forest, but it was decided that this would be too expensive. David suggested having a look at army surplus camouflage material, and that is what we used. It did the job perfectly at a fifth of the price. The material provided the impression that the plant material used had greater depth within a forest environment - at least that was the intention.

A few years ago, the Friends helped Darren Tillett, the propagator at the Botanic Gardens, to attend a

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The bamboo used to surround the two raised open sides was the most expensive part of the display, mainly due to freight costs, but it finished the display with an authentic tropical material. The bamboo off-cuts were made into discreet labels for the plants. Discreet labeling was one of the judges' criteria for both the gold and the supreme awards. I heard that there were a number of close contenders for the Supreme Award for Horticulture, and that it was the bamboo labeling that tipped it in our favour.

Most of the plants came from the Botanic Gardens. There were thirty eight species, hybrids and cultivars of carnivorous plants, and fourteen species of other plants used for background foliage. The Friends purchased three large *Sarracenias*, and a number of *Dionaea* (Venus fly traps) which have now been donated to the Gardens. The Venus fly traps were a favourite with children during the show, as they poked and prodded them to see their traps close.

We cannot thank Darren and other staff at the Botanic Gardens enough for their continuous support throughout this exercise. I know Darren worked on this project in his own time as well as at work. Thanks must go to all the members who gave up their time to hand out leaflets, and answer questions during the show. I know you enjoyed it, but it helped make it the success it was. Special thanks must also go to Water World in Blenheim Road for the loan of the water feature that provided a pleasant background and added to the wet environment we were looking for.

Charles Graham

Future developments

Those who have a particular interest in the Gardens have been frustrated in recent years by the slowness, if not seeming lack of action, in moving towards what are seen as urgently needed goals. It seems that after a long wait progress will soon become apparent on a number of fronts.

- It is now three and a half years since Dr David Given's untimely death and the process in appointing a new Curator for the Christchurch Botanic Gardens is proceeding. The position was advertised several weeks ago and from a healthy number of applicants a short list has been drawn up. The employment consultants are currently doing "due diligence" and an outcome is expected soon. It is hoped that we will have a new Curator before the end of this year.

- A design competition was staged for proposals for the new Visitors' Centre and several architectural firms made submissions. One concept has been selected and is due to be "signed off" by the City Council before the end of May following which it will be revealed to the public. The detail design is yet to be done and we expect there will be opportunities to make submissions once the plans are made public.

- Last year the Friends organized a workshop to bring up ideas for constructing a Gondwana Garden. The workshop was successful but further progress is on hold until such time as details of the new Visitors' Centre have been accepted by the Council and are made public.

The Friends are currently organizing another workshop – this time to gather ideas on how best to "tell the story of our indigenous flora" with particular attention to the native plant section. The format will be the similar to that of the Gondwana workshop - up to 20 of the top "experts and stakeholders" from around the country and locally will be brought together for a day of debate and brainstorming. Members will have opportunities to contribute at the 20 June Gardens walk and at the AGM in August.

Events in the Gardens

Saturday 2 May - end of October.

A photographic display in the Information Centre entitled "**Up close and personal - take a closer look...beauty is everywhere**". Many beautiful flowers are overlooked due to their size and form. Through the use of photography, those that view the display will be introduced to flowers they wouldn't normally notice.

Entry is free and available for viewing during opening hours: 9.00am - 4.00pm Mon - Fri and 10.15am - 4.00pm Sat - Sun.

Practical Demonstrations for Gardeners

The Friends of the Botanic Gardens in association with Gardens staff are this year providing a series of practical demonstrations for gardeners covering the four seasons. The first one held on 2 May dealt with the care of perennials and attracted a good crowd of approximately 40 people. The second demonstration, dealing with the pruning of roses, will take place on Saturday 4 July. See the Coming Events Programme for further details.

Articles

The Garden of Two Oceans

The Chinese friendship garden at the Ellerslie Flower Show was a great success in terms of its aims: friendship and a display of an Oriental style, and for that it received a Special Merit Award.

The purpose of the garden was to celebrate relationships between China and Christchurch, a translation of Chinese garden concepts into the South Island environment. It was designed by landscape architect Graham Densem, who has lived in both Hong Kong and Japan. The Garden of Two Oceans was named not only for the China and the Tasman Seas (connected by the Pacific) but also because it has the Yin/Yang meaning of complementary opposites: China, vast, ancient and continental; New Zealand, small, young and oceanic.

At Ellerslie, the Garden of Two Oceans was viewed either from the east or through its main Chinese gate on the south side. You had to imagine yourself in a pavilion "looking out" from enclosed to open, from dark (yin) to light (yang). The garden style referred to the Chinese traditional gardens originally created by Confucian scholar-officials. In China the owner was likely to have been Daoist or Buddhist, but the principles governing his behaviour were 100% Confucian. Each of these philosophies played a guiding role in the creation of the traditional garden in China.

Etched into the courtyard floor, concentric wave patterns connected China and New Zealand, including the yin/yang symbol for China and a stylised Southern Cross for New Zealand.

To the west, a precisely rectangular pond with glass frontage was set flush against a dragon wall. Exceptions to the Chinese norm had to be made with this water feature because site restrictions made a softly contoured pond impossible. One of my tasks, as plants person, was to source forty 5-7" goldfish and thirty water lilies to give them shelter. Both fish and plants were flown down from Auckland, and all had to be sold post-haste as soon as the show ended!

The walls of the garden we painted Chinese red, an imperial colour and a colour symbolic of good fortune and vibrancy.

The main N-S axis led from the gate across the courtyard and up several steps to a Moon Gate on the northern wall. Mounted in that perfect circle was the Flying Horse of Gansu, China's equivalent of Pegasus, representing long links between Christchurch and the province of Gansu in the northwest of China that Rewi Alley held so dear.

Plants have symbolic meaning in a Chinese garden, and they are used sparingly. We used 12-ft potted black bamboos (zhu) to create changing shadows on the walls as the sun tracked through the day. We also planted two trees common in New Zealand but originating in China, the Yulan magnolia (*M. denudata*) and the blood-red *Acer palmatum* whose homeland is the east coast of China as well as Japan.

In a Chinese garden, plants are always set against grainy rocks, symbolising the Chinese reverence and ancient belief in immortality of stone. We used mostly Chinese plants: black and green mondo grass (maidong), *Liriope muscari*, *Nandina domestica* (nan tianzhu) and chrysanthemum (juhua, symbol for autumn). Care was taken to leave the spaces so important in the yin/yang balance of the garden.

In the southwest corner we placed potted trees clipped penjing style by a local Chinese master: *Pinus radiata*, *Capuccina coprosma*, a silver fir. In Chinese, penjing means "landscape in a basin", what's known in Japan as bonsai. Miniaturising trees is believed to condense the "chi", or life-force, which is found in everyone and everywhere.

Behind a child-level window, a miniature rural Chinese scene was recreated as our homage to the small things that excited us as children. "From the smallest of dreams arise the grandest of plans." For us on the Chinese garden committee, this toy landscape represented our big dream of building this garden for Ellerslie and an even bigger dream to have our own permanent Chinese garden in Christchurch.

Diana Madgin and Bill Willmott are thinking of taking a last garden tour to China in May 2010 if there is sufficient interest. Contact <wew25@ext.canterbury.ac.nz> or phone 385-3559.

Diana Madgin

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Proteoid What?

Recently, someone asked me what I knew about proteoid roots. The resulting blank stare told her that I knew precisely nothing.

To start with, the protea family has about 80 genera and more than 2000 species, having evolved over some 95 million years.



Protea cynaroides

What better plant for us to begin with, than the magnificent king protea, *Protea cynaroides*, South Africa's national flower. Like most other proteas, it thrives in poor soils. In the wet season, fallen, decomposing leaf litter releases much-needed nutrients into the soil. This stimulates the proteoid roots, which look like fragments of cotton wool 2 to 5 cm thick forming a mat that may provide 80% of the total root mass of any one plant. This mat is the plant's survival kit. However, most of these roots shrivel and die at the end of the dry season having absorbed any life-saving water or nutrients that became available during those hard times.

It is these proteoid roots that can potentially be the plant's downfall in cultivation. Over-watering and the over zealous use of fertilizer may cause fatal, fungal infections, such as *Phytophthora*.

Members of the protea family are found in Australia, South Africa, South and Central America, India, East and South East Asia and Oceania. Only two members of the family survive in the New Zealand flora. They are *Knightia excelsa*, rewarewa and *Toronia toru*. This was not always the case. Coal de-

posits in the South Island contain abundant fossilised protea pollen. The protea family is one of the few among the flowering plants that has no symbiotic mycorrhizal fungi.

Some of the protea family that you will recognise are: *Banksia*; *Macadamia* with its edible nuts; *Guveina*, the Chilean Hazelnut, grown commercially in New Zealand; *Embothrium coccineum*, the Chilean Fire Tree; and the handsome *Telopea speciosissima* from Australia.

Neil O'Brien

Darwin Was a Gardener Too

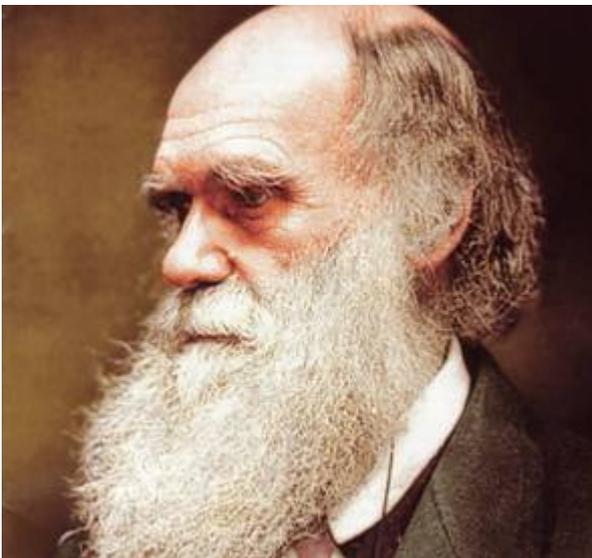
This year is the 200th anniversary of the birth of Charles Darwin and the 150th anniversary of the publication of "On the Origin of Species". How did Charles Darwin arrive at his famous explanation for the origin of species? Where did he get his evidence? What plants and animals did he think about? We know of course, about his famous voyage as a young man on the *Beagle* but we also know that he spent decades at his home, Down House, in Kent. Down House was surrounded by lawns, flower gardens and 18 acres of land. There was a field of 12 acres, part of which was converted into a kitchen garden, experimental plot and an area for glass-houses.

Darwin's publications show that he was very familiar, through observation and experiment, with the plants and animals that surrounded him at home and in the wider countryside. For instance, in the first chapter of "On the Origin of Species", entitled "Variation under Domestication", Darwin wrote about how farmers, gardeners, pigeon fanciers - anyone concerned to increase the value of plants and animals for economic and aesthetic reasons - seized upon inherited characteristics. Selective breeding from individuals with favourable characteristics, enhanced those characteristics in future generations, often to the extent that offspring looked quite different from their ancestors first selected.

"The pear, though cultivated in ancient times, appears, from Pliny's description, to have been a fruit of very inferior quality, But the gardeners of the classical period.....never thought what splendid fruit we should eat; though we owe our excellent fruit, in some small degree, to their having naturally chosen and preserved the best varieties they could anywhere find."

Darwin saw that the explanation or mechanism for the development of varieties could be applied to the development of new forms in the natural world i.e. for the origin and evolution of species. The second chapter of the book is called "Variation under Nature" and in the third and fourth chapters, "Struggle for Existence" and "Natural Selection" he set down and amplified the great binding principle, natural selection, which explains the origin of new species. Natural selection is the "preservation" of those heritable characteristics which enable the species to better adapt itself to the environment and thus increase its numbers.

Darwin used the phrase "natural selection" to distinguish it from the same phenomenon occurring under domestication. There is no essential difference between selection under domestication and in nature; it is just that in the former, humans purposely select certain characteristics and in the latter, the environment determines which characteristics are enhanced and maintained and which are not. Humans wish to, and sometimes do, achieve marked changes in a relatively small number of generations, although, as Darwin pointed out in the chapter "Struggle for Existence", with the unlimited time available to nature, the results of natural selection



may be even more vivid than those achieved under domestication.

