Tāne's Tree Trust Newsletter
Native Trees for the Future
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PTA: IS IT A MAJOR THREAT TO OUR REMAINING KAURI FORESTS?

by Peter Berg

Many of our Tāne's Tree Trust members will have read with some concern of the existence of a recently identified fungus-like organism which is believed to be responsible for the decline and deaths of kauri trees in the Auckland region. Scientists are now reasonably confident the cause is a disease being called *Phytophthora* taxon *Agathis* (PTA). The disease is capable of killing trees of all sizes. Symptoms include yellowing leaves, thinning canopy, dead branches and the death of trees. Trees may also develop large lesions that bleed resin.

For those of us with an interest in trees, kauri is one of the icon species but for many New Zealanders the significance of the species goes much deeper than that. Traditional Maori attitudes to the land, the sky, rivers, lakes and seas and the creatures that live in them are based on both centuries of accumulated knowledge and their beliefs about the beginning of the world. In Maori mythology Tane is placed at the beginning of time when, using the power of his massive legs and back he finally separated the sky father *Ranginui* and earth mother *Papatuanuku* and let light into the world, and the creatures of the world were able to thrive. The connection to the native forest, *te Wao nui o Tane* is one of the foundations of the Maori world. Maori see themselves as directly descended from *Tane Nui a Rangi* as were all other creatures.

The kauri tree symbolizes Tane with *Tane mahuta* the "father of the forest" the largest living tree in New Zealand and amongst the very largest in the world. Our own Trust is proud to share this name in our drive to see natural forest (Tane's kingdom) planted more widely. Kauri is also an icon because it is one of the world's natural wonders....the largest kauri ever officially measured was possibly the largest living thing ever recorded with some of the giant redwoods in California the only things of competitive size. It is therefore difficult if not impossible to know what the value of these trees is....they are so inextricably part of Aotearoa-New Zealand that the country could never be the same without them.

So what do we presently know about PTA?

The disease is found in soil, and it is believed to be spread by the movement of soil and water in the soil. Soil can be moved from site to site by humans (via activities such as tramping, running and mountain biking) and animals such as wild pigs.

Agencies such as MAF Biosecurity NZ, the Auckland Regional Council, Department of Conservation, Landcare Research, Scion, and other regional authorities now have a programme underway to better understand the disease and its pathology and to ensure that appropriate public awareness and precautions are taken to minimise further spread. A Kauri Dieback Joint Agency Response Team has been formed based on the MAF Biosecurity response model and is expecting to have a response plan prepared for approval in February. PTA has been declared an unwanted organism under the provisions of the Biosecurity Act 1993 which provides reasonably extensive powers to take appropriate action.

The disease was only identified in April 2008 and is new to science throughout the world. However advances in DNA technology have allowed samples taken from dying trees on Great Barrier Island around 1972 by Dr Peter Gadgill of FRI to be retested, and PTA was recently confirmed. Gadgill had surmised the problem was a species of Phytophthora with other abiotic factors permitting its development (unusually damp soil conditions have traditionally been associated with root attack by Phytophthora species). Because PTA is so new to science there is a lot we don't know about it which is why the focus is on containing the disease until more research is done.

The disease is obvious at a number of sites in the Waitakere Ranges, and also at DOC reserves at Pakiri, Albany and Okura, and of course Great Barrier Island. It has been isolated from soil in Northland (Trounson and Waipoua). So far it has not been found in the Hunua Ranges, the Coromandel or sites further south.

It is killing kauri of all ages; however, there are some sites (such as Great Barrier) where some trees are affected while others appear to be healthy.

To help prevent the disease spreading further forest visitors and users are being asked to ensure their footwear and equipment is clean and free of soil before and after visiting areas where kauri trees are present. It is also recommended they and their dogs, etc stay on existing tracks at all times, and avoid kauri roots. Dead or dying trees should be reported to the MAF, the local Regional Council or DoC. There is a hotline 0800 NZ KAURI (0800 69 52874) for calls and a website, www.kauridieback.co.nz.

