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The National Horticultural Magazine

The National Horticultural Magazine is a quarterly journal, being the official publication of The American Horticultural Society, Incorporated. It is devoted to the dissemination of knowledge in the science and art of growing ornamental plants, fruits, vegetables, and related subjects. The Journal is printed by Monumental Printing Company at Thirty-second Street and Elm Avenue in Baltimore, Maryland, and is entered as second class matter in the post office of that city in accordance with the Act of August 24, 1912. Additional entry for Washington, D. C., was authorized July 15, 1955, in accordance with the provisions of Section 132.122, Postal Manual. Subscription to the Journal is included in membership, which is \$5.00 a calendar year.

Original papers increasing the historical, varietal, and cultural knowledges of plant materials of economic and aesthetic importance are most welcomed and will be published as promptly as possible. Material of lasting interest appearing in related journals will be reprinted as available. Publications received for the Library will be reviewed and made available to members after publication of the reviews. These books are designated "Library" following the prices in the book reviews. Reviews of private collections will also be accepted and published. These books, however, are not available for loan to members of the Society.

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Missing numbers will be replaced without charge provided claim is received in the Editorial Office within thirty days after publication date.



Mucuna bennettii

One of the most spectacular garden climbers at the Botanic Gardens in Singapore is the New Guinea Creeper, introduced from New Guinea in 1940. The specimen in the Botanic Gardens from which this illustration was made now covers several hundred square feet. The pendulous trusses of brilliant orange-scarlet flowers are a foot or more in length and many hundreds of such trusses appear at one time. The climber flowers three or four times a year and, when in full bloom, it is a remarkably striking sight.

Journey West

JAN A. SCHUURMAN

After traveling from Europe to Indonesia in 1949 I made some notes, which were published under the title *Journey East* in the Nov.-Dec. 1952 number of the *Garden Journal* of the New York Botanical Garden.

When the time came for me to proceed in the opposite direction, the American Horticultural Society did me the honor of suggesting that I should describe my botanical and horticultural impressions for publication in their *Journal*.

May I therefore introduce myself: Jan A. Schuurman, nationality Dutch, a diplomatic officer, 67 years old, and still an incorrigible tyro in the fields of botany and gardening.

We were to leave Djakarta at the end of March 1955 for Singapore where we were to board the M/V. *Boissevain* for Mauritius, Lourenço-Marques, Durban, East London, Port Elizabeth and Cape Town. I had planned the voyage this way because of the long stays announced for various important points, notably Singapore, Durban and Cape Town. This would enable us to see something of the vegetation in the countries concerned. From Cape Town, after a five-day stay, we were booked on the *Winchester Castle* via the Canary Islands to Southampton.

Being a member of the International Association for Plant Taxonomy at Utrecht, Holland, I asked this association whom I should see at the various ports of call, and I promptly got a list of botanists. Then I wrote letters to these people, announcing the date of my arrival, and they all responded in the most generous way. Moreover, I requested several of the twenty-odd plant societies to which I belong to let me know what I could do for them, but they kept completely mum. I shall therefore try to give the reader an idea of what is going on in far-away countries in the domain of gardening, and include some factual information which he can use for the card index kept by his private secretary for future reference.

Before leaving Indonesia, I drove to the Botanic Garden at Bogor (formerly Buitenzorg)

to enjoy once more its charming vistas, to walk in the coolness of its shady avenues, to marvel again at the richness of its collections and to take leave of the friends I have among the staff.

Since the garden was established by Professor Reinwardt on the 18th of May 1817, generation upon generation of devoted workers have gradually created a mighty institute of learning, the largest of its kind in the tropics, for the garden is much more than its name implies. Of course the 200 acres of ground harbouring the collection of some 10,000 species of plants remains the nucleus of the "Kebun Raja" (Great Garden), but in addition it comprises:

- a. several subsidiary gardens on the islands of Java and Sumatra, the best known being the Mountain Garden at Tjibodas, one hour's drive from Bogor (200 acres at an altitude of 4500 feet, with a jungle reserve of 3500 acres of primeval rain forest, from the montane up to the subalpine zone at 9200 feet).
- b. The Bibliotheca Bogoriensis, a library for the pure and applied biological sciences, especially botany and horticulture (60,000 volumes including serials, and 100,000 pamphlets, reprints, etc.).
- c. the Herbarium Bogoriense (1,500,000 sheets) and Museum for Systematic Botany.
- d. the famous Treub (physiological) Laboratory for foreign students.
- e. the Photographic Studio and Drafting Room.
- f. the Administration of the nature reserves and game laws.
- g. the Zoological Museum and Laboratory (the insects alone number more than 3,000,000 specimens, by far the largest collection in the tropics).
- h. the Marine Research Station at Djakarta with its public aquarium, its museum and its seagoing vessels.

Hundreds of publications were issued by the Garden during the 139 years of its existence. Several standard works are now being written under its auspices, and three scientific (illustrated) serials are published at irregular times, viz.:

- 1). *Reinwardtia* (botanical) edited by the Herbarium Bogoriense.
- 2). *Annales Bogorienses* (biological) edited by the Treub Laboratory.
- 3). *Treubia* (zoology, hydrobiology, oceanography of the Indo-Australian Archipelago) edited by the Museum Zoologicum.

The Garden employs a staff of 350. It has honorary members and correspondents all over the world besides field collectors in Indonesia. Expeditions are sent to various parts of the archipelago.

In order to stimulate popular interest in gardening, the Garden maintains a sales department where the public may purchase plants propagated in the Garden.

The Garden is the home of the Indonesian Naturalists' Club (which publishes a quarterly magazine) and, above all, of the Foundation editing the well-known *Flora Malesiana*, a colossal project on an international basis, conceived and directed by Professor C.G.G.J. van Steenis, D.Sc., which will take at least thirty years to complete.

This brief summary of the main activities of the Kebun Raja will convince the reader of the immensity and diversity of its work. The Garden is fortunate in having Prof. Dr. Kusnoto Setyodiwirgo as its Director, whose ability, energy, enthusiasm, and tenacity are a guarantee that the tradition of the past will be continued.

When I drove back from Bogor I knew that I would often feel a keen nostalgia for this wonderful spot.

There now only remained a few days crammed with activities such as packing, paying calls and selling furniture.

Djakarta, the place where we resided, is the capital of Indonesia. There are some good private gardens, but not many for a city of nearly three million inhabitants. There is also a Garden Club established in 1951. If Djakarta were not so badly overcrowded, there would be more room for gardens and more interest in horticulture. The city of Bandung, four hours inland by car and less congested than Djakarta, has better gardens and a thriving garden club.

In the afternoon of Sunday, the 27th of March, 1955, my wife and I started on our long trek, and our first destination was Singapore.

There, on the 31st of March, we visited the Botanic Gardens. We were struck at once by the general improvement in the look of things since our previous visit in 1949. During the intervening six years a great deal had been achieved by successive executives.

A cordial welcome awaited us from the

present Director, Dr. J. W. Purseglove, formerly of Entebbe, Uganda, who is discharging his new duties with great zeal and vigour. These duties are quite extensive: apart from the living plant collections there are the herbarium, the library, the publications and the nature reserves, as well as the upkeep of Government House Domain. The previous Director, Mr. M. R. Henderson (1949-1954), is now retired. His predecessor, Professor R. E. Holttum (1925-1949), is at Kew pursuing his taxonomic studies of Malayan plants. The Director before him, Mr. I. H. Burkill (1912-1925), is actively engaged in botanical research, and his predecessor, Mr. H. N. Ridley, C.M.G., F.R.S., the first scientific Director of the Gardens (1888-1912), hopes to have celebrated his 100th birthday by the 10th of December 1955. Now what about the yarn that life in the humid tropics is unhealthy?

The Singapore Gardens were founded on their present site in 1859 and replaced a previous garden established by the famous first Governor, Sir Stamford Raffles, with the help of Wallich, on the Fort Canning Hill in 1822. It was at the present gardens that rubber was introduced in 1877 and it was Mr. Ridley who worked out the tapping technique for Hevea rubber and who was largely responsible for the development of the crop in Malaya.

The gardens are now run and financed as a Government Department. They have very cordial relations with the University of Malaya built on an adjacent site that was formerly occupied by the Economic Gardens.

It is not possible here to describe the various kinds of activities of the Singapore Gardens, the collecting, the exchange of herbarium specimens, the taxonomic research, the weekly wild flower exhibits, the plant and seed exchange with other botanical institutions, the sale of plants to raise the standard of local horticulture, and the free delivery of plants to schools and other Government institutions.

As at Bogor, important publications are produced at the Gardens by a relatively small number of men. At irregular intervals (every 12 to 18 months) an issue of the *Gardens' Journal* is published. It sells for Straits \$10. a copy. Vol. XIV is now completed. This Journal is a successor to other

serials that appeared formerly under different names.

Moreover, a number of excellent books have been put out, among which I may mention the following, whose authors are so well known that they do not need any introduction:

Holttum: *Plant Life in Malaya*, a perfect gem giving in 250 pages a clear picture of the How and Why of plant behavior under humid tropical conditions. This book is based on the author's 31 years of experience as Director of the Botanical Gardens and later Professor of Botany at the University of Malaya.

Corner: *Wayside Trees of Malaya*, a standard work in two volumes (one text, one photographs).

Holttum: *Orchids*. This is Vol. I of a *Flora of Malaya*.

Holttum: *Ferns of Malaya*. This is Vol. II of the same *Flora*.

Henderson: *Malayan Wild Flowers*. Although arranged according to keys, like a flora, this well-illustrated work is in reality a selection (Dicotyledons 3 vols., Monocotyledons 1 vol.). It is published by the Malayan Nature Society at Kuala Lumpur.

Holttum: *Gardening in the Lowlands of Malaya*, another treasure, filling a long-felt need.

The Singapore Botanic Gardens welcome all serious students of botany. These can come and work there and may either publish the results of their labours for their own account or avail themselves of the advantage of publishing them in the *Garden Journal*.

The Botanic Garden is now working on the breeding and raising of orchid hybrids suitable for hot, humid countries without seasons. It is difficult to get real colour into the gardens at Singapore because of climatic conditions, and plants brought in from other areas, which enjoy either a dry or a cool season, flower only spasmodically here and often do not set seeds. The solution appears to be to *breed* plants that will flower well in the Singapore climate.

The question of hybridizing is, of course, a controversial one, and personally I must confess that I have an ingrained aversion

Avenue of young royal palms (Oreodoxa regia), five years old, lining the office road entrance to the Botanic Gardens, Singapore.





Phalaenopsis denevei

This striking orchid from Sarawak is a fairly recent discovery. The flowers are a light warm brown, with a dark maroon lip and white-spotted center. It has been used as a parent of some of the better orchid hybrids at the Botanic Gardens in Singapore. The Gardens have an extensive collection of indigenous and introduced species of orchids, in addition to a very large number of hybrids.

is served lavishly to orchids at the growing stage, either in pots or in the ground.

When I asked about the relations between the Singapore Gardens and other botanical centres, I was told that with respect to plant material from the American tropics the greatest care has to be taken in order to prevent the introduction of Hevea blight into a country whose economy is mainly bound up with rubber.

From Singapore, through lazy seas and in great heat, we sailed to Penang, a charming city named after the Pinang palm (*Areca catechu*).

The botanical gardens here are easily reached by bus with one transfer at Macalister street. These gardens, formerly called the Waterfall Gardens, come under the supervision of the Agricultural Department. They are open from 6:30 to 6:30 and one does not notice any supervision. The public is very well behaved, it seems. It is only right that dogs are not allowed, but I was surprised at the number of monkeys. They must eat or destroy a huge quantity of seeds and young shoots.

In the six years I had not been at Penang, the garden had much improved. The path to the lily pool now is lined with a great variety of perennial herbs, including several Marantas, many aroids and *Tacca latifolia*. A water reservoir in a clearing in the forest was well filled, but the stream through the famous waterfall and fernery was a mere trickle.

The white Bougainvillea, which draws the attention at Singapore, was not in evidence here.

I saw no giant snails.

It had become clear to me that my interests clashed with those of the owners of the ship. My idea was to make appointments in advance for visits ashore, but for the ship

to "bastards," but it would be puerile to deny that the crossing done with orchids at Singapore has produced noteworthy results. Due recognition was given when orchid hybrids exhibited by a Singapore grower, Mrs. Gracia Lewis, received two out of the three First Class Certificates awarded by the Royal Horticultural Society at the 1954 Chelsea Show, which is the highest award the Society can give for any individual bloom. One of these orchids, the hybrid 'Vanda Tan Chay-Yan,' was raised at the Gardens.

The Singapore Gardens have a large collection of orchid hybrids (more than 2500 crosses have been made) but at Singapore the crossing is not done in a haphazard way and the parent species are not relegated to obscurity. In fact, a book will be published listing all orchid hybrids grown at Singapore up to a certain date and properly mentioning their parentage. This will remove the main objection to "bastards," namely that "you do not know what sort of a thing you are looking at." So that when I saw the hundreds of flasks with hybrid orchid pups in all stages of development, I wished them luck.

A feature of orchid growing at Singapore is the heavy feeding. A concoction is made of remnants from the fish market and this

the main consideration was freight, not the passengers. The stay of four days announced for Singapore was reduced to one. That is why I had no time to see the forests. At Penang we landed on a Saturday afternoon at one o'clock, just when everybody had gone home, but we were told we could go "up the Hill," although there was nothing to be seen there, so we heard. However, I remembered a report about a *Paphiopedilum* growing on Penang Hill, and we therefore concluded it might be worth while to go up. You take a bus part of the way and change to a shuttle car that takes you to Hill Station. The fare is insignificant. The funicular railway to the top costs Straits \$1.20 a person, return. All the way up you are treated to fine panoramas and to hurried views of most intriguing plants. In fact, this hill seemed to be a botanist's paradise (Corner's book mentioned above states on p. 45 that Penang Hill is the most fascinating part of Malaya for the botanist). There are good walking roads, restaurants where the weary can rest their limbs, and apparently no buildings under construction. A sign tells you that it is strictly forbidden to pick flowers. I have not found out whether the hill is Government property, or a nature reserve, or under the care of a society, but somebody should be warmly complimented on an excellent job of preservation.

I shall now make the reader envious by mentioning some of the herbaceous plants I saw when we walked down from the top, but there were several times as many that I did not know or could not name:

Ferns: *Davallia* spp., *Polypodium*, *Drynaria*, *Dipteris conjugata*, tree ferns, *Lygodium*, and not many nest ferns. Whole cliff faces were covered by entire-leaved ferns, and a few species of *Gleichenia* formed the usual thickets. Along the paths cut *Gleichenia* lay in unsightly masses which, I hoped, would be removed.

Orchids: *Arundina bambusifolia*, *Spathoglossis plicata*, a tall, white-flowering terrestrial orchid, one or more *Dendrobiums*, and what looked to me like *Paphiopedilum* out of flower.

Weeds: *Lantana camara* and *Ageratum*, but the infestation by these weeds, so ubiquitous in the secondary forest on Java, was not yet serious here.

A portion of the Garden Lake, Botanic Gardens, Singapore, showing the sacred lotus (Nelumbium speciosum). The Garden Lake is four acres in extent and has a goodly collection of aquatics.

Other Plants: *Thunbergia alata*, *Convolvulus*, climbing palms, *Nepenthes* sp., *Melastomaceae* (herbs and trees), *Phaeomeria* spp., *Pandanus* sp. (strap-leaved), a *Gesneriad*, *Ixora*, *Philodendron* spp., etc., etc.

Going back through the town we saw *Plumerias* in all shades, white, red, pink, shell, cream, and clear yellow. We were also shown the house of "number one rich Chinese man," who is reputed to have created a magnificent private garden, but it was too late to enter. And so back to the boat and away to Mauritius.

The Mascarenhas (Mascarene Islands), of which the approximate center is the intersection of the degrees 60 E. Long. and 20 S. Lat., embrace the volcanic islands of Réunion (French, 965 square miles), Mauritius (British, 720 square miles), Rodrigues (British, 42 square miles), and a few smaller ones.

After sailing for more than a week through the Indian Ocean with its flying fishes and monsoon showers, we landed at Port Louis (Mauritius) where we had an appointment with Dr. R. E. Vaughan, formerly director of the Mauritius Institute, who met us with a car at the dock.

Seen from the ship, Mauritius looks like parts of California in spring: green hills with rocks, scattered bushes and the occasional cow path.