Throughout his work, Darwin showed a familiarity with garden and field plants and used them to illustrate his theory. In "On the Origin of Species" he noted, for example, the variation in leaves of cabbages, the flowers of heartsease (*Viola tricolor*) and the fruits of gooseberries. He studied pollination in 233 cabbages of different varieties that he grew himself and in lobelia (*Lobelia fulgens*) in his gar-

den. He tackled the enormously important topic of co-evolution of flowers and insects by studying the floral structure, for instance, of red clover (*Trifolium pratense*). "Hive-bees" were seen to suck nectar easily out of incarnate clover (*Trifolium incarnatum*) but not out of red clover, plants of which were only visited by "humble-bees", the crucial point being the ability, or otherwise, of the insects' probosci to penetrate the flowers. Darwin went on to publish extensively on plants e.g. "On the Various Contrivances by Which British and Foreign Orchids are Fertilised by Insects" (1862), "Insectivorous Plants" (1875), "The Movements and Habits of Climbing Plants" (1875), "The Different Forms of Flowers on Plants of the Same Species" (1877). We can find an example of his attention to local plants in "Forms of Flowers", where he wrote about flowers of the cowslip (*Primula veris*) which he no doubt found in the local fields. He observed that cowslip plants existed as one of two forms. One form bore flowers with long pistils, the anthers only coming about halfway up the corolla. The other form had flowers with short pistils about half the length of the corolla with the stigma below the anthers. The pollen grains of the form with the long pistils were smaller than those with short pistils. (The village children made the best floral necklaces with the long-pistil form.) After detailed consideration of this difference, called heterostyly, Darwin concluded that for a cross between cowslip plants to be maximally fertile, the cross must occur between one form and the other. Heterostyly is an adaptation to ensure intercrossing of distinct plants.

Darwin's theory provided a context, a reference point, a general explanation for the huge variety of form and function observed in living things. As Theodore Dobzhansky, an American geneticist who helped establish the genetic basis of evolution put it in the title of an essay: "Nothing Makes Sense in Biology Except in the Light of Evolution" (1973). We may not know the exact reasons why a flower has coloured sepals or another has a corolla rather than separate petals, but we can say that the structures have developed in response to natural selection.

As gardeners in the 21st century we might feel a long way from the intellectual debates of the mid-nineteenth century and academic discussions on plant evolution, but Darwin was a gardener too. His observations on garden plants mean that gardeners can feel part of the tradition of observations on domesticated plants contributing to our understanding of the natural world. There is nothing to prevent gardeners from using natural selection as a basis for hypotheses as to why plants in their own gardens

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have particular structures and patterns of growth.

In a recent book (available in paperback, and from the Christchurch City Libraries), "Darwin's Island: The Galapagos in the Garden of England", Steve Jones (2009), shows in much greater detail than in this article, how Darwin used his observations of his gardens, greenhouses and fields to develop his theory of evolution. The libraries also hold an attractively illustrated edition of "On the Origin of Species" (2008, ed. David Quamen).

Darwin's publications have been reproduced on-line at <http://darwin-online.org.uk/>

Alan Hart

Vacancy - newsletter/document mail co-ordinator

Jean Norton, who has capably worked for some years in co-ordinating and arranging despatch of the Friends' quarterly Newsletters and any other documentation which needs to be mailed to members is unfortunately giving up the position. This will occur after mailing the Annual General Meeting notices early in August.

The work which is of importance to all members is not onerous, although it requires attention to detail. Any person willing to take over the position for the benefit of all members is invited to contact Jean (tel 383-9711). She will be happy to explain the requirements.

Look at that shrub – *Daphne bholua* or Himalayan daphne, paper daphne

Most of us who have an interest in gardening, even a slight interest, know and probably have a daphne bush. When we think of daphne we tend automatically to think of the common *Daphne odora*. It is hard not to think that way. When we go into garden centres in spring the *D. odora* bushes are grouped near the entrance giving off their strong, deliciously sweet fragrance enticing us to buy one.



Daphne bholua

But *D. odora* is not the only daphne available. In the Christchurch Botanic Gardens there are at least two specimens of *Daphne bholua*; one is in the fragrant garden and another near the sundial between the two halves of the herbaceous border.

D. bholua has the great benefit of flowering in winter, much earlier than the early spring flowering of *D. odora*. In fact both of the specimens in the Gardens were flowering profusely in early May.

D. bholua forms a taller more erect plant than *D. odora*; the specimens in the Gardens are well over 2 metres high. It has rather longer narrower leaves. The flowers are highly scented, mauve in colour opening white to reddish mauve. The species is somewhat variable and not surprisingly there are a number of named cultivars. Forms originating from the lower slopes of the Himalayas are evergreen whereas those from higher altitudes can be semi-evergreen.

The species is widely distributed in the eastern Himalayas where the unbreakable bark is stripped off to make paper pulp (hence paper daphne) and rope.

Bill Whitmore

Friends Group Events

Guiding Report:

Every day from 16 September 2008 to 17 May 2009 an intrepid Friend of the Botanic Garden was to be seen at the main entrance of the gardens at 1-30 pm ready and willing to guide anybody with \$5 to spare on an exploratory walk of that botanical and historical wonderland. In January and February a morning trip was added starting at 10 or 10-30am. By far the majority of clients are overseas visitors with a predominance of North Americans, mainly from the USA (35%), UK (24%) and Australia (14%). New Zealand clients made up 11% this season, a significant increase on last years 7% of the total. Often these clients are new New Zealanders or recent residents into Christchurch.

With this predominance of overseas clients it is not surprising therefore that the tours this year reflected the global economic downturn especially in the New Year when March in particular saw a massive 35% downturn in clients.

Total numbers this season are 495, which is a fall of 28% compared to last season. The most spectacular downturn however was associated with the morning tours. These were introduced in 2006-7 season in some respects to soak up the enthusiasm of a new intake of trained guides who were not getting enough opportunities to exercise their skills. In that season February in particular serviced an additional 82 clients in the morning, compared to 134 in the afternoon, with a total for the two months of 128 compared with 222 in the afternoon. This season the mornings proved a disaster area with only 41 clients in the two months of January and February. In addition the number of blank days when the morning guide would slink off with no-one rose from 20 in that first year to a massive 40 this season.

In comparison the afternoon tours showed less of an increase of blank days, rising from 72 last season to 92 this season.

However the economic down turn was not the only influence on the guiding this season especially in the new year. There was the added complication of the Caterpillar tours being introduced to the Gardens and the March downturn in particular might well have been influenced by the Ellerslie International Flower Show.

There is therefore much for the Botanic Gardens Guides to think about and resolve before the next season commences in September. Despite it all the Guides are in great spirits because after all just being in the gardens is a delight, clients or not, and every season will bring its ups and downs whether in the weather or the economy.

Bob Crowder

Future Activities

The Friends Committee are keen to know what future activities members would like to have and also to know what your preferences are. It is intended within the next few months to send out a questionnaire to all members so we can get a cross section of views and any ideas you may have regarding our future activities.

Plant propagation group – call for volunteers

The propagating teams of the Friends of the Botanic Gardens have vacancies for members who would like to be more directly involved with the plants of the Christchurch Botanic Gardens. The teams multiply plants and shrubs, pot and grow them and then sell them to the public to fund special projects for the Gardens. We sell all year on the "green trolley" outside the Information Centre and at three special sales days. If you have never taken cuttings, or divided mature plants, and would like to try these skills, this is your opportunity! We'll value your contribution.

Phone Helen Constable, 980-9358 or e-mail hrcon@paradise.net.nz

A message from Biddy Pollard

At the Christmas party last December, members signed a petition to the Council requesting reconsideration to purchase historic the Thorrington woodland to add to the adjacent Ernle Clark reserve. This petition with 1064 signatures helped to persuade the Council, and they have bought the woodland, lake and surrounding gardens. Thank you for all your signatures. This community effort has improved our environment by creating an elegant park for future generations.

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