Feral pigs are one of the main ways similar diseases are spread overseas because they dig around roots. This is a matter for further research but may lead to a drive to eliminate pigs from key reserves.

Tane Mahuta has been examined and is not showing any signs of the disease at the moment.

A Maori advisory group has been formed reflecting the significance of this taonga species to Maori and their kaitiaki role.

A technical working group has agreed that initial research focus should be on optimising diagnostic and sampling techniques, developing hygiene methods to limit its spread and better defining symptomology to inform and assist future activity to control PTA.

The above website and the newsletter "Kauri Konnect" are good sources of additional information.

TEN YEAR CONFERENCE

In October this year it will be ten years since the conference "Native Trees for the Future" was held at Waikato University. The Trustees have decided that we should hold another conference to celebrate our successes since 1999 and to try and determine the best way forward. This will be held at Waikato University from the 18th to the 20th November and we are seeking sponsorship to keep costs as low as possible. Accommodation will be available at the University Halls of Residence. There will be a wide range of presentations and discussions with, hopefully, at least one overseas speaker. If any members have ideas about what they would like to see included in the programme please contact Ian Barton at ibtrees@wc.net.nz. Papers and poster displays are also sought and if anyone knows of indigenous planting on sites within about an hour's drive of Hamilton, please let Ian or Peter know. The preliminary programme is outlined below (note that this is subject to change but should be finalized by the time of the next newsletter): -

Day 1:

- First Keynote paper
- Tane's Tree Trust. "What is it; what are its achievements"
- Presented paper
- Presented paper
- Background paper on ecosourcing
- Optional discussion groups: -
  1. Ecosourcing
  2. Carbon issues and indigenous species
  3. Reducing establishment costs

Dinner and speaker. Launch of Training handbook.

Day 2:

- Second keynote paper
- Discussion groups "An Indigenous forestry strategy"
- Discussion groups "Indigenous research"
- Presented paper
- Presented paper
- Iwi perspectives on indigenous forestry
- Plenary session. Report back from discussion groups & determination of next steps where required .
- "Tane's Tree Trust - the next ten years" Discussion and summation

Day 3:

- Field trip to indigenous sites.

Tane's Tree Trust members are invited to register their interest in the conference by e.mailing Ian Barton at ibtrees@wc.net.nz.

PROJECTS:

Sustainable Farming Fund:

The project to produce a bulletin on beech management has begun and David Bergin and Mark Smale will be visiting South Islanders interested in growing and managing beech early this year. If you are one of these and have not yet been contacted please get in touch with Mark Smale SmaleM@landcareresearch.co.nz, or David Bergin David.Bergin@scionresearch.com.

The new establishment handbook, funded by SFF and FITEC, on the practical aspects of establishing new indigenous forests both for production and conservation is now well advanced and is expected to go to the printer in June. The hand book will be the basis of future Trust workshops and a proposed course on indigenous forestry.

Funding to carry out a survey of native tree plantings and establish sample plots in these stands will also begin in early this year. An important component of this project is to collect information on the carbon sequestration potential of native species; shrubs as well as trees. It would be appreciated if members who have plantings of indigenous species could contact David Bergin at David.Bergin@scionresearch.com .

Other projects:

We have received a grant from the Lake Taupo Protection Trust to expand the work being done at the Taupo Native Plant Nursery on the production of bare-rooted trees and nurse plants. The work will be done during 2009, in conjunction with the Taupo Nursery and Peter Cimino Cole who ran the earlier project at Mahurangi. Planting trials are expected to follow from this.

Funding has also been obtained from FIDA to set up the database of planted native plantations. This is something we have been trying to do for some years and it is good to know that it will now be underway. Much of the work on all the above projects is being done by staff of Scion.

