

Gardenwise

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Cover photo of the Gardens' forest fringe showing from right native monumental species (*Cyathocalyx sumatranus*, *Millettia atropurpurea*, *Shorea leprosula*, *S. gratissima*, *Litsea elliptica*, and *Castanopsis schefferiana*). Photo by Marlane Guelden

DIRECTOR'S MESSAGE

T

he dedication of the centre for visitors at the Bukit Timah Nature Reserve marked the second birthday of the National Parks Board. Caught up in the intensifying whirl of activities associated with the development of the Board's infrastructure, manpower and programmes, the staff rarely has had the time to sit back and reflect upon just how far we have come in two short years.

It took a visitor returning to the Singapore Botanic Gardens following a previous visit a year ago to place things in perspective. "You guys don't allow grass to grow under your feet!" Strange statement to make about people looking after Singapore's national parks and nature reserves. But it did point out that even within a single year the changes wrought have been striking.

This visitor was not merely describing the fresh earth works at the northern Bukit Timah Core of the Botanic Gardens. The statement took in a whole list of activities which included the following: the restoration of the classic 19th-century bungalow, home of the former directors of the Gardens, Burkill Hall; the landscaping works at Palm Valley; the on-going

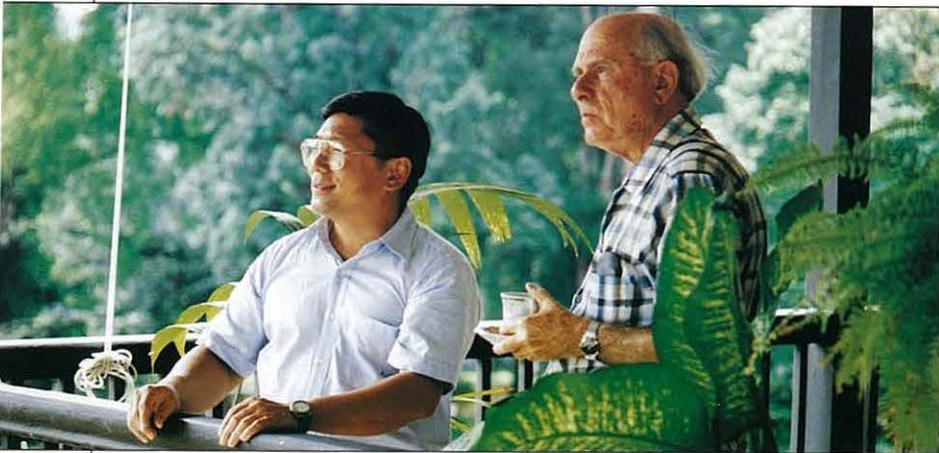
roads which had formerly bisected the Gardens. The incorporation of these road segments and Dalvey Valley makes possible the merger of the northern and southern halves of the Gardens. It also provides a new area for the construction of proper gateway facilities for visitors to the Singapore Botanic Gardens without sacrificing original garden space.

The above covers what had been accomplished in the past year in the Singapore Botanic Gardens alone. At Fort Canning Park, the rejuvenated Fort Canning Centre is generating a welcome pulse of life to the Park. The programmes of the resident performing arts groups, the Singapore Dance Theatre and Theatreworks, have brought more visitors to the park in the past year than in several past years combined. The new shelter in historically authentic style at the keramat accords dignity to the reputed tomb of Iskandar Shah, while the Far East Command Headquarters of World War II, the 'Battlebox' under the Hill, was opened for the first time ever to civilians of Singapore. A new parking lot accommodates the increasing vehicular traffic to the Park, and the construction of a 19th century 'walk of history' is currently in progress.

Our birthday present from NParks to Singapore at the Bukit Timah Nature Reserve houses facilities that are integral to our programme for raising the awareness of our people to the importance of our natural legacy and the need to protect the diversity of our native wildlife species and communities. Dedicated by Mr. S. Dhanabalan in his last official function for NParks as Minister for National Development, the Centre features an exhibit on the current wildlife in our nature reserves besides providing much needed visitor amenities. The tropicalised building with its sheltering eaves is based on the indigenous architectural style. It will serve as the starting point for organised forays into our nature reserves. It is also tangible proof of NParks' commitment to its role as steward of the gazetted nature reserves covering 3% of land-scarce Singapore.

Under the guidance of the Second National Parks Board established in June, 1992, the staff may still not permit "grass to grow beneath their feet" as they strive to bring to completion the many exciting projects in our national parks and nature reserves. But what will grow for certain is the capacity and the capability of the staff to realise the potential of our parks as prime resources for recreation, conservation, research and education.

Dr Tan Wee Kiat
Executive Director



Former Director of the Gardens H M Burkill (1957-69) and Dr Tan on the veranda of Burkill Hall. On 1st October Mr and Mrs Burkill returned to Singapore and the Gardens to celebrate with us the dedication of Burkill Hall, his birthplace. The Hall was named in honour of Mr Burkill and his father I H Burkill, Director of the Gardens from 1912 to 1925.

Above: The 1866 colonial bungalow restored

construction of the orchid nursery and the orchid display area at the new Orchid Garden; the construction of the bungalow-style electrical substation along the newly re-aligned Cluny Road that will provide power to the Gardens and its environs; the planting of hundreds of new trees in strategic locations in the historic Tanglin Core to shield the rising towers of the city from view from within the Gardens; the donation of a beautiful new sculpture by the Swiss community in Singapore; the renovation of an old garage into a handsome Gardens landmark; and most striking of all, the expunction of sections of Cluny and Dalvey

*Leslie Choudhury,
Bernard Harrison,
Ho Cheek Sun and
Bernard Tan*

*Join
NParks' Board*

The National Parks Board is pleased to welcome four new members who have been appointed to serve on the Board for the next two years. We welcome them both as individuals and as representatives of widely ranging fields of endeavour whose diversity will serve to broaden the Board's vision and help us manage and promote the National Parks and Nature Reserves.

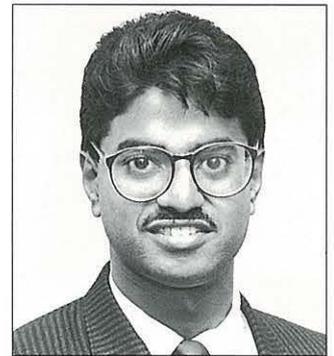
Mr Leslie Choudhury, General Manager of Tour East Singapore (Jetset), has worked in the travel industry in Singapore and the USA for nearly 10 years. Under his management, Tour East won STPB's "Travel Agency of the Year" Award in 1990.

Mr Bernard Ming-Deh Harrison has been with the Singapore Zoological Gardens for 20 years and its Executive Director since 1981. His expertise is sought in the design of other zoological gardens in the region and he is well represented in the scientific publications devoted to the design and educational uses of the zoo. Apart from professional memberships, he is a member of the National Council on the Environment.

Mr Ho Cheek Sun is Deputy Secretary for the Ministry of National Development. He comes to the Board with a wide range of experience in business and government. He has served as director or member of five statutory boards, and his ministerial postings have included Ministry of Defence, Finance, Communication and National Development, which he joined in 1985.

Dr Bernard Tan Tiong Gie is Associate Professor in Physics and Dean of the Science Faculty at the National University of Singapore since 1985. He holds several board directorships and has been recipient of both the Public Service Medal and the Public Service Star. He is also a Chavalier dans l'ordre des Palmes Academiques.

We wish to take this opportunity to express our sincere appreciation to those retiring Board Members, Dr Leo Tan Wee Hin, Mr Joseph Chew Khiam Soon, and Dr Chua Sian Eng, for their valuable guidance and contributions during the first crucial years of the Board's development.



Mr Choudhury



Mr Harrison



Mr Ho



Dr Tan

APPLAUSE ALL 'ROUND

Our National Day Award Winners

New Board Member, Mr Ho Cheek Sun, Deputy Secretary for National Development, received the Public Administration Silver Medal during the last National Day celebrations. Mrs Tan-Yan Oi Chee, serving the Board as Assistant Director/Corporate Services since 1989 after 10 years with Ministry headquarters, received the Efficiency Medal.

Mr Sambohari bin Haji Said, Senior Leading Hand, received this year's Long Service Medal. Sambohari has been employed at the Botanic Gardens since 1960. Last year Senior Foreman Gardener, Mr Maulud bin Elin, received the Long Service Medal. His date of first appointment was in January 1958. The National Parks Board is very pleased that their long and faithful service has received the public recognition it deserves.

New Staff Member Joyce Teo Honoured at Graduation

Ms Teo Chew Bee Joyce, Assistant Research Officer, Orchidology, received the Diploma in Biotechnology from the Singapore

Polytechnic in July, 1992. Ms Teo was chosen the student representative to address the Assembly during the graduation ceremony at Kallang Theatre.

Joyce joined the NParks' staff in June 1992 after having completed her major research project in *Torenia* 'Little Gem' tissue culture. She says that she finds the complexity of the orchid breeding programme very challenging.

What does she especially like about the job?

'All my classmates are stuck in bio-tech labs,' says Joyce, 'and part of my job takes me outdoors into the Gardens, with a chance to learn more, not just do laboratory work.'

Visitors to the Nature Reserves in Singapore often go there as an outdoor pursuit, away from the bustle of city life. Students frequent the Reserves as a destination to break away from the classroom routine after examination time. To gain fully from what the Nature Reserves have to offer, one must come prepared or at least come with the right frame of mind. Teachers who lead students in such outdoor activities may need guidance in deriving the greatest educational benefits from 'mother nature'.

NParks' official opening of the Nature Reserves Visitor Centre on 6 June 1992 signaled a whole new approach to excursions in the Nature Reserves — one that emphasises orientation, understanding and preparedness.



Tucked gently at the foot of Bukit Timah Hill, the Centre beckons visitors to Singapore's oldest Nature Reserve. The generous use of timber and the wide verandah all round make the Centre an inviting and friendly building. Besides providing the basic public conveniences of toilets, telephone and carpark, the Centre plays a vital role in giving information and interpretation to anyone interested in our rich natural heritage.

All the displays and exhibits are located at the exhibition hall on the second storey. Each corner of the hall is devoted to specific topics such as rainforest characteristics, nutrient cycling, animal diversity, and man's relationship with the forest. Visitors are introduced to the history and importance of the Nature Reserves and the intricate relationship of our plants and animals, be they birds or bees. Those with an interest in aquatic life may catch a glimpse of our freshwater habitat and its native fishes in the aquarium.

Should there be a need for talks, classroom discussion or an audio-visual presentation, a seminar room is there for such purposes. Housed under one roof is the Rangers' Office, a preparation room, stores and workshop for the maintenance staff of the Nature Reserves. A vending machine with drinks has been installed to quench the thirst of weary hikers.

With the increasing interest in nature appreciation amongst Singaporeans, the Visitor Centre will contribute to the education and enjoyment of thousands of visitors who will pass through its doors in the years to come. Hopefully, public awareness and a better understanding of our fragile environment will contribute towards the conservation of what little natural area is left on this small tropical island.

Tay Eng Pin
Senior Research Officer, Taxonomy

THE NATURE RESERVES' VISITOR CENTRE



Minister for National Development Mr S Dhanabalan officially opened the Visitor Centre on 6th June. At the model of Bukit Timah, l to r Chairman of the Board Mr Tan

Keong Choon, Deputy Chairman Mr Ng Kiat Chong, new Board Member Mr Ho Cheok Sun, Mr Dhanabalan, Dr Tan Wee Kiat, Mrs Dhanabalan and Mrs K C Tan.

SURVEY OF THE NATURE RESERVES

A project is being conducted to document the present state of the physical and biological features of the Nature Reserves. Comprehensive data on topography, soil types, drainage patterns, diversity and distribution of plant and animal life, and so forth are being gathered through aerial and ground surveys. The information is necessary for formulating management strategies to better protect the rich flora and fauna and for masterplanning for appropriate recreational and educational facilities for the public.

The project is commissioned by NParks with seed money of \$500,000 provided by Government and another \$500,000 by a private donor. Personnel carrying out the study are from NParks, the National University of Singapore's Botany, Zoology and Geography Departments and a private consultant, Mr Wong Yew Kwan.

Phase I of the project is expected to be complete in March 1993 and will yield a macro view of the impact of past human activity and developments affecting the Nature Reserves, the distribution of forest

types, and physical features. Phase II will begin in April 1993. Taking about 3 to 5 years, this phase will involve a detailed inventory of flora and fauna, populations and distribution of plant and animal communities and mapping. Data will be stored in a geographic information system.

Through excision for developments, the gazetted Nature Reserves have decreased in area from 3800 ha in 1951 to 2795 ha today. Though still rich in native plant and animal life, the boundaries of the Reserves are today fragmented by developments, and certain disturbed areas require reforestation. NParks's mandate as Government's trustee for the Nature Reserves is to actively and properly manage Singapore's natural heritage and to increase public awareness of this asset. This project will provide base line information for masterplanning and formulation of a management plan for the Nature Reserves.

Leong Chee Chiew
Deputy Executive Director,
Director (Research)



NEW RANGE FOR SHOREA CURTISII ON SINGAPORE ISLAND

When Symington wrote his time-tested manual on the Dipterocarpaceae (Symington, 1942), he reckoned that *Shorea curtisii* (Seraya) was endemic to the Malay Peninsula, including Singapore. Meijer (1964) states that the species also occurs in North Borneo, and Ashton (1982) records its occurrence in Sumatra.

In the Malay Peninsula, Seraya has an interesting distribution pattern. It occurs inland on the Main Range and in other hilly and mountainous habitats, commonly at altitudes ranging from about 300 m to about 800 m asl, although in Kerling, in the State of Selangor, it occurs at about 150 m asl. It is completely absent in the Lowland Dipterocarp Forest, only to reappear again at low altitudes in the Coastal Hill Forest. On Pangkor Island, on the west coast of the Malay Peninsula, for example, it occurs at about 150 m asl, while in Cape Richado, another coastal hill, it occurs at about 20 m asl.

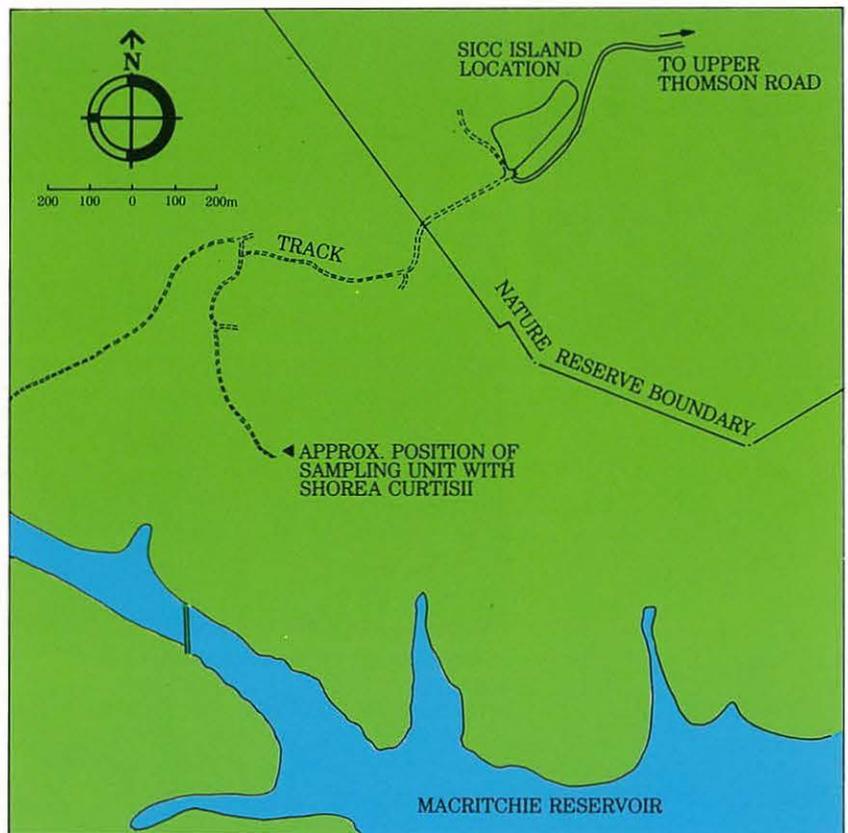
In Singapore we have always believed that Seraya occurs only in the forest at Bukit Timah, which, according to Symington's classification of Malayan Forests (Symington, *ibid*), should also be considered as a Coastal Hill Forest. On Bukit Timah one starts to find it at an elevation of about 80 to 100 m asl. We were therefore totally surprised when we stumbled upon several large trees of the species. We were enumerating the trees of one of the sampling units in our current survey of the tree flora of the Nature Reserves within the Central Catchment Area (commissioned by the National Parks Board). In this survey we make use of aerial photographs to delineate structural forest types. The discovery was made in one area with Forest Type 4, forests with the largest tree crowns and with uniform cover as seen from the aerial photographs.

The approximate position of the sampling unit is given in the sketch map. The stand of trees stretches from near the top of a broad ridge, sloping eastward, somewhat gradually at first and then sharply into a ravine and stream. A topo map of the area indicates that the sampling unit is located at approximately 35 m asl. In specific composition, foresters would classify the stand as typical Lowland Dipterocarp Forest.

In the sampling unit with four 0.05 ha circles, we netted in 3 trees, the largest of which has a girth of 267 cm above buttress; the other two have girths of 216 cm and 210 cm. Another tree of about the same size was dead. It could have died recently as the bark was still intact. So far as we could see, there are no young trees nor saplings of the species at the site.

Complete identification of the associated species within the sampling unit would take a while, but the sample included large trees of *Dipterocarpus grandiflorus*, *D. sublamellatus*, *Shorea macroptera*, a young *Shorea* which could be *S. bracteolata* and a *Vatica ridleyana*.

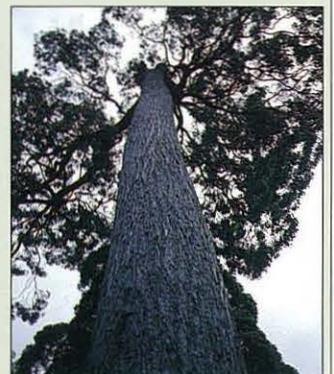
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SHOREA CURTISII (SERAYA)

Seraya is quite easily recognised among the other lofty trees in the forest by its massive columnar trunk and distinctive bark showing deep vertical fissures and ridges. The winged fruits, typical of the dipterocarp family, resemble shuttlecocks that spin as they fall, and currents of air may disperse them over long distances. Seraya fruits every 5 to 10 years after a severe drought, and its growth rate has been calculated at 59 years to attain about 2.1 m girth. It produces dark red meranti timber.

Normally seen as the predominant species on ridges 300 to 800 m above sea level in Peninsular Malaysia, this magnificent species occurs well below this range in Singapore's Nature Reserves. It is one of the very few forest trees that can be identified from afar by its pale bluish crown, like a vast head of broccoli in the distance.



VIP ORCHIDS AT THE SINGAPORE BOTANIC GARDENS



Dendrobium Sok Hiong Wee

The naming of VIP orchid hybrids in the Singapore Botanic Gardens began in 1957. The first VIP orchid was *Aranthera Anne Black*, named after Lady Black, wife of the Governor of Singapore, Sir Robert Black. Since then, more than 70 hybrids have been named after dignitaries who have paid official visits to the Botanic Gardens.

These VIP orchids are the fruits of a breeding programme which was initiated in 1928 by Prof Holttum, Director of the Gardens from 1926 to 1949. The orchids named include the Yang di-Pertuan Agong of Malaysia in 1964, Mrs. Indira Gandhi the Prime Minister of India in 1968, Queen Elizabeth of England in 1972, Mrs. Margaret Thatcher in 1985, Her Majesty Paduka Seri Baginda Raja Isteri Pengiran Anak Saleha of Brunei in 1990, and more recently Mr Frederik Willem de Klerk, President of South Africa.

Featured here are four of the newest and most noteworthy VIP orchids:

Dendrobium Khunying Boonruen, *Dendrobium Ryzhkova*, *Dendrobium Sok Hiong Wee*, and *Dendrobium Saleha*.

Dendrobium Khunying Boonruen was named after the wife of His Excellency Maj-Gen Chatichai Choonhavan, the Prime Minister of Thailand on his visit to the Botanic Gardens in 1988. This excellent hybrid is the result of a cross between two outstanding parents, *Dendrobium Sirima Bandaranaike* and *Dendrobium Pink Lips*. The stems (pseudobulbs) resemble a collection of canes and reach a height of 80 to 90 cm. The plant blooms throughout the year when grown under full sun. During peak flowering seasons, each plant can bear more than 10 upright sprays. Each spray can easily carry more than 30 spirally arranged flowers. The flowers vary in size and colour in a range of pinks and purples. The petals of the flower are curly,

resembling the horns of an antelope. This superior hybrid won two major trophies in the 1990 Orchid Society of South East Asia (OSSEA) Orchid Show — the John Laycock Challenge Cup for the best local hybrid and the Quek Kiah Huat Challenge Cup for the best local *Dendrobium*.

Dendrobium Sok Hiong Wee was named after the First Lady of Singapore. This lovely hybrid is the result of the cross between *Dendrobium Garnet Beauty* and *Dendrobium Premier Yusof*. Offspring from this hybridization produce flowers that display an unusual and strikingly attractive range of colours. One choice clone, 'Premier' produces more than 24 flowers on sprays averaging more than 50 cm long. The sepals and petals are yellow at the base, gradually becoming suffused with reddish orange to the tips. The broad lip is reddish orange with a yellow throat.

Dendrobium Ryzhkova was named after Mrs. Lioudmila Ryzhkova, wife of the Prime Minister of the previous Union of the Soviet Socialist Republics in 1990. This strong and vigorous hybrid resulted from a cross between *Dendrobium Garnet Beauty* and *Dendrobium Fran's Twist*. It thrives well under full sun. Each spray can reach a length of 50 cm, bearing more than 30 well displayed flowers. Petals and sepals have excellent texture and substance. Petals are curly and beetroot purple with an attractive glossy finish. Sepals are purple but gradually becoming light yellow towards the base. The flower also possesses a showy lip which is violet purple. *Dendrobium Ryzhkova* won a trophy for the best *Dendrobium* cut flower of the show in the 1991 Japan Grand Prix International Orchid Festival.

Dendrobium Saleha was named after the Wife of Brunei's Sultan Hassanah Bolkiah

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The non-dipterocarps include large trees of *Dyera costulata* (Jelutong), *Dialium platysepalum* (KerANJI), *Parartocarpus bracteatus*, *Artocarpus dadah* and *Planchonella maingayi*. The main storey and under storey species include *Gluta wallichii*, *Santiria apiculata*, *S. griffithii*, *Canarium littorale* and several species of *Xanthophyllum* and *Madhuca sericea*. Members of the Myristicaceae and Annonaceae are also present.

In the shrub layer, the palm *Licuala ferruginea* and the woody shrub *Agrostistachys longifolia* are prominent. The survey is ongoing and there are still some areas with phototype resembling that of the stands of forests just described. Only time will tell if we will find more specimens of Seraya. Two such areas which we already have sampled, although not containing Seraya, are nevertheless exciting in that they are typical Lowland Dipterocarp Forest with species which we have just mentioned but in addition contain *Swintonia schwenckii*, *Hopea mengarawan*, *Shorea gibbosa*, *S. gratissima* and *S. parvifolia*.

As we all know, the forests within the Central Catchment Area are mostly secondary

forests at various stages of secondary succession. Such stands of dipterocarp forests which are still relatively undisturbed are indeed valuable national assets and we should manage them properly to ensure their preservation and survival.

Although there is no way of proving it now, Seraya might well have occurred on such hills as Mount Faber, Pearls Hill and Fort Canning Hill in Singapore, judging by the present find and by habitats like Cape Richado and Pangkor Island which carry this species. Our Herbarium collections, however, do not have specimens collected from any of these Singapore localities.

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Wong Yew Kwan
Ali Ibrahim
September, 1992

in 1990. It is the progeny of a cross between *Dendrobium* Mie Fukuda and *Dendrobium* Mary Trowse. It is a robust and free flowering hybrid. Each spray bears more than 20 flowers. Petals are twisted and have a tone of rich brown and gold. Sepals are yellowish brown. The overall colour of the lip is similar to the petals except that its centre is white.



Dendrobium Ryzhkova

THE RHS ORCHID INFORMATION SYSTEM

The Royal Horticultural Society (RHS) Orchid Register, an international agent through which orchid hybrids are registered, has been serving orchidists throughout the world since 1856. Since then, more than 80,000 hybrids have been registered.

Information about each RHS registered orchid hybrid may be found in the Sander's List of Orchid Hybrids, first published in 1906 by Frederick K Sanders. Together with supplements and addenda, the list provides a complete, systematic listing of all the hybrids. The most recent 5-year addendum was produced in 1990.

The Sander's List contains the names, parentage, registrants and dates of the 80,000 orchid hybrids registered from 1856 to the end of 1990. In order to find the relevant information, one has to go through book after book and page after page of data. The task is not only time-consuming but also tedious.

After many years of diligent work, the first version of the RHS Orchid Information System, a complete computerised Sander's List of Orchid Hybrids, became available to the orchid world last year. The production of the RHS Information System was made possible through the efforts of four parties: the RHS, three Australian computer experts, the American Orchid Society and Singapore Botanic Gardens.

The RHS has provided the records, information and data, and the Australians, the computer expertise. The American Orchid Society has been responsible for marketing the product. Singapore Botanic Gardens made the project happen by helping to coordinate these contributions and by forging a close collaboration and cohesion among the participants. The Gardens thus has played a pivotal role in the development of the RHS Information System and in its continued operation and accessibility to the Orchid World.

The System comes in a compact disk (CD) and is designed to convert the orchid registration data into the information and answers needed. It does this efficiently, rapidly and by interaction with the user. The System is intended to assist the serious orchid grower, especially those who are producing new orchid hybrids and who are interested in knowing the genetic background of the



Dendrobium Saleha I

parents. Compatible with most computers, the System permits rapid access to a wealth of information. In a matter of moments, one can locate a name, find out the parentage of a hybrid or construct a family tree. Furthermore, the System consists of a picture library which produces beautiful pictures of orchids.

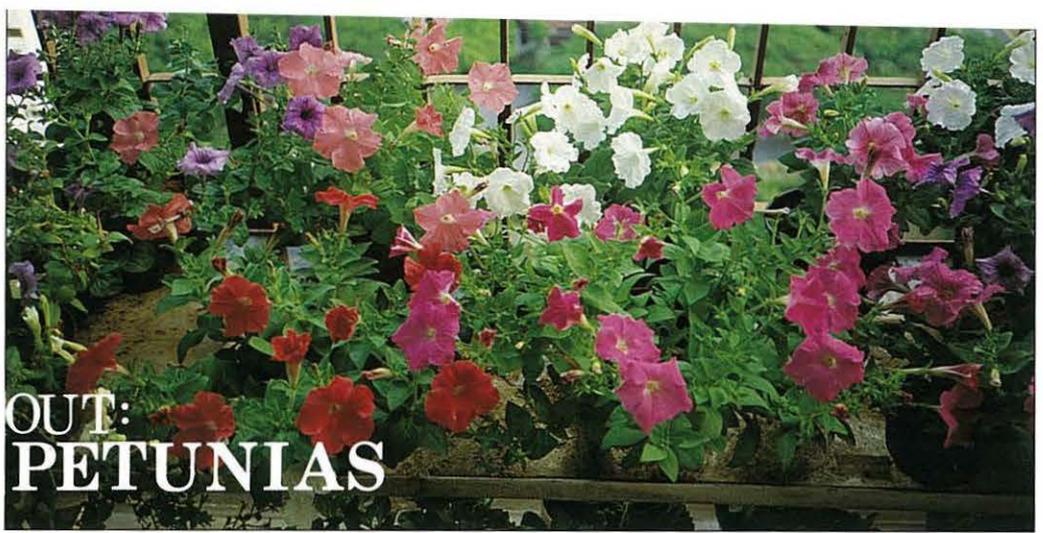
The first version of the system is available for US\$1,280. Anyone who is interested may contact either Mr. Peyton Coffin, Assistant Director for Marketing, or myself at the Gardens.

Dr Yam Tim Wing
Research Officer, Orchidology



Dendrobium Khunying Boonruen

BRANCHING OUT: GROWING PETUNIAS



A multi-colourful display of *Petunia* with matched *Caladium* adds a fresh and zestful touch to the highrise balcony.

The genus *Petunia* consists of forty species which are natives of South America. The ease of breeding has resulted in numerous garden hybrids today, each having its own beauty and form. *P. hybrida*, the offspring that embraces all the varieties is created from two parents, *P. axillaris* and *P. violacea*, both from Argentina.

P. axillaris is a robust, upright perennial with flowers that are white and fragrant. The violet-flowered *P. violacea* is prostrate with rose-red to violet-red flowers.

You can obtain new colours from cross breeding the plants that you have. Start by purchasing a packet of seeds of available varieties in the supermarket's gardening counter or from a reputable nursery overseas. Some varieties have such alluring names like *Petunia* Petticoat, Supercascade Blush, Super Magic Sky Blue, Strawberry Daddy, Crown Jewels, Velvet Carpet, Rainbow and Bonanza. It is always thrilling to see what colours emerge from the packets.

Getting started

Here is what you will need to get started:

- petunia seeds
- Jiffy-7 peat with tray and plastic cover
- planting stick or dibbler
- trowel
- watering can
- 13 cm pots
- saron netting
- burnt earth and potting mix
- fertiliser
- label, pencil and notebook to record growth.

Sowing seed using Jiffy-7

1. Soak the Jiffy-7 with water in the tray for about 15 minutes until it has fully expanded.
2. Scratch 2 to 3 parallel furrows with a dibbler at about 1 cm distance and 3 mm deep.
3. Fold a small piece of paper, and place some *Petunia* seeds in the fold. Deposit the seeds in the furrows making sure they are evenly spread. Cover with the surrounding peat.
4. Label, indicating the variety and date of sowing, and make a record in your notebook.
5. Place the plastic cover over the Jiffy tray.
6. Leave it within close view. A good place might be your study, office or your kitchen.

Monitoring seedling growth

The seeds will start to germinate within two to three days, with or without light. As soon as the first pair of leaves emerge, remove the cover and shift the tray toward more light. Check that the peat does not dry out. Rotate the tray if necessary to prevent the seedlings from bending toward the light. The seedlings are ready for transplanting when they have 2 pairs of leaves.

Petunia goes through various stages of growth. From a weak-stemmed seedling, it soon develops a whorl of leaves with a still very weak but short stem. Very often, the whorl of leaves will topple to one side. It helps at this point to put a layer of soil over the base of the stem in order to stabilise the plant. This may be the most difficult stage of growth. But once this is overcome, the plant grows vigorously sending out branches.

Transplanting the seedlings

The delicate seedlings require a gentle hand in pricking out and transferring them to new soil. As far as possible, prick out some of the peat with the roots, and plant firmly.

The steps are as follows:

1. Place a piece of saron netting to cover the drainage holes before filling the 13 cm pot with potting mix to 2 cm from the brim; tap it to firm the soil.
2. Lift the seedlings from the root zone with some of the peat.
3. Dig and plant the seedlings, several to a pot.
4. Water well using a watering can with a fine hose.
5. Leave the transplanted seedlings under shade for three or four days before shifting them to more light.
6. Water daily.

Choosing correct soil mix

It is worth while to start clean. Buy a bag of potting mix, which usually consists of a combination of sand, peat, perlite, and vermiculite. Mix this with sterilised soil or burnt earth in the correct proportions (2 burnt earth to 1 potting mix) to achieve a well-drained and moisture-retentive balance.

Choosing pots and troughs

Plastic pots are better than clay ones as they are lighter, less cumbersome, and unlikely to break when dropped. Less watering is also needed. Although there are many colours to choose from, the neutral colours like black, white and earth brown are preferred, as they blend well in an interior decor.

All pots come with drainage holes to allow excess water to drain out. Hanging baskets are ideal for displaying petunias because of their trailing habit. For mass colour effect, display them in window boxes, troughs and other suitable planters.

Feeding requirements

Once the seedling is established in the new soil, you may introduce fertiliser to give it a fast start. There are many types of fertiliser in the market today. Check the instructions given, and because the plants are still very small, reduce the dosage recommended. For the busy gardener, a slow-release compound granular fertiliser, like NPK, or an organic fertiliser may be a good idea. Apply fertiliser once a month.

Pruning

To encourage more branching, pinch the ends of the shoots when the plant is about 7 cm high and again when the branching has attained another 7 cm or 12 cm. Train the branches for effective use of space and display.

Flower buds appear at the terminal and axillary shoots. The excitement for the home gardener mounts as he waits for the flower to open!

Propagating by stem cuttings

Petunias can be propagated by stem. Select healthy growing shoots with 3 or more nodes. Insert these cuttings into the soil used for growing petunias, and place the pot under shade until rooting occurs.

Controlling pests and diseases

Petunias are prone to viruses like tobacco mosaic. Affected plants must be destroyed immediately. The common garden pests, like snails, grasshoppers, beetles, whiteflies, aphids, and soil mealy bugs also attack petunias. If these pests are beyond control, a fortnightly spray of a suitable insecticide may be necessary. In case of soil mealy bugs, change the soil to reduce infestation. Occasional drenching of malathion or diazinon is useful.

It takes about 9 weeks for the plant to reach flowering size. Once flowers have started, the plant will flower continuously for close to a year with sufficient light given. With several pots of this lovely plant, you can enjoy magical colours all year round.

HAPPY GARDENING!

Jennifer Ng
Assistant Director (Education)

Growing Petunias is one of a wide variety of hands-on gardening courses offered to the general public for a nominal fee. For details of this and other courses which meet regularly at the School of Horticulture, please phone 4709924.

RESEARCH NOTES: ANGSANA WILT DISEASE

Between January 1985 and December 1990, 811 Angsana trees were removed from roadsides around Singapore following infection with Angsana Wilt Disease. This represented a cost to Singapore of just over \$300,000. In response to the Angsana Wilt Disease epidemic, a project funded by the National Science and Technology Board and Societe Generale de Surveillance (Pte) Ltd commenced on 1 November 1991. The project involves 11 staff from NParks, SGS, the Primary Production Department, and the Parks and Recreation Department.

The aim of the project is to establish the cause of the disease and to formulate disease control strategies to enable the Maintenance Divisions' staff of PRD and other organisations to protect the estimated 20,000 Angsana trees already planted around Singapore.

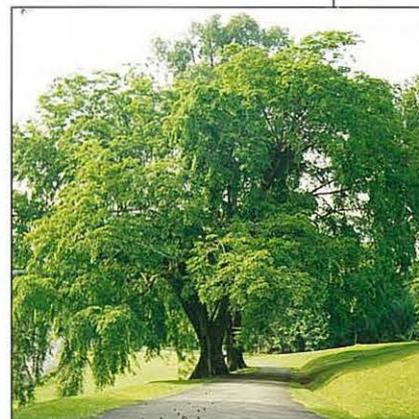
Since the commencement of the project, a fungus called *Fusarium oxysporum* has been shown to be the cause of the disease. This fungus also causes similar diseases in banana, hibiscus, peas and tomatoes. The fungus gets into the food and water transport system of the plant blocking all the tiny vessels. The result is that the plant wilts and loses its leaves just as though it had run out of water. The disease process, from the first signs of infection to the death of the tree, can be as short as five weeks. At the same time we

are studying a small wood boring beetle to see if it is responsible for spreading the disease from tree to tree. Knowing the method of spread is essential before we can formulate control methods.

We have also tested a wide range of fungicides in the laboratory and identified which fungicides are effective against this disease. This is important as it is critical to match the fungicide with the disease. Otherwise control will not be achieved.

For the long term control strategy, we are collecting cuttings from as many as possible of the 20,000 Angsanas growing in Singapore as well as in neighbouring countries and infecting them with the disease. The purpose of this is to screen for possible disease resistant ones. These resistant plants will then be multiplied and used for future plantings to replace the susceptible clones which are currently being used.

Dr F R Sanderson
Plant Health Specialist



A healthy Angsana (*Pterocarpus indicus*) specimen at Gallop Road

Record-breaking crowds turned up for Skyrise Gardens: Plants for Apartments '92, held at the Marina Square Shopping Mall Atrium over the last weekend in May.

This first-of-its-kind plant show for indoor gardeners was designed to bring the garden city indoors—to some 85 percent of Singaporeans living in 625,000 Housing Board homes across the Island. Organised by the Parks and Recreation Department and National Parks Board, the exhibition featured the A to Z of plants and practical, economical plant-care information for high-rise apartment living conditions.

In opening the Skyrise Gardens show, Minister for National Development Mr S Dhanabalan, the Guest of Honour and spearhead behind the event, noted the keen interest exhibited by Singaporeans in using plants to decorate their homes.

"I feel that this interest should be encouraged and sustained," he said. "If the right type of plants are grown and they are skilfully arranged and displayed, plants can do wonders to brighten up homes."

Novice and sophisticated hobbyist alike came to "see and learn" from the exhibits, the

gardening demonstrations, and the landscaped model flats, complete with a comprehensive guide on costs and creation of indoor garden spaces.

The plant doctor and his interns were on hand to "diagnose and prescribe" remedies for sick plants suffering from a variety of unwelcome house guests. And the more seasoned gardeners, members of the Singapore Gardening Society, the Singapore Bonsai Society and the Orchid Society of South East Asia, generously shared advice and tips on plant cultivation, as well as their many years of personal satisfaction in growing and living with plants.

The demonstration sessions spread over the two-day weekend showed how plants can be decoratively arranged, grown hydroponically without soil, shaped into bonsai, made into miniature landscapes or fountains, and kept alive and healthy.

After so much hard work, we were very pleased at the warm reception and the excitement generated by the show. By popular demand, Skyrise Gardens is likely to become a Singapore tradition, so be sure to look for us again in about two years' time.



FIRST SKYRISE GARDENS A SUCCESS

Right: The brightening effect of plants introduced in the home
Below: L to r, Mrs Jennifer Ng, Dr Pim Sanderson, and Mrs Choo-Toh Get Ten staff the plant clinic at Skyrise Gardens.



Fort Canning Revitalised

Since its inception in June 1990, the National Parks Board has been tackling in earnest the mammoth task of revitalising Fort Canning Park. Already significant changes can be seen.

The sacred tomb, Keramat Iskandar Syah, believed to be the resting place of the last Malay ruler of Temasek, now wears a roof of 14th-century Malay design in keeping with its presumed origins. This traditional "pendopo" structure has supports of twenty carved wood pillars with intricate bracings in a fighting cock motif of Javanese origin.

The Fort Gate, a salient reminder of the Fort era, along with the cupolas and cemetery structures in the former Christian Cemetery have been sensitively restored to retain their original character.

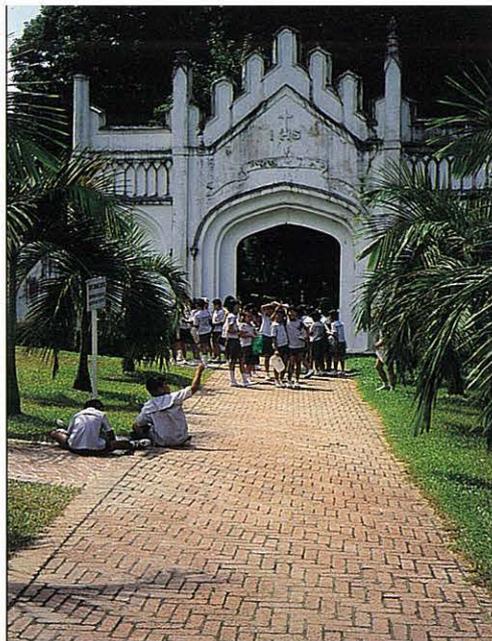
Renovation work has transformed the near derelict Military Barracks (also remembered as "the old squash court") into Fort Canning Centre. The handsome and commanding building was officially opened on 15 June 1991 by Deputy Prime Minister Mr Ong Teng Cheong. It is now the residence of the Singapore Dance Theatre and TheatreWorks, two of Singapore's leading performing arts groups, as well as the National Parks Board's Fort Canning Management.

The Park with its many attractions and verdant areas provides a superb backdrop for the arts groups' performances and activities, which in turn help to generate interest in and enhance visitorship to the Park. The gallery space inside the Centre, its foyers and periphery are now popular venues for corporate and private functions.

The year's event of most relevance to the history of Fort Canning and Singapore was the opening of the Underground Far East Command Centre for the first time to the public, with the accompaniment of an exhibition on World War II staged within to mark Heritage Day 1992. It was here that Lt-General Percival made the crucial decision to surrender to the Japanese during the Second World War.

On 31 January 1992 Minister of State for National Development Mr Lim Hng Kiang officially opened the Underground Command Centre, sometimes referred to as the "Battle Box" or "bunkers". By the close of the event at end of May 1992, some 37,000 visitors had been through the bunkers and exhibition. Their encouraging feedback has prompted the Board to further restore and enhance the bunkers as a permanent anchor exhibit at Fort Canning Park.

Re-grading and re-turfing works have been carried out to improve the greenery and visibility of the Park. Park amenities are being continually added. A new car park near Fort



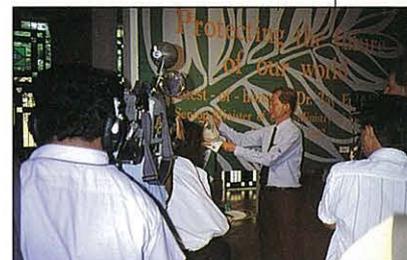
Left and below: Singapore history lessons come to life at Fort Canning's Gothic Arch and cemetery stones



Canning Centre was completed recently to cater for increasing vehicular traffic to the Park. The "19th Century Walk of History" linking historical relics of that era is being developed to provide better orientation and circulation for park users. The upgraded footpath reticulation will be provided with improved lighting to enhance the Park's safety at night.

Come visit today's Fort Canning. It is no longer the "Forbidden Hill" of the past. Come and savour its rich historical heritage in a peaceful and inviting park setting.

Dr Foong Thai Wu
Senior Research Officer



FORT CANNING CENTRE WINS AWARD FOR ARCHITECTURE

The Singapore Institute of Architects selected Fort Canning Centre to receive the 3rd Architectural Design 1991 Honourable Mention Award under the Conservation Category. In marking the contribution made by the developer, in addition to that of the architect, SIA hopes to promote good architectural design in Singapore.

Dr Tay Eng Soon, Senior Minister of State for Education, launches World Environment Day '92 at Fort Canning
Above: SDT dancers "introduce" Fort Canning Centre



An exhibition by artist Eng Tow in Fort Canning Centre Gallery

In June, Mr Lim Kheng Chye gave two albums of historic postcards to the Botanic Gardens archival collection. The albums follow two main themes, the Botanic Gardens and the natural history of Singapore, including early horticulture. Many of the historical pictures that enhance the exhibition at the Nature Reserves Visitor Centre were borrowed from Mr Lim's collection.

Mr Lim is a Singaporean who grew up and trained in architecture here. A practising architect for some 25 years, he does not specialise but rather prefers to do a variety of work, whatever the client requires.

COLLECTOR LIM KHENG CHYE Gives Historic Postcards To Gardens

For the past 10 years he has been collecting postcards but has been interested in old things, like cigarette cards, since he was a boy. He collects coins, phone cards, historical documents and old papers. Initially, he collected coins, especially Singapore merchant tokens. These were issued by the British Merchants in Singapore in the absence of proper currency from around 1828 to 1853. He began collecting them in the 1970s.

His interest in collecting postcards was sparked by his interest in history.

"I have had a long time interest in the history of Singapore," he says. "The study of architecture involves the study of history and different cultures and styles and I am interested in what influences the styles that are seen in Singapore".

Most of his postcards come mainly from England, America and Europe. They are not likely to be found here because people buy postcards to send away. And they are cheaper to buy overseas. Is it an expensive hobby? Yes, says Mr Lim, as dealers will sell a good scenery card for up to \$50, depending on the scarcity and demand for the card.

The range of his collection is wide and includes street scenes, ethnic people, railway stations and occupations, as well as the less sought after subjects from natural history. The postcards cover a wide time span beginning with the 1890s, when postcards were first produced, up until the end of World War II. "They are more interesting if they have been used, and the postmark can be used to give a date," says Mr Lim. "But very old postcards, that is before 1905, can easily be recognised because they weren't divided on the back to give a space for the address."

What advice does Mr Lim have for optimum storage conditions of old postcards to prevent deterioration?

"Avoid PVC materials," he says. "They are best kept in proper postcard albums."

For those who have an interest in seeing Mr Lim's postcards, and he does receive requests as often as once a month, you may be interested to know that part of his collection may be viewed at the National Archives where it is currently on loan.

Dr Elspeth Waghorn
Research Officer, Nature Reserves Survey



Postcards recapture old times in Singapore: Coconut plantation, Bullock cart, Entrance to Botanic Gardens and Chinese farmer

NPARKS' BOOK REVIEWS

Tropical Gardener's Guide to Healthy Plants by F R Sanderson, Fong Yok King and Saiful Anuar bin Mohd Said (The National Parks Board, 1992, Softcover \$11.00)

This practical handbook with excellent photographs is designed to help identify and treat plant health problems encountered by the home gardener. The *Guide* provides easy and quick answers to the Singapore gardener's questions about the common pests and diseases affecting his plants. It also gives valid pointers on how to keep plants in good health so that they do not succumb to pests and diseases so readily.

The 31-page publication should find its place on every home gardener's bookshelf in the tropics, and the clear and amply illustrated text and specific instructions will ensure that it does not just sit on the shelf. This is a book to be thumbed through whenever plant health problems arise; and as all gardeners know, they arise only too frequently.

Naturally Yours, Singapore by Tan Wee Kiat and Chew Yen Fook (The National Parks Board and Visual Connections, 1992, Hardcover \$29.90)

This 100-page, hard-bound volume gives an up-to-date account of the state of Singapore's natural heritage in the National Parks, Nature Reserves, wildlife sanctuaries and cityscape. Opening this book is like uncovering a treasure trove. There is a surprising richness of natural life forms depicted, and it is heartening to know that such a diversity of flora and fauna can still be found in Singapore, if one will only give time and patience to seeking them out.

The text and the 150 photographs complement one another in making this publication more than another pretty, coffee table rendering. It is an excellent introductory reference to the student of nature. Both author and photographer are keen naturalists and their personal concern for the natural environment is conveyed through this joint effort. There is a gentle reminder that all the natural beauty in Singapore is not there by chance, nor will it remain for all time. The web of life is so delicate and intricately balanced that an insensitive touch could unravel it altogether. But given some care, it is possible to pick up the strands and weave a new, if not better, pattern.

Gardens' Bulletin Vol 43 and Supplement No 2

Published twice yearly, the *Gardens' Bulletin* is the in-house journal reflecting scientific interests and activities of the Singapore Botanic Gardens. Articles published in the latest issue of the *Gardens' Bulletin* Vol 43 comprise the following:

Stone, Benjamin C. New and Noteworthy Malesian Myrsinaceae, VI. Revision of the Genus *Hymenandra* A.DC

West, John A. New Algal Records from the Singapore Mangroves.

Kochummen, K.M. Notes on the Systematy of Malayan Phanerogams. XXXI Lauraceae.

Lim-Ho Chee Len, Phua Lek Kheng, Low Neok Chein & Goh Chong Jin. Embryo Culture of *Howea* Palms.

Wong, K.M. *Schizostachyum terminale* Holtt., An Interesting New Bamboo Record for Borneo.

The Gardens' Bulletin Supplement No 2

Corner, E.J.H.

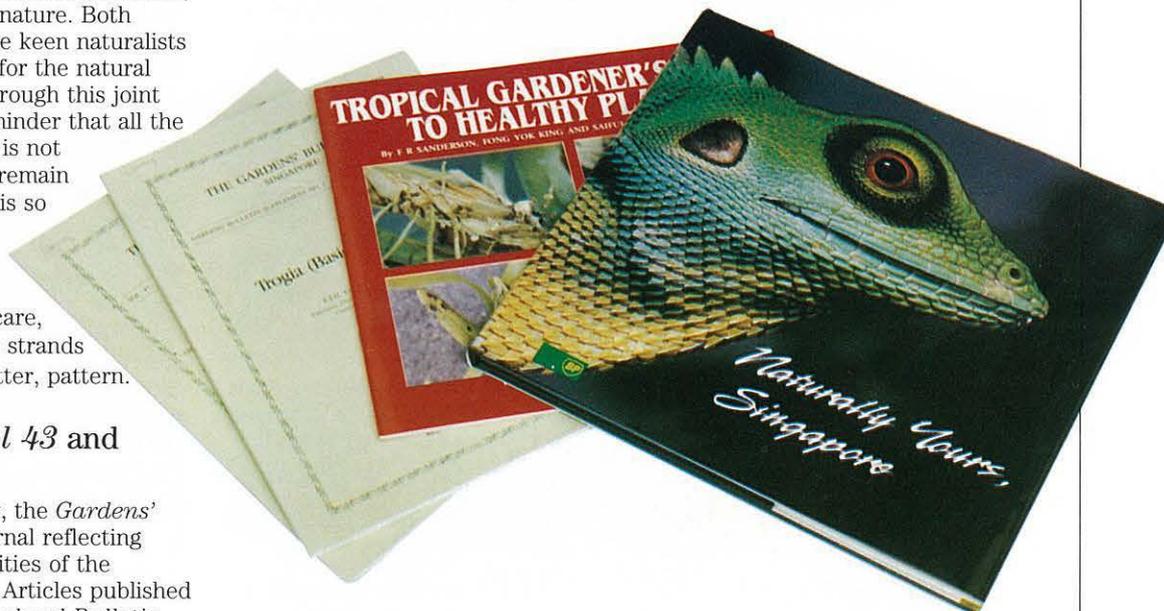
Trogia (Basidiomycetes).

This Supplement is devoted to a monograph of the genus *Trogia*. 73 species are recorded from tropical Asia and Australasia, and 17 from the neotropics. Keys to identification and descriptions of most species are given.

Ng Siew Yin

Director, Corporate Services

All the publications reviewed here plus back issues of the *Gardens' Bulletin* are for sale at the Public Affairs and Marketing Office.



IN MEMORIAM

The staff and friends of the National Parks Board were saddened by the death of first J W Purseglove, director of the Gardens from 1954 to 1957, and more recently by the death of Muthiya Pillai Ramiah, Overseer at the Orchid Nursery for over 50 years.

John William Purseglove, a former Director of the Botanic Gardens, Singapore died at his home in Sissinghurst, Kent in December last year. He was 79.

A north countryman born in the Peak District of Derbyshire, Purseglove first studied botany at Manchester University. From there he proceeded to Cambridge University to study tropical agriculture on a colonial scholarship which led to further study of the subject at the Imperial College of Tropical Agriculture in Trinidad.

Following this he joined the Colonial Service and was posted as an agricultural officer to Uganda where he was to remain for 16 very productive years. Evidence of this is the collection of 4000 of his botanical specimens presented to and now preserved in Kew Gardens. A new species of clover bears his name, *Trifolium purseglovei*. His work included important land reforms and a resettlement programme of great benefit to the native population.

Purseglove's next assignment was in Cambridge where he lectured to colonial scholars on tropical agriculture. After two years in this appointment, he was appointed Director of the Botanic Gardens in Singapore.

The Botanic Gardens had suffered a period of neglect during the Japanese Occupation of Singapore which ended in 1945. Numbers of its staff were taken prisoners and sent to work on the Siam Burma railway where more than 20 lost their lives. By 1954, when Purseglove was appointed, it had to a large extent been recuperated. But now history intervened to create a new situation with new problems to be faced.

In 1955 the early steps were taken for the constitutional development of Singapore into a fully independent country. It would no longer be a colonial territory staffed by colonial civil servants. Already the process of converting the public service into a local one had begun. Purseglove recognised that this might not be as rapidly achieved at the Gardens as in other departments since botanists and others had to be sent overseas for training before being brought back to take the place of expatriates.

Already the Gardens was suffering from a severe shortage of staff and this was to lead to the regular activities of the staff being restricted. It is not surprising that during his tenure of office his collecting was confined to short visits to places like Frasers' Hill and only once was he able to make a more lengthy expedition to Sarawak in 1956.

It is in other aspects of the Botanic Gardens that the results of his work are to be looked for. From the start of the first Botanic

Gardens on Government Hill at Fort Canning by Stamford Raffles in 1822 to its re-establishment with a full complement of staff by the end of 1954, the Botanic Gardens had survived vicissitudes of many kinds. These Purseglove perseveringly researched and recorded in an interesting article entitled "History & Function of Botanic Gardens with Special Reference to Singapore," including a detailed account of the part Ridley played in establishing the rubber industry in Malaysia in which he corrected a number of misconceptions which sought to invest the event with romantic and fanciful overtones.

Purseglove identified ferns, orchids and palms as the areas in which the Singapore Gardens was outstanding. Work in hybridizing of orchids had started in 1929 with the double aim of producing hybrids of commercial merit and investigating the relationship between the various groups of orchids. A wide range of beautiful hybrids resulted and the number of orchid enthusiasts in Singapore greatly increased. To this work Purseglove contributed by establishing an orchid unit in the Gardens.

In 1957 Purseglove resigned from the Gardens and took up the appointment of Professor of Tropical Agriculture at the University of the West Indies where he remained for 10 years and where he was able to continue his interest in orchids by setting up an orchid section in the botanical garden there.

After leaving Trinidad he became tropical crops specialist at the British Government Research Section at East Malling which allowed him to complete and published his books on "Tropical Crops" which established him as an international authority as the subject.

He was awarded the C. M. G. in 1973. He is survived by his wife whom he married during his service in Africa and by his son.

Sir Percival McNeice

(Some months ago, Peyton Coffin had interviewed Ramiah and prepared this portrait for a "Spotlight on Our Staff" in the upcoming newsletter. Our readers will appreciate how very shocked we were to learn of the death of this dedicated gardener. Following is the text of Peyton's article.)

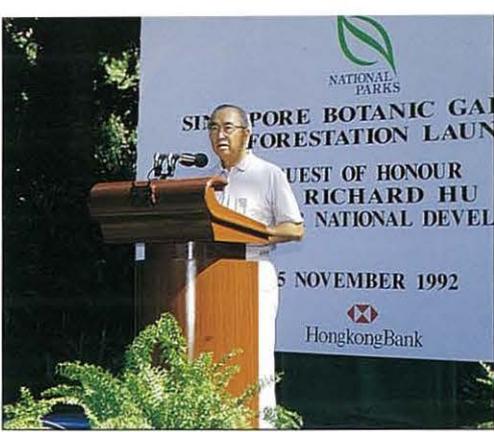
'Way back in 1939, a young fellow named Muthiya Pillai Ramiah wandered into the Singapore Botanic Gardens and met Professor Eric Holttum, who offered him a job tending orchid plants. At the time, the "Orchid House" was located around—and the potting works under—Burkill Hall. He became Prof Holttum's chief assistant, involved in pollination, propagation and seedling care. Then, the war came to Singapore.....

Continued on page 16

J W Purseglove, from a photo taken in 1971



Muthiya Pillai Ramiah holding *Christiara* Ramiah at the Orchid Nursery



Dr Hu launches the Reforestation Programme

Reforestation Programme Launched at SBG Forest

The Forest and Programme for Rejuvenation

The primary lowland tropical rainforest of approximately four hectares located in the Heritage Core of the Gardens represents one of the few remaining vestiges of the Island's original vegetation. This small plot furnishes the growing space and conditions for a lowland tropical forest community containing at least 200 plant species counted to date. A number of these species are not found elsewhere in Singapore.

The findings of a survey conducted by NUS show that the jungle has done surprisingly well after 130 years of isolation. However it does appear now that remedial action is necessary to maintain the primary forest character and its biodiversity. The major problem is the influence of alien species over the native ones. However great care must be taken to protect the regeneration of native plants while the weeds are being eradicated.

The survival of this unique natural resource for educational and scientific enrichment now depends on timely intervention. The programme to rejuvenate the Forest is a cooperative effort between the National Parks Board, the National University of Singapore Botany Department, with sponsorship by HongkongBank and volunteer support from the National Youth Achievement Award.

Briefly, the project entails —

- a systematic inventory of plants currently found in the jungle,
- careful weeding out of the foreign invaders (i.e. plants not native to Singapore's lowland rainforest),
- planting native species, and
- providing for interpretive and educational programmes once the area is reforested.

During the school holidays, student volunteers from secondary and tertiary institutions have been assisting with the jungle weeding. Under supervision by NParks staff and trained volunteer leaders, the students receive instruction on the biology of the forest and the importance of returning it to its native state. They learn to identify the weeds and to use the proper methods and tools required to remove them. In addition to the weeding, the students collect native plant saplings and seeds for propagation.

Launch of Reforestation Programme

Dr Richard Hu, Minister for National Development, officially launched the reforestation programme at Singapore Botanic Gardens' Forest on Thursday morning, 5 November 1992.

Following the Launch speeches at the Forest fringe by Mr Richard Hale, Executive Director & Chief Executive Officer of HongkongBank, and the guest of honour, Dr Richard Hu, the invited guests planted 58 native sapling trees, with student volunteer assistance.



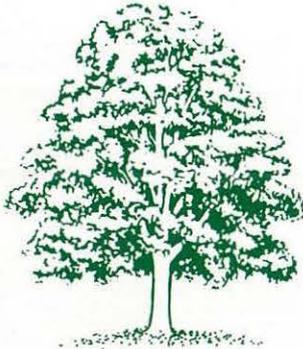
NParks' staff conducted tours of the Forest highlighting those features which make it especially interesting and unique. They pointed out specimens of some of the world's tallest tropical trees and a few ancients which are estimated to have been standing for well over 200 years. Guests saw some of the rarer species found nowhere else in Singapore, as well as specimens of the region's rainforest plantlife which have been used for the benefit of mankind in traditional medicine, in nutrition and construction.

Interpretive plaques, sponsored by HongkongBank, have been erected to describe some of the more prominent trees with information about their characteristics, habits of growth, common uses, and other interesting features. The plaques serve both to inform and to stimulate awareness and appreciation for Singapore's natural history.

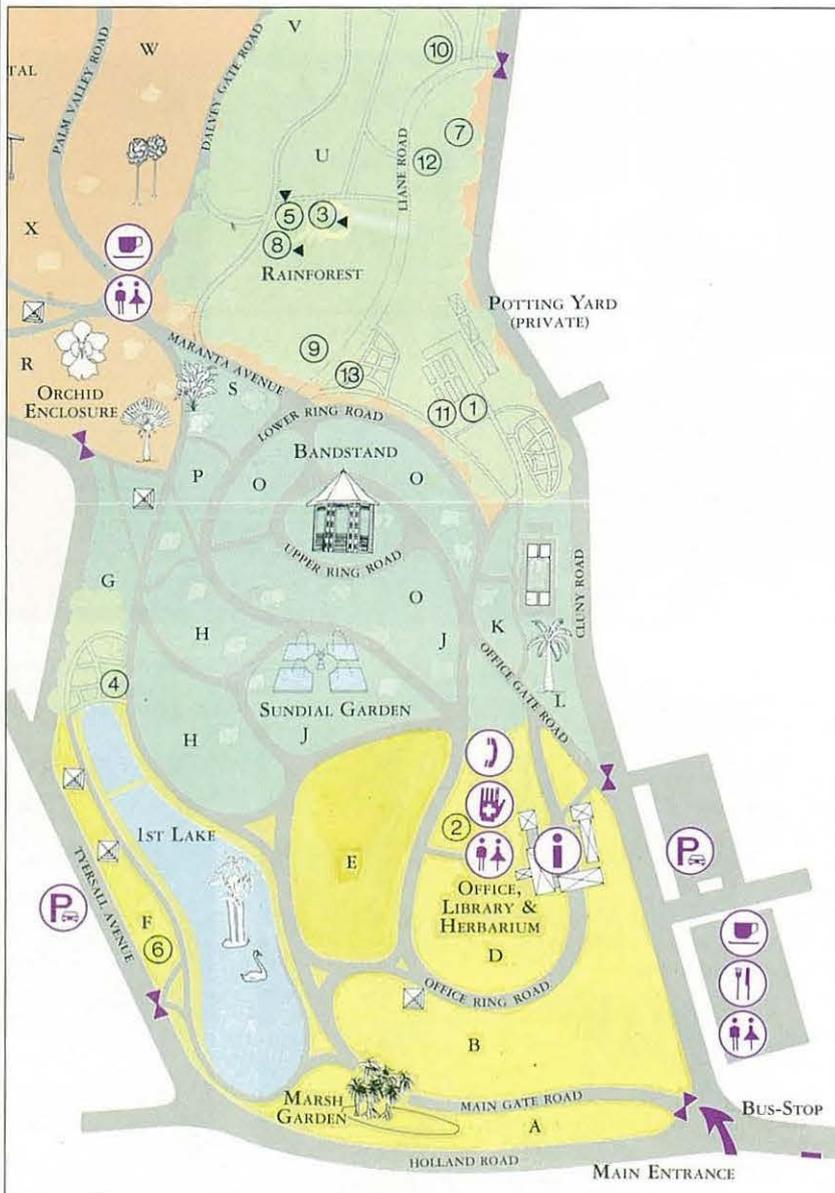
Dr Hu plants *Sindora wallichii* with assistance from St Margaret's Girls School volunteer Ham Yuni and Dr Tan Wee Kiat.

MONUMENTAL TREES IN SINGAPORE BOTANIC GARDENS

NAME	FAMILY	GIRTH	HEIGHT	AGE*	LOCATION
1 <i>Antiaris toxicaria</i>	Moraceae	370cm	45m	100+yr	Potting Yard
2 <i>Ceiba pentandra</i>	Bombacaceae	600cm	67m		Lawn D-205
3 <i>Dyera costulata</i>	Apocynaceae	355cm	40m		Forest
4 <i>Filicium decipens</i>	Sapindaceae	270cm	62m	150+yr	The Dell
5 <i>Koompasia malaccensis</i>	Leguminosae	370cm	73m		Forest
6 <i>Milletia atropurpurea</i>	Leguminosae	430cm	60m	150+yr	Lawn F-1
7 <i>Scaphium macropodium</i>	Sterculiaceae	400cm	73m		Liane Gate
8 <i>Shorea gratissima</i>	Dipterocarpaceae	420cm	62m		Forest
9 <i>Shorea leprosula</i>	Dipterocarpaceae	270cm	75m		Liane Rd/Water tank
10 <i>Shorea macroptera</i>	Dipterocarpaceae	440cm	73m		Liane Gate
11 <i>Shorea pauciflora</i>	Dipterocarpaceae	400cm	77m		Forest
12 <i>Shorea ovalis</i>	Dipterocarpaceae	210cm	77m		Liane Rd
13 <i>Terminalia subspatulata</i>	Combretaceae	400cm	65m	150+yr	Liane Rd/Maranta Ave



* The age of the trees given is estimated age.



← page 14

IN MEMORIAM

Ramiah escaped the first round-ups of civilians and travelled through Indo-China, Viet Nam, Cambodia, Laos and Burma, before returning on the Siam Railway in 1945—to SBG, to see if his old job was available. It was, and he started back to work on the same day, moving into staff quarters, where he lived until 1982.

In 1948 he made the cross, *Vanda luzonica* X *Vanda Kapoho* and named the orchid after his father, *Vanda Muthiya*. In that same year the orchid display was first opened to the public. Before the public display, an authorization letter from Prof Holttum was required to see the orchids, and Ramiah remembers many dignitaries and orchidologists seeking seedlings and asking him to explain his breeding methods. The present Orchid Enclosure was not opened until 1958.

With consistently outstanding performance ratings, Ramiah received the National Day medal for efficiency in 1972. He retired in 1985 and was immediately re-employed on a year-to-year basis until his death on 16 November 1992.

In honour of his long and faithful service, the orchid *Christieara* Ramiah (*Ascocenda Mangkiatkul* x *Aerides odorata*) was registered in 1989 by the Singapore Botanic Gardens.

Peyton Coffin
Assistant Director (Marketing)

Editor: Bonnie Tinsley; Designer: Eng Siak Loy; Editorial assistants: Lim Kar Yee, Chan Man Chi, Christine Moey; Photos for this issue by Ali Ibrahim (5), Fong Yoke King (9), Koh Poo Kiong (11), Jennifer Ng (8), Peyton Coffin (11), Robert Teo (4), Tay Eng Pin (2,10), Whang Lay Keng (14), Yam Tim Wing (6,7).