

Newsletter

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

No 103, Autumn 2016

President's report

It's not always easy to be a "Friend" but sometimes you have to front up and tell it like it is. Dale Carnegie in *How to win Friends and Influence People* advises - "Do not criticise, condemn or complain if you want to bring others to your way of thinking." However our rules have as their first objective - "To promote, support and protect the Christchurch Botanic Gardens....."

So with that risk in mind, this is the situation. The Gardens staff and management have gone through another restructuring recently with the loss of several competent gardeners partially replaced with folk with different skills made redundant in other parts of the council. The management focus has been diluted in the Gardens by requiring some key officers, notably John Clemens (Conservation and Sustainability) and Lynda Burns (Communication and Interpretation) to have a city-wide function rather than just the Botanic Gardens. (Jeremy already had responsibilities beyond the Gardens.) This and other factors have required some of the previously hands-on staff to move to more management roles.

The results of this are starting to show in the less travelled parts of the Gardens. The remaining staff are doing a great job keeping up the standards in the more popular parts

When guiding a delightful English client in late December she commented "that's a Scotch thistle isn't it? I was hoping she hadn't noticed. It was indeed a Scotch thistle, almost my head height and towering a good three feet over the hebe bed in the Cockayne Garden. I phoned on the next working morning and it soon vanished. I did wonder however why it had not been noticed in the weeks it took to grow that big - in apparently the most popular hired wedding site.

But more insidious and more troublesome is the steady invasion of creeping oxalis and other nasties in the rock garden, and other areas, to add to the existing widespread onion weed problem. There's even a healthy start-up Californian thistle clump.

So where to go with this? Firstly we need to keep reminding the decision-makers that the Gardens is the flagship of the parks system and our 1.5 million visitors expect and deserve international standards. While promoting conservation and sustainability city-wide is laudable, it should start with the Gardens. For instance, the new Hebe collection, planted about three years ago, is stalled, half-done and still unlabelled. Hebe is our largest and most significant genus and deserves high priority as a conservation project and as a story worth telling.

Having got that off my chest, what can we do to help? In short - by volunteering. The urgent problem is weed control and by the time you read this some concerted efforts will be under way to raise a volunteer team. And as with all gardening once you're on top of the weeds the fun jobs can start. More details will follow.

Meanwhile the guides are having the best month since the earthquakes and the propagators are well stocked for some big sales coming up.

Check out the Coming Events - I look forward to seeing you there.

Alan Morgan

Garden News

From Curator John Clemens

Botanic gardens and biosecurity

Biosecurity and the management of invasive species is a top priority for a botanic garden with a long history of plant (and other) introductions.

A botanic garden: many "worlds" in one place

Botanic gardens cast in the traditional mould typically brought together plants from many continents, not just to delight members of the public, but to reflect civic pride and promote economic development. Christchurch Botanic Gardens were no exception. In the 1880s, the Botanic Gardens had a large "pie chart" arboretum with each slice dedicated to growing trees from a different continent (Fig. 1). Alas, this was most likely devastated by fire; no trace other than the occasional conifer remains today.

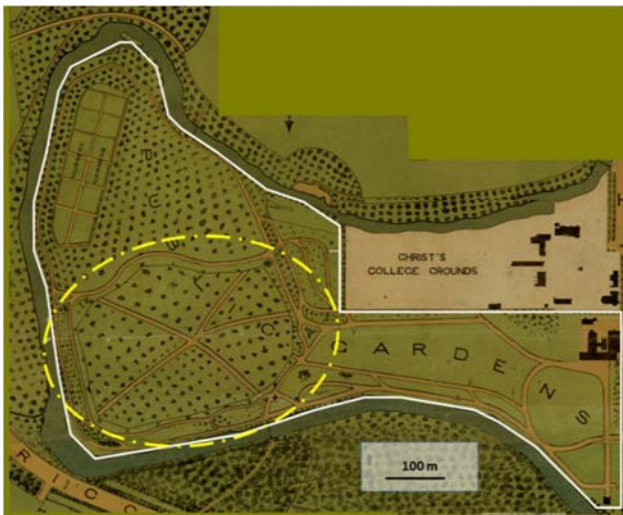


Figure 1. A plan of the 1887 arboretum (ringed) within the Botanic Gardens: a "pie chart" with each "slice" dedicated to trees of a different continent.

Like others, our Botanic Gardens have also been the centre for numerous unwanted introductions, including the unintentional importation of some plants that might have become invasive, and of plant pests and pathogens. These days the

Botanic Gardens work with other agencies to protect our native biodiversity and land-based industries, and to educate our visitors about conservation and care for the environment. Nonetheless, many of these introductions live on among us.

A 24-hour BioBlitz survey was undertaken in 2005 by a consortium of like-minded people who wanted to raise public awareness of our teeming biodiversity. Volunteers found around 1,200 different organisms living wild in our Botanic Gardens and Hagley Park, and over a third of these were introductions from overseas. The species list included 100 species of mites and insects, 300 bacteria, 100 algae, 23 freshwater invertebrates, almost 300 plant species, and 79 fungi. Although most of these are overlooked or unseen by the public, some of the fungi, such as the cep or penny bun (*Boletus edulis*), associated with introduced vegetation are favoured by local collectors.

Many fungi form beneficial associations with our plants, several species of which occur in the Botanic Gardens. Other fungi lead to the decline and death of the introduced trees. It is a wonder that the plants, local and imported, managed to survive in this strange mixture of the world's biodiversity. It is likely that many introduced plants did not establish successfully in past decades. Except for their names entered in our accession books, their absence today goes unnoticed.

Our biosecurity setting

Although this sounds like a quirky slice of cultural and biological history, the story is not finished. New Zealand's economy, enhanced by a growing tourism industry, is dependent on the passage of people, products and the materials needed for production across its borders. Although geographically isolated from other land masses by nearly 2,000 km of the South Pacific Ocean, movements of people and materials through its ports and airports pose a constant threat to the country's indigenous wildlife and

primary industries. Incursions of harmful pests and diseases can be costly. For example it cost \$25m to eradicate the Queensland fruit fly incursion in Auckland in 2015, and the imported bacterium of kiwifruit vines first detected in New Zealand in 2012 cost growers over \$200m annually at the height of the infection.

While uncontrolled importations are out of the question in a biosecurity-conscious world, the Botanic Gardens assist government agencies in any way they can to identify the spread of pests and diseases already present in New Zealand. We are also an excellent location for the detection of new, unintended incursions from other countries. Introduced plants in botanic gardens, arboreta, city streets and private gardens can provide unique opportunities for the early detection of pest and disease problems, and provide clues to their control. They also provide research opportunities and help us to educate the public about plant health challenges and good biosecurity practice.

Biosecurity surveillance

The New Zealand Ministry for Primary Industry (MPI) undertakes routine high risk sites surveillance (HRSS) of forestry and landscape plants throughout the country. The Botanic Gardens constitute one such high risk site. Surveillance determines which pests and diseases are already present, and if they are spreading. However, the main purpose of surveillance is to give early warning of new arrivals, to enable timely responses of incursions, and to increase the probability of successful eradication. There are several survey lines in the Christchurch Botanic Gardens that are regularly walked by specialist consultants employed on behalf of MPI.

The collections of introduced plants in the Botanic Gardens also contribute to the International Plant Sentinel Network. By studying the pests and diseases associated with these introduced plants, we can alert authorities in other countries where these plants originated of potential problems. New Zealand has already accumulated hundreds of plant-feeding invertebrates, mainly since the mid-1800s. Aphids are by far the most common plant-feeding group, with 110 recorded species.

The future

The Christchurch Botanic Gardens, like others around the world, offer amazing opportunities for helping members of the public to understand biosecurity issues in engaging ways in a natural, non-threatening classroom. Behind the scenes, staff and science and governmental collaborators take advantage of the rich biodiversity to receive early warning of incursions and to study plant-insect and other associations. These two realms, the public and the expert, are complementary, with the public making a significant contribution towards detecting new organisms. While invasive threats are real, and bear serious consequences, a future in which the public understands and is supportive of biosecurity measures is a bright one (Fig. 2).