NEW ZEALAND TREES

Instead of continuing the series on New Zealand trees in this and the next issue of the Newsletter we instead publish, in two parts, an intriguing letter which appeared in the supplement to the Weekly News of February 16th 1867.

Sir, I read your article on the sandhills some weeks ago, and think you would greatly oblige many of your readers by reprinting in the Weekly News "A French view of New Zealand" given in the Supplement to the Weekly News 29th April 1865 and Supplement to the same journal June 3rd 1865. Most of what I know about the trees of New Zealand, I have gathered from these two translations. Yours etc.... J L Sinclair

The following is a translation from the New Caledonian Moniteur of an article by Mr M H Jouan, Captain of the French transport Bonite.[i]

Captain Cook was the first to announce the richness of the forests of New Zealand, principally those of the SW of the Middle Island, in the ports of the straight which carries his name; and in the neighbourhood of the gulf of Hauraki at the bottom of which Auckland is situate. More than sixty kinds of wood may be utilized for various purposes. The grand family of the coniferae (pines) is largely represented in the species Taxus, Podocarpus, Dacrydium etc, some specimens of which attain colossal dimensions and furnish resinous woods used for building and other purposes.

The kauri tree is most employed in the woods named and is also largely exported. Neither too tender nor too hard, it is applicable for all sorts of usages: its lightness permits its employment for masts of vessels although its value for this purpose suffers a little from defaults of elasticity. Its durability is surprising; and it has been stated that at the commencement of 1861 the two trees which the unfortunate Marion had cut in 1772, at the Bay of Islands for the purpose of making masts for the vessel, the 'Castries' had lain upon the ground for 89 years exposed to all changes of weather.[ii] The outside alone had suffered some alteration, but the inside was perfectly sound. The kauri (dammera Australis, A Cunn) belongs to the species dammera, of the tribe of abietinées[iii], a kind which comprises many large trees, having the leaves alternate and hard, the flowers diviques, the males having extra-auxiliary husks and the seeds being pennated. The species is also represented in tropical Asia, in some of the isles of the West Pacific, amongst others in New Caledonia, where four kinds –different from those

of New Zealand- attain grand dimensions; but we have not yet seen any kauri tree approaching the size of those of New Zealand. The larger sized kauri trees are encountered only in the northern part of Ika-na-mawi –the Northern Island- forming forests upon the most miserable soil: upon the clayey slopes of the hills of the district, and which have been formerly, without doubt, covered by trees, if we may judge by the mass of resin that is found. The kauri is not met with more southerly than the 38th degree of latitude. Those on the western side, on the same side as the ports of Kaipara and Hokianga, where the timber has been made the object of great commerce, are the best and most capable of resistance; perhaps because the heavy winds of the west which blow almost constantly in that part of the country, hinder their rapid growth.

The kauri is recognizable by its straight trunk, conical shape and rising from 25 to 30 meters under the branches without a knot, terminated by an enormous summit of branches raised in the air, and which carry bouquets of slender flowers equally upraised. The trunk of the tree is from five to eight metres in circumference at the base, but there are some which are much larger. One is cited in the peninsula of Hauraki that was on the point of being cut for the purpose of sending a slice to the Universal Exhibition[iv], having five and a half meters in diameter at its base. A traveller (Marjoribanks in his "Voyage to New Zealand" 1846) speaks of another at Mercury Bay which had near 75 feet of circumference[v]. The bark is smooth and of a grey silver colour, the inner bark being ordinarily thicker on the side which is the least exposed to the sun, and in thickness varying from eight to twenty centimetres[vi]. The wood is close grained, yellowish straw-coloured- sometimes drawing towards red, and somewhat brittle. It is cut into planks or boards, and the smaller pieces serve to make shingles for the roofs. It exhales a particularly resinous odour. When varnished it is made into particularly handsome articles of household furniture. Sometimes the tree is marked, from the commencement of decomposition, in such a manner that the wood is strewn with stains and paler veins. We have seen at Auckland, very pretty pieces of furniture destined for the Exhibition, made from kauri in that state. At the foot of this tree a grand mass of gum, or rather resin is found. When it is fresh it is colourless and translucid; on becoming old, it takes the colour of the ordinary resin. Upon burning it exhales a strong odour of turpentine and gives off a thick, black smoke. In certain localities which at the present day are altogether denuded of trees, considerable deposits of gum are found, which indicates that forests formerly existed on the spot. The attempt has been made to utilize part of this resin, which has not been employed up to the present day, except by the aborigines for the purpose of making torches or caulking their canoes. It serves as a good substitute for copal gum, and in America it is made use of for dressing cotton stuffs. From Auckland in 1861 there were exported 1600 tons, at the mean price of 250f(rancs) the ton.

The heat of fire is fatal to kauri, and large quantities have perished from setting fire to the herbs in the vicinity of forests. Previous to the New Zealanders receiving iron tools from Europeans, they caused the fall of the enormous trees for making large canoes by burning them at the foot; and it was by the same process that they succeeded in scooping out the greater portion of the inside of the canoe. During the 30 years that New Zealand has been frequented by Europeans a considerable quantity of the timber has been cut down, and at the present time, upon the borders of the sea, in the neighbourhood of Auckland, where there are now only ferns and brambles, there were at one time forests of kauri; and it is to be feared upon calculation which has been made, that those which remain will soon be exhausted. The finest trees in the vicinity of the sea have been carried almost totally away for some time, and as necessary consequence the cutting of wood fit for sale and the transport become more and more difficult. It is necessary, as far as possible, that the sawmill where the wood is cut be near the sea, in order to facilitate the embarkation, and also communicate with the forest by a stream, upon which truncated trees are floated from the place where they have been felled, and often split by means of gunpowder when they are too large. They are afterwards dragged by a number of oxen to the stream, where barriers have been fixed at different places; in order to secure a sufficiency of water to make them float to the sawmill. At Auckland, in January 1862, sawn kauri was sold for 63 francs the cubic meter, and the shingles about 18 francs the thousand.

The English Government, in 1820, sent to New Zealand two transport vessels for the purpose of obtaining kauri spars, stated to be proper for masts of large vessels. Unfortunately the two ships took scarcely anything but pieces of kahikatea, another colossal pine easily to be confounded with the

first, but of which the wood is soft, brittle and quickly becomes valueless when exposed to the air. This mistake threw discredit upon the kauri, but it was soon explained away, and for a long time the English navy were supplied from the west side with masts, which must be from 22 meters to 25 meters in length without a single knot with a minimum diameter of 0.55 centimetres (sic) at the smallest end.

The totara (taxus Australis, Polack; podocarpus totara, Hooker) has the appearance of a yew: its trunk straight, conical shaped, and attains a height of 20 meters under the branches, with a circumference of 6 meters to 7 meters. Ordinarily the bark is smooth; but it is sometimes split considerably by the sun. The roots extend on all sides to a great height above the soil. The totara is one of the most majestic trees of New Zealand. The wood is reddish brown, covered by an inner bark of little thickness. The tree is particularly applicable for making posts and piles for humid conditions. We have seen a sample of this wood carved, and representing a group of animals –a tiger and alligator- to be sent to the Exhibition: which proved that it could be profitably employed for such purposes. The totara grows in the same forests as the kauri, but it is less common. The banks of the Waiho (river Thames in the Gulf of Hauraki) furnish the greatest quantity of it; and the native tribes of that district make almost all their canoes from the trees, of which some are ten meters in circumference.

The tanekaha (podocarpus asplenifolius, Jameson: phyllocladus trichomanoides, A Cunn.) has somewhat the appearance also of the yew. Its dimensions are not so considerable as those preceding, as its trunk scarcely exceeds the height of 16 meters, under the branches, with 60 to 70 centimeters of circumference. It is however not the less useful, although a little heavy, for making handsome masts for small vessels. The wood is hard, of a golden colour, and exhales a very strong odour of turpentine. The exudation of resin is less than from the other coniferous trees of New Zealand. From the bark a black or deep brown dye is extracted.

