

The Magazine of the Friends of Pukekura Park

Volume 3, Number 2
June 2008



Kohekohe a spectacular New Zealand tree

Dysoxylum spectabile – Kohekohe Photos Derek Hughes

This Magazine is made possible through the generous support of the George Mason Charitable Trust

The first trees planted in Pukekura Park

David Medway

The first trees were planted in the Recreation Grounds (later Pukekura Park) on 29 May 1876. A ceremony to mark the event was held in the presence of a large number of local citizens who had gathered on the hill later named Cannon Hill. In the course of this ceremony, Jane Carrington, a daughter of F.A. Carrington, Superintendent of the province of Taranaki, planted a “British” Oak (*Quercus robur*) representing Great Britain on (presumably) the east side of the hill, a Puriri (*Vitex lucens*) representing New Zealand on the north side of the hill, a Norfolk Island Pine (*Araucaria heterophylla*) representing the South Pacific islands on the west side of the hill, and a Pinus insignis (Radiata Pine *Pinus radiata*) representing America on the south side of the hill. Those present were invited to plant trees at the conclusion of the formal ceremony. Accordingly, “the place assumed quite an active appearance and all along the walk might be seen persons in groups busy at work planting different kinds of trees”. As a result, the area presented “quite a garden-like appearance from the number of shrubs and flowering plants brought to the grounds and set by visitors” (*Taranaki Herald* 31/5/1876).

R.C. Hughes (“Father of the Park”), his sister, and his mother were among those who planted trees on that occasion (*The Budget and Taranaki Weekly Herald* 15/6/1929; *Taranaki Herald* 17/10/1929). Amazingly, R. C. Hughes was also present 53 years later, on 17 October 1929, when control of Pukekura Park was formally handed over to the New Plymouth Borough Council. Those present on that occasion walked around the lower lake (Fountain Lake) inspecting en route “a group of historic trees planted on the occasion of the formal opening of the park on May 29, 1876. One of the trees is an English yew - today it is little more than a stump - planted by Mrs T. K. Skinner. The second is a puriri planted by Mr. R. C. Hughes, and the third a rimu planted by Mrs. M. A. Hughes. Next comes a Norfolk Island pine planted by Mrs Thos. Colson, and then a pinus insignis planted by Miss Jane Carrington Last of all is a pinus radiata, planted by some person unknown, which is said to be the finest specimen of its kind in the North Island. These trees are all situated to the west of Cannon Hill, near the upper end of the lower lake” (*Taranaki Herald* 17/10/1929). As far as I am aware, R. C. Hughes was the only person present on this occasion who had also been present on the opening day of the Park in 1876. It seems that the information about who had planted the individual trees in this “group of historic trees” half a century earlier must have been provided by him.

People continued taking suitable plants to the Park in the days immediately after the formal opening on 29 May 1876. These were planted either by themselves in places pointed out to them, or by the gardener employed to get the grounds ready for those contributions (*Taranaki Herald* 31/5/1876). By only a fortnight later, “about four hundred young trees and flowering shrubs” had been planted in the Park since the opening day, and additions were being made daily (*The Budget* 13/6/1876). At its meeting in July 1876, the Recreation Grounds Board thanked “the nurserymen and ladies and gentlemen for their extremely liberal contributions of shrubs and plants” (*Taranaki Herald* 12/7/1876).

Fifty years later, the Superintendent of the Park, Thomas Horton, informed the Pukekura Park Board at its meeting in August 1926 that he thought he had located the “four special trees” which were the first planted in the Park. The Board authorised him to prepare tablets giving full particulars for attachment to each tree (*The Budget and Taranaki Weekly Herald* 21/8/1926). This may not have been done at the time because, in June 1929, the committee set up to arrange the ceremony of officially handing the Park over to the Borough Council proposed to have certain historic trees in the Park marked for the occasion with boards giving their history (*The Budget and Taranaki Weekly Herald* 15/6/1929). I do not know if this was done, nor am I aware that any such boards exist. Today, 132 years after the opening ceremony, it may not be possible to determine which, if any, of the many trees planted on that occasion still survive.

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The importance of introduced plants as a winter source of nectar for Tui in Pukekura Park and Brooklands

David Medway

It was stated in the souvenir programme produced for the official opening of Brooklands on 10 March 1934 that “One of the responsibilities that is appreciated by the Pukekura Park Board is the necessity for increasing the natural food supply of the native birds, and to this end the policy of planting honey and berry bearing trees is to be steadily continued” (Puke Arika ARC 2003-859, Box 2, MS 1695). The anonymous author of an “Out in the Park” article which appeared in the *Daily News* at New Plymouth on 27 June 1974 wrote that native birds are “an integral part of the Pukekura Park scene and many ornamental plantings have been made with the specific objective of providing more food for them”. More recently, Ian McDowell, Superintendent of Pukekura Park at the time he wrote, was able to record that the introduced “single flowered camellias, tree lucerne, Australian banksias, acacias and winter flowering eucalypts, aloes, kniphofias (or red hot poker) and the Taiwan cherry *Prunus campanulata* were specifically planted throughout the park as they all have flowers bearing nectar accessible to birds with brush-tipped tongues” (*Daily News* 12/8/1995).



Photo David Medway

Tui feeding at flowers of *Aloe arborescens*.
Brooklands, June 2002.

Some Tui (*Prosthemadera novaeseelandiae*) appear to be resident in Pukekura Park and Brooklands (“the Park”), and several pairs nest there each year. Their number increases significantly from about April as birds arrive from elsewhere in search of floral nectar sources to sustain themselves during the cooler months of the year. Tui are common in the Park from then until about October when most leave the area with the end of Kowhai (*Sophora microphylla*) flowering.



Photo David Medway

Tui feeding at flowers of *Camellia japonica* ‘Emperor of Russia’. Brooklands, July 2005.

Tui seem to have adapted well to the loss of most of New Zealand’s prime lowland native forest that was probably their principal habitat in former times. However, it appears that Tui in many parts of mainland New Zealand now rely on the floral nectar of a variety of introduced plants to help meet their energy needs, particularly in the cooler months of the year when those needs are greatest.

I spent about 204 hours on 96 days in June-August 2003 and in June-August 2004 in the Park. During this time I saw Tui feeding 1247 times on nectar of the flowers of various plants, both native and introduced (see Tables 1 and 2). A very significant number of these, 1117 times or 90%, were observations of Tui feeding from flowers of introduced plants. The introduced plants visited most for nectar were camellias (*Camellia* spp: Theaceae family), to which there were 637 observed feeding visits involving 33 species and identified cultivars, and the Formosan Cherry (*Prunus campanulata*), to which there were 339 observed feeding visits.

Table 1. Number of observations of Tui feeding at flowers other than camellias in June-August 2003 and in June-August 2004 (The plants marked * are native New Zealand plants).

<i>Alberta magna</i>	2	<i>Prunus campanulata</i>	339
<i>Aloe arborescens</i>	10	<i>Prunus</i> 'Accolade'	11
<i>Aloe ferox</i>	2	<i>Prunus</i> 'Fuku Bana'	5
<i>Aloe petricola</i>	1	<i>Prunus</i> 'Okame'	10
<i>Backhousia citriodora</i>	3	<i>Rhododendron arboreum</i>	8
<i>Banksia integrifolia</i>	7	<i>Rhododendron delavayi</i>	10
<i>Chiranthodendron pentadactylon</i>	16	<i>Rhododendron</i> 'Kermesinum'	16
<i>Corylopsis spicata</i>	13	<i>Rhododendron</i> 'Pink Delight'	1
* <i>Dysoxylum spectabile</i>	93	<i>Rhododendron</i> 'Rubrum'	14
<i>Edgeworthia gardneri</i>	3	* <i>Sophora microphylla</i>	21
* <i>Metrosideros fulgens</i>	5	* <i>Vitex lucens</i>	7
* <i>Pittosporum umbellatum</i>	4		
Total feeding observations: 601			

The value of camellias as a source of floral nectar for some New Zealand birds has long been recognised, but their importance in that regard has been little studied and remains unrecorded in the scientific literature. As early as 1924, W. W. Smith, who was Curator of Pukekura Park from 1908-1920, wrote that every winter and early spring the Tui was to be seen in New Plymouth "sucking the honey from kowhai, eucalyptus and single camellias" (*Taranaki Herald* 29/12/1924). Duncan & Davies Ltd, Nurserymen of New Plymouth, whose principal V.C. (later Sir Victor) Davies became a member of the Pukekura Park Board in 1932, recognized the value of single flowered camellias as a source of nectar for birds. For example, in their 1939 *Catalogue of Choice Nursery Stock* they included single flowered camellias in a list of native and introduced plants sold by them which produced berries or honey for attracting birds. In an article about Arbor Day which appeared in the *Taranaki Herald* of 4 August 1942 it was stated that "A popular introduced shrub, the single flowered camellia, provides a great store for honey-eating birds during the winter".



Photo David Medway

Camellia japonica 'Emperor of Russia'.
Brooklands, July 2004

Jack Goodwin, when he became Curator of the Park in 1949, was impressed by the way in which camellias in the Park had held their own, and he found seedling camellias growing freely everywhere. Goodwin observed



Tui feeding at flowers of *Prunus campanulata*.
Brooklands, August 2003.

that camellia flowers, especially the single pinks and reds, were “beloved” by Tuks and Bellbirds (*Anthornis melanura*) (*New Zealand Camellia Bulletin* 2(4) (1961): 5-8). Subsequent anonymous authors of “Out in the Park” articles in the *Daily News* also attested to the importance of camellias as a source of floral nectar in the Park. For example - “Most varieties of camellia are coming into flower now much to the delight of the tuks and the waxeyes which fly from flower to flower gathering the nectar. Camellias are an important source of food at this time of the year for these birds” (*Daily News* 2/7/1965); “Camellias are featured prominently throughout Pukekura Park. The single flowered varieties are particularly sought after by native birds especially the tuks” (*Daily News* 15/8/1969); “Camellias are prominent subjects throughout Pukekura Park and create a real attraction for native birds including the occasional bellbird, numerous tuks and of course waxeyes. These birds can be seen on the single flowered varieties foraging for nectar” (*Daily News* 12/6/1970); “Camellias are plentiful and are a constant source of nourishment to the native birds” (*Daily News* 30/7/1971); and “The camellia species are particularly important in providing the nectar-feeding birds with food during the winter months, and in bush settings like Pukekura Park the tui will often be seen at close quarters feeding on these flowers” (*Daily News* 16/8/1979).

Camellias of many sorts and ages are numerous in the Park. Of particular importance among them as sources of floral nectar for Tui during my study, as will be seen from Table 2, were the old, large *C. japonica* ‘Emperor of Russia’ growing on the main lawn at Brooklands, and the plants of *C. tsaii*, *C. hybrid* ‘Margaret Waterhouse’, *C. hybrid* ‘Clarrie Fawcett’, *C. hybrid* ‘Citation’, and *C. reticulata* ‘Shot Silk’ which are in the Camellia Collection on Racecourse Walk in Pukekura Park.



Tui feeding at flowers of *Rhododendron arboreum delavayi*.
Rhododendron Dell, July 2002.

Many of the “unnamed/unidentified cultivars” mentioned in Table 2 are single or semi-double flowered *C. japonica* or *C. saluenensis* seedlings that are unnamed. Several of the camellia cultivars at which I saw Tui feeding during my study have names that have not been registered. For example, ‘Tui’s Tucker’ and ‘Tui’s Mate’ are unregistered names given by George Fuller, Curator of the Park from 1965-1990, to two large, single-flowered *C. japonica* seedlings growing near the Shortland Street entrance to the Park. I have included my observations of Tui feeding at the flowers of *Gordonia chrysandra*. Although this plant is not a camellia, it has camellia-like single flowers and is also a member of the Theaceae family.

Table 2. Number of observations of Tui feeding at camellia flowers in June–August 2003 and in June–August 2004.

<i>C. japonica</i> 'Emperor of Russia'	93	<i>C. reticulata</i> 'Ross Clark'	5
<i>C. tsaii</i>	50	<i>C. reticulata</i> 'Howard Asper'	5
<i>C. hybrid</i> 'Margaret Waterhouse'	48	<i>C. fraterna</i> 'Pink'	5
<i>C. hybrid</i> 'Clarrie Fawcett'	40	<i>C. hybrid</i> 'Pink WDC'	4
<i>C. hybrid</i> 'Citation'	39	<i>C. japonica</i> 'Kon-wabisuke'	4
<i>C. reticulata</i> 'Shot Silk'	36	<i>C. hybrid</i> 'Fairy Blush'	4
<i>C. japonica</i> 'Tui's Mate'	21	<i>C. reticulata</i> 'William Hertrich'	3
<i>C. transnokoensis</i>	17	<i>C. cuspidata</i>	2
<i>C. japonica</i> 'Tui's Tucker'	17	<i>C. reticulata</i> 'Inspiration'	2
<i>C. hybrid</i> 'Dr Lesley'	16	<i>C. reticulata</i> 'Crimson Robe'	2
<i>C. reticulata</i> 'Confucius'	13	<i>C. wabisuke</i> 'Tarokaja'	2
<i>C. hybrid</i> 'Kunming x Parker'	12	<i>C. japonica</i> 'R.L.Wheeler'	2
<i>C. hybrid</i> 'Cornish Snow'	11	<i>C. hybrid</i> 'Donation'	1
<i>C. rosiflora</i>	9	<i>C. hybrid</i> 'Wirlinga Belle'	1
<i>C. reticulata</i> 'Willow Wand'	6	<i>C. hybrid</i> 'Gay Buttons'	1
<i>C. chekiangoleosa</i>	5	<i>C. tsaii</i> x <i>fraterna</i>	1
<i>C. reticulata</i> 'Cornelian'	5	<i>Gordonia chrysandra</i>	9
<i>C. unnamed/unidentified cultivars</i>	155		
Total feeding observations:	646		

The anonymous author of an "Out in the Park" article in the *Daily News* of 6 September 1979 considered that Tui are attracted to the Park by a continuing food supply through the winter. My study indicates that many of the camellias and the Formosan Cherries growing in the Park are of prime importance as sources of floral nectar for Tui during that time of year. The availability of suitable native and, especially, introduced nectar resources is almost certainly the main reason why so many Tui are attracted to the Park, and reside there throughout the cooler months. The continued provision of those resources in adequate number and variety will help ensure that the Park remains an outstanding year-round habitat for Tui.

From Friends

First Impressions

John and Susan O'Sullivan

When we first visited Pukekura Park we stood with our backs to the band rotunda astonished at this colosseum of natural beauty. Before us the amphitheatre of the lake and rising beyond and around, tier upon tier of green. Walls not just of green but of every conceivable shade. This kaleidoscope of green was further enhanced by a mosaic of textures from glossy broad leaves to the delicate tracery of ferns. At the centre of this vista was "Poets Bridge" picked out in red. We found ourselves recalling that Constable, the English landscape painter of the late 18th early 19th century used this technique of a small point of red in his paintings to draw the eye back towards the middle of his landscape paintings. This was a park that needed our full attention and rather different from those we were familiar with in England.

Now we have moved to New Plymouth from Widnes in the North West of England. We have joined The Friends of Pukekura Park and are constantly having our horticultural knowledge challenged. We come from a nation whose history is built on the mighty oak tree. For centuries it sourced our navy and our houses. On a walk through

Recent walks in Pukekura Park

Elise Smith



Photo Elise Smith

Group with George Fuller beneath the Moreton Bay Fig

This year the Ramblers have been to some rarely-visited parts of the Park. Often the paths traversed are only minutes from main-road entrances, yet once you are deep among the trees, you are barely aware of the surrounding city. On one of these rambles we went along Racecourse Walk from the TSB Stadium entrance and followed the escarpment down into Primula Dell and to the Fernery. The large female Kahikatea (*Dacrycarpus dacrydioides*) tree in the Dell was fruiting, attracting the Park birds, and the song of the Tui rang out.



Photo Elise Smith

David Medway and George Fuller at the WWII slit trench

We had two fascinating guided walks. In April, with George Fuller, we visited the site of the original tennis and croquet grounds next to Victoria Road, and then looped down to the Main Lake, past the Moreton Bay Fig (*Ficus macrophylla*) to the playground area and back up to Victoria Road via the Japanese garden. In May, David Medway took us to the Coronation Avenue end of the Park, along the George Fuller Walk, and into the bush below Highlands Intermediate School. Some of the Kohekohe (*Dysoxylum spectabile*) trees were in flower, and the fluffy Pukatea (*Laurelia novae-zelandiae*) seeds wafted past on the breeze. We walked the newly graded track through part of Maranui Gully, which will assist access for staff engaged in weed control operations, admired the vigorous natural re-vegetation, and made our way back past the Pukekura Park tennis courts.

the park we are told that the oak trees here are something of a liability as they grow too quickly, outgrowing their strength and that branches can fall off. For years we nurtured an *Agapanthus* plant. It spent winters under fleecy in a sheltered greenhouse and was brought out into the open only when the weather was equable. After five years we triumphed and it bore two blooms. Now, as we join the “Friends” on Thursday morning working bees we are asked to destroy them as here they are treated as a weed. We read an article in one of your horticultural magazines naming the most pernicious weeds in the North Island. Half of them we nurtured in our Widnes garden and were very satisfied if they managed to thrive. Your climate and soil makes for such ideal growing conditions that we now worry if we leave the garden fork imbedded in the soil for more than a few minutes!

Thursday morning work parties and the guided walks, both organised by the “Friends,” are occasions we look forward to. We learn so much about the flora and fauna in the company of nice people, many whom we can now call our friends. On one point of planting, however, we will not be swayed - we still like *Agapanthus*.

Winter displays

Donna Christiansen
Technical Officer Fernery and Display Houses



Photo Derek Hughes

Haemanthus coccineus

After a dry and hot summer the weather is cooling down and we are preparing for winter displays. The winter annuals Ornamental Kale, Cinerarias, Polyanthus, Cyclamen and Primulas are growing quickly and will be ready to display in the next few months. Our winter/spring bulbs *Lachenalia*, Tulips, *Veltheimia* are also growing rapidly. On display at present is the wonderful *Haemanthus coccineus*, a bulb native to South Africa. It produces red umbel flowers in early autumn. When the flowers have finished a pair of very wide leaves appear which lay flat on the ground making it a great foliage plant.

Our Orchid collection will continue to make a show over the winter months with Cymbidiums flowering in House 2. In the Kibby House the *Miltonia*, *Zygopetalum*, *Paphiopedilum*, *Angraecum*, and *Calanthe*, to name a few, will be on display. Winter is a great time to visit the Fernery as there is always so much to see, and it is dry and warm.



Photos Derek Hughes

The growing areas of the Fernery are unseen by most visitors, but they are very important areas for us in which to grow plants for display in the public areas. The Arboriculture team has been in and limbed up and cut back trees around the boundary fences of the Fernery compound. This has allowed a lot more sunlight into areas which had become very dark and shaded. Bruce and Diana Andrews donated a number of wooden benches they no longer required. Those benches have now been rebuilt and are in full use in our covered growing areas. Our biggest project is the renewal of the roofing material on the Cymbidium House. The old roofing material has deteriorated to the extent that light levels are too low for our plants to grow and flower to their full potential.

Steve Curtis joined our team in February. Steve has a Diploma in Horticulture. He is originally from Bristol in England and has been living in New Zealand for 10 years. For the last 8 years he worked at Westown Horticulture, a local wholesale nursery.

Kohekohe - a spectacular New Zealand tree



Photo David Medway



Photo Derek Hughes

Autumn and the Zoo

Chris Connolly
Curator Pukekura Park

By mid-May, autumn had well and truly arrived following a long, warm and sunny summer. Cooler nights and clear sunny days produced fabulous autumn colour in the Park. In particular, the Dawn Redwoods (*Metasequoia glyptostroboides*) growing along the southern side of the Lily Pond at Brooklands Bowl, and the large specimen near the Tea House, were a sight to behold when the late afternoon sun was still catching their foliage.

Primula Dell near the Fernery has recently received a make-over, and the plantings there have been re-arranged with the addition of a number of *Primula* species. We are anticipating that this delightful area of the Park will be worth a special visit in the spring.

While we have been busy in the Park, the Zoo team at Brooklands have also had their hands full. They have been working hard to improve the quality of the displays and the environment the birds and animals live in, plus making arrangements for some animal changes. The exciting news from the Zoo is that in the next few months there will be changes made to two of the groups of exotic animals we have.

As part of an Australasian-wide initiative to ensure the genetic pool of Capuchin monkeys remains healthy, the females from our troop will be sent to Hamilton Zoo and some to Melbourne Zoo in Australia, and in return we will receive females from Hamilton Zoo. The other change is with the small-clawed Asian otter. Our old male named Paddles will join a similar aged otter at the Franklin Zoo, and we will receive a young male named Bud from Underwater World in Mooloolaba, Australia.

There are very strict procedures to follow and quarantine requirements which must be met when exotic animals are being moved around. We are currently working through these compliance requirements with the other zoos involved in these exchanges.

From the Website

Kohekohe - a spectacular New Zealand tree

David Medway

The genus *Dysoxylum* (Family Meliaceae) contains about 150 species of mainly tropical and subtropical trees. The only New Zealand member of the genus, the Kohekohe (*Dysoxylum spectabile*), is endemic.

The Kohekohe is one of New Zealand's most spectacular trees. It used to form extensive tracts of coastal and lowland forest from North Cape south to Nelson, but these have now mostly disappeared in the face of settlement. In some areas, many trees have also been destroyed as a result of browsing by the introduced Brushtail Possum (*Trichosurus vulpecula*). Fortunately, remnants of the former Kohekohe forests still survive. One such remnant is in the native forest area of Brooklands Park where healthy Kohekohe are the most common and conspicuous canopy tree.

The Kohekohe has long, drooping panicles of greenish-white, waxy flowers which sprout from the trunk and branches during late autumn - early winter. The three to four-celled fruit capsules open about 15 months later to reveal fleshy, scarlet arils which each contain two seeds. Kohekohe flowers are an important and favoured source of floral nectar for Tui (*Prosthemadera novaeseelandiae*) and Bellbirds (*Anthornis melanura*). At Brooklands Park, on 16 May 2002, I watched a North Island Kaka (*Nestor meridionalis septentrionalis*), a rare visitor to New Plymouth, breaking open several green Kohekohe fruit capsules and extracting and eating their arils.

Photos-left-show unique flowering style and flower close-up.

Springs eternal are needed for Pukekura Park

Elise Smith

Pukekura Park has the feel of a rainforest, with the lush vegetation and an element of untamed nature. Indeed, the plants here expect to benefit from 1.5m of rainfall a year, water which is also vital to the continuing flow of the winding streams and lakes. The character of the waterways changes dramatically depending upon the recent rainfall, or lack of it. One of the reasons for forming the Friends of Pukekura Park in 1996 was that the state of the lakes had become a public concern.

The Pukekura Park lakes were created at the end of the 19th century in the main valley, with dams forming the Bowl of Brooklands lakes, two lakes near the Fernery, the Main Lake and the Fountain Lake. The Park is surrounded by urban development, with a high percentage of impermeable surface area (roofs and tarmac), which necessitates the efficient removal of storm water. The size of culverts and water channels in the Park has been increased in recent years to accommodate the ever-increasing flow of water from the storm water system.

The lake system is fed by three streams, two of which rise from permanent springs in the dense bush at the southern end of the Park. The continuous flow of water into the system is crucial during dry summer months and, should the springs dry up, that would be an indication that the soil water is severely depleted, which could be disastrous for the plant life. The physical properties of the soil determine the water-holding capacity, and the arrangement of a complicated layer-cake of white clay, brittle red iron-pan, and crunchy chocolate scoria influences the points where springs seep from the faces of eroded banks.



One of the permanent spring sites, Maranui Gully. Water trickles from the bank where the line of an impermeable layer may be seen.

May 2008

Up to sixty springs trickling from the plateau surrounding the Park were noted by George Fuller. These used to feed the system throughout the year, but now the storm water from the roads is taken straight into the lakes, and Racecourse water is diverted away from the Pukekura catchment into the Te Henui Stream, and is lost to the Park. The observation that surface water is eroding the slope below the Racecourse plateau gives cause for concern, firstly, because if the water is not retained it cannot slowly return to the lakes through groundwater systems and, secondly, this run-off scours the surface, washing away seedlings, leaf-litter and miniature wildlife inhabitants, and brings sediment into the lake system. Similar surface water damage has been observed recently in the southern end of the Park. Historically, there has been a problem with erosion and in-filling, despite sediment traps on the streams feeding the Main Lake.



Soil profile of the bottom terrace at the Pukekura Park Sportsground. Layer 12, dark red iron pan, overlaid with pale clay.

May 2008

In 1995, winter floods caused problems in the city, with water flowing off the Racecourse and threatening houses on Rogan Street and Ridge Lane. The flood also washed away part of a dam wall retaining Brooklands Lily Pond, filled the lakes with mud, and necessitated

a major clean-up. Some shallow lake areas became stagnant later during hot dry summer spells, and ducks died from avian botulism. Another problem was contamination of the lakes from three sources of excrement which caused nutrient loading during periods of low flow. Preventing the Racecourse stables discharging into the lakes resulted in a dramatic improvement. The state of the lakes was far better during this last year, a very dry summer, than their state a decade earlier.

Small catchments are prone to more exaggerated responses to rainfall than large catchments, and in an area such as Pukekura Park, which is surrounded by urban sealed areas, small problems of water flow will be exacerbated. Natural lake ecology is not possible under these circumstances. Holistic management, which considers the wider implications of engineering works on the environment, could find solutions to the urban surface water problem, and also increase the ground water table. The slopes surrounding Pukekura Park are fragile, and require vegetation to be maintained on them in order to reduce the run-off of water during rainstorms and to encourage replenishment of the groundwater. The Maranui Gully area, which is undergoing natural revegetation, is likely to be of great benefit in this process. It is hoped that hydrological studies will soon be underway to monitor the runoff, soil-water-plant relationships, and the available ground water supply required to maintain the water flow through dry summer months. This will be an interesting comparison and update to the information that the Friends collected in 1997-1999, and will provide data to manage the hydrology and thus maintain the lush vegetation which gives Pukekura Park that wild rainforest atmosphere.



Photo Derek Hughes

Water feature behind the Water Wheel

Autumn colour in Pukekura Park and Brooklands

George Fuller

Because there are very few trees native to New Zealand that drop their leaves over winter, our forest colour is predominantly a verdant green monochrome. Therefore, if a tree drops its leaves in winter it is fairly safe to assume that it is not a New Zealand native. Deciduous trees and shrubs are characteristic of the native flora of the temperate zone of the northern hemisphere.

In New Plymouth we have to be content with a very limited range of trees that can be relied upon to give good autumn colour. Oak, beech, birch, lime, sycamore, elm, larch, and poplar are only a dingy reminder here of their brilliant counterparts in the northern hemisphere - unless one is excited by shades of brown!

The following are the main trees in Pukekura Park and/or Brooklands that afford the most reliable autumn colour: Maple (*Acer* spp.); Ginkgo (*Ginkgo biloba*); Honey Locust (*Gleditsia triacanthos*); Wzonder Tree (*Idesia polycarpa*); Liquidambar (*Liquidambar styraciflua*); Tulip Tree (*Liriodendron tulipifera*); Dawn Redwood (*Metasequoia glyptostroboides*); Tupelo (*Nyssa sylvatica*); Cherry (*Prunus* spp. and cultivars); and Swamp Cypress (*Taxodium distichum*).

The Friends website www.pukekura.org.nz carries an extended version of this article along with an insight into the chemistry of autumn colour. See Ecology of the Park for George Fuller's comprehensive article.



Photo David Medway



Photo David Medway



Photo Derek Hughes

TSB Bowl of Brooklands surrounded by late autumn colour.



Photo David Medway

Dawn Redwoods (*Metasequoia glyptostroboides*) in autumn colour beside the Lily Pond featuring Michael Smithers' sculpture 'Aotearoa'.



Photo David Medway

Views of autumn-coloured Dawn Redwoods (*Metasequoia glyptostroboides*) beside the Lily Pond.



Photo Derek Hughes

Looking up the amphitheatre at the TSB Bowl of Brooklands with London Planes (*Platanus acerifolia*) in right foreground and Common Horse Chestnuts (*Aesculus hippocastanum*) in centre background.



Photo Derek Hughes