Figure 2. A dangerous character: a most un-Wanted pest plant, boneseed (*Chrysanthemoides monilifera* ssp. *monilifera*), taking part in an educational programme on invasive plant eradication.

This article is a short version a paper written by Clemens and Brockerhoff to appear in the *BG Journal of Botanic Gardens Conservation International* during 2016.

Events in the Gardens

From Sue McManaway, Visitor Experience Officer, Parks Unit, Christchurch City Council.

Sunday Bandstand

Brass, silver and pipe band music at the Central Lawn in the Botanic Gardens. Every Sunday from 12.30pm, 7 February to 20 March.

Children's Discovery Trail

Leaves of Gold Discovery Trail. Suitable for ages 4-10 years. Pick up activity card from the Gardens Visitor Centre. 16 April to 1 May (School Holidays).

Autumn Garden Show incorporating the National Chrysanthemum Show.

The inaugural Autumn Garden show is being held in conjunction with the NZ Chrysanthemum show. Jointly presented by the Canterbury Horticultural Society and the Christchurch Botanic Gardens.

This will be a floral extravaganza that will appeal to gardeners and flower lovers young and old. To support the national event, a showcase of garden and plants people will create garden displays and workshops to inspire, educate and entertain show goers. Specialist horticultural clubs, circles and societies will create garden designs and displays in the garden galore marquee.

In the ilex function room at the Botanic Gardens. 30 April to 1 May.

Articles

Heritage Observatory

In the heart of the Christchurch Botanic Gardens there's a nondescript little wooden building known affectionately to the Gardens staff as "the Workshop". It's what remains of an historic magnetic observatory built in 1901 in anticipation of Commander Robert Falcon Scott's ground-breaking expedition to Antarctica.

Some years ago, Susan Molloy, Botanic Gardens' resources coordinator, was perusing old maps of the Gardens when she came across a sizeable cluster of buildings in an acre of what was known at the time as "the wilderness". A climatological recording station had been operating there since 1888 (and still does), but the proposal for a magnetic observatory came from England at the turn of the century. Since Captain Ross' 1850s expedition to Antarctica, the Royal Society and the Royal Geographical Society were keen to return with an expeditionary force of geologists, marine, bird and botanical scientists, despite the objections of the British Chancellor, who had been reported as saying that Ross' expedition had already

discovered all there was to know about the Antarctic.

Eventually the British government contributed substantially, and sufficient funds were raised for Scott's 1901 expedition. A magnetic observatory was imperative for Scott to calibrate his scientific instruments, and Christchurch seemed the ideal spot. "The Royal Society recognised the need for a magnetic observatory in this part of the world," says Susan Molloy. "There were fifty in the northern hemisphere but only four in the south—in Indonesia, Mauritius, at a small private observatory outside Melbourne, and in Argentina, which was considered unreliable." Coleridge-Farr, Surveyor General for New Zealand, designated the site in the west of the Christchurch Botanic Gardens, close to the heart of the city, a major port and the quarantine station on Quail Island.



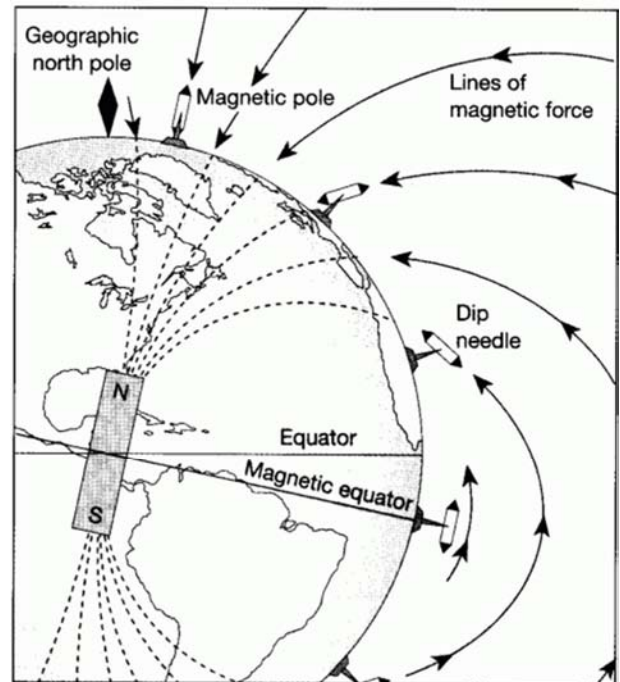
The Observatory office built in 1901



The grounds of the Magnetic Observatory 1915. The tents belong to an expedition from the Carnegie Institute, Washington on board the ship "Carnegie". They used the Observatory facilities for comparison and standardisation of magnitude instruments.

Magnetic poles move around, and the strength of the magnetic field varies from day to day. The magnetic North Pole was located in 1831, but the magnetic South Pole had yet to be calibrated. The magnetic Poles are located close to, but not exactly at, the geographic North and South Poles. At "Magnetograph House" in the Christchurch Botanic Gardens, Scott would have used a declination-inclination magnetometer and another magnetometer that measured the strength of the magnetic field. Declination is the difference between the direction a magnetic needle points and the direction to the true pole; inclination is the angle the needle inclines from the horizontal. Thus, a needle near the equator would remain horizontal because the magnetic lines of flux are running parallel to the earth's surface, while at the poles the needle would

incline 90 degrees, i.e. point vertical, since lines of flux are entering/exiting the earth at 90 degrees at that point (see diagram).



The earth's magnetic field causes a dip needle (compass oriented in a vertical plane) to align with the lines of magnetic force. The dip angle decreases uniformly from 90 degrees at the magnetic poles to 0 degrees at the magnetic equator. Consequently, the distance to the magnetic poles can be determined from the dip angle.

Scott was assisted by the expedition's physicist, Mr Louis Bernacchi, who had worked at the Melbourne observatory and was "a specialist in terrestrial magnetism and in pendulum observations, with a knowledge of surveying and astronomical work" (Weekly Press, 18 September 1901). Coleridge-Farr insisted that the public stay well away from the magnetograph, because it could be affected even by keys and hobnail boots.

Because of the Boer War in South Africa, some instruments did not arrive from England until 1902. In order to be ready for Scott, a seismograph was borrowed from the Canterbury Museum; other instruments were borrowed from the Royal Society's Observatory at Kew until instruments could be purchased. The seismograph was so sensitive it could record a cantering horse at fifty yards, and that was a problem with so much horse traffic on Riccarton Avenue only a short distance away.

The Lands and Survey Department ran the observatory from 1901 until 1926, when it became part of the Department of Scientific and Industrial Research (DSIR) until its closure in 1969. Instruments were housed in three buildings hidden behind high hedges, and more than a dozen scientists and technicians worked on the site. Initially the land was leased to Lands and Survey by the Domains Board. In 1969, when all the buildings were demolished barring the Workshop, the land was returned to the Botanic Gardens, which by that time was governed by the Christchurch City Council.

The site has no official heritage protection, but the DSIR requested that the City Council preserve four features: the gravity base, two bench marks, and the site where Scott took his measurements.

The gravity base, part of the New Zealand Gravity Base Network is in the floor of the Workshop. It has a registration number and is still operational. Under a concrete slab outside the present building is the original bench mark installed by the Lands and Survey Department. A second bench mark is in the adjacent climatological station. The precise spot where Scott took his measurements is not known, but Susan and former Gardens Curator Lawrie Metcalf know its approximate site.



The last 1950s Magnetic Observatory and Geophysics staff.

Susan plans to use the remaining observatory building for her growing collection of memorabilia. Funds permitting, she envisages information panels, beginning with Captain Cook, who took the first New Zealand magnetic readings at Dusky Sound in 1773. Some delightfully surprising donations have been

made already. American women at McMurdo Base made a quilt and auctioned it to the 200 staff at their base. "They love to visit the Botanic Gardens when they come out from wintering over, and they wondered if the money could be used for a special Gardens project." says Susan. Another group from McMurdo put together a fun "naked calendar" and sent the proceeds for the project. "Don't think of this as dirty money!" they wrote.

New Zealand's leading magnetic observatories today are Eyrewell in Canterbury and Scott Base in Antarctica. But Susan hates to see history forgotten. "We need something significant to show that seventy years of magnetic and geophysical sciences were carried out here." She envisages tours of school children, interested public, and scientists enjoying the Workshop and strolling the Observatory Lawn.

Photographs and captions provided by Susan Molloy

Diana Madgin

Nedra Johnson writes about the nikau palm

I suppose if I was asked to name my favourite tree the nikau *Rhopalostylis sapida* would be near the top – and I have one in my garden with two flowers. While it has flowered previously this time I have been able to watch the whole performance from my bathroom window. It has been fascinating.



Nikau flower

The first one flower had two layers of protection (spathes) for the tightly closed flower, so neatly

packed away. The top layer came off some months ago but the second one has taken its time and is still hanging on though the flower cluster is nearly completely exposed. Some of the numerous buds are fully out with many more to come. Each tiny flower is a pinkish colour with prominent white stamens that give a rather light, almost fluffy appearance. The flowers don't last long and I noticed quite a few flies and ants so perhaps this is the way each little flower is fertilised. The stems of this inflorescence are a distinct green.

I have watched the second flower forming as a swelling under the palm frond for some months. It only emerged when the frond fell off. This is a much bigger inflorescence than the earlier one and its stems were a creamy white, now changing to pale green. It only had one layer of protection that I could see.

Unfortunately I didn't look closely enough at the flowers when they first came out and I didn't read about nikau until it was too late to see the male and female flowers. But I have done so now in *The Native Trees of New Zealand* by J T Salmon, 1980. "Flowers are in groups of three along the inflorescence branches. Each group comprises a small female flower sitting between two males." So I am annoyed to miss the opportunity to see this myself, though the actual flowers change very quickly into a berry form.

I am hoping to see the berries colour up in time but now they are still green. Perhaps I will follow this up at a later date.

Advice regarding hand pollination of plants

Home gardeners are sometimes advised not to leave pollination of some plants to nature. Adrienne Moore has passed on advice on this subject from *RHS The Garden* of November 1981.

Once again a contributor ("Growing fruit trees in pots", April 1981) recommends recourse to a

camel hair brush or a rabbit appendage as an aid to hand pollination. But for many gardeners the tail of a well-fed cat is likely to be the more readily available and effective improvisation for use, for example, with only one peach tree.

Tuck the well-fed cat under the right arm, facing behind you and with the right hand apply the tip of the tail where needed,

I have use the method often enough over the years, although I agree that there must be some "accord" between the parties to the contrivance."

Art in the Gardens: Cherubs

A marble statuette of six cherubs, or putti, is located in the Townend House. The photo shows the cherubs, two female and four male, enjoying themselves playing music and drinking surrounded by the, then current, display featuring poinsettias.

I was unable to find out the identity of the sculptor or how it came into the Gardens' possession. Can anyone provide further information?

Bill Whitmore



Cherubs in the Townend House

Contact Numbers

Committee

President	Alan Morgan	384 9976
Treasurer	Tracy Shui	021 172 8515
Secretary	Roy Sinclair	337 6926
Membership	Penny Martin	332 6866
Plant Propagation	Don Bell	343 6699
Other Committee Members	Earl Bennett	352 9027
	Jeanette Christiansen	355 5007
	Charles Etherington	355 2571
	Sandi MacRae	379 4770
Ex Officio, Curator	John Clemens	941 7589

Other Contacts

Newsletter Editor	Bill Whitmore	339 8356
Newsletter formatting	Maria Adamski	
Guides Co-ordinator	Faye Fleming	351 7798
Group guided walks:	Pat Whitman	384 3475

Enquiries about membership should be made to Penny Martin 332-6866 Graememartin1@xtra.co.nz

Gardens enquiries Information Centre 941-6840 x 7590

Friends' website

Have you visited the Friends' website? The address is <http://www.friendschchbotanicgardens.org.nz/>

Distribution of Newsletter

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 Penny Martin – phone 332 6866 or email graememartin1@xtra.co.nz

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

Website - <http://www.friendschchbotanicgardens.org.nz/>