There were more than half a million inhabitants, so that the average population density must be around 725 to the square mile.

As we drove inland through luxurious vegetation, I was not surprised to hear Dr. Vaughan say that there was not a native plant in sight. All the bushes and trees we saw were exotics, but some of them were new to me, like *Colvillea racemosa*, a magnificent leguminous tree from Madagascar crowned with sprays of orange-red flowers. We also learned that Li-chee and Long-an are producing fruit here, and we noticed that the coconut palms were shorter than in Indonesia.

Mauritius has a little more than 700 native flowering plants (largely trees and shrubs, of which 65 to 70 per cent are endemic to the Mascarene islands). The visitor is led to assume that a large part of this vegetation is a remnant of the forest that in the dim past adorned the surface of the lost continent of Lemuria, now under the Indian Ocean.

When the first settlers descended upon Mauritius, the island was covered, according to accounts, with a mantle of forest stretching down to the sea. But the Dutch are traders and they soon wrought havoc upon the ebony trees they found. Now there are only a limited number of small ebony trees left. Moreover, the Dutch brought dogs and pigs which exterminated the helpless Dodo and another bird, *Aphanopteryx*. Is the present generation any different?

Dr. Vaughan first took us to his house, a charming wooden structure, beautifully furnished. In the garden I was shown several palms including:

- a. the Round Island Bottle Palm, *Mascarena revaughanii* Bailey, endemic to Round Island, a 417 acre islet rising steeply to a height of 1000 feet at 14 miles' distance from Mauritius. This palm has a curiously swollen base and was formerly known as *Hyophorbe amaricaulis*;
- b. the Rodrigues Palm, *Mascarena verschaeltii* Bailey, endemic to Rodrigues;
- c. *Acanthophoenix crinita* Wendl., endemic to Mauritius and Réunion.

In other places we also saw *Latania loddigesii*, a beautiful fan-leaved palm endemic to Round Island and some other small satellites of Mauritius.

Most of these palms, if not all, are in cultivation in Southern Florida, which may be a good thing, for their continued existence

in their original habitat seems somewhat precarious. I was generously presented with seed of the Round Island Bottle Palm and have some left to give away.

The Vaughans' garden had suffered from cyclones. I also saw evidence of the presence of the giant snail. Two termite species are called White Ant and Philippine Ant respectively.

The chauffeur, a Mauritius Moslem, spoke French and English.

Driving to the southwest corner of the island we noticed some afforestation (Pine, Eucalyptus and Cryptomeria). Native trees are not used for afforestation, partly because—on account of their very slow growth—



Penang. Landscape as seen from the Funicular Railway.

they do not bring in any money. Therefore, only exotics are propagated. Along the road I saw large patches of a yellow-flowering *Hedychium*, the leaves all pointing in the same direction. *Ravenala madagascariensis* had become a weed. *Cuscuta* draped some of the vegetation, and isolated tree ferns (*Cyathia*) betrayed that the forest had been destroyed here not so long ago.

When the car could not go any further, we got out and went for a walk down a well kept path of lichen-covered lumps of lava. The first part of our walk, however, was level and rather sandy. Here we were in a most interesting *Philippia-Helichrysum* bush with introduced Guava. This xerophytic phase is an edaphic climax, a heath vegeta-

tion also met with in Réunion, in the uplands of Madagascar and on East African mountain slopes. Among the cryptogams encountered were *Lycopodium cernuum* and *Gleichenia* sp. The average annual rainfall here is 120 inches, the soil acid, the elevation 2200 feet.

Leaving the plateau and following the path, we entered the forest. This is upland climax forest, in which the trees form a number of different strata or storeys; the top storey forms a discontinuous canopy; the second storey consists of a dense growth of stems but the foliage does not quite intercept the sun's rays; the lowermost storey is made up of occasional bushes, and on the ground plenty of ferns and other herbs flourish in the dappled light. Trees included species of *Mimusops*, *Calvaria*, *Canarium*, *Eugenia* and *Sideroxylon*. Needless to say that I owe these names to Dr. Vaughan, without whose experienced and scientific guidance I would have been helpless. The soil is shallow; hence many of the large trees have buttresses and very short boles branching horizontally at 15 to 20 feet.

Among other plants seen I may mention *Hymenophyllum* spp. and other filmy ferns, various epiphytic orchids (one tiny orchid sweetly scented), *Eurina lobata*, and a curious lilaceous epiphyte, an endemic species of *Cohnia* with roots looking like orchid roots. There also was—alas—*Lantana* (here pink-flowered; in the lowlands the usual butter-and-eggs). The worst pests in this forest were *Ardisia* and *Guava*.

I was delighted to learn from Dr. Vaughan that more than 6000 acres of indigenous forest are now protected by law and have been proclaimed a nature reserve. We saw one of the observation plots, 20 by 50 metres, used to study the ecology of the forest, with all the exotic plants removed. This plot is fenced in, but nothing can protect the forest against monkeys.

A curious feature of Mauritius was the scarcity of insects at the time of our visit—few butterflies, no mosquitoes.

After our walk, which I estimated at four to five miles, back and forth, and which we enjoyed immensely, we drove back to the house where Mrs. Vaughan offered us a delicious curry lunch.

The ship left too early to suit us; so there

was no time to visit the famous Royal Botanic Gardens at Pamplemousses.

We sped back to the dock through the friendly landscape along roads lined with Banyan trees.

Thus ended an unforgettable day.

After a few more days at sea we reached



Dr. R. E. Vaughan, host to the author in the Mascarene Islands, and Mr. Schuurman.

Lourenço Marques (pronounced Lorenzo Marksh), the southernmost port of Portuguese East Africa, and were met on board by Mr. J. Gomes-Pedro, an agronomical engineer attached to the Cotton Board (Junta de Exportação de Algodão), whose car was waiting at the pier. As it still was a little

early, we went to the Polana Hotel named after a local Queen. Walking around the grounds I was reminded of Professor Vaughan's words "not a native plant in sight." It seems as if throughout the tropics, at the ports and principal population centers, a cosmopolitan vegetation is forming, which represses the original plants. The same holds true for the city I came from, Djakarta, and for the main towns and highroads on Java. This vegetation consists of garden plants, roadside trees, weeds, economic plants and other exotics. It is largely American in origin.

In the hotel grounds I was, however, shown two indigenous shrubs, both red-flowering and ornamental: *Bauhinia punctata* and *Erythrina humeana*.

Next, Mr. Gomes-Pedro took us to the Cotton Board to meet the Director, Professor A. Quintanilha, of international fame, who received us most graciously in his study and presented me with some of his numerous publications. Around 1930 Portugal had to import raw cotton. Now, due to extension of the area and to raising the yield per acre, Portuguese East Africa produces enough to meet the greatly increased demand of the mother country and to have a balance for export.

The Herbarium is based on Dalla Torre et Harms *Genera Siphonogamarum*, on the *Flora Capensis* and on the *Flora of Tropical Africa*. Mr. Gomes-Pedro is making a checklist of the plants of Portuguese East Africa, a gigantic undertaking. When it is finished, it will already be antiquated, and many additions, mistakes and taxonomic changes will have to be taken care of. "So then I start afresh," said Mr. Gomes-Pedro.

Lourenço-Marques had a botanical garden, which has been turned into a municipal park. A new botanical garden is being planned. We inspected the old garden, still containing its plants, nice old specimens, well grown and well labeled. Among the names I shall mention only the following: *Azelia quanzenensis* (timber), *Allamanda violacea*, *Aloe bainesii* (big branching tree), *Araucaria excelsa* (100 to 150 feet; this is the Norfolk pine, the little three-story tree you buy at home, 1 or 2 feet high, in a pot); *Bixa orellana* (the seeds have a red dye); *Encephalartos* spp.; *Ficus sycamorus* (a native

giant); *Grevillea robusta* (Australian Silver Oak); *Pachypodium saundersii* (quite unlike the species from Namaqualand and belying its generic name); *Taxodium distichum* (complete with knees, just like way down South in Dixie) and (in the fernery) *Aeolanthus* sp. (a native Labiate, a good cover plant with fine flowers).

The main street trees are *Grevillea robusta*, *Melia azedarach* and *Eucalyptus*.

Our host told us that there are three nature reserves in the colony and that the prevailing forest types are the evergreen montane forest and the dry ravine forest. Time only allowed us to drive about 20 or 25 miles into the country. So in the afternoon we left the neat, prosperous, well-built town, and—without passing dismal slums and disreputable suburbs as one sees in the outskirts of most cities—we crossed the Matola river and took a paved motor road through the bush. At first there were Tung oil tree avenues, scattered cashew trees, some *Opuntia dillenii* (having become a weed here), nice specimens of Kajeput trees in flower (*Melaleuca leucadendron*, used for avenues and for colonizing in swamps) and *Ricinus* run wild. There are also *Sclerocarya* trees, of which elephants—if any—love to eat the fruit, with the result that they become inebriated. The road turned, and we saw a clear dividing line between Mangrove Swamp and Acacia Woodland. Driving through the latter we stopped several times to penetrate on foot into the wilderness. No dangerous insects, no snakes, no wild animals. Just plants, sunshine and quiet. So I felt very happy here. Among the plants we met with were in the first place *Acacia delagoensis* and *Acacia xanthophloea*. Moreover, *Aloe marlothii*, *Carissa bispinosa*, *Cissus quadrangularis*, *Cissus rotundifolia*, *Euphorbia grandidens*, tree-forming *Euphorbias*, *Gossypium* (wild cotton), *Holmskioldia* sp., *Plumbago capensis*, *Sarcostemma* in flower (draping itself around the higher branches), and many more, whose names I have noted but which need not all be mentioned here. Of course, I got practically all that information from Mr. Gomes-Pedro, who knows and names every plant in this African jungle.

We now left the sedimentary deposit and continued on volcanic soil (basalt). The

dominant trees here were *Combretum apiculatum* and a *Pterocarpus*, but there were also good specimens of *Acacia robusta*. This part of the world is called Small Lebombo. Here we could look a great distance across the Umbelazi River and way beyond, as far as the Revumbo range where Swaziland begins.

Back at Lourenço-Marques we took a look at the sandy beaches, some extensively used as camping sites, which would explain the influx of baboons. With unerring memory Mr. Gomes-Pedro pointed out dozens of species peculiar to the dunes.

Then came the time to return to the ship, but not until after our host and his charming wife had offered us a sumptuous dinner at a Portuguese restaurant. We hated to part. We felt we had made friends here too.

Having left Lourenço-Marques we were heading for Durban when I was struck by a delicious fragrance in the air: the smoke of a bush fire in Zululand. Like many other countries, South Africa is known for its fires, set by people for utilitarian reasons.

Now, before I say anything else about South Africa I might as well tell the reason why I came there during the worst possible season, the South African autumn: I had planned my voyage in such a way that we would arrive in Europe during the best possible season (if there is such a thing). But the autumn in South Africa is the time when the vegetation rests, so that flowering is at a minimum. Nevertheless, the country is botanically so rich that there remained a great deal to be seen.

Our first port of call in the Union was Durban. We landed in the late afternoon and walked through the center of the city. At one place we were struck by a loud noise made by swarms of mynah birds preparing for the night in a fair-sized *Ficus macrophylla*. Another tree, a pyramidal *Pandanus*, much branched and bearing either tassels or balls, lined some of the streets. Both these trees are exotics, but we later saw another fig which is native: *Ficus natalensis*.

The morning after our arrival we called on Miss Forbes, Officer in charge of Botanic Station, to whom I had announced our visit for this very day. When we entered the room, we found her telephoning to ascertain whether Mr. and Mrs. Schuurman had ar-

rived. This good timing shows that with an introduction from the I.A.P.T. it is possible to meet leading botanists "à la minute," provided the old boat for once does not play havoc with its schedule.

The office of the Botanic Station is in the Botanical Garden and originally formed part of it, but at present it comes under the Union Government, whereas the Botanical Garden is municipal.

After morning tea, Miss Forbes asked a pretty young lady on her staff, Miss A. Dohse, to take charge of us. This girl proved to be not only attractive but also an indefatigable driver and an expert botanist.

Soon we were off in a nice car to the Isipinga River. On our way we passed quite some ruderal vegetation, and noticed that here, too, the principal weeds are *Lantana camara* and *Ricinus communis* (Castor oil plant). Another plant frequently encountered is *Hibiscus cannabinus*, which immigrants from India have brought along.

Near the place where the river reaches the sea we took a walk in a rather sandy grove that had obviously developed from a mangrove swamp. Here we found a *Hæmanthus* sp., *Peristrophe natalensis* (the last time I found a species of this genus was in the mountains above Bogor, Java), *Dioscorea cotinifolia*, a climber (*Dalbergia armata*, and how!), *Hibiscus tileaceus*, a fern (*Pellaea* sp.), *Sansevieria thyrsiflora*, *Cyperus alternifolius*, a *Crassula*, *Strelitzia nicolai*, and *Carissa grandiflora*. This assortment made me presume that there is a distinct dry season here. The coast consists either of rocky hills or of sandy beaches, interrupted here and there by a river or a lagoon. Going inwards from the beach the sequence was: (1) sand and salt water, (2) brackish flats (pioneers: halophytes and *Carpobrotus acinaciformis*), (3) mangrove swamp (*Rhizophora* and *Bruguiera*, but no *Avicennia*), and (4) the grove mentioned above. Going inwards from the rocky coast the sequence was: (1) scrub, (2) scrub forest, (3) coastal forest. A blue-flowering *Barleria* creeping over the boulders seemed to be a first class rock plant, at least in this dwarf form. Other denizens of the rocky coast were: *Brachylaena discolor*, *Mimusops caffra*, *Euphorbia tetragona*, *Aloe thraskii*, *Crassula perfoliata*, *Anthospermum littor-*

eum, *Grewia occidentalis* and blue- and yellow-flowering Commelinaceae. I owe most of these names to Miss Dohse.

We now turned inland and noticed that tall specimens of *Araucaria* are common in Natal. We saw them later again in other parts of South Africa. We also found that *Spathodea* will flower here when it is still comparatively low, whereas in Indonesia we had seen flowers only on tall specimens.

In the afternoon we visited the Krans Kloof Reservation and enjoyed the wide view down the valley. Here we found *Erythrina humeana* again and made the acquaintance of the striking flowers of *Leonotis leonurus*. It was at Krans Kloof, too, that we saw our first Proteas. Here *Senecio mikanioides* and *Helichrysum* were in evidence, and also the fruiting spikes of the pink-magenta-flowering *Watsonia densiflora*, as well as *Dombeya rotundifolia* with white flowers.

There was still time before dusk to take a look at the Umhlanga Rocks and adjacent beach. Quite a nice forest had developed on the sandy soil, and to my delight one of the finest plants I noticed here was an old acquaintance: *Asparagus plumosus*. Miss Dohse was equally proficient in naming plants as my previous mentors, and I have a list of names she gave me, but these were mostly new to me, and I have a suspicion that they would mean little to the average reader. So I shall only mention *Dracaena hookeriana* and a beautiful carmine-flowering parasite (*Loranthus dregei*), which our charming hostess picked from the tree. A few minutes later we heard a scream and the parasite lay on the pavement: there was a chamaeleon on it!

That evening we decided we would desert the ship and travel by land, because all along the promises of protracted stays ashore had proved unreliable. So we booked seats on the South African Railways' Motor Coach to Cape Town. The tickets cost £. 31.9. each which included meals for five days and hotel rooms for the intervening four nights. And was it ever a good thing we decided to incur this extra expense! We heard later that the ship had done little else but lie out at sea at various ports of call without communication with the shore for the passengers.

Next morning we spent in the Durban

Botanical Gardens. We took the bus there from the Post Office (sixpence a head). The Gardens were started around 1845 as a trial ground for tropical and subtropical plants. They were brought into prominence by Dr. Medley Wood, who passed away in 1917 but whose memory still lives in these gardens. They now form an oasis in the midst of a district built full.

The better part of the morning we walked around under the guidance of the Curator, Mr. Thorp. From my list of more than twenty names the following may be mentioned: *Pterospermum heyneanum* (from India, with large white fragrant flowers), *Dichorisandra* (a very fine blue-flowering Commelinaceous plant from Colombia), *Sterculia platanifera*, many species of *Encephalartos* and *Cycas*, *Tibouchina stenocarpa*, *Michelia fuscata* (readers in Louisiana will know the very fragrant flowers of this shrub), *Stenocarpus* (Proteaceous, from Australia), *Euphorbia cooperi*, *Sansevieria cylindrica* (man size), *Ferraria spectabilis*, and *Monadenium* (reputed to be so poisonous that people have died because they slept under this bush). I was puzzled by a large bed of alternating pink and blue Hydrangeas and learned upon enquiry that they were growing in a mixture of alkaline and acid soil.

At this point I may be permitted to insert a paragraph about what South African ecologists call "Veld types," that is landscapes with a certain flora conditioned by water (rainfall), light, temperature, soil, and biotic factors. I had prepared myself by studying Professor R. S. Adamson's book *The Vegetation of South Africa*, London, 1938, (British Empire Vegetation Committee). This book distinguishes 53 vegetation types. At Durban I acquired a later publication, *Veld Types of South Africa* by J.P.H. Acocks, M.Sc., Pretoria, 1953, (Botanical Survey Memoir 28), which distinguishes 70 veld types, plus 75 variations, and defines the concept of veld type as "a unit of vegetation whose range of variation is small enough to permit the whole of it to have the same farming potentialities." It was clear from the maps that on our journey from Durban to Cape Town we would traverse only three main types: (a) Bush veld, (b) Macchia (that is chaparral or

sclerophyll), and (c) most of the scarce forest areas of the Union.

On the 20th of April we boarded the Canadian-built bus. We passed field after field of low-growing bananas and stopped to look at the Valley of the Thousand Hills, a large extent of eroded terrain where parts of the original surface layer stood out as far as the eye could see like so many flat-topped crags. At Pietermaritzburg there was not enough time to visit the Botanical Garden, but we did enjoy a visit to the excellent zoological museum belonging to Natal University. Then into the Umkomaas Valley where we saw our first thickets of giant Euphorbias on rocky eastern slopes, followed by planted forest with Cosmos growing wild. Suddenly, after a monotonous drive through agricultural country, we were passing the Ingeli National Forest, which was all one could desire. Big trees, tassels of lichens, flowering creepers growing high into the bush. We were at an altitude of 5000 feet and part of the time fogs occur in these parts. No more Euphorbia for hours. We had now left Natal Province and entered the Cape Province. Nearing Kokstad at 4500 feet we noticed some large white buildings from afar: the establishment of a native herb doctor. We spent a comfortable night at Kokstad and walked the next morning along its oak avenues and among the old larch trees in its neglected park. We were informed that alien trees, especially Eucalyptus, Oak and Pine, are being used on a large scale, supplanting the original trees.

Nearly all of the 21st of April we drove through Pondoland and Tembuland, which—together with 'Xosa Territory'—form the Transkei Territories where no white man may start a farm. They are inhabited by 1,500,000 people, who have their own local parliament (Bunga) at Umtata. The proceedings of this parliament take place in the local languages. The people live in round adobe structures with a thatched roof, one door and one window (or none), the yards often enclosed by hedges of agave or aloe which, when in flower, are a magnificent sight. All doors face the East. Thousands of these dwellings, stone grey and partly whitewashed, are scattered over the mountainside, but nowhere cluttered together. There are no fences, no buildings, few roads,

and practically no towns, except where the few white people live (officials, missionaries, traders, professionals). The people are a happy lot and very law-abiding. The police force is the smallest in the world for the number of people. The landscape consists of low mountains covered with grass and here and there fields of poor corn or sorghum. There are many sheep and even more cattle (longhorn). The latter form the people's capital and are, therefore, bred in great numbers with the result that overgrazing is general. Bush only occurs in patches on the slopes. Black men ride black horses herding black cattle (or brown). The women like to dress in an orangey terracotta. To cross the Great Kei River, the road drops from 2600 to 500 feet. As soon as the descent begins, the scenery changes from dreary cultivated land to interesting vegetation, with plenty of aloe. We noticed a fine specimen of *Aloe bainesii*, the branching arborescent species.

This same aloe we saw again from time to time next day, the 22nd of April, after spending the night at East London, a seaport in a district where the African women are well dressed but the fashion is different from that in Pondoland and Tembuland. The beautiful Bird-of-Paradise Flower (*Strelitzia reginae*) is very common in East London; one sees it in many gardens and in the central strip of automobile roads.

Having left this city, we came upon a large compound inhabited by the people who work in a big textile plant under the supervision of one white man. A little further on we were told that during the war Euphorbia was taken in large quantities for rubber, but it was a needless sacrifice: Euphorbia could not be used as a source of rubber. We were also told that between East London and our next stop there is sometimes no rain for three years; still it is good sheep country. Old Morpheus became very troublesome during this part of the tour, so that I am not able to say much about it, except that we ran into *Portulacaria afra* in quantity and into pineapple plantations.

Then we reached Grahamstown which, like several other of the older places in the Cape Province, has a small botanical garden. We had 45 minutes for lunch. I decided to skip the meal so that I could spend 20

minutes in the garden. It is not in the first instance devoted to native plants, but it is a lovely, peaceful place, grading into bush and built on hard, grey clay. Here stands the Schonland Botanical Laboratory, a memorial to one of South Africa's greatest botanists. There were large, ancient specimens of *Araucaria*, *Dracaena draco* and the Australian grass tree. To my delight, *Aloe ciliaris*, the climber that has perhaps the most beautiful flowers of all red-blooming aloes, was in full glory. A *Bauhinia* sported small red flowers and an agave butter-yellow ones. *Tecomaria capensis* was covered with bright red blooms. Elsewhere I had seen it with yellow flowers, but usually the flowers are orange.



Zantedeschia aethiopica, the common "arum lily."

That night we drove as far as Port Elizabeth.

Off again on the 23rd of April and the first thing that struck us was that we saw no more rondavels (native dwellings). On the other hand, ant hills now dotted the landscape. Near St. Francis Bay we saw wild ostriches and other large birds. Here also grew *Proteas* in white and pink shades. We passed a forest, partly planted, 125 miles long and 11 to 13 miles deep. The mountains to the North are called the T'sitsikama (rain makers) Range. After crossing Storms River, we entered a national forest, the T'sitsikama Forest, part of which is called "Nature's Valley." The trees here are much overgrown by climbers and a conspicuous

feature of the forest is a plant described by the bus driver as "wild banana." It had, however, a very tall, bare stem and I was informed later that it is *Strelitzia augusta*. Being without botanic guidance I could not name some of the plants. But I got unexpected assistance from the bus driver whom I asked for the name of a flower. Said he, "This is not really a flower. It is some vegetation that is growing here." So then I knew exactly what it was.

We were all the time crossing rivers. The banks of some of these were covered with a narrow belt of native forest which in turn was flanked by planted forest. After leaving Groot River Pass, we struck a landscape that would have reminded us of parts of Europe (sandy soil, pine woods, heather and bracken) but for the abundance of *Zantedeschia aethiopica* (*Richardia africana*).

Later in the day we reached the famous Knysna forest (pronounced Nize-na), which Professor Adamson describes as a "temperate forest" and which forms the subject of another Botanical Survey Memoir (No. 17) of the Union Department of Agriculture, viz., "*Forest Succession and Ecology in the Knysna Region*" by J.F.V. Phillips. This region is described by Acocks as one of "high, well distributed rainfall, sour sandy soils and vigorous vegetation." It is one of the few extensive original forests in South Africa, the home of a small residual herd of elephants. Part of the forest is a reservation known as the Garden of Eden. Fortunately, the bus stopped and the passengers were given time to walk around. Here in the sandy humus grow many, many ferns and tree ferns and, of course, tall trees and trees that are not so tall. The principal trees are Ironwood, Stinkwood (the young growth has a smell), White Elder and species of Yellow-wood (the very large species is *Podocarpus falcatus* or Outerriqua Yellow-wood; the commoner but smaller species is *P. latifolius*). There was no opportunity for detailed observation, but it was a pleasure to roam in a peaceful, deep forest. Next we passed four small lakes with fine river marshes. The first is called Groen Vlei; the second, Zwart Vlei, has been selected for a flying boat base; the third and fourth, called Ronde Vlei and Lange Vlei, appeared

worth exploring. In the evening we were given hotel accommodation at George, and everybody on the bus was satisfied except the lady tourist from South Chicago, who always found fault with everything and who did not tip.

Now came our last day on the bus, the 24th. The westernmost part of Cape Province has been settled for centuries, but we enjoyed seeing the salt marshes between Great and Small Brak River, the Seal Rock and especially Mossel Bay. Here the traveler can find a sea boot hanging from an old Melkhout tree. It is called the oldest post office in South Africa, because in a sea boot at this place the explorers and sailors since the days of the Portuguese used to place their letters as well as messages to those coming after them. Upon crossing Gouritz River, we saw quite a forest of low aloe, one of the many species encountered since Durban. Soon, however, the landscape became mangy with cultivation. Among the places passed were Albertinia, Swellendam (with a 200-year-old grapevine bearing fruit), Caledon (a wild flower center), and Houwhoek Pass (good vegetation). Finally we reached Cape Town. We realized that, however interesting the bus ride had been, we had seen only the road, not the country. There must be infinitely more than we had seen. I tried to walk into the country at different spots along the road, but when time is limited and you cannot mention any definite destination it is not easy to get out of a town where you don't know your way and where all eyes gaze at you and all dogs bark at you.

For the newcomer at Cape Town the wealth of scientific institutions in the Union is somewhat bewildering. South Africa has no less than eight universities, namely Bloemfontein (Afrikaans), Cape Town (English), Fort Hare (Native), Natal (English, at Durban and Pietermaritzburg), Pretoria (Afrikaans), Rhodes (English, at Grahamstown), Stellenbosch (Afrikaans) and Witwatersrand (English).

The National Botanic Gardens are at Kirstenbosch (just outside of Cape Town municipal area) and have subsidiary gardens at Worcester (Karoo Garden), Caledon, Tulbagh and Calvinia. But there is also a second botanical garden at Cape Town,

which is really the first, because it is the old East India Company's garden, started by the first Governor of the Cape.

Cape Town has three important herbaria, the Herbarium of the South African Museum, the Bolus Herbarium of the University of Cape Town, and the Herbarium of the National Botanic Gardens.

So here was an attractive but rather formidable program staring me in the face, but once again I was lucky enough to have an extremely competent guide for whom I had an introduction from the International Association of Plant Taxonomists. This was Mrs. Levyns, an authority on the famous Cape Flora, and the author of several works. She showed us the old Company's Gardens



Protea lepidocarpodendron, the black-bearded
Protea on the Cape Peninsula.

first, and there we saw *Strelitzia reginae* and *Phormium tenax* in seed. Moreover, we learned that a rather malodorous plant we had smelt and seen all along the coast is *Agathosma foetidissima*. At the herbaria we met Mrs. Bolus, a niece of the well-known botanist, and Dr. Schelpe, a pteridologist returned from Oxford and the British Museum. Later in the day we went to Kirstenbosch. Bound up with the National Botanic Gardens is the name of Professor Compton, but he has resigned, and his successor is Professor Rycroft, the present Director. Words fail me to give an adequate description of the beauties of Kirstenbosch. This garden is situated in a hollow in the mountainside. It



Staavia dodii. A rare member of the endemic family *Bruniaceae*. This species is confined to a small area in the Cape of Good Hope Nature Reserve.

Cissus seitziana, a large shrub from South West Africa with heavy limbs and big leaves. It was lovely to see the Sun Birds hover over the flowers.

The last day before we left Cape Town one of our friends drove us to the sand dunes north of the city. Here we found, of course, a typical seashore vegetation, but including such things as *Cotyledon*, a climbing *Asclepiad* and "vygies" (little figs, the name for *Mesembrianthemums*).

We tried to go up to the flat top of Table Mountain, but were unsuccessful. Either the table cloth (or fog) was on the table, or the winds were too strong and the cableway not working.

We were sorry to leave Cape Town, but glad to be sailing on such a comfortable ship as the *Winchester Castle* (Union Castle Line), which made one stop only on its way to Southampton, namely at the port of Las Palmas on the island of Gran Canaria. This island forms part of a small archipelago off the west coast of North Africa, the Canary Islands, belonging to Spain. Unfortunately, we had only one day and we had no introduction, but our luck did not desert us. We found a wonderful cicerone in the Dutch consul, Mr. Myers, who showed us as much of the city and its surroundings as we could see in our limited time. During World War I the forests of Gran Canaria were cut, but they are now being replanted, or rather replaced by *Eucalyptus* and *Casuarina*, while *Opuntia* spp. have established themselves of their own accord. The original coniferous forest remains only on the mountain tops. In reading over my notes, I find: conglomerate slopes, caves, camels, lichens on stones, no giant snail, no poisonous insects or snakes, but mosquitoes. Prominent in the city were palms as street trees and in copses: prominent in the landscape were pink-flowering, ivy-leaved and other *Pelargoniums* cascading down walls and roadsides. I did some botanizing in the chaparral and found *Euphorbias*, succulent composites, *Mesembrianthemums* and *Aeoniums*. All this right near the town. Las Palmas has no botani-

is quite large, the mountain serving as a majestic background. In this ideal setting the rich flora of South Africa is cultivated to best advantage. There is permanent water, clear air and plenty of sun. Large collections of heaths (of which South Africa harbours approximately 600 species), *Proteas*, *Encephalartos* and other groups are among the attractions. I could not see enough in one afternoon, so I went back another day under the kindly guidance of Professor R. S. Adamson. Among the thousands of species I noted *Cussonia paniculata*, *Bauhinia galpinii* (which sets seed here, whereas it does not do so at Djakarta), the Silver tree (*Leucodendron argenteum*) and the Keurboom (*Virgilia oroboides*). We also had a long talk with Mr. Hall, an authority on Succulents, who is known, among other things, for his eagle eye in detecting plants where everybody else will overlook them. The collection of succulents is nothing short of magnificent. The number of species is very large, the condition of the plants marvelous and the percentage of rarities high. I was particularly struck by the *Mesembrianthemum* collection and was told that Mesems usually do not grow in the most torrid places but under shrubs, in cracks or on sunless slopes. Nearly all South African soils are more or less acid. Again I noted several names, such as *Neorautanenia* (a Legume), *Ceraria*, *Euphorbia dregeana* (looking like *Sansevieria cylindrica*) and

Pelargonium viscosissimum?

cal garden, but Orotava on the island of Tenerife has one. It seems that from a botanical point of view Tenerife is at least as interesting as Gran Canaria.

Incidentally, Las Palmas has what is considered to be the most beautiful hotel in the world, the Santa Catalina. It certainly is a peach.

With regret we left Las Palmas and Mr. Myers, but it was time to set out on the last lap of our voyage, the trip to Europe.

Life on board the large and sumptuous *Winchester Castle* was most enjoyable, except that the food was too good and too plentiful, so that we could not get into our clothes anymore.

Leaving the ship at Southampton, we landed in Britain, the classical home of gardening. No nation is more garden minded than the British. In no other country have the love of plants and the knowledge of plants become so widespread. And nowhere else is there a keener interest in rare and new species. Britain has many excellent botanical gardens, numbers of beautiful private gardens and parks, rich botanical and gardening libraries, as well as the most extensive herbarium in the world (at Kew). For these and other reasons she is a Mecca for the discerning gardener. Moreover, scenically, Britain has an intimate and unobtrusive beauty that goes straight to the heart. In fact, it is a very lovely country, particularly so in May. The most abundant spring flowers seemed to be the English daisy, Primrose, Cowslip, Broom, the lesser Celandine, Coltsfoot, Buttercup, Dandelion, Anemone, Violet, and, last but not least, the Bluebells. Nothing is more beautiful on the forest floor than these solid sheets of blue hyacinths. For that is what they are. And they grow all over the British Isles; we saw millions of them in England and millions again in Scotland (by the way, there is another pretty flower, which is known as the Bluebell of Scotland, but this is a summer-flowering *Campanula* growing on open ground). The prominent spring-flowering tree in England was Hawthorn.

We paid several most enjoyable visits to the Royal Botanic Gardens at Kew. These Gardens are so well known, and the Illustrated Guide (2 shillings sixpence) is so



complete that I can, with a good conscience, desist from attempting a description, which—after all—could not do these Gardens justice. They are easily reached by Underground Railway, but the visitor should bear in mind that the greenhouses and buildings are closed in the mornings, and that there is a stand where the publications are on sale, but no list of the latter. One of the most interesting publications is the *Kew Bulletin* (quarterly, H.M. Stationery Office, 17 shillings sixpence a copy).

We had timed our visit in such a way that we could be in London for the Chelsea Show. That is the yearly flower show of the Royal Horticultural Society. It is without doubt the greatest gardening event on earth, lasting several days. On the Tuesday morning the Queen visited the Show, only one attendant per stand could be present; no members, no public. In the afternoon the members of the Royal Horticultural Society (they are called Fellows) were admitted free of charge to a preview, but only the fellows themselves; no relatives or friends. Therefore, my wife, who was not yet a fellow, joined the Society for the very purpose of being able to attend the preview (one guinea = 21 shillings for one year's overseas membership). On the next few days the public was admitted against payment of an entrance fee.

We were anxious to attend the preview because we had been warned that on the other days the crowd would be appalling. Well, on that Tuesday afternoon the crowd was not appalling, but still it was quite formidable. And, remember, fellows only. The Society has 47,600 fellows, and they

all seemed to be there. Anyway there must have been tens of thousands of people, of all nationalities. That day the buses on certain lines bore a sign "Chelsea Show." As soon as we emerged from the underground station we saw nothing but parked cars for blocks on end and a steady stream of fellows trotting show-wards. Once within the grounds we saw miles of stands, and in the center a very large exhibition marquee consisting of ten ridges full of the world's most exquisite plants. There were public telephones, a post office, an army of uniformed



Mountains in Seven Weeks Poort with Aloe ferox in the foreground.

attendants, restaurants, bars, a military band and what not. I shall not try to describe the exhibits (there is a printed catalogue). It was interesting to notice that business was brisk, fellows giving orders to the exhibitors wherever we looked. I wistfully remembered our little Garden Club at Djakarta, with 350 members, and how much trouble it is to keep that going.

Another day we called on Mr. and Mrs. Higgins at Croydon. The reader will remember this name, for Mrs. Vera Higgins is known the world over as an authority on succulents and other plants and as the author of several books. After we had discussed our business we were about ready to leave, when Mr. Higgins said "Now, would you

like to see the collection?" We had no idea there was a collection, nor where it could be in this small but cozy house. But we were taken out of the back door into a large suburban garden crammed with lovely plants among which were rarities such as *Meta-sequoia*. And then came a surprise; at the end of the garden were greenhouses containing an extraordinarily large and fine succulent collection, including rare plants and very rare plants and unique plants. The assemblage of Crassulaceous plants is the largest in the country. There was also an astounding number of succulent *Mesembrianthemums* and Mr. Higgins knew the name of each species as well as its cultural requirements. No wonder that the plants looked healthy, just as if they had been flown in from their native haunts the day before. Our host told us about another exceptional collection, the property of a streetcar conductor. This private initiative to build up something very special in the field of gardening—or to excel in any other field—is typical for the Briton. After having spent entirely too much time in the garden, we went into the house for tea, and here another surprise was awaiting us: a priceless collection of herbals and other old gardening books. We came away rather dumbfounded but deeply grateful.

We still had to call on relatives in Surrey. As I went for a walk with my cousin, he stopped to show me a weed he had never seen before. I said I did not know it. Then came a voice from the rear: "That is a *Polygonum*." A passerby had overheard my remark.

The last half of our time in Britain we spent in Scotland at the house of a friend we had known at Djakarta. This house is situated in a county called Kirkcudbrightshire (Kirk-Q-brr-shrr, with the accent on the Q), and the garden is in charge of Mr. D-L. Puzzled why he should always be referred to by initials only, I made inquiries and found out that the name is Dalziell and that this word is never pronounced; you just spell the first and last letters: Dee-Ell.

We had been to the office of the Royal Horticultural Society in London and among the treasures there acquired were guides to the gardens of England and of Scotland. Thus we found that the Gardens at Logan

would be open on a certain day during our presence in the Realm of the Scots. Of course we went. After a few hours' drive we reached the estate. It is located on a tongue of land jutting out into the Irish Sea not far from the island of Arran. Again great numbers of cars and nearly a thousand visitors, and that in this isolated spot! To our amazement there were Monkey Puzzles (*Araucaria imbricata*) 60 feet high, whole avenues of *Cordyline australis*, giant rhododendrons 30 feet high, and even quite a number of tree ferns (*Dicksonia antarctica*). The herbaceous plants, too, were a sight to behold. Primulas (Candelabra mostly) were present in great numbers, many apparently self-sown; *Incarvillea delavayi* caught the eye, blooming magnificently on a scree. And there were hundreds or thousands of other species and varieties. We learned that the Gulf Stream strikes this western part of Scotland, which would explain why semi-tropical plants are grown in the open here at this latitude.

We visited several other gardens among which I wish to mention a farmer's place with a good rock garden. The husband bred chickens and sheep; the wife had graduated in agriculture and bacteriology. After tea we went around the farm and I noticed some new boards placed into the door of a shed in order to be used. I was told that these boards must not be moved because a couple of birds had chosen this place to make a nest. Perhaps this is another British characteristic: Respect for others, Respect for Life,



View of rhenosterveld near Riversdale with *Aloe ferox* in foreground.

Respect for the Law, Respect for Tradition.

Thus ended our latest Odyssey. What next? Of course, from Britain we crossed to Holland, but that is my home, and nobody wants to blow his own horn or that of his country.

For the event that one or more of my readers should be tempted to go on a botanical or horticultural rampage, too, I may add that there is very little to fear. I have sailed the seas for almost half a century and only very rarely have I run into a gale. Since our departure from Djakarta on the 27th of March to the time of our arrival in Holland in June we even have had hardly any rain. As a matter of fact there must be more good than bad weather in the world. Dangerous insects, leeches, ticks, etc., there are in certain places, but one is told in time how to avoid or cure their bite. And the jungle is cleaner than most industrial areas.

c/o Institute for Systematic Botany, Utrecht, the 1st of August 1955.

Illustrations appearing as the frontispiece and on pages 3, 4, and 5, were made from photographs kindly furnished by Mr. G. H. Addison, Curator, Botanic Gardens, Singapore, while those on pages 12, 13, 14, 15, 16 and 17 by Mrs. Lewyns, Lecturer, Cape Town University and Acting Curator, Bolus Herbarium, Cape Town; the others were furnished by the author.

View in du Toits Kloof near Paarl showing the rugged mountains of the Cape.



Some New and Old Herbs New to Me

HELEN M. FOX

As time goes by, my collection of herbs has grown so alarmingly that from lack of space I have had to discard many I would like to have kept. This seems to be true of most plant specialists, each of whom handles it in his own way. Dr. Bailey once told me, after he had written his descriptions and made herbarium specimens of collections of plants such as dianthus and campanulas, he would discard the lot. It seemed dreadful to think of some of those rare plants being thrown out, as it was when Mr. Morrison dug up and dispersed his daffodil hybrids, but both plantsmen were compelled to make room for the next subject to be studied.

To enter my collection in the first place, plants must have herbal virtues such as medicinal, fragrance, flavor or folklore. To remain in my garden, the plants must be good looking, have a fragrance, and must not be too invasive, too spreading, and must not look too much like others in the same category.

Where I live in southern New York, many plants, such as some of the lavenders, rosemaries, bay and California sages, are not hardy. In order to keep them from year to year, I dig them up and pot them before frost comes. Then, I put them in a heated garage, or bring them into the house to pass the winter.

Among the hardy plants, almost the first shrub to bloom in my garden, is *Daphne genkwa*. It grows about three feet high and in the early spring its bare branches are purple with tubular blossoms, fragrant of cinnamon. It is very handsome with tulips. Since all *Daphnes* have medicinal properties, this one qualifies to belong in the herb garden although it is absent from the *United States Dispensatory* where *Daphne genkium*, *D. mezereum* and *D. laureola* are listed.

A plant associated with Bacchus in Roman days is *Hedera Helix*, known as English ivy in spite of being native to most of Europe, Asia and North Africa. In my part of the world it grows well in sheltered positions, such as facing south and protected from

northern winter winds. This ivy climbs by means of aerial rootlets. The leaves of the typical form are fan shaped, have slightly wavy margins and are palmately veined; all of them begin from the base and spread out like the sticks in a fan. The leaves are glossy and all are a deep green except for those having spots and lighter margins.

For the first time I have a flowering ivy. Its leaves are three-and-a-half inches across and three inches long. The flowers grow in spherical panicles, are greenish yellow, have a fragrance similar to privet and appear to be very attractive to bees. Later, they ripen into round, black fruits. Shoots taken from infertile branches do not fruit although it has been said that once ivy has grown as high as it can find something to cling to, it will flower. But I have not found this to be true. I had a plant which grew up to a two-story stone chimney and could go no further. It never flowered. There are many varieties, differing from each other in size of leaves and the number of lobes. Some are as small as one-and-a-half inches long and have three lobes, the lower ones being further subdivided into three lobes. One called *H. marginata* has the leaves margined with white. There is a large-leaved and a small-leaved form of this. There is also a form called *rubra* where the margins become roseate in autumn and a form called *conglomerata* with crowded small leaves, almost shrublike and very slow growing. This one is much admired and I am always giving away cuttings.

The fresh leaves of *Hedera Helix* smell of balsam and have a bitter taste. They were formerly used locally to cure skin diseases and old ulcers. Both leaves and fruits are poisonous when eaten and sometimes cause dermatitis. I have seen trunks of old plants in Greek gardens of the Bosphorus as thick as those of goodly sized trees. From these and other trunks a resinous substance is exuded from incision in the bark. This substance is called "ivy gum" and formerly was used as a plug in cavities to relieve toothache, in spite of its reputed poisonous effects.

A striking, good-looking plant is *Silybium marianum* with the popular names of St. Mary's, Blessed or Holy Thistle. The stems are ridged, branched, and rise to two feet. The leaves are ovate, stalkless, prickly along the margins, toothed, twisted and spotted. The veins, like the spots, are pale green on the darker green surface. The basal leaves are ten inches long. The rosy-violet, thistle-like flowers have spiny-pointed bracts in many rows. The heads are erect. With me, the plant behaves like an annual but some say it is biennial. It probably can be either.

In looking up my herbs, I go first to the *Herbal* of Dioscorides, a Greek physician of the first century A.D., whose herbal embraces Greek medicine as practiced by Asclepius and was the authoritative work from his day to the Renaissance. The book is available to-day in an English edition edited by Robert T. Gunther and published by the Oxford Press in 1934. Unfortunately the English of a much earlier edition has not been modernized. Dioscorides mentions this plant and calls it *Silibium*. In the Gunther edition the botanical name *Silybium marianum* is given. His description is as follows: "Silibium is a broad Acantha having leaves like white Chamaeleon which being but newly sprung up is eaten sodden with oil and salt. But ye juice of ye root being drunk with Melicrate as much as a dram doth produce vomitings."

The Twenty-fourth Edition of the *United States Dispensatory*, published in 1947, says the plant was used of old, that extracts of the drug from the plant are said to cause rise of blood pressure, and to have other beneficial effects.

Dioscorides mentions a plant called *Thymbra* to which Gunther adds the name *Satureia Thymbra*. The plant is described under a drawing of *Micromeria Juliana* showing that confusion in the naming of savorys began very early. The text says "*Thymbra*—is also growing in barren and rough places like thyme but yet is less tender and bearing a stalk full of flowers of greenish color. It can perform ye things as Thyme, being after ye like manner and it is fitting for ye use in health. There is also a native *Satureia* of less virtue in everything because it does not partake of so much of sharpness."

Seed of this plant called *Thymbra spicata*

L. came to me from Israel. It is neat looking, grows eight to nine inches high, is hairy, and very leafy and resembles woody thymes or *Satureia montana*. The main stalk is woody and brown while the side branches are pale green. All branches carry whorls of narrow ciliate leaves about half an inch long. From within two parts of whorls and on each side of the stem grows a purple stalkless flower tinged roseate. The calyx is hairy as is the corolla. In my garden the flowers smelt of thyme but without sweetness. Undoubtedly, however, in their native, warm country they smell much sweeter as is true of most herbs. In my plants the corolla



Gottschö-Schleisner

Thymbra spicata

is as long as the calyx but not twice as long, which it should be, according to Post, *Flora of Syria, Palestine and Sinai*. This author says there is but one species that blooms in May and June in dry hills, widely scattered in Lebanon, Beirut and down to Jerusalem. *Thymbra spicata* has been described growing in Cyprus as "cushions of rosy pink flowers with a pleasant scent and most attractive." The plant is said to be an annual. I have potted it up and brought it indoors but, judging from its behavior so far, doubt whether it will live through the winter.

A plant formerly known as *Betonica officinalis*, betony or wormwood, now bears the name of *Stachys officinalis* L. It is native to Europe and Asia Minor and is hardy for

me. It grows to three feet high, the main stalk being naked except for whorls of leaves far apart. It is topped by a spire composed of closely placed whorls of roseate flowers. Each whorl along the stalk is subtended by two stalkless leaves. The basal leaves, however, have stalks. All the leaves are ridged, toothed, and woolly as is the whole plant. It has not been too decorative the first year in the garden but I will see how it behaves another year before rooting it out. Dioscorides gives a drawing of the plant which has been identified as a species of *Stachys*, but it is placed above a description of *Mentha arvensis*. The plant in the picture is now identified as a yellow-flowered betony. My plant has pink flowers and there is a variant with purple flowers and neither of these grows in Greece.

Not finding the right plant in Dioscorides, I consulted P. F. Fournier, *Plantes Medicinales et Veneneuses de France*, and there found it was used in antiquity and the Middle Ages for almost all ailments and that it seemed particularly effective for respiratory ailments and also for asthma and coughs.

In my part of the world it is hard to believe the leaves of rue are evergreen because severe cold makes them so bedraggled they die before spring. Lately, I have grown two rue new to me, *Ruta montana* and *R. chalapensis*, having obtained seeds of both from Portugal. They are Mediterranean plants. *Ruta chalapensis* is a handsome plant and grows about fifteen inches high. The flowers differ from those of *R. graveolens* in having the petals fringed and the leaves slightly more slender. It smells like *graveolens* and the color of the flowers is the same mustard yellow. To date I have not found any record of *chalapensis* being used for its herbal virtues. The other plant, *R. montana*, has not flowered for me as yet. The flowers are said to be small and yellow. The leaves are grey green and so finely divided as to be lacelike. It is being carried over indoors this winter until it can be determined whether or not it is hardy. This rue yields Algerian oil of rue as does another rue, *R. bracteata*. Since early days dwellers along the Mediterranean littoral used some of the rue as a medicine and condiment. The second use is odd because when too many of the leaves are eaten they are

poisonous and only a few cause the tongue to pucker. Moreover, to modern taste the flavor is unpleasant.

The traveler in Greece or North Africa will find Euphorbias are conspicuous plants in the landscape. They should be in the garden because of their importance in medicine, but only a few, because the foliage is of so unusual a blue green that it does not merge with the grey green of most herbs. The leaves are fleshy, stiff-textured, thickly placed along the stems and the flowers form heads of mustard yellow. The Euphorbias belong to the EUPHORBACEAE, a large family, of which poinsettias and Ipecac are members. Bailey says there are over one thousand species of Euphorbia.

The *United States Dispensatory* lists twelve as medicinal and comments that nearly all of the family yield products which are powerful cathartics and emetics; that their milky juice irritates the skin and many of them have been used by Africans to poison arrows.

Two Euphorbias are new to me. The first is *Euphorbia characias* which is native to Abyssinia, Madagascar and South Africa as well as the Mediterranean. The plants, oddly enough, came through a severe winter unhurt but have not yet flowered for me, though they are two years old. The stems are tinged rose and branch freely. They are leafy with slender, obovate, and stalkless leaves pointed at their tips, grey green and having a strange smell. They feel velvety.

Dioscorides calls this species Tithmalos Characias, dwarf mountain pine. He mentions there are seven kinds of Euphorbia, that the male is Characias and the stems full of a sharp white juice. "—But ye leaves like ye Olive tree but longer and narrower, ye root gross and woody. But on ye tops of ye stalks the hair of rush like little rods and under them hollow cases like to basins or little hives in which is ye seed. It grows in rough and hilly places. But ye juice hath a purging faculty." He says it is also a depilatory.

My other Euphorbia was formerly *polychroma* but is now called *epithymoides* and is entirely hardy and native to eastern Europe. It grows only about one foot high, has oblong leaves, and yellow flowers in umbels which appear here in May. They are effec-



Gottischo-Schteisner

Molucella laevis (right) with *Euphorbia characias*; *Salvia tiliaefolia* in background

tive with the bright greens of early spring.

When I was in Portugal in the month of February, I was told that in the southern part of the country there are many thymes not known to gardeners and that they would be blooming in April. As yet I have not returned to see them. Judging from the few

I have grown from seeds sent me by my delightful Portuguese friends, they might be welcome additions to gardens in warm climates. So far they have not proved hardy for me. One of these is *Thymus capitellatus* Hoffm. & Link. The plant is seven inches high, has a main woody stem from which the



Gottscho-Schleisner

Argemone platyceras

others branch out and these side branches are not woody. The leaves are tiny, about one-eighth inch long, narrow and rounded at the tips, and they have stalks. They grow in whorls about one inch apart. The tiny flowers grow in clublike spires at the tips of the stems and seem to dot the plant with white. They bloomed for me from the end of May and on into mid-June. The whole plant smells strong, medicinal, unpleasant, and resinous.

An American poppy has proved most attractive. It is either *Argemone mexicana* or *Argemone platyceras*. Probably I have both. *Mexicana* is supposed to have yellow flowers and is a herb while *platyceras* is not a herb and its flowers are either white, rarely rose purple or rose. My plants come in all these colors but the white ones, which are a very snowy white, self sow freely and bloom practically all summer. From notes on the plants in my garden, I can report the leaves are clasping, spiny, deeply indented, feather-veined in white, with the crest of each jag

having a thorn at its tip. The leaves at the base of the stem are six inches long. Except for the thorniness along the central veins and at the tips, the leaves feel smooth and look glaucous. The stems are round, two to three feet high and a yellowish green than the leaves which are bluer. The buds are thorny as are the seed capsules. The flowers measure two inches across and have the crepe texture typical of poppies.

I first saw these poppies on a trip West and they were growing from Iowa to Colorado and down to Mexico. Sometimes the flowers were colored but more often they were white.

Argemone, in Greek, means eye disease. According to authorities the yellow juice of *mexicana* was administered for warts and other skin defects and also as a cure for cataract of the eye. The seeds are said to be purgative and when smoked with tobacco to be a powerful narcotic.

I am finishing up with *Molucella laevis* though I have not been able to find any herbal use of the plant. It is quaint and appears in the illustration behind *Euphorbia characias*, taken in my garden. Seeds of this plant came to me last spring with other seeds from Israel. Since it was labelled "Molucca balm," I did not recognize it as a plant I had grown many years ago under the name of shell flower, or Bells of Ireland. Because it was called balm, I thought it must be a herb but find the name is erroneous and that it was given to the plant because it was thought to have come from Molucca or the Spice Islands. The plant is native to the Mediterranean littoral and the flowers grow inside curiously shaped, wide green cornucopia-like bracts. They are inconspicuous, greenish with a violet lip and pleasantly fragrant. The stems grow twelve or eighteen inches high. The leaves are long petioled, rounded, subcordate and coarsely toothed. The whole plant is fleshy and green and stands up straight. It is useful in the border to provide a solid green effect among highly colored annuals or perennials. G. E. Post says it grows in fields and waste places in Aleppo and the Jordan valley.

Thus, from year to year, the herbs come and go in the garden and interest in them is continually renewed and kept alive.

Dioscoreas as Ornamental Foliage Plants

W. O. HAWLEY¹

Newly discovered species of *Dioscorea* with highly ornamental variegated leaves may someday be as popular as coleus and begonias in our homes and gardens. This genus is of world-wide distribution, but occurs mainly in tropical regions. Members are varied in appearance and some have proved to be an important source of basic compounds for drug research, particularly in the production of precursors of cortisone.

While growing the numerous accessions of *Dioscorea* for the cortisone program at the United States Plant Introduction Garden, Glenn Dale, Maryland, the decorative nature of some of them was noted. Subsequently, a few were selected for future distribution as ornamental vines for indoors or out-of-doors.

The genus *Dioscorea* includes over six hundred species. Some of them are important food plants in the tropics, but otherwise the species are little known except to botanists who may have had occasion to work with them. A few are native of the United States; two species, *D. quaternata* and *D. villosa*, are found wild in the vicinity of Washington, D. C. Neither is of ornamental value. Some species become pestilential weeds by natural propagation of aerial tubers.

The culture of *Dioscorea* as ornamentals was recorded by English gardeners in the latter part of the nineteenth century when collections of several species with solid green leaves were made by British explorers of that period. Baines of England wrote in 1894 that *Dioscorea* "is useful in ornamental plantings where there is need for an attractive vine covering in a shaded location." This adaptability to light-deficient situations has also been noted in the plants at Glenn Dale. A report made in 1913 states that species of *Dioscorea* indigenous to the Hawaiian Islands are known as "Hoi" or "Bitter Yams." At least one of these species, then identified as *D. sativa*, produced edible tubers and was

"cultivated for the supply of ships before the introduction of the potato." At that time another Hawaiian species, tentatively identified as *D. divaricata* (?) (P. I. 10311 and P. I. 10312), was introduced into the United States. It produced aerial tubers and was dioecious. The same source reported that the "Air Potato or Giant Yam Vine" was offered to the horticultural trade in Child's Combination Catalogue for 1910. This could have been one of the first sales programs related to *Dioscorea*.

In 1914, a species (*D. bulbifera*, P.I. 38134) from Pago Pago was presented to the United States by Commander C. D. Sterns, then Governor of American Samoa. This introduction was a vigorous, large-leaved type, later offered for distribution. It was not exploited by American nurserymen at that time. The selections now under cultivation have greater horticultural possibilities.

Plant Characteristics

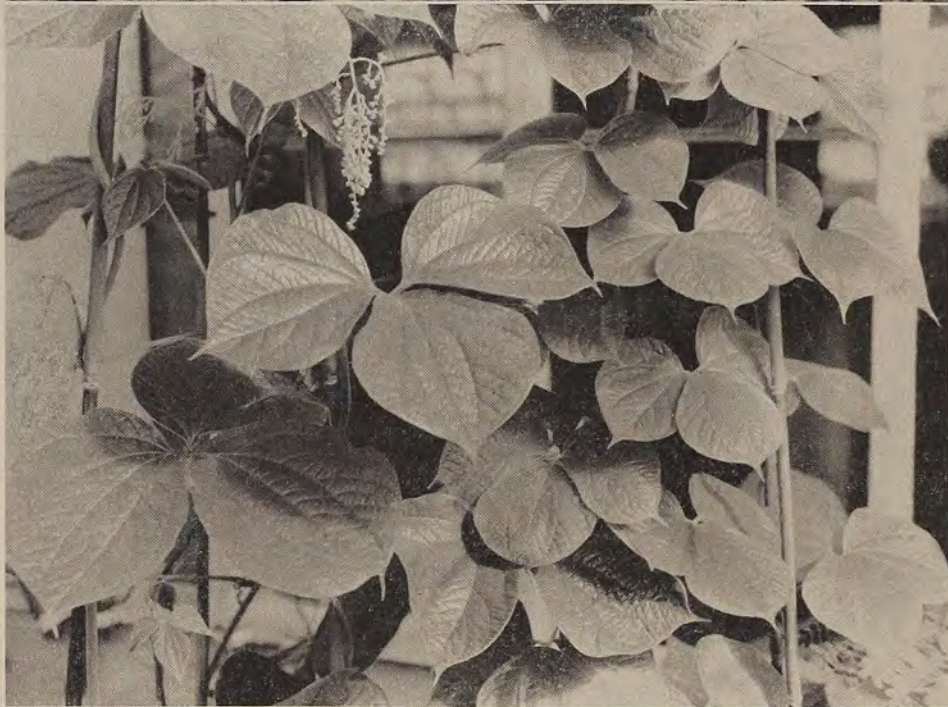
All forms that have been selected as ornamentals are vinelike in growth and habit and will climb any supporting structure on which they can entwine themselves. They are slow to moderately fast growers. In warm climates a dozen tubers of the more vigorous types will grow to cover a hundred square feet of trellis in about six months.

Stem and Leaf Variations. Stems of the selections are variable in color and shape. They include several shades of green, and one is deep purple. Some are thick and fleshy, others are thin and wiry, and a few have thornlike outgrowths. The varieties of *D. alata* have winged stems which may be solid green, purple, or green with purple flecking.

Leaves are alternate in most species, but opposite in a few. In the later stages of growth, lateral branches are often produced from the buds in the leaf axils.

Variation in leaf characteristics is the most prominent feature of these plants. This includes differences in color, shape, and sur-

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face texture. The variegated forms are the most attractive and include not only the purple-leaved types but also those that are mottled green. Selections with solid-colored leaves range through the various shades of green.

Leaves are mostly cordate. In some varieties they are broad and rounded, in others elongated and tapering. There are differences in the basal lobes, those in one species being auriculate or often overlapping; another hastate, similar in shape to an arrow-head; some are deeply cleft and lobed; and one is a delicate, glossy form with frilled margins. Surface textures may be glossy or dull and smooth or pubescent.

The range of size and vigor includes those which are small and slow growing to the very vigorous forms which may have leaves ten to twelve inches wide and grow many feet in a period of months. A complete description of each selection is included at the end of this article.

Flowering Habits. Most will not flower easily when growing under environmental conditions which may differ considerably from those of their natural tropical element, but this is of no consequence since these plants are of interest primarily for their foliage. Warm, humid conditions with some shade and long days encourage flower initiation. The flowers may be clustered close to the stem or hanging in racemes up to eighteen inches in length, depending on the variety. Although the flowers are not particularly showy or attractive, two flowering selections are included among those to be developed as ornamentals.

Most species are known to be dioecious. Flowers range from minute blossoms, slightly larger than a pin head, to the male flowers of some of the monoecious forms, which are

five-eighths of an inch in diameter. Most types produce flowers which are green throughout. A few are white, and there are some reds and purples. Among the flowering selections listed, *D. bulbifera* L. (P.I. 198086) is the only fragrant form which has been grown at Glenn Dale. The plants become well established over a period of months before they will bloom. Flowering is usually prolific once it has been initiated. *Aerial Tubers.* Many of the *Dioscoreas* will produce aerial tubers, which occur in the leaf axils and are an interesting peculiarity; but, like the flowers, they are not of special ornamental value. Among the selections, *D. bulbifera* produces the largest aerial tubers. On this particular species they will develop to about one inch in diameter before dropping from the vine. Aerial tubers are coal black, brown, or some shade of green, depending on the species, and will develop after the plant has been under cultivation for several months. All species producing aerial tubers should not be planted unless one is prepared to keep its natural means of propagation under control.

Propagation

Cuttings. The use of stem cuttings has been the most popular method of propagation at Glenn Dale. Mallet-type cuttings, which include a leaf and a one-inch section of the vine, are made from recently matured material at a time when the plants are in a vigorous state of growth. The leaves may be trimmed to about half size if overlapping in the propagating bed is objectionable. The cuttings are dusted with a root-inducing compound, such as Hormodin #2, and placed in a rooting medium with the bud at a depth of about one and one-half inches.

Various rooting mediums may be used,

Top: Leaves of a light green variegated selection (PI 209446). This form is a moderate grower with medium size leaves, three to four inches across. The variegation is gray-green.

Center: Leaves and flowers of the trifoliolate ornamental selection (PI 194613). This selection is a vigorous grower with very pubescent leaves and stems. Like the other vigorous types, it should be suitable to out-of-door planting especially in warm climates.

Bottom: Leaves of one of the purple ornamental selections (PI 198284). This selection is one of the more vigorous growers and should be quite suitable for out-of-door use. The leaves average about seven inches across and are a very deep purple green.



however, a coarse grade of well-washed builder's sand has proved satisfactory. After leveling, the bed should be thoroughly syringed and permitted to drain. Trenches are then cut in succession as rows are set in. Cuttings are watered-in, with care being taken not to wet the leaf surfaces. This precaution must again be observed when successive waterings are applied.

Environment in the propagation enclosure should be slightly humid with some ventilation. The temperature of the rooting medium should be maintained close to 70 degrees Fahrenheit and the air temperature about the same. Rooting will occur in four to six weeks, at which time the young plants can be transplanted from the propagating bench.

Tuber Division. After one season of vigorous growth, most varieties can be dug and propagations from the tubers can be made. In a growing medium of soil, sand, and fibrous material, the purple-leaved species may produce rounded, white tubers on underground shoots several feet from the plant as well as under the crown. Other species produce tubers which are different in shape and color from those of the purple-leaved types, but tuber production is usually limited to the original planting location. When one or two large tubers are formed, rather than several small ones, they often may be cut into several pieces and placed in a well ventilated location so that the surfaces can dry before they are planted.

Aerial Tubers. Aerial tubers also provide a means of propagation. These do not occur on all species. However, when they are available they may be started in any good growing or propagating medium and will produce normal plants.

Seeds. If seeds are obtainable propagation by this means is possible. For several reasons, however, this method is less desirable than others. Seeds are difficult to pro-

duce under cultivation because the plants are usually dioecious, and the small size of the flowers makes hand-pollination impractical for commercial seed production. In addition, genetic instability of some species might result in seedling variations which would be inferior to the original selections. *Other Means of Propagation.* The purple-leaved types will sometimes sprout from underground runners and develop small plants without tubers. These can be cut from the runners and will start normal tuber production in a few months.

Culture

A warm, lightly shaded, and slightly humid environment with long daylight periods favors good growth. Short days and cool night temperatures will cause many species to drop their leaves and enter dormancy. The growing medium should be a sandy loam type soil with plenty of fibrous organic matter, such as peat moss or leaf mold. *Dioscorea* responds well to applications of fertilizers. It will also resist the effects of nutrient deficiencies and may grow fairly well even in poor soils.

Pests

Dioscorea appears to be as susceptible to insects and diseases as are many of our other herbaceous ornamentals. Under greenhouse conditions it suffers from infestations of red spider, mealy bugs, soft scale and root knot nematodes. Out-of-doors the tender growing tips may be attacked by aphids.

Tubers are susceptible to rot fungi when damaged in handling. Broken tuber pieces should be cut smooth, treated with a fungicide, such as Semesan, and surface dried before further handling. Tubers planted with wet wounds will most certainly begin to rot soon after planting.

Some species are damaged by aerosol insecticides. Leaves killed by this means are

Top: Left: Aerial tubers also show species variation. These vegetative parts are convenient for propagation and occur on some of the ornamentals. Right: Flowering racemes of various species.

Bottom: Left: The inflorescence of monoecious species. The male flowers of this selection (PI 214003) are the largest observed at Glenn Dale. Right: Leaves of ornamental selections. Forms and colors to meet the taste and desires of most any connoisseur of plants.



Different types of stems typical of those found among the ornamental Dioscorea selections. Left to right: two thin and wiry forms; light green and terete; pubescent or hairy; dark green and terete; wiry and spined; coarse and thorny; winged and light green; reddish-black and winged; winged with purple flecking.

usually replaced in a few weeks by new shoots provided that the plants are in a healthy condition. Growing stem tips may also be killed by this treatment.

Storage and Shipping

If storage of the dormant tubers is desired, they should be thoroughly surface dried before bagging or boxing. Tubers of species with thin skins should be handled very carefully and any damaged surfaces should be treated with a fungicide as stated above under Pests. The storage chamber should be moderately ventilated and frost-free.

Tubers collected for shipping should be prepared as for storage and packed with a

Cuttings being placed in a rooting medium of clean coarse sand.



Paul Norfolk, of the Glenn Dale Introduction Garden, selecting vines to be used for vegetative propagation by cuttings.



material that will prevent bruising or breaking of the surface tissues. Sphagnum moss has been used successfully for this purpose.

Detailed Descriptions of Glenn Dale Selections

The descriptions herein are based on observations of plants grown under greenhouse conditions. New accessions are continually being placed under cultivation at Glenn Dale, thus making it possible that a few additional ornamental selections will be made.

P.I. 213446, *Dioscorea* sp.

A variegated type with large cordate leaves, 7 to 8 inches across. The upper surface displays a very dark green base color and a fine pubescence which gives a velvety, iridescent sheen. The gray-green variegation is found in irregular areas located mostly along the midrib. The lower surface is a solid beet-leaf purple, devoid of pubescence. A vigorous and fast-growing selection.

P. I. 198284, *Dioscorea* sp.

Similar to P.I. 213446 but with slightly less detail in the venation and at least two additional shades of green in the variegated areas. A very vigorous grower with the velvety sheen of the purple leaf-types.

P.I. 198254, *Dioscorea dodecaneura*

Similar to P.I. 198284, but much smaller, the leaf being only about three inches across and elongated with an attenuate tip. This species may bloom after several months' growth. The flowers are small, on racemes up to six inches in length, and not particularly attractive. Adaptable where space is limited and curtailed growth is desired.

P.I. 209446, *Dioscorea* sp.

A medium size form with cordate leaves three to four inches across, the basal lobes sometimes overlapping. Medium green with gray-green areas between the veins. A moderately vigorous grower with wiry stems and crisp leaf texture. The upper surfaces somewhat glossy. Considered by some to be the most beautiful selection.

P.I. 198338, *Dioscorea campestris*

A species that is different from the other selections in that the leaf shape is lanceolate rather than cordate. The leaf is small, one inch across by three inches long, and light green in color. Stems are thin and wiry.

This selection flowers easily and also produces pea-size aerial tubers which may be used for propagation.

P.I. 194613, *Dioscorea dregeana*

A trifoliolate type, vigorous and rampant. Light green leaves and stems covered with a coarse pubescence. Good for out-of-door cover or screening purposes.

P.I. 226708, *Dioscorea pentaphylla*

Another vigorous grower with large digitately compound leaves which are a medium green. Propagates readily from cuttings.

P.I. 214003, *Dioscorea logoa-santa*

This selection was made solely for its curious flowering habit, which consists of the production of staminate and pistillate flowers on different sections of the same vine. The staminate flowers, which are interesting and somewhat attractive, are about five-eighths of an inch in diameter and are the largest *Dioscorea* flowers observed at Glenn Dale.

P.I. 198086, *Dioscorea bulbifera*

Selected as a flowering type. Although the flowers are very small, they occur in profusion on racemes up to eighteen inches long. They are white at first, fading to a deep red, and have a delicate fragrance. The leaves are cordate, medium size, and medium green in color. A rather vigorous grower producing aerial tubers which may be used for propagation.

P.I. 205144, *Dioscorea bartlettii*

A thick-leaved form having elongate, cordate leaves, which are purple when young and turn semi-dark green with very glossy surfaces upon maturing. Leaves measure three to four inches across and about eight inches in length. A moderate grower, well suited to indoor use.

P.I. 198992, *Dioscorea trifida*

A trilobate form selected for its thick winged, deep purple stems. Dark green leaves about eight inches across with the central lobe slightly longer than the other two. A vigorous grower.

P.I. 220212, *Dioscorea trifida*

The most vigorous of this group of selections. The leaves are light green, trilobate, and fifteen to eighteen inches across. The stems are thick and winged, light green flecked with purple. This selection should be unusually good for patio or large trellis cover.

Recent Advances In Horticulture

"Our Daily Poison"¹

A seriously posed question that concerns the healthfulness of the food we eat, the water we drink, and the air we breathe, merits earnest attention. The thesis of this book is that the entire population of the United States (where the general mortality rate has declined from 17.2 deaths per 1000 in 1900 to 9.6 in 1950, and where life expectancy increased from 47 to over 67 in the same period) is now being systematically and cumulatively poisoned. "We are," says the author, "living in a poisoned world." This is due, he informs us, to the fact that pesticides are sprayed over the fruits and vegetables we eat, the air we breathe in hotels and public halls is impregnated with poisoned vapors, and a noxious chemical is being added to our drinking water.

Prior to reading this, the reviewers supposed that growers of fruits and vegetables were rather careful, under the instruction of agricultural advisers, not to spray these products at a time they are approaching marketing and might carry spray residues. Also that the Food and Drug Administration, under the new Federal Food, Drug, and Cosmetic Act of 1954, was extremely reserved, about permitting spray residues on food products offered for public sale. We believed also that much progress had been made in the last decade or two, in the science and practice of ventilation and air conditioning, especially in public buildings, and that this is a process of purifying the air. We had even believed that most dental authorities either approved the use of fluorine in public water supplies or administered fluorine treatments to their juvenile clients as a means of preventing tooth decay, though this result might eventually reduce the demand for their services.

It is in order, therefore, to inquire by what competence and authority the author of this book makes such startling claims. The title page gives no clue to this question either as to his baccalaureate degrees or profession-

al connections, but in a preface he is described as a recognized writer of ability and a qualified chemist. Both statements might be true in a limited sense, but neither would assure that he is qualified in the very specialized sciences of physiological chemistry and human nutrition, much less as an authority on human health. He may be a writer of ability, but recognized by whom? Inspection of the last two editions of the comprehensive directory of *American Men of Science* fails to disclose Mr. Wickenden's name. He is not listed in *Who's Who in America, 1952-1953*. The encyclopedic index to the world's chemical literature, *Chemical Abstracts*, lists no article of his in the last five years.

We are, however, reviewing this book, not appraising its author as a scientist or writer. In a general way, its most striking feature is the dogmatic character of its assertions; it has no light or gray tones but all are heavy and mostly black. The style is that of an ardent crusader, not of a scientist objectively seeking the facts. There is more than a slight tendency to exaggeration, to draw startling conclusions from few and isolated examples. Thus, in attempting to show how disastrously fatal modern pesticides are, the author adds all the theoretical numbers of persons that the annual production of ten different pesticides might be capable of killing, and arrives at fifteen billions—more than six times the population of the world. It would seem sufficient to make his point if the author had merely stated that the hundred million pounds of DDT annually produced in the United States is enough to kill off the whole world's population (provided all of it was eaten by people!). One could just as logically compute the theoretical mortality from the nicotine in the 300 billion cigarettes that Americans consume, or from the carbon monoxide in the exhaust of 60 million automobiles.

One of the author's medical sponsors speaks of "man's arrogant assumption that he can solve the extremely complex biological problems of agriculture and public health by the dissemination of deadly poisons." Does anyone seriously believe that the hosts

¹A review of a book published under the title: *Our Daily Poison, The Effect of DDT, Fluorides, Hormones and Other Chemicals on Modern Man*. Leonard Wickenden. The Devin-Adair Company, New York. 1955. 178 pages. \$3.00. (Library).

of intelligent and competent persons who are engaged in research and administration of agriculture and public health in this country would countenance such an assumption?

The repeated charge which the author levels against entomologists and plant pathologists, that in general they have no program for combating agricultural pests than to produce ever more violent poisons, and that the effect of their efforts to date has been a vast increase in the number and variety of pests, is a gross libel against a fine group of scientists. Far from depending exclusively or mainly upon poisons, most of them are studying every means that has demonstrated any worth at all for the control of pests. These include the breeding of pest-resistant crops, the introduction of predators and biological antagonists, and a comprehensive and meticulous study of plant physiology and ecology to strengthen the constitution of crops and eliminate adverse influences. No reputable agricultural school in this country would give a degree to an entomologist or plant pathologist who had not been trained in all these phases of agricultural science.

It would require a book of nearly equal dimensions to the one under review to answer all the author's contentions and point out his errors of fact, or interpretation, and excessive generalization. One especially prominent error requires mention. It is stated (p. 11) that a virus "is probably a non-living poison, produced in living cells which are in turn attacked by the poison. Diseased tissue produces viruses; viruses produce diseased tissues." It is also inferred that the prominence which virus diseases, especially of man and farm animals, have attained in recent years is correlated in some way with the use of modern pesticides, in particular the chlorinated hydrocarbons.

Although virologists are generally reluctant positively to define the nature of a virus, whether living or non-living, there are few today who would not concede that viruses show the same manifestations of life—multiplication and specificity—that characterize all microorganisms. Many viruses have been grown in chicken eggs and tissue cultures, they have been shown to possess distinctive morphology; they have been photographed in the process of entering cells, multiplying therein, and then discharging, much the same

as with other parasitic organisms. Some of the most familiar virus diseases of man, farm animals, and plants long antedate in history the known use of any pesticides.

There is scant mention of the Food and Drug Administration, and mostly derogatory references to the U. S. Public Health Service. The author apparently considers them incompetent or worse in the discharge of their sworn duty to protect the public health. The American Dental Association is similarly discredited as a trustworthy authority in the matter of fluoridation of water supplies. Pronouncements from these organizations would, therefore, probably carry little weight with the author, but to the general public some recent statements from them may be reassuring.

With reference to the existence of dangerous pesticide residues on food crops, this has been since 1954 under the direct control of the Food and Drug Administration, by virtue of the Miller Bill, the author of which Wickenden at times mentions with approval. Tolerances and exemptions have been issued since then in some cases but not where this Administration believed that any probable hazard to the public health was involved. In a recent policy statement, W. B. Rankin, Assistant to the Commissioner of the FDA, said, "Where a tolerance is issued by the Federal Government, it means: (1) that residues up to the tolerance level are safe; this has been established by adequate experimental studies on animals; (2) that the pesticide can be employed usefully in agriculture without leaving excessive residues; this has been established—by the U. S. Department of Agriculture; (3) that when the pesticide is used according to proper directions, it will leave residues that are within the permitted level; we will not issue a tolerance unless there is evidence that it can be met."

And the American Dental Association reported at the end of 1955 that the completion of 10-year fluoridation tests in three North American cities revealed a reduction of nearly 60 per cent in dental decay. Dr. H. Trendley Dean, secretary of the Association's Council on Dental Research, stated that "other studies augment the overwhelming mass of scientific evidence on the treatment's effectiveness, safety, and economy."—
FREEMAN A. WEISS & FREDERICK W. COE.

Light and Your House Plants

PEGGIE SCHULZ

Window gardeners always long for windows ablaze with flowering house plants. It must be admitted, however, that such indoor gardens are generally confined to the realms of wishful thinking.

Many window gardeners forget to apply to their indoor gardens the basic principles of outdoor gardening. Plants growing indoors or outdoors need proper soil, fertilizing, watering, humidity and, most of all, adequate amounts of light.

The windows in many homes fail to admit enough light so plants can manufacture food. If this requirement is not met, plants cannot flower.

With the aid of fluorescent lights it becomes a relatively simple matter to supply indoor gardens with controlled light. Fluorescent-lighted plant setups are a boon to gardeners who have but little window space. For with these lights it is possible to turn any dark corner, upstairs or downstairs, into a garden. Basements make ideal nooks for lighted gardens.

Here are the essentials for a simple light setup: two 40-watt daylight or white fluorescent tubes, a reflector to force light down on the plants, and a plant table. The cost of the tubes and reflector varies from ten to fifteen dollars, depending on how de luxe a unit you purchase. If you want to make your own reflector, paint a two by four-foot piece of plywood with white enamel (this gives excellent light reflection). Secure the lights to the plywood and suspend them horizontally over the plants. You can make a stationary fixture by suspending the lights with chains. Should you desire a more flexible unit, suspend the lights by means of pulleys. This will enable you to raise and lower the lights according to the type of

plant you wish to grow. If you don't favor the do-it-yourself methods, you will find there are many fine commercial fluorescent-lighted plant units on the market.

The average indoor gardener will find that the light tubes should be approximately eighteen to twenty inches above the plant table. To bring plants into flower you will need to leave the lights burning fourteen to eighteen hours per day. If you don't fancy the chore of switching lights on and off, you can purchase an automatic timer to do the job.

As you work with your lighted garden you will discover that house plants, like outdoor garden subjects, need varying degrees of light. Most foliage plants will grow into handsome specimens under low light intensities. Plants such as gloxinias and many other tuberous-rooted gesneriads, as well as the little wax begonia, need maximum amounts of artificial light to make them grow into symmetrical blooming plants. Space these light-lovers so there is about eight inches between light tubes and pot rims.

African violets are well suited to under-light culture. They need 300-600 foot candles to turn into specimen plants. Blooming-sized plants should be spaced so there is about 11 inches between light tubes and pot rims. Smaller plants can be somewhat closer to lights.

Plants growing directly under the light tubes do not need constant turning to grow symmetrical. If you spill water on hairy-leaved plants, you need not bother blotting it off. Light shed by the fluorescent tubes will not burn the dampened surface.

Temperatures of 70-75 degrees Fahrenheit which are found in the average home are

fine for the growth of quite a number of house plants. But such temperatures are apt to dry moisture from the air and, even with perfect light, plants have a difficult time flowering in an arid atmosphere. I like to grow all of my house plants in specially constructed galvanized trays. I fill these trays about half full of pea rock and keep water in the trays just below the pot level. Such practice keeps the humidity at 40-50 per cent. This coupled with sufficient light is high enough to bring most commonly grown house plants into flower.

The care of house plants under lights approximates that of window-grown plants. They need be watered thoroughly and then let dry fairly well before being watered again. The general run of house plants responds to twice-a-month feedings of any good all-purpose fertilizer.

If you are specializing in any one group of house plants, you will do well to consult books on the subject. These books give you excellent soil formulas and many special tricks to help you get the most out of your hobby.

Growing house plants from seed can be lots of fun and what a boost these seedlings receive from properly controlled light! Sprinkle the seed atop the media of your choice, place the planting in a warm dark place for a few days. As soon as flecks of green appear, set the planter close to the light tubes. You'll be amazed when the seedlings develop into stocky plants, rather than the stragglers grown at the average window. When seedlings have four to six good leaves, it is time to prick them out and plant into community pots. I find the new plastic bulb pans a happy choice for this first move. These pans hold moisture much longer than clay pots. After transplanting, slip a transparent plastic bag or pane of glass over the pot and place it close to the lights. When the leaves of the seedlings begin touching one another, it is time to move them

into individual 2-inch pots. Light-grown African violets and gloxinias can be brought into bloom from seed in less than five months.

If you derive much of your indoor gardening pleasure from propagation then, surely, lights are for you! Cuttings root with great ease under lights. Insert cuttings in moist sand, sphagnum moss or peat moss. If possible, slip the planted unit into a transparent plastic bag and place it under the lights. Even without bottom heat, it is not unusual for cuttings to strike root in a week or less.

House plants at the window or under lights are sometimes subject to pest and disease. If the leaves of your African violet look droopy and appear to need water even though the soil is moist, this plant may be suffering from the first onslaughts of crown rot. Remove the plant from its pot and with a sharp knife cut away all the decayed portion of stem and the wilted outer leaves. Dust the trimmed portion with Fermate and insert it into moist sand or a glass of water. Place it under the lights and in no time at all it will show a strong crop of fresh roots. As soon as root growth appears to be sufficient, replant into proper soil and a 4-inch pot and place it eleven inches from the light tubes.

You can eliminate the largest share of house-plant pests by using specially designed house-plant "bombs." Directions come with these under-pressure sprayers. Bulbous plants of any kind benefit greatly when their soil is soaked at planting time and at intervals of six weeks with a mixture of Carco-X. This treatment eliminates thrips on gloxinias and other bulbous plants, including amaryllis.

If your indoor garden hasn't lived up to your expectations, why don't you, too, try growing your plants under fluorescent light?

(See Page 39 for a book review of "Growing Plants Under Artificial Light" authored by Mrs. Schulz.—Ed.)



The Glossy Abelia

ERIK HANS KRAUSE

The large and extremely versatile Honey-suckle family (CAPRIFOLIACEAE), with fourteen genera and around four hundred species, has contributed many popular and useful shrubs to horticulture. A listing of only three of the genera, *Viburnum*, *Weigela*, *Lonicera*, would make an impressive catalog.

Yet some of the most attractive members of this family are seen and enjoyed in relatively few gardens: the Abelias. Of course it is true that with few exceptions the Abelias are not hardy in the more northern sections, and all of them have a delicate structure which calls for a special setting.

In keeping with the spirit of simplicity of this series, the species most suitable for average conditions will be selected: the Glossy Abelia. (Named after Dr. Clarke Abel, physician and author on China, 1780-1826.) As the botanical name indicates, it is a hybrid between two Chinese Abelias, which originated before 1880.

Though the parents are restricted to milder zones, the *A. grandiflora* does quite well in Zone V where it will flower until definitely discouraged. This hybrid, like the parents, is a small plant, though the spreading branches reach out in graceful arches. The ovate leaves, lustrous dark green as the evergreen parent *A. uniflora*, are beautiful just in themselves. Near the end of June, or later in cooler climates, the axillary and terminal cymes begin to form; even before the flowers open. The very strange purplish sepals form a pattern unlike any other plant. From the center of these irregular formations arise, week after week, the slender buds, to open into delicate mauve-pink, fragrant flowers.

It would seem that this long succession of fragrant blossoms, when most other plants show the wear and tear of the past seasons, is reason enough to reserve a special place for the Glossy Abelia.

Descanso Gardens—Floral Wonderland

JOHN L. THRELKELD

Descanso Gardens is nestled in a bowl of the San Rafael Hills in La Cañada, California—a community in the foothills between Glendale and Pasadena—and accessible in a matter of minutes by any mode of transportation from downtown Los Angeles.

Descanso Gardens is a Mecca for the lover of Nature; a Mecca to be returned to—not just yearly, but seasonally or even monthly. Each time the gardens are visited, each turn of a trail offers a new vista reminding one of perpetual springtime.

Even though Descanso Gardens is visited yearly by thousands of people, each person viewing the scene for the first time has the feeling that a paradise has just been discovered not hitherto seen by man. A rushing stream, banked with flowers, winds its way through the shadows of the overhanging branches of picturesque California Live Oak trees. A meadow seems to be held in place by a circle of flowers and trees dancing to the music of myriads of songbirds, creating a

scene of Nature's beauty not soon to be forgotten.

One doesn't have to be a student of botany or a naturalist to enjoy the serenity of Descanso Gardens. A love of nature and time to relax are the only requirements for enjoyment.

The gardens are like an historical novel, filled with romance, adventure and downright enjoyment at the turn of every trail. Mother Nature was at work on the setting for centuries before man ever came into the story. The hills, valleys, canyons, streams, and trees were forming a background long before Balboa ever sighted the Pacific

A Dedicatory Article to the American Camellia Society's Annual Meeting in Hollywood-Los Angeles, February 23 through 26, and to the Los Angeles Camellia Show to be staged in the Descanso Gardens February 25 and 26.—Ed.



One of the reflection pools along the stream bordering the Shade Area.

Ocean, and before the Padres directed the construction of the missions that are so characteristic of the California scene.

Written history began when Governor Pedro Fages of California granted 36,400 acres of land to José Maria Verdugo in the year 1784. The grant was named Rancho San Rafael. Sr. Verdugo was an industrious farmer and cattle man, developing the vast acreage into a thriving community of vaqueros and granjeros.

Upon Sr. Verdugo's death in 1831, the property was willed to his son, Julio, and his daughter, Catalina. The property was divided in half, Julio farming the southern section. The city of Glendale and the community of Eagle Rock now populate that section. Because of Catalina's ill health, the northern half was left in idleness.

Julio became indebted and borrowed some \$3,400. The interest was compounded at 3% per month. In a very short time the interest brought the total to \$58,750. The southern half of the property was sold at Sheriff's auction for that sum in 1869.

The northern half, which included the present site of Descanso Gardens and the communities of La Cañada, Montrose, La Crescenta and Verdugo City, changed hands a number of times and lay in sheer idleness for many years.

Conditions as known today came into being nearly one hundred years ago. A great fire caused almost complete destruction of the beautiful California Live Oak forest. Only a few of the original great oaks survived. "Old Verdugo," one of the last monarchs, is still to be seen in Descanso Gardens in a position of prominence. Acorns deposited before the fire were covered by debris carried by an ensuing flood. Spring brought germination of the acorns and the forest came into being again. Many think the oaks' gnarled and twisted appearance of today is more picturesque than the previous forest could have been.

In 1937, Manchester Boddy began his plan of acquisition and development of the present garden area. He purchased 165 acres, 25 of which were densely covered by beautiful California Live Oak trees, and set about to cut trails and clear a site upon which to build a home. In a span of about thirteen years, the forest was cleared of

underbrush and poison oak, and the nucleus of the gardens installed.

Various types of ventures were started during those thirteen years. Livestock raising, vegetable and fruit growing, cut flower production, and, in 1940, the idea of growing camellias for sale on the commercial market was conceived.

In 1941, Mr. Boddy secured the services of J. Howard Asper who planted the first camellias on the Descanso property, little realizing that his efforts would lead to a camellia planting second to none in the world.

Camellia growing demanded a great deal of irrigation in the semi-arid conditions of Southern California. The Hall-Beckley Canyon two miles north in the Sierra Madre Mountains became the source of very high quality water.

The camellias flourished. They liked their situation in one of the most beautiful natural settings possible. The twenty-five acres of California Live Oak trees on a northern slope of the San Rafael Hills offered nearly perfect growing conditions. The soil, being of decomposed granite origin, provided perfect drainage, having a generous supply of top soil as laid down by the natural forest.

Planting the camellias in this woodland was a very simple procedure. Stream beds, natural drainage gullies and a generous sprinkling of boulders offered conditions ideal to the gardener. Over the entire twenty-five acres, any ground flat enough was planted to camellias.

The original planting included the most widely known varieties at that time, including acres of 'Pink Perfection,' 'Elegans,' 'Eureka,' 'Daikagura,' and many other of the old-fashioned camellias.

The camellia cut flower business met with varying degrees of success and gradually led to the establishment of a wholesale nursery organization. The nursery business branched out to cover other types of plants—including roses, Ceanothus, Leptospermum and many other types of flora.

In 1945, the services of the already famous hybridizer, Dr. Walter E. Lammerts, were engaged to carry on a project in research and development of these specialty plants.

The research program grew with great strides. Consequently, many new and inter-

esting types of plants were introduced, including *Ceanothus* Hybrids—'Sierra Blue' and 'Mountain Haze'; the Daily News series of flowering and fruiting peaches; Roses—including the 'Descanso Pillar,' 'Chrysler Imperial,' 'Queen Elizabeth' and others; *Leptospermum* Hybrids of great beauty; and, of particular importance, the importation and introduction of eighteen new varieties of *Camellia reticulata* from Kunming, China.

The problem of unsolicited visitors became so great as to prompt a decision to remove the nursery to another location, letting the already spectacularly beautiful gardens become truly a show garden, open to the public on a paid admission basis.

The camellia plantings were expanded to include the rare and unusual types of camellias being grown throughout the world. Commercial growers and hobbyists, world wide, were contacted for the purpose of importing exotic plants to this garden development. Consequently, many new introductions were made. Such outstanding *C. japonica* varieties as 'Pride of Descanso,' 'Berenice Boddy,' 'Jenny Jones,' 'Hana-Fuki' (Mrs. Howard Asper) and others were introduced.

One section of the garden is devoted to the camellia species including the wild form of *C. reticulata*, *C. pitardii*, *C. saluenensis* and twenty others.

And, of course, the 18 new varieties of *C. reticulata* mentioned above were included in



Ansel Kickbush

"Old Verdugo," 500 year old California Live Oak, one of few remaining survivors of tremendous fire of 1883.

a spectacularly beautiful section of the gardens. The flowers of the Kunming reticulatas are still amazing to camellia enthusiasts. It will take many years for the development of a final analysis of their value. However, it appears at present that a new era of camellia culture dawned with the import of these plants.

The stream beds, drainage gullies and areas unsuited to camellias were planted to many varieties of azaleas, rhododendrons, ferns, fuchsias and other types of shade plants. Winding trails through the forest were established to coincide with the natural plantings as much as possible—each turn offering a vista of great floral beauty.

The now world-famous "History of the Rose" Garden was installed, the research work being done by Dr. Walter E. Lammerets. Correspondence was started with rosarians all over the world, and specimen plants began to come in and take their place in their proper position of importance in the Rose History Garden. So great was the response and findings that roses dating centuries before the time of Christ were planted, creating a garden of such character as to be unique in the world.

The roses are planted in their proper historical order—beginning with *R. gallica officinalis* and *R. damascena* and progressing a century or portion thereof at a time, showing the rose and its development up to the latest All-America Rose Selections winner for 1956.

The Descanso Gardens rose plantings reach their peak of beauty in May and June each year. This garden is not only a history of the rose, but also a history of horticulture and mankind—showing the triumphs of man in developing the primitive types of roses into the spectacular, ever-blooming hybrid teas, grandifloras, floribundas and other types of roses so popularly grown today.

Difficulties were constantly encountered in operating so vast a garden, finally becoming so great as to make continued operation impossible. The decision was made to subdivide and build homes on the site, destroying the beautiful forest which had persisted through fires, floods, eons of time and the tremendous garden development.

But the Los Angeles County Board of Supervisors, mindful of the need of pre-

serving the waning natural beauty spots in the western area, intervened and caused the County of Los Angeles to take over the gardens on a lease arrangement with a view to the eventual purchase. The gardens were placed under the jurisdiction of the County of Los Angeles, Department of Parks and Recreation, on November 16, 1953.

Many more improvements and additions have been made, and development is proceeding at a fast pace to make Descanso Gardens one of the most outstanding year-round garden spots in the United States.

In addition to the floral attractions, there are certain special events such as the Annual Camellia Festival (Feb. 25-Mar. 11, 1956) which is a cooperative effort of Descanso Gardens and all people of camellia interest in Los Angeles County. La Feria de las Flores (Fair of the Flowers) combines the beauties of the gardens with the colorful folk dancing of the Latin-American people reminiscent of the days of the Verdugos and is held in April. The Rose Festival is in May, and other music and dance programs provide activities throughout the year.

Garden tours, meeting rooms in a beautiful mansion for horticultural-minded organizations, and lectures add to the interest. A special food catering service is available for groups upon request.

Plans for future development include extensive night lighting in an artistic manner, the construction of a fine restaurant, and the planting and development of a half-mile trail. The trail will include virtually every type of shade plant currently grown in Southern California as well as new plant introductions through the cooperation of the Los Angeles State and County Arboretum and other organizations of horticultural interests in Southern California.

Extensive picnic areas, scenic rest spots, special events, music and festivals, combined with the unmatched beauty of hundreds of thousands of flowering plants, provide something of interest to everyone of any age.

Times may change. Inhabitants of the forest may change. But one thing will never change. The serene beauty of Descanso Gardens will continue to unfold chapters in a novel book of Nature to thrill future generations as it has thrilled many generations in the past with its air of perpetual springtime.

A Book Or Two

(Books noted "(Library)" are available for loan to the membership.)

Camellias In The Huntington Gardens, Volume II.

William Hertrich, Curator Emeritus. Abbey San Encino Press, Pasadena, California. 1955. 378 pages. Illustrated. \$10.00. (Library).

Second of probably three volumes, which, when completed, will contain a delightful, generous and very worth while description of the more than 1,000 cultivars (or varieties) of camellias growing in the Huntington Botanical Gardens at San Marino, Los Angeles County, California.

This new book should be of particular interest to persons looking for accurate descriptive information on the flower, leaves, and habit of camellia varieties since it is unusually strong in that field. The book is divided into three main parts. The first is a brief but very constructive three-page review of the grafting methods used at the Huntington Gardens. Nine good illustrations make it easy for the beginner or the experienced gardener to see just how they handle this important job. Part 2 is a history of our fairly new and beautiful *Camellia reticulata*. Three pages of text and two illustrations tell that story. Part 3, which makes up most of the book, is a description of the flowers of almost one-third of the approximately one thousand camellias now growing in the Huntington Garden. For example, there are 249 descriptions of *C. japonica*, three descriptions to a page, followed by three corresponding black and white plates representing the best in photography. Each plate occupies a full page which means the picture ranges from around two-thirds to the full size of the flower with many valuable flower details camellia enthusiasts would like to have. These descriptions and pictures are arranged in alphabetical order from 'A. J. Pink' to 'Yuki-Botan.'

The 29 pages of pictures and text on *C. reticulata* which follows that on *C. japonica* will undoubtedly be of interest to those looking for accurate information on the flower, leaves, and habit, of the 19 different reticulatas included and described in alphabetical order from 'Buddha' to 'Willow Wand.'

The thoughtful arrangement of the index should be of help to those who want to check information in a hurry, since it names the variety and the synonym, if any, and gives the page number. If the page number is in bold figures, it means there is a picture of the flower on that page. Another helpful point in the description is the use that may be made of particular varieties, i.e. 'Covina,' tolerant to sun, compact, recommended for hedges. There is, of course, in a good book like this, information on the habit of the plant, such as upright, densely foliaged, dwarf proportions, free-flowering, mid-season bloom, as well as information on the size, color, and make-up of the flower and leaves.

This book contains three beautiful colored pictures or plates on three reticulatas. The frontispiece is of *C. reticulata* 'Willow Wand,' the second is of 'Noble Pearl,' and the third of 'Purple Gown.' These pictures show these wonderful flowers in their true colors. There are also two full pages of pictures, near the end of the book, of leaf studies of the reticulatas described and illustrated.

Having visited many of the famous camellia gardens in the country, I know how beautiful they are and how hard it would be to try to describe this

beauty in a book. This beauty, of course, is the result of years of experience in planting, setting, grafting, measuring, photographing, studying and caring for the plants. The results of some of these studies are recorded in this new book which would be a real asset to libraries and community garden clubs that wish to provide the latest information for their members who are interested in one of America's most beautiful flowers—the Camellia.

Frank L. Teuton, U. S. Department of Agriculture, Washington, D. C.

Garden Design Illustrated.

John A. and Carol Grant. University of Washington Press, Seattle, Washington, 1955. 161 pages. Illustrated: color, black-and-white, and line drawings. \$5.75.

Many garden designers quite apparently seem to be unaware of the importance of design value, function, and relationship of plant materials. Mr. Grant, a practicing landscape architect, horticulturist, and lecturer in the Pacific Northwest for many years, believes that "today good garden design requires both the sympathetic understanding of the plantsman and the design sense of the garden architect." His approach is practical and from experience; he amply discusses such matters as design principles, plant material of many kinds, pictorial effects, scale, texture, structure, size, shape, and pattern of foliage, color, drifts, contours, and cultural requirements. Many illustrations convey their specific application and use. This, the third garden book written in collaboration with his wife, an informed critic and editor, is filled with workable information and guidance both for the beginning gardener and the professional landscape designer.

M. C. L.

Growing Plants Under Artificial Light.

Peggie Schulz. M. Barrows & Company, Inc., New York. 1955. 146 pages. Illustrated. \$3.50. (Library).

Anybody have an empty closet? A north dining room? A dark city apartment? Unused space anywhere in the house? And, of course, an interest in photoperiodism? Mrs. Schulz actually tells you how to grow plants anywhere under artificial light. In collaboration with scientific workers in this field, gardeners, homemakers, interior decorators, commercial florists, and her husband, she very expertly describes various types of fixtures, places for them, estimates on amounts and costs of electricity needed, and gives detailed instructions for the culture of some 155 plants under fluorescent or incandescent lights. Light in the greenhouse is also very adequately covered, as well as a complete list of dealers and supplies. The opus is a non-technical and invaluable guide and is the first of its kind on the market treating this twentieth century's boon to gardeners.

M. E.

(See Mrs. Schulz' article on this subject in this issue of THE NATIONAL HORTICULTURAL MAGAZINE.—Ed.)

Japanese Flower Arrangement.

Seido Iwata. The Studio Publications, Inc., New York. (First published by Seibikai Floral Art Institute, Tokyo). Printed in Japan. 1955. 84 pages. Illustrated. \$6.95. (Library).

Rebelling against the over-developed stylization demanded by conformity to the rigid traditional rules of the old schools, Mrs. Iwata, an eminent Japanese flower arranger, writer, and lecturer, started her own Seki-So-Ryu (School of the Rocks and the Flowers), which takes an entirely new approach to flowers and avoids basic design or preliminary pattern in an arrangement. There she teaches students to preserve natural beauty, to understand and love flowers, and to create original arrangements which must follow nature rather than prescribed formulas. A few illustrations show some mechanics of placing flowers and branches in the container, and several ways of preserving flowers. The Japanese printer has presented an extraordinarily fine and very artistic format in the placement of the arrangement illustrations, and the jacket design by Foujita, a famous international artist.

M. C. L.

Geraniums for Home and Garden.

Helen K. Krauss. The Macmillan Company, New York. 1955. 194 pages. Illustrated. \$5.00. (Library).

To those who are familiar with the excellent book Mrs. Krauss wrote about Begonias, the present volume will be no surprise. It has all the same excellences. If the Begonia volume opened the eyes of many outside the great begonia fraternity, this book should amaze and delight all.

The familiar geranium, with its gay red flowers, is almost a traditional matter and for many, as for the reviewer, pots of rose-, apple-, and lemon-scented geraniums, date back to very early recollections.

The extent of the revival of interest in the two more commonly known groups of flowering geraniums is amazing, unless you are already aware of it. The race that now bears the name of *Pelargonium hortorum* elaborates endlessly and the other race now known as *P. domesticum* has been diversified magnificently.

The reviewer has already reported on the beauties of geraniums with colored and variegated leaves, but it seems he knew less than the half. The *National Horticultural Magazine* has also had lead articles on the species and their derivatives with scented leaves but here the reporting was even less complete.

The book is excellent. But, unless you are hard hearted, read it at your peril or you will join the armies of devotees. Our thanks to Mrs. Krauss.
B. Y. M.

Garden Spice & Wild Pot-Herbs.

Walter C. Muensch & Myron A. Rice. Cornell University Press, Ithaca, New York. 1955. 211 pages. Illustrated with woodcuts by Elfriede Abbe. \$5.75. (Library).

This is a handsome book with superlative illustrations. The text is entirely accurate and will furnish impeccable source material, henceforth, for every grower of herbs. The inclusion of so many native plants and other so-called herbs makes it particularly valuable. No herbalist should be without it.

Drs. Muensch and Rice are botanists and their book is written from a botanical slant, lending authenticity and authority but lessening the poetry. Moreover, many readers, including gardeners, will have to turn to the glossary to understand the botanical terms and to a dictionary for an explanation of the medical words.

In my own writings, not to be compared to these authorities, I have always translated these terms into English. This may be the result of an unforgettable experience while a freshman at Vassar. Dr. Taylor, our philosophy teacher, began his first lecture with the remark couched in the Edwardian English of those days, "Young ladies, I expect your papers to be written in English."

The sections on germinating and propagating herbs and the one on seeds are superbly done. The descriptions are, of course, authoritative. But as a herb enthusiast, I wish the authors had given more varieties of certain plants, such as the different rose-maries, winter savories, and so on. Among the lavenderers, they omit the dwarf forms of *Lavandula officinalis*, which are the hardest in New York State and have exceedingly fragrant flowers. Naturally, the experience of each gardener is different and mine sometimes varies with the authors. For example, I have found the smell of *Salvia sclarea* to be very unpleasant, whereas they describe it as "somewhat lavender like." Nor do they mention its principal function, namely, that it is a fixative in perfume. It is ungenerous, however, to unfavorably criticize so admirable and complete a work as this.

Helen M. Fox

Amateur Beekeeping.

Edward Lloyd Sechrist. The Devin-Adair Company, New York. 1955. 148 pages. Illustrated (mostly humorously). \$3.50. (Library).

Mr. Sechrist's commanding report for the beginner dexterously instructs the apiculturist-to-be in the reverential techniques of bee handling. The very comprehensive and irresistible recipe for your success, based on fifty skillful years of bee management, includes a discussion on how to begin (equipment, location, avoiding stings, etc.), working among your bees, the essentials of bee behavior, harvesting a crop, wintering your bees, etc., etc., all recorded in a non-technical language (but weighty tomes are referenced). The author pioneered in the process of helping bees through the winter with artificial heat—guaranteeing a rapid build-up of colonies when needed early in the spring for pollinating fruit trees. He discusses this method fully.

M. E.

The Daffodil and Tulip Year Book, 1956, No. 21.

The Royal Horticultural Society, London, England. 1955. 142 pages. Illustrated. \$1.65, post free.

Aside from the usual reports of shows and the excellent photographs of outstanding new varieties, this issue is of value not only for its tribute to and contributions from Mr. Secrett, but in articles by D. Blanchard, W. J. Dunlop, F. R. Waley and Alex Gray, all of which lead somewhat away from the familiar trends.

There is a brief report on a visit to Portland, Oregon, which happily was only a part of the trip—bits from New Zealand and Australia. These, with unusually brief notes on Tulips, close the work.

B. Y. M.

Pests and Diseases of Ornamentals, Plants, and Lawns.

Cynthia Wescott, Guest Editor, and Peter K. Nelson, Associate Editor. *Plants & Gardens*, Vol. 11, No. 1, 1955. The Brooklyn Botanic Gardens, Brooklyn 25, New York. 97 pages. Illustrated. \$1.00.

The identity of the guest editor and the names of eleven specialists who contributed the text are sufficient guarantee of the authority and up-to-dateness of this manual of garden ailments. In brief, it is a digest, adaptable at once to practical application in the garden, of the extensive literature, both technical and popular, on garden enemies and the means of controlling them. The illustrations are superb—the best, we think, that have yet appeared in any handbook dealing with this subject. The very handy index, organized to show host plants, their principal diseases and pests, and the distinguishing symptoms of each, will be extremely useful to the gardener who must have his pest lore in book form (as which of us does not at times) when he encounters an unfamiliar malady among his plants. Contributors and chapter titles are: Clyde C. Hamilton, Insecticides and Miticides; John C. Schread, Insect Pests of Ornamentals and Their Control; Floyd F. Smith and Edgar A. Taylor, Pests of Garden Roses; W. D. McClellan, Fungicides—Past, Present, and Future; L. M. Massey, Spraying and Dusting Roses for Disease Control; Charles J. Gould, Bulb Disease; H. N. Miller, Disease Problems of Foliage Plants; Irene Van de Water, Insect Pests and Diseases of Iris and Daylily; Frank L. Howard and Malcolm C. Shurtleff, Lawn Pests; Cynthia Westcott, Rogues' Gallery of Plant Enemies, and Notes on Materials and Equipment. The Brooklyn Botanic Garden is to be complimented.

Freeman Weiss

American Camellia Yearbook, 1955.

Edited for the Society by Arthur C. Brown, Gainesville, Florida. 1955. 438 pages. Illustrated in color and black and white.

As always, the Yearbok for 1955 contains a wide range of articles, falling almost equally into the now familiar editorial groupings—the first major grouping reports of new camellias—"things to come" for most of us.

Reports from other lands with an interesting paper on the commercial propagation of tea in India precede the several report sections—especially the sad but necessary hospital section—then a whole section that is given over to personal opinions and experiences, including long reports on the effect of cold in early 1955. Then the regionals continue.

Dr. Hume contributes a most important paper on "Camellia Writings." It is not intended as a complete annotated bibliography but it is most valuable, although some of the evaluations are more kind than just.

A valuable addition to its excellent predecessors.

B. Y. M.

'Til Summer Comes Again.

Eleanor R. Bolton. (Privately printed) Available from the author, Box 179, Route 2, Fairfax, Virginia. 1955 Revised Edition. 29 pages. Illustrated. \$1.50.

"From Daffodil to Chrysanthemum preserve your garden flowers so that from Chrysanthemum to Daffodil you may continue to enjoy them." Tested

methods and successful original techniques for long-time preservation of flowers, seed pods, leaves, and branches are adequately described in this small booklet, proved to be an excellent addition to the garden library. Mrs. Bolton's dried arrangements retain the beauty of color and texture of living material in the summer garden.

M. C. L.

Crab Apples for America.

Donald Wyman. The American Association of Botanical Gardens and Arboreta. (President Dr. John C. Wister, Arthur Hoyt Scott Horticultural Foundation), Swarthmore, Pennsylvania. 1955. 63 pages. \$2.00. (Library).

Although this small, paperbound volume is of doubtful usefulness to the average home gardener, it is indispensable as a reference for large collectors, landscape architects and nurserymen. It accounts for at least 125 species and varieties now being offered commercially. An additional 135 species and varieties that can be found growing in public plantings in the United States and Canada are also treated. Each listing is complete with such information as habitat, size, color of flower and fruit, approximate date of introduction, and a public garden where a live specimen may be found. There are references to kinds that will withstand severe cold, those that are highly fire-blight resistant, whether annual or alternate bearers. Selected lists also name the best for flowers, for fruits, colored foliage, eating, etc., as well as those for special landscape purposes—pendulous, branching, fastigiate, and unique forms.

Francis de Vos

Woody Plants for Landscape Use.

L. J. Enright. College Science Publishers, State College, Pennsylvania. 1955. 127 pages. \$3.00. (Library).

A splendid guide to the selection of over six hundred ornamental trees, shrubs, and vines for landscape use in the Northeast, containing three major divisions: I. A catalogue of deciduous and evergreen woody plants (each of which is subdivided according to plant size), II. Landscape planting design values based upon physical characteristics (color of bark, twigs, flowers, etc.), and III. Landscape planting design values based upon specific use and esthetics (plants suitable for lawns, at doorways, on fences, etc.). The guide is beautifully written and is amazingly clever in presenting the exact answer to any of your questions.

Creative Flower Arranging.

Margaret Carrick. M. Barrows and Company, Inc., New York. 1955. 192 pages. Photography by Jack Carrick. \$4.50. (Library).

Here is visible evidence of Mrs. Carrick's teaching, as a contemporary flower-artist, to arrange creatively for today, expressing our times, our ways of life, and, most importantly, ourselves! A hundred and fifty-eight black-and-white illustrations and four color plates by her husband show her arrangements, refreshingly uncluttered, in baskets, modern mobiles, and containers of glass, ceramics, versatile metals, and weathered wood, with accessories of natural rock, crafted wood, and figurines in their new inclusive meaning of masks, heads,

animal forms, and human figures. This book is bound to stimulate the arranger to fresh, creative fancies, whether they be for home or flower show, or just to satisfy one's individuality.

M. C. L.

Water. The Yearbook of Agriculture, 1955.

Alfred Stefferud, Editor. U. S. Department of Agriculture, Washington, D. C. (Available from Superintendent of Documents, Government Printing Office, Washington 25, D. C.). 1955. 751 pages. Illustrated. \$2.00.

Reflecting the current national concern, following a series of years when drought in some parts of the country and floods in others caused enormous human suffering and economic loss, the latest Yearbook of the U. S. Department of Agriculture is appropriately dedicated to the subject of water. In a foreword, Secretary Benson says, "Nearly every one in this country in the past few years has experienced some problem caused by too much water when we do not want it or too little water when we do want it. . . . Water, land, and people are inseparable components of one thing, our welfare. The subject of water can be viewed from the various aspects of soil conservation, agronomy, forestry, irrigation, wildlife, recreation, business, industry, law, and so on—but never alone."

Even for an Agricultural Yearbook, the subject of water in its manifold applications to human life is too vast for one set of covers. The committee that planned this Yearbook, therefore, had to limit its scope to the explanation of the nature, behavior, and conservation of water in agriculture. Editor Stefferud states that although one purpose was to supply information in a practical, useful way for farmers and others who use water, it is equally important to emphasize that more information and more wisdom are needed in understanding water and its uses. Some degree of this understanding has now become incumbent on our entire population.

The main headings include Our Need for Water, Where We Get Our Water, Water and Our Soil, Our Crops, Our Forests, Our Wildlife; Water for Irrigation, Pure Water for Farms and Cities, and A Look to the Future (which is perhaps the most important chapter.) Individual articles bear intriguing titles such as Hauling Down More Water from the Sky, Conversion of Saline Waters, Underground Sources of Water, Is Weather Subject to Cycles, Floods and a Program to Alleviate Them, Fire on the Watershed of the Nation, What Research is Doing on Problems of Water in Agriculture. There is an article on how the atoms of water are held together and why this gives water some of its unique properties. There is even one on water dowsing—the Age-Old Debate about a Forked Stick. Here is material for browsing or for serious reading through many a long winter evening.

F. A. W.

Handbook on Flower Arrangement.

Guest Editor, Marion Feddersen, Special printing of *Plants & Gardens*. Vol. 11, No. 3. The Brooklyn Botanic Gardens, Brooklyn 25, New York. 1955. 64 pages. Illustrated. \$.75.

Here it is, all over again for perhaps the thousandth time. No matter! It is a good small handbook with mostly clear photographs and sketches, reasonably persuasive texts, and points of departure

that can take you into almost any of the styles or schools, not forgetting the current do-it-yourself note and the sentimental souls who have to work with "teenyweenies."

Some of the arrangements shown appear to have been splendid and some, to this reviewer, look as if they had been plain gawdawful.

B. Y. M.

Climates In Miniature.

T. Bedford Franklin. Philosophical Library, Inc., New York. 1955. 137 pages. Illustrated. \$.375. (Library).

A fascinating and instructive little book—sure to make your gardening a more successful and pleasurable experience. Ever wonder why your neighbor a short distance away escaped frost damages on his dahlias when yours were frozen back to the ground? Or why your tomatoes of the same variety were ripe before his? You will delight in reading every word and studying the many tables in this book, which is a report on thirty years of experience in performing simple experiments in studying microclimates in the garden. There are differences of soil, sunshine, temperatures and humidity in your garden—no matter how small. The author explains how the differences affect plants.

Francis de Vos

Botany, Principles and Problems.

Edmund W. Sinnott & Katherine S. Wilson. McGraw Hill Book Company, Inc., New York. 1955. 528 pages. Illustrated. \$.675.

The reviewer did find an attitude of interest, curiosity, and of critical thought, while studying this Fifth Edition of this well-liked textbook. A whole new chapter on Plants and Life has been added since the last edition and many of the plant names have been modernized. The chapter devoted to the history of botany is as informative as ever—the one discussing the roots contains many sections such as material and soil, physiology, notably osmosis & absorption, and are very well written. The Metabolism chapter is completely rewritten and the plant kingdom chapter goes into more detail in presenting a broad survey of classification. Many new illustrations have been added. The Fifth Edition has a new format, the pages being a little larger and the text printed in two columns.

Robert E. Turner

Indoor Plants And How To Grow Them.

A. Bertrand. Translated from the French by Vera Higgins. Philosophical Library, Inc., New York. 1955. 92 pages. Illustrated. \$.475. (Library).

M. Bertrand has authored a charming little book in which he tells how to care for plants in our living rooms. The major portion of the book is taken up with a description of the plants, in alphabetical order, the varieties to be found, and any special points to be observed about their cultivation.

Pesticide Handbook, 1955.

Edited by Donald E. H. Frear. Seventh Edition. College Science Publishers, State College, Pennsylvania. 1955. 208 pages. Illustrated. \$1.25 (paper), \$3.00 (cloth).

Although the 1956 edition of this annual volume will be current about as soon as this review appears, it may not be amiss to call attention to some of the deficiencies one encounters in using this guide

to pesticides while acknowledging its real utility. It is primarily a list of names of insecticides, fungicides, herbicides, rodenticides, soil conditioners, and—less extensive—of equipment for applying them. In all, 6,204 products are listed. It seems to this reviewer that the annual revisions of this admittedly difficult array of products tend to fall progressively behind their actual development and appearance on the market. As each edition appears near the beginning of the year for which it is current, it is evident that it can be reasonably complete only for the previous year. Thus, the 1955 edition fails to list—at least under easily recognizable headings—a number of products that are now on the market or are frequently mentioned in current literature. Examples are Chlorobenzilate, Chlorothion, CMU, Di-met, Karmex, Omazene, Ovex, Sodar, Telvar, Vapam, Uramite. One notes also the absence of the groupings Acaricides and Nematocides, which now include distinctive products that are highly important to pesticide specialists. The *Pesticide Handbook* has become, nevertheless, indispensable to the student of this fast-growing assemblage of agricultural chemicals.

Freeman Weiss

House & Garden's New Complete Book of Gardens.

The Editors of *House & Garden*, with an introduction by Richardson Wright. Simon and Schuster, New York. 1955. 320 pages. Illustrated. \$10.00.

This elegant look-book is designed as a complete reference for the home gardener. It is as complete in its contents as it is in its physical magnitude—measuring about ten by thirteen inches and sumptuously treating: plans for small gardens, growing wildflowers, city backyards, rock gardening, growing cut flowers, planting terraces and patios, landscaping swimming pools, using power tools, designing and making steps and paths, selecting the right trees for the right place, maintaining a healthy lawn—hedges, shrubs, perennials, annuals, roses, bulbs, greenhouses, potted plants, flower arrangements, fruits, espaliered trees, vegetables and herbs. (92 pages being in full color).

Every item is inspiring—including those we may remember from regular issues of *House & Garden*—and will be rewarding when executed in our own backyard, ten acres, and estate, whether we live in Maine, Arizona, or in California.

M. E.

Handbook on Roses.

Richard Thomson, Guest Editor & Peter K. Nelson, Associate Editor. Special printing of *Plants & Gardens*. Vol. 11, No. 2. The Brooklyn Botanic Gardens, Brooklyn 25, New York. 1955. 80 pages. Illustrated. \$1.00.

This compact booklet with its excellent illustrations is addressed, first to the beginner, then to the uncertain, and finally to the specialist, be he collector or incipient hybridist. Most of it has been said before, perhaps not so succinctly or so well, