GARDENWISE

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Director's Message

On sixth of June, 1990, the National Parks Board came into being. This was the culmination of an effort that began as a germ of an idea some six years earlier. The formation of a new statutory body is no small matter, and the justifications for setting into motion the ponderous wheels of bureaucracy towards this purpose must indeed be strong.

The media coverage of the formation of the National Parks Board has been extensive. The Board's mission has been clearly broadcast: to develop, manage and promote the Singapore Botanic Gardens, Fort Canning Park and the nature reserves of Singapore as local and international resources for recreation, research, education and conservation. Answers to the questions as to how it came about that the Board had to be formed to do this, and why it is necessary to form an autonomous body for the purpose may perhaps not have been so clearly recorded.

Dendrobium National Parks

The Parks and Recreation Department came into being in 1973 through the merger of the Parks and Trees Division of the Public Works Department and the Singapore Botanic Gardens. The post of Director of the Singapore Botanic Gardens was deleted, and the Commissioner of Parks and Recreation had command of the resources of the Gardens and the Parks and Trees Division to implement the Garden City programme for the greening of Singapore and the development and maintenance of public amenities for recreational purposes. The needs and requirements of a traditional botanic garden were subject to the more urgent priorities of a Department charged with the maintenance and development of the entire green estate of the republic. Today, visitors from the rest of the world can view the successful achievements of the Parks and Recreation Department from the moment their plane touches down at Changi Airport.

It is now time to pay full attention to the programmes and activities which bring life and meaning to a modern botanic garden. These programmes and activities centre on research, education, recreation and conservation. A significant level of these activities had been sustained at the Singapore Botanic Gardens during the tenure of the Parks and Recreation Department. The standard of maintenance of the Gardens has been very high, especially in comparison to other tropical botanic institutions. Public amenity aspects have been enhanced, and horticultural research programmes had been initiated which had great bearing on the success of the Garden City programme. A School of Ornamental Horticulture for the formal training of horticulturists had been instituted to train and produce staff for running the Parks and Recreation Department's programmes. And the Labrador Nature Reserve and Bukit Timah Nature Reserve were looked after by the Department's staff.

What then will be different under the National Parks Board? For a start, the activities and programmes mentioned above will be refined, enhanced, and modified. For recreation, the amenities in the Gardens will have to be upgraded to cater to a larger and more demanding visitorship. The physical development of the Gardens should not only take into consideration the conservation of the historical tone and ambience of one of the world's great colonial tropical botanic gardens, but also its increasingly critical role for research, education and conservation as the premier botanic garden in the equatorial zone amidst some of the most threatened and valuable tropical forests in the world. The visitor attractions should

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reflect this unique asset of the Gardens' location and history and require specialised and expert fostering for their proper development. Similarly, the research effort should be contributory to the global effort of documentation and conservation of the wealth of tropical biological diversity for future wise exploitation. Intrinsic to the recreation and research programmes is their educational value. Specially developed outreach educational programmes should cover not only wider applications of tropical gardening, but also tie in with the efforts of local horticultural groups like the orchid and gardening societies.

The conservation effort will centre on the nature reserves of Singapore. A proper documentation of our natural resources and current status and condition of our nature reserves has to be carried out so that a proper management programme can be planned and implemented. The construction of a Visitor Centre at Bukit Timah will provide the base for the educational effort centred on raising public awareness, knowledge and appreciation for our indigenous flora and fauna.

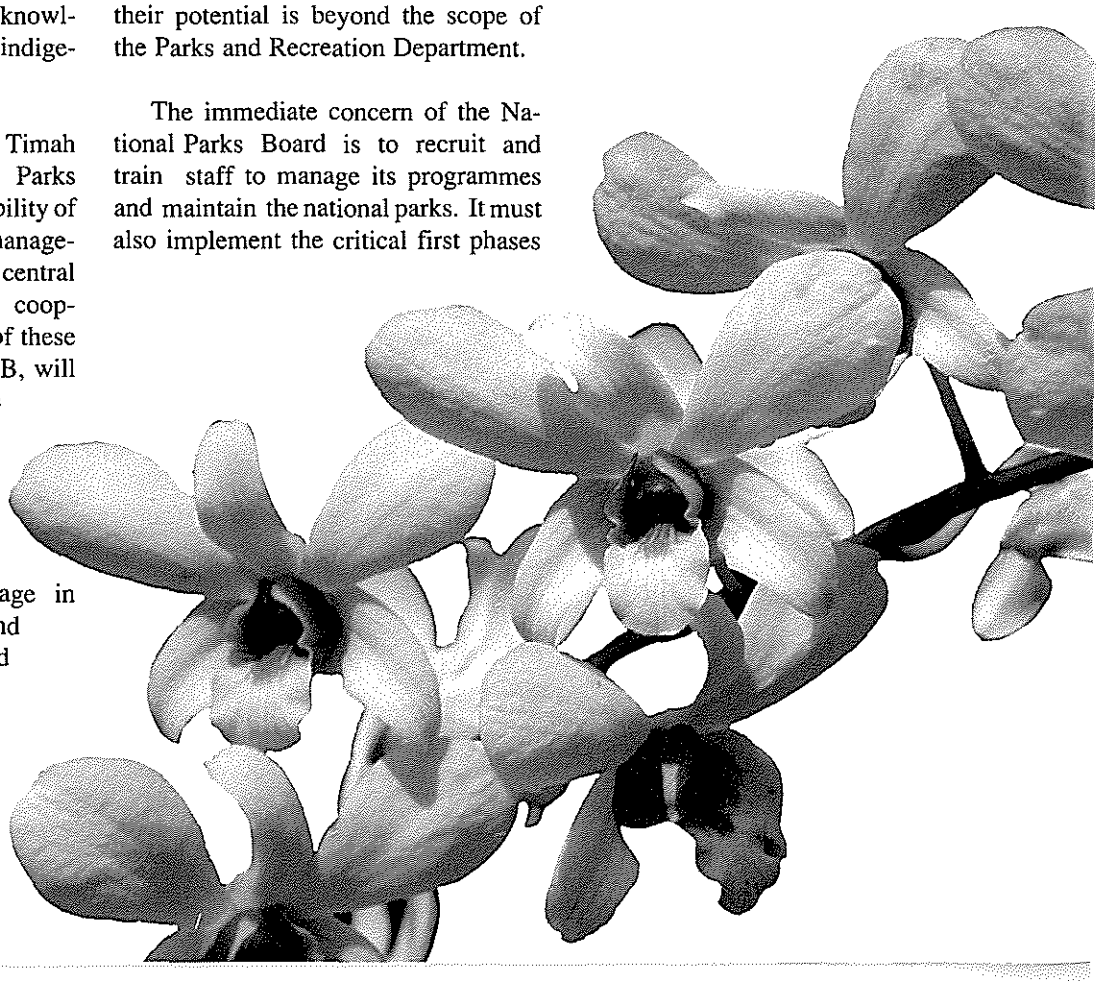
In addition to the Bukit Timah nature reserve, the National Parks Board will take on the responsibility of overseeing the protection, management and conservation of the central catchment reserve lands. The cooperation of the primary users of these lands, namely MINDEF and PUB, will be solicited towards this end. The future of our nature reserves is very much dependent upon the efforts of the National Parks Board in inculcating a sense of the need and urgency for preserving our natural heritage in the face of more immediate and tangible exploitation of the land itself.

The Ministry of National Development, parent ministry of the National Parks Board, recognised that in order for the Board to meet its obligations adequately, it must possess sufficient critical mass and infrastructure. To achieve this, the development, management and promotion of Fort Canning Park was added to the portfolio of the Board. This is not as incongruous to the mission of the Board as it may initially appear. The first botanic garden in Singapore was established by its founder, Raffles, on the hill. The history of Singapore can be traced back to the 14th century in the form of historical structures and objects from archaeological excavations on the hill. Fort Canning Park is also the major piece of green in the heart of the city, and its integration into the civic and cultural district development requires much of the care and expertise required for the proper development of the Singapore Botanic Gardens. Its inclusion completes the trio of Singapore's heritage parks, the management of which to properly realise their potential is beyond the scope of the Parks and Recreation Department.

The immediate concern of the National Parks Board is to recruit and train staff to manage its programmes and maintain the national parks. It must also implement the critical first phases of the redevelopment of the Singapore Botanic Gardens and Fort Canning Park as well as the successful completion of the construction of the Nature Reserves Visitor Centre. The marshalling of community support to help the Board achieve its goals is very much on the agenda, and in the days to come, the residents of Singapore will be called upon to involve themselves in the grand adventure.

Kiat D. Tan

DR TAN WEE KIAT
Executive Director
National Parks Board



Board Members

National Parks Board

MR TAN KEONG CHOON

Our distinguished Chairman, who is also Managing Director of Tropical Produce Co (Pte) Ltd, has had a long association with the national parks. His interest stems from 1983 when he was appointed Chairman of the Nature Reserves Board, a position where he was incumbent until it was superseded by the formation of the National Parks Board on 6 June 1990. Mr Tan also serves on a number of prestigious Committees which impinge on the educational and commercial sectors of our community.

MR SYED YUSOF ALSAGOFF

Mr Alsagoff is a keen orchidologist and long term President of the Orchid Society of South East Asia. He has produced many notable orchid hybrids and gathered extensive knowledge of the orchids of this region. Mr Alsagoff is a familiar figure not only in regional orchid circles but is also well known internationally.

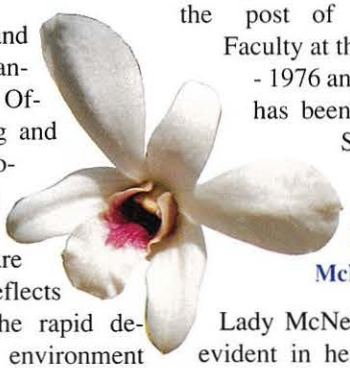
MR JOSEPH CHEW KHIAM SOON

Currently the Director of Marketing Services with Singapore Airlines Ltd, Mr Chew has had an illustrious career in both SIA and the Singapore Tourist Promotion Board, where he held the post of Director during the periods 1976 - 1978 and 1985 - 1989. Mr Chew's vast experience in the tourist related industry will be invaluable to the fledgeling National Parks Board, in the development of its visitor oriented programmes.

DR CHUA SIAN ENG

The current Commissioner of the Parks and Recreation Department, Dr Chua is also represented in several landscape/ green committees.

MR RICHARD E HALE



Well-known in banking and commerce, the General Manager and Chief Executive Officer of the Hongkong and Shanghai Banking Corporation also has a keen interest in natural history. The Hongkong Bank's Care for Nature programme reflects Mr Hale's concern for the rapid destruction of the natural environment especially in a rapidly developing country with limited land resources like Singapore. Mr Hale's perception of the problem dovetails well into the National Parks Board mission for the national parks.

The National Parks Board Members in the shade of the Kapok (Ceiba pentandra) behind the Herbarium; seated from left to right Prof Lim, Mr Tan, Lady McNeice, and behind, Dr Tan, Dr Chua, Mr Alsagoff, Mr Chew, Mr Hale. Dr Leo Tan not pictured.

PROF GLORIA LIM

An eminent microbiologist, Prof Lim is with the Botany Department, National University of Singapore, where she has followed an illustrious career culminating in her appointment as Head of the very Department from which she graduated with the highest honours. She has also held the post of Dean of the Science Faculty at the University from 1973 - 1976 and from 1979 - 1980, and has been serving on the Public Service Commission since 1982.

LADY YUEN-PENG McNEICE

Lady McNeice's love for nature is evident in her active support of the work of many organisations involved in the conservation and promotion of wildlife. She is also a dedicated gardener and an accomplished photographer.

DR LEO TAN WEE HIN

As Director of the Singapore Science Centre, Dr Tan figures prominently in the scientific and educational fields. Dr Tan is a marine biologist, especially well versed in the marine ecology of Singapore. His diverse interests in the biological sciences are an asset both to the Science Centre and to the National Parks Board.

Transplanting A Mature Palm

The National Parks Board Experience

by Saiful Anuar and Jun-Ichi Inada

The transplanting of trees has always been looked upon as a challenging and difficult task. Unless carefully carried out, results are seldom satisfactory especially when it comes to mature trees such as palms. The planning and development unit recently undertook the task of transplanting a mature, 10-metre palm, *Phoenix sylvestris*.

Preparation began about 3 months before the actual date of transplanting. First the lower, older leaves were pruned off to reduce the shock of having its roots severed. The root ball of the palm was then prepared by digging a trench around it and then filling it up with either coco peat or sand plus leaf mold. We then observed the palm to see its reaction. It should regulate transpiration and other physical functions using the root ball that had been reduced in size. It is very important for the survival of the plant for new roots to grow. This was observed and after the roots had established we started on the preparation of the actual transplanting.

The planting hole was first prepared about 0.4m larger than the root ball. Sand and granite chips were first added into the hole to provide for drainage. The root ball was then properly wrapped with burlap and securely tied with manila rope. This was done to keep the root ball intact and to prevent injury to the roots.

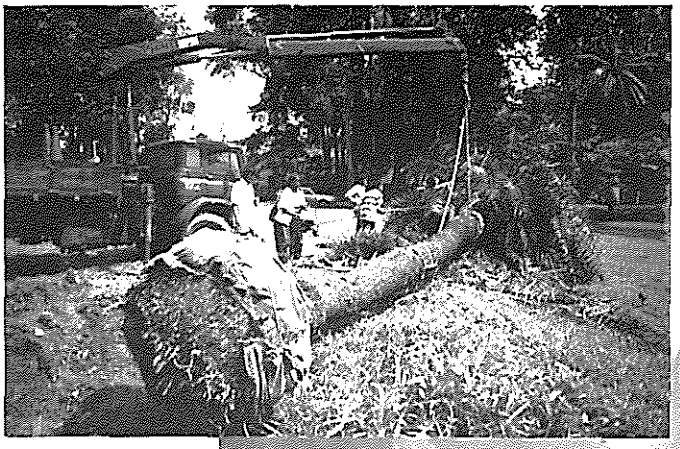
Next the palm was transported to the site. Two 6-tonne lorry cranes were used to lift the palm up into the lorry. Burlap was used to wrap the points of the trunk where the palm was lifted to prevent injury caused by the ropes used. Balancing is very important because any injury sustained due to lifting, either to the roots or the leaves, will affect the survival of the palm. Close supervision is very important here.

On site, the palm was properly positioned using the crane before it was lowered into the hole, because any shifting done would damage the root ball. The crane was used to steady the palm as the hole was filled up.

The palm was then supported using timber of an appropriate size, ensuring once again that the point of contact between the trunk and the stakes were wrapped with burlap to prevent injury. A generous watering of the palm followed.

The palm was inspected almost every day to ensure its survival. So far we are pleased to say that it is surviving well.

We have gained quite a bit of knowledge, especially on the finer aspects of transplanting. We hope to improve on it in the future as we undertake more such tasks. Right now we are preparing to transplant a mature *Euphorbia* species to another part of the garden. A new challenge awaits!



Above: Preparation and wrapping of the root ball.

Above: Final pruning of the palm before lifting into the lorry.

Right: Planting and staking of the palm at the new site.

Branching Out

by Jennifer Ng

INDOOR PLANT CARE
Part 1

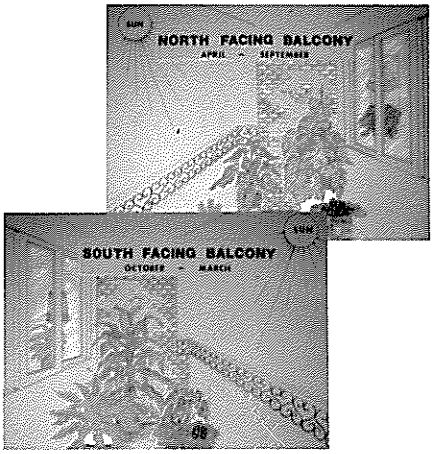
Introduction to Good Gardening

The magic of living green softens and adds a distinctive appeal to our homes, our offices and without our knowing it reflects our lifestyle. True gardeners are caring, hardworking, often friendly and down-to-earth people. Gardening is also the best form of relaxation after a hard day's work in the office. As many of my gardening friends will testify, time comes to a standstill whenever they potter around.

There is really very little secret in growing healthy plants in a tropical climate like Singapore with its abundant rain, continuous sunlight and warmth which are most ideal for lush growth. Even the dry spells in late January to February, June and July can be regarded favourably as these changes encourage prolific blooms for some plants.

The first wise step to good gardening is to know the weather in the understanding of plant needs; that is, not just temperature and rainfall but also the amount of light in relation to the position of the house at different times of the year. Knowing the weather helps us to plan our watering, pruning and spraying schedules and alerts us to shift our plants according to their light requirements. It allows us to examine the area where we want greenery. Does it have sufficient light for the particular type of plant we fancy, for example?

The second step is to be as tidy as possible. I remember one day visiting the home of a young and talented gardening student. He was giving his plants away because his mother was opposed to the idea of having any plants in the house because of dirt, scattered pots and tools. Proper storage for soil, chemicals and tools is therefore part of good gardening practice.



To begin, what are the essential gardening tools and paraphernalia?

You would need:

1. **A good set of gardening tools**
- secateurs;
- hand trowel, hand fork and dibbler;
- watering can;
- sprayer;
- some 15-cm to 30-cm pots.

2. **Clean soil**
- for rooting, e.g. sand or mixture of sand and coco-peat (finely shredded coconut husk);
- for potting, e.g. good quality topsoil, burnt earth,and peat/ perlite/vermiculite/ sand-based mix.

3. **Well-balanced fertilisers**
- inorganic or chemical fertilisers e.g. Nitrophoska, Complesal, Osmocote, Phostrogen, Gaviota, and Hyponex,
- organic fertilisers e.g. Nitrosol, and Hortimeal.

4. **Insecticides and other pesticides**
- for chewing insects, e.g. Malathion, Diazinon, Dipterex and Sevin,
- for sucking insects, e.g. Monothion, Rogor-40, and White Summer Oil;
- for mites, e.g. Trithane, Kelthane, Omite, and Mitac;
- for slugs, e.g. Meta tablets.

5. **Fungicides**
- for preventive measures, e.g. Captan, Tersan or Thiram;
- for curative measures, e.g. Benlate.

Here are some general tips on watering, feeding, and spraying :

Be vigilant in :

a. watering
- check the soil regularly;
- water well, always allowing enough water to seep in.

b. feeding
- study their individual needs; some are heavy feeders -especially flowering plants and fruit trees;
- use dilute feeds for seedlings, young plants and those sensitive to chemicals.

c. spraying pesticides
- have a good knowledge of pest and disease symptoms;
- carry out regular inspections and treat the infected plants promptly;
- read the instructions given on the label;
- reduce the dosage for seedlings and plants sensitive to chemicals, e.g. ferns, hairy-leaved plants like Begonia and African Violet.

Know your plants and their requirements for light and pruning:

a. cuttings
- cuttings are to be placed in a shaded area so as to reduce water loss.

b. newly transplanted plants
- newly transplanted or repotted plants require shade for a few days to recover from the transplanting shock caused when the plants are uprooted.

c. shade-loving plants
- shade-loving plants prefer indirect light or the morning or evening sun for growth.

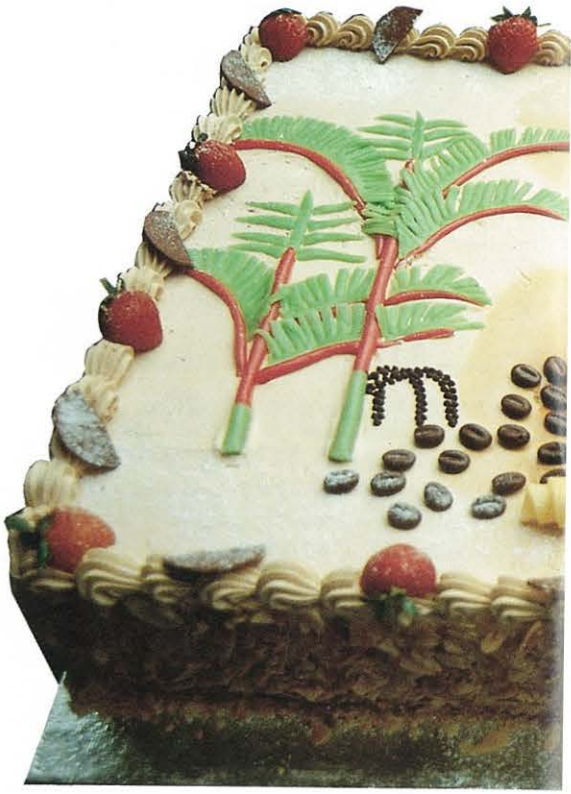
d. sun-loving plants
- sun-loving plants grow vigorously well in strong sunlight. Some even require light for flowering.

Finally be ready to prune :

a. dead and diseased branches;
b. overcrowded branches;
c. old branches and flowering shoots to initiate new growth and induce flowering.

In the next issue of Gardenwise, we will examine the choice of plants suitable for indoor gardening.

All dressed up for the occasion
The School of Ornamental Horticulture was chosen as the venue for the Inauguration of the National Parks Board.



The Birthday Cake
The 9 kg hazelnut cream cake was decorat Singapore Botanic Gardens.

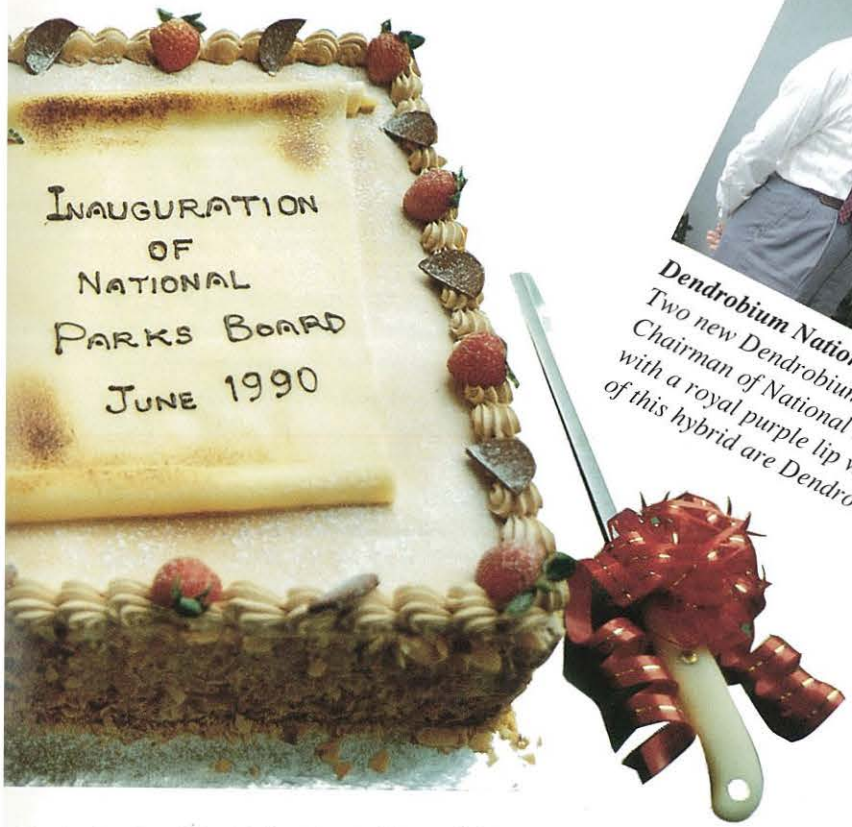
Souvenirs for the guests
Sealing Wax seedlings were distributed to guests as a memento of the inauguration.

Happy I
National P

With a great flurry of balloons taking t on 6 June 1990. Guests and staff g Horticulture to celebrate the auspicious birth. Why audience, 6 June 1990 is a particularly auspicious organisations according to the Feng Shui annals. mission are old and venerable. "At 130 years, th three," said Dr Tan. "Fort Canning Park's histor century. The forests of our nature reserves like tha of evolution and growth. The charge of the fledg venerable treasures is a heavy one. We are t individuals who have agreed to serve on the Boa

Welcome Address
Dr Tan Wee Kiat, the Executive Director of National Parks Board, welcomed guests and shared some of his thoughts and aspirations.

Guests signing in
Mr Ho Cheok Sun, Director of Infrastructure, Ministry of National Development, signing the guest book on arrival.

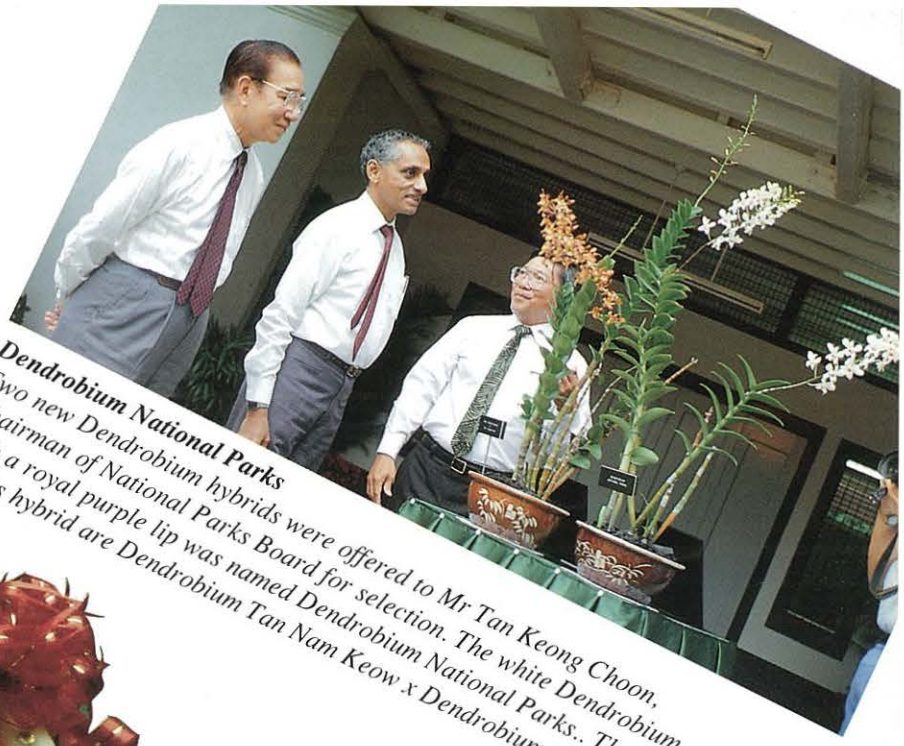


with the Sealing Wax Palm, the emblem of the

irthday
rks Board

e air, the National Parks Board was inaugurated
ered on the lawn of the School of Ornamental
spicious? As Dr Tan Wee Kiat pointed out to the
: for the launching of new ventures, projects and
nough the Board is brand new, the objects of its
ngapore Botanic Gardens is the youngest of the
rkens back to the days of Temasek in the 14th
n Bukit Timah are the result of 130 million years
National Parks Board to properly manage these
fore very fortunate to have such outstanding

Happy Birthday, National Parks!



Dendrobium National Parks
Two new Dendrobium hybrids were offered to Mr Tan Keong Choon, Chairman of National Parks Board for selection. The white Dendrobium with a royal purple lip was named Dendrobium National Parks.. The parents of this hybrid are Dendrobium Tan Nam Keow x Dendrobium Meritt Island.

Mr Richard Hale receiving the letter of appointment
Letters of appointment were presented by Mr J. Y. Pillay, Permanent Secretary, Ministry of National Development, to board members.

Up, up and away!
Hundreds of balloons were released by guests led by Mr J Y Pillay, Mr Tan Keong Choon and Dr Tan Wee Kiat.

Cut and Destroy

It's the Most Effective Method of Pest Control

by Pim Sanderson

During the Singapore Botanic Gardens' 130th Anniversary celebrations, a plant clinic was held for people to bring along their problems.

The most striking point which emerged from this activity was that the majority of Singaporeans already have a good understanding of how to grow plants. This was apparent from the type of questions most frequently asked. They were about the difficult pests and diseases not readily identified or controlled. They included mites, scale insects, soft rots and thrips.

Mites are amongst the most difficult of pests to control because of their size. They are too small to see. It is only after a large population has developed, the damage done, and the symptoms obvious, that the problem is detected.

Scales, although reasonably easy to control, still remain on the leaf after spraying, thus giving the impression that they are still alive and well. The chances are that the control measures were successful, and that the subsequent sprays, applied in frustration, were unwarranted.

The difficulties in controlling the soft-rots come through the problem of identification. They all look very similar, yet without a positive identification, control is difficult because each requires special treatment. The fungal soft-rots do not respond to the normally used fungicides and require special chemicals. For the *Phytophthora* diseases, fungicides such as metalaxyl (Ridomil) and etridiazole (Terrazole) must be used. For diseases caused by *Sclerotium*, maneb, (Tritogol-M, B M Maneb), and etridiazole (Terrazole) are the best. The bacterial soft rots on the other hand will not respond to any of the readily available sprays.

Control of all of these diseases, including the bacterial diseases, can be achieved by **the cut and destroy approach. JUST USE YOUR SECATEURS!** This has to be the main control strategy for the home gardener. Whenever you are walking around your garden carry a pair of secateurs in your hand. This is the cheapest, easiest, and in the majority of instances, the most effective method of pest control.

Thrips, like mites are also too small to be seen with the eye and are only detected when symptoms occur. The difficulty in controlling thrips is because most of the sprays available only control the adults. As eggs hatch out the population rapidly returns to the original level.

As we have had a recurring thrip problem, over the past few years, on the *Mesua ferrea* trees in the Botanic Gardens, it was decided to study the problem more closely to see if we could understand the reason why.

Each morning young leaves were collected and, using a microscope because the thrips are too small, we counted the number of active thrips and live eggs on these leaves.

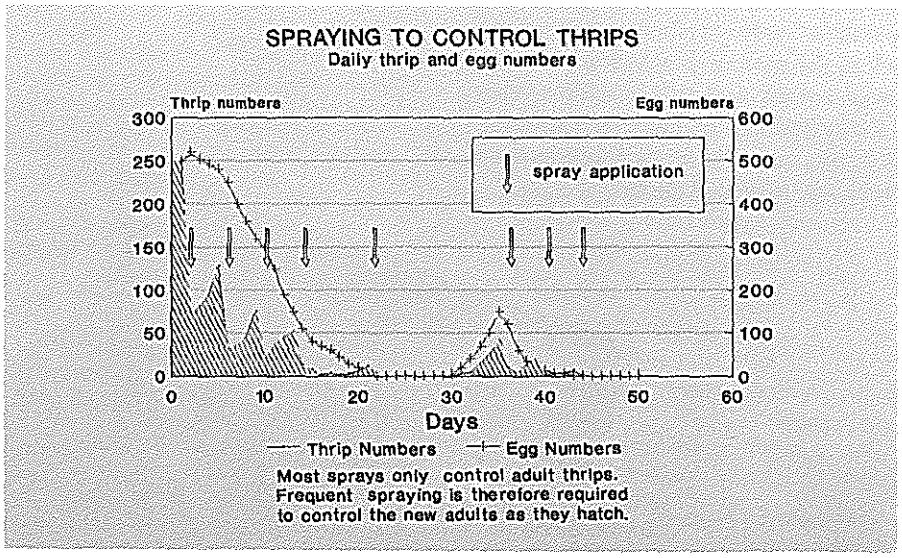
Following the first spray we were surprised and somewhat disappointed to find that there were still live thrips on the leaves, even progressively more surprised over the following days as the population of thrips rose rapidly. Following subsequent sprays a similar pattern occurred. Encouragingly, each peak was lower than the previous.

There had been a large number of eggs laid on the emerging leaves, and this reservoir was being depleted as each batch of thrips hatched out following the succeeding sprays. What had become apparent was that the infestation would not be controlled until all the eggs had hatched and the emerging thrips killed. It took five applications of spray to achieve this control.

As subsequent flushes of new leaves appeared - the first only five days after we had stopped spraying, the process of infestation followed by frequent sprays was repeated. On the second occasion, however, control was achieved with three, rather than five, sprays.

For both thrips and mites, which are very small and usually detected because of the symptoms that they produce, this is an important procedure to be followed for effective control. It is not sufficient to apply only one spray and expect it to do the job.

For most pests and diseases in the home garden, however, the best method of control is to **"cut and destroy"** using secateurs.



The Joy of Flower Arranging

With Mrs Kim

Equipped with our vases, pinholders, scissors and pails of water, members of the National Parks staff gather in nervous anticipation — those of us who are novices. We are now in our fourth ikebana lesson with founding president of the Singapore Sogetsu Association, Mrs Kazue Kato Kim.

Mrs Kim began the formal study of ikebana as a young girl in her native Japan. After the war she studied at Tokyo's Sogetsu School where she was encouraged to explore styles and materials with freedom. Since 1957 as a young bride in Singapore, she has been teaching the Sogetsu style using the plant materials that grow well in our climate. She has received the highest commendations from the late Grand Master of the Sogetsu School, Mr Sofu Teshigahara, and over the years has won many prizes in Japan for her distinctive tropical creations.

Mrs Kim bows low as she enters the room and with characteristic deftness moves to sketch the day's lesson and then proceeds to the arranging. First shin at 15 degrees, then soe at 75. It all appears so easy, that is until the students have their turn.

Gladiolus and Sansevieria in an example of variation #2 upright style

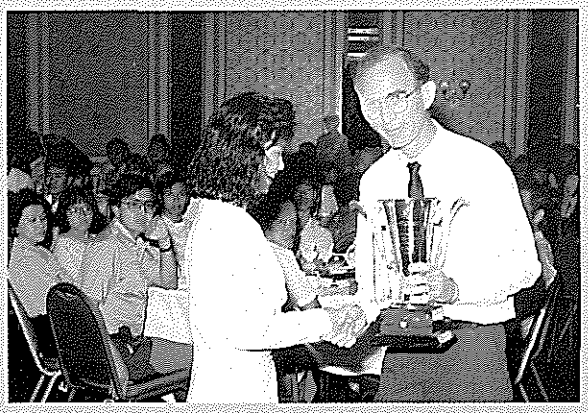
We struggle with plant parts as if they are uncooperative building blocks rather than flower and leaf. To bolster our flagging spirits and loosen our fingers, we offer each other helpful suggestions and always encouragement. Then when we have given our creations their final nudges and twists, Mrs Kim comes along to add the finishing touches. An adjustment here, a leaf folded and pinned there, and VOILA! Mere flowers are transformed into works of art.

Never mind a little smudged pride. We are learning through practice the fundamentals and basic styles of the Sogetsu tradition, plus a whole new vocabulary to express such concepts as harmony, honesty, hope.

Mrs Kim adding the finishing touches with l to r, Ms Woon, Ms Whang, Ms Marican and Ms Fong

OSSEA AWARDS

Singapore Botanic Gardens took four cups in this year's Orchid Society of South East Asia Singapore Orchid Show 1990 held at the Gardens' Orchid Enclosure. *Dendrobium* Khunying Boonruen won the Quek Kiah Huat Challenge Cup for the best local Dendrobium, the John Laycock Challenge Cup for the best local hybrid and the George C.C. Chan Challenge Cup for the best originator of the best local hybrid. The Caltex Challenge Cup went to the Gardens *Paphiopedilum* Shireen for the best *Paphiopedilum*. Assistant Horticulturist Ms Whang Lay Keng is pictured here receiving the George C.C. Chan Challenge Cup from OSSEA Committee member, Mr Harold Johnson.



Care for Nature

Clean and Green Week

Students from 25 schools and an entourage of dignitaries with their staff, nature enthusiasts and the press took to Bukit Timah Hill on 7 November in an upward climb for nature.

Organized by the Ministry of the Environment and the National Parks Board and sponsored by Hongkong Bank, the Nature Trek was one of the major events in this year's Clean and Green Week. All agreed it was especially successful thanks to the spirit of congeniality and combined energies of the participating organizations.

The morning was cool and the forest, welcoming. 125 students, most of them on their first visit to the Nature Reserve, began arriving at 7:30. They were divided into small groups and assigned guides, all volunteers from the National University Departments of Botany and Zoology, the Malayan Nature Society and the National Parks Board.

As part of the educational programme, Hongkong Bank sponsored the placement of 25 interpretive plaques to identify plant species found in the Reserve. These, along with the HongkongBank-sponsored trail maps, provided the students useful information about Bukit Timah Nature Reserve.

Dressed in fresh Care-for-Nature t-shirts and armed with their worksheets, they set off at a brisk pace toward the summit. Along the way, their attention was drawn to the newly installed plaques describing some of the more interesting forest trees. *Artocarpus elasticus,* they learned for example, displays leaves of two different shapes and its cream yellow fruits are popular with monkeys. Jungle folk make many uses of the bark of the tree — for clothing, blankets, basket linings, house walls and string. By referring to the illustrations on the plaque, the students were able to find plant specimens of leaves and fruits of *Artocarpus elasticus* on the ground.

Dr Lee Boon Yang delivering his keynote address

On the upward trail

At the summit, the officials planted four young indigenous saplings native to the forest in a reforestation ceremony following speeches by Mr Richard Hale, Chief Executive Officer of Hongkong Bank, Dr Tan Wee Kiat, Executive Director, National Parks Board, and by Dr Lee Boon Yang, Senior Minister of State for National Development and Home Affairs. The species planted were *Dyera costulata* (Jelutong), *Shorea ovalis* (Meranti kepong) and *Dipterocarpus caudatus* (Keruing gasing).

Addressing the students gathered round the summit hut, Dr Tan Wee Kiat said, "The schools' participation in today's activities will help prepare our younger generations to be future caretakers. Ultimately it will be up to you to protect what remains of our Nature Reserves. You, in turn, must help to make your parents' generation realise that the existence of the natural flora and fauna of Singapore, which we take so much for granted, will not endure without positive action."

In symbolic affirmation of Singapore's commitment to its nature reserves, the guests witnessed the unveiling of a plaque of *Shorea curtisii* wrapped in a Christmasy package of red and green. Then the VIP guests took a guided tour along Ginger Walk noting some of the more interesting features of the forest.

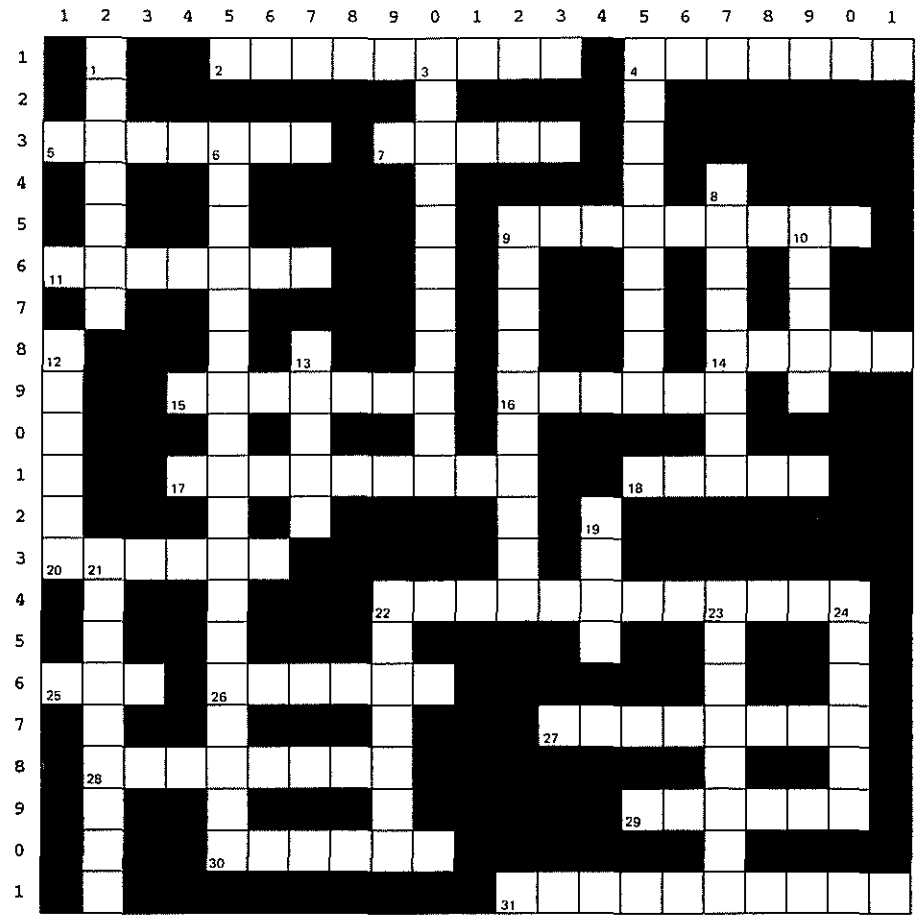
Finally Dr Lee Boon Yang saw the students and their guides off on a Nature Trek-Nature Trail Competition that lasted until the afternoon. The teams took various paths into the forest on their tours of discovery. One team, after listening to the "music of the forest" supplied by the cicadas, were excited to find a skeleton of the insect, which they delightedly showed to the SBC cameraman.

Upon completion of their Nature Trek, the students were given as a final challenge a crossword puzzle requiring the use of key words from their forest lesson (see page facing). Prize packets of books related to the natural environment were awarded to the winning schools for their libraries. The first prize of $600 went to St Nicholas Girls' School who managed to complete the crossword puzzle without error.

Congratulations to St Nicholas and to all the schools that exhibited such enthusiasm for the day's Care-for-Nature programme. May your talents and those of your generation be used to further the cause of conservation in Singapore and throughout the world.

Care-for-Nature Crossword

Bukit Timah Nature Reserve



By Chee Kiat and Jennifer Ng

DOWN

1. You don't normally see them in the day; cause uneven holes on the leaves.
3. Looks just like twigs.
4. Strikes on tall trees.
6. The Nature Reserves are managed by this statutory board which was formed on 6 June 1990. The Board also manages the Singapore Botanic Gardens and Fort Canning Park.
8. Climbing amphibian.
9. Without them, these giant trees would topple.
10. Big woody climber.
12. Cane.
13. Build mud or paper nests.
19. Found on the underside of the fertile frond of a fern.
21. One of the world's largest moths.
22. This activity is prohibited in the Nature Reserve.
23. A fern which has the species name, 'singaporeana'.
24. Apa Apa, Ha Ha.

ACROSS

2. Term is used to refer to the great variety of species in a population, which diminishes with the extinction of every species.
4. Crusts on rocks and tree trunks.
5. Malay name of a tree. A district in Singapore is named after this tree.
7. A ferocious animal which used to haunt the Reserve.
9. Brilliant blue, flutters and feeds on bird droppings.
11. Recycles wood cellulose; a cleaner of the forest; not an ant but more related to cockroach.
14. Mushrooms.
15. Greyish brown, tail longer than its body; a common companion.
16. Friendly officer who patrols the Reserve.
17. Plants which anchor themselves to other plants for support, water and nutrients.
18. Found on the sides of drains and rocks; often green and slimy, and a nutritious diet for the snails.
20. Care for _____.
22. Careful management of our natural resources without causing the extinction of any plant or animal species.
25. Liquid substance that oozes out from the trunk when cut.
26. Flowers.
27. Pronounced leaf apices to drain off excess water; possessed by leaves of many rainforest species.
28. Fish Eyes.
29. Most common dipterocarp; signature tree of Bukit Timah Nature Reserve.
30. A common resident with a metallic sheen to its plumage; feeds on insects.
31. Genus name for the Jackfruit and Chempedak too.

In Memoriam

PROF ERIC HOLTTUM

It is with great sadness that we report the death of our long-time friend and supporter, Richard Eric Holttum. Prof Holttum, former Director of the Singapore Botanic Gardens (1925-1949) and first Professor of Botany at the University of Malaya, Singapore (1949-1954) died peacefully in London on 18 September 1990.

Prof Holttum was born at Linton, Cambridgeshire, England in 1895 and studied botany at Cambridge. In 1921 he was asked to accompany Prof A C Seward, the distinguished palaeobotanist, on an expedition to West Greenland. The following year he was invited to take up a post in Singapore as Assistant Director, Gardens Department, Straits Settlements (Singapore, Malacca and Penang) and in 1925 succeeded Mr I H Burkill as Director until 1949.

During his term of service, Prof Holttum organized many of the plant collecting expeditions to the Malay Peninsula, Sumatra and Borneo, adding a tremendous amount of knowledge to the flora of the region. Details of his travels are recorded in the Cyclopaedia of Collectors in the first volume of *Flora Malesiana* (1950), p. 239.

Platycerium holttumii in the Plant House Annexe

Prof Holttum's keen interest in tropical horticulture and botany focused particularly on ferns, bamboos, gingers and orchids. When the Malayan Orchid Society (now the Orchid Society of South East Asia) was founded by John Laycock in 1928, he was invited to join as one of its earliest members. Prof Holttum was made the patron of the Singapore Gardening Society when the latter was established in 1937. He laid the foundation of orchid breeding in the region by hybridizing free flowering orchid species and by starting orchid propagation in flask culture in 1928. Through his successive raising of orchid seedlings, numerous hybrids were produced, particularly in the genera *Spathoglottis, Arachnis, Renanthera, Vanda* and *Phalaenopsis*.

Professor Holttum, 1954

He contributed many articles on gardening to the Malayan Agri-Horticultural Association's Magazine for well over 20 years and was himself the editor of the publication for a long time. A prolific writer, he is best remembered

Arachnopsis Eric Holttum, one of numerous plants named after Holttum

for four books on horticulture and botany: *Gardening in the Lowlands of Malaya, Plant Life in Malaya, Flora of Malaya, Vol I Orchids and Vol II Ferns.* The first book is an essential guide to local plants for all gardening enthusiasts. The second is a good introduction to Malayan plants and the last two volumes continue to be popular reference books on ferns and orchids of Malaya and Singapore.

Holttum retired as Director of the Singapore Botanic Gardens in 1949 and was asked to establish the first Department of Botany at the newly formed University of Malaya in Singapore. He held this post until 1954 when he returned to England. Since then, the Royal Botanic Gardens at Kew was his second home. There he worked tirelessly on the taxonomy and systematics of ferns and contributed the definitive work on *Pteridophyta* in the *Flora Malesiana* project.

Prof Holttum's enthusiasm and dedication to his research continued at Kew despite his failing health. His death marked the end of a long and fulfilling life, a distinguished career and a mutually beneficial association of nearly seven decades with the Singapore Botanic Gardens.

Photo contributions for this issue: Mr Syed Yusof Alsagoff, Mr Jonathan Choo, Mr Jun-ichi Inada, Mrs Jennifer Ng, Dr Pim Sanderson, Mr Tay Eng Pin.

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