The miro (podocarpus ferruginea, Hooker) is of the size of the tanekaha, and serves the same purposes. It is the hardest of all the resinous woods of the colony. The fruit resembles a drupe, and is sought after by the wild pigeons, and which grow fat from feeding upon it.

The kahikatea (podocarpus dacrydioides, A. Rich; dacrydium excelsum, A. Cunn) attains dimensions almost as large as the kauri. It differs however in its foliage, which recalls to mind that of the yew. The wood is very easily worked, but it has a thick inner bark, is very soft, and deteriorates in value very quickly when exposed to alternations of temperature- -to dryness and to humidity. A long time after the tree has been cut, it is affected by the temperature; and in rainy seasons it becomes a true hygrometer. It is only used in the inside of houses and ordinarily serves for works of little importance, such as packing cases, flooring etc. The kahikatea affects low and humid grounds, especially the borders of rivers. Its fruit is of a red colour, and is much prized by the natives. It is said that the more one advances towards the south the wood becomes better, and that the kahikatea of Stewart's Island (the most southerly of the group) is as resistant as the kauri.

The rimu (dacrydium cupressinum, A Cunn.) is of the taxinées species and, most affects humid grounds, where it sometimes attains 22 meters in height, with three or four meters in circumference. In appearance it somewhat resembles the cypress, and its bright foliage has been compared to that of the weeping willow. The wood is red, of a fine grain and very hard. It is employed principally for articles of household furniture.

Such are the principle conifers of New Zealand, and those which attain the largest dimensions; but there are others, although humble specimens enough, which are utilized for various purposes, and amongst these we must cite the toatoa[vii] (podocarpus asplenifolius, Taylor) which may be said to take the place of the cedar; the matai (pod. spicata, Hooker) resembling very much the totara, and with which instruments of music are made; the koaka[viii] (Dacrydium plumesum, A. Cunn); the hutu (phyllocladus hutu[ix], Taylor) &c, &c.

To be continued

i Captain Jouan visited Auckland in 1863.

ii These were masts procured for the "Marquis de Castries" in June 1772 but abandoned when Marion du Fresne was killed, reputedly for breaking tapu.

iii Not now correct Abietineae is the family containing the pines, cedars, larches and firs but not Agathis.

iv Following Britain's Great Exhibition of 1851 there were a great many more, especially in Europe. This reference is probably to the Paris Universal Exhibition of 1867.

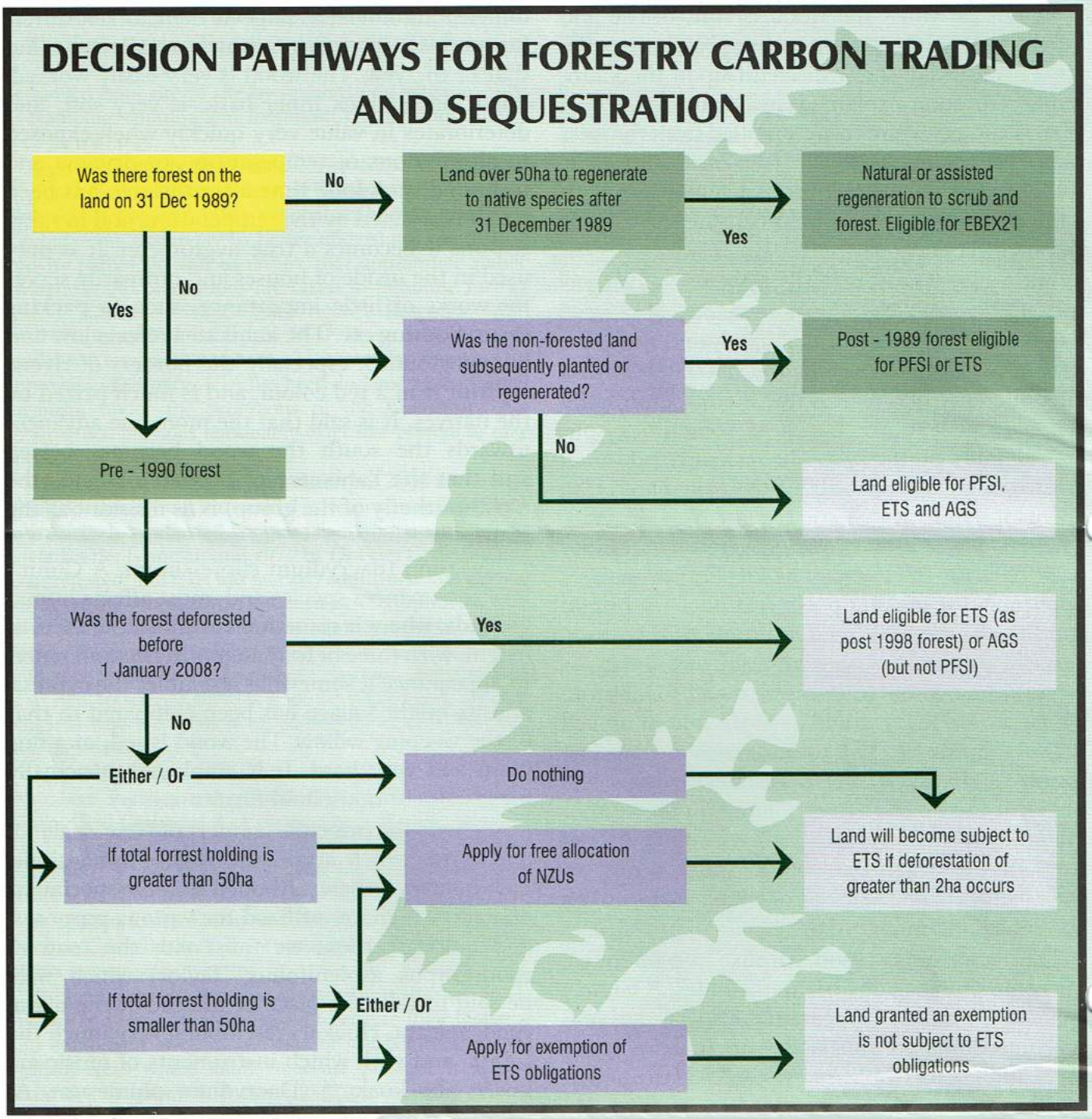
v Reputedly the largest kauri recorded it was first measured by Laslett in the early 1840's and was probably felled about 1870 (see Reed "The Story of the kauri" pg 89).

vi The term inner bark may mean sapwood, judging by the thickness of 20 cm quoted. See also notes on totara and kahikatea.

vii Probably toatoa (Phyllocladus glauca). Phyllocladus asplenifolius is endemic to Tasmania.

viii Kawaka (Libocedrus plumosa).

ix I can find no record of this in scientific literature.



There were some errors in the above diagram as published in Newsletter 15 (Sept 2008). Please use this version.

TRUST ACTIVITIES (MAY 2008 TO JANUARY 2009)

Renewal of Subscriptions:

An account for your 2008/09 subscription were sent with the May 2008 newsletter. A few have not yet paid and you will receive a reminder account with this newsletter.

Trust Contact April to July 2009

Ian Barton will be overseas from 19 April to 10 July 2009. Trust members needing to make contact during this time should contact Peter Berg; either by mail to PO Box 1169, Pukekohe: telephone (09) 309 5049 or e.mail at p.berg@pentarch.biz.

WORKSHOPS

Workshops have been held at Taupo on the growing cheaper seedlings and at Kaukapakapa and Wellington as test workshops for the new establishment handbook mentioned above. No further workshops are planned for this year but please note details above of a national conference to be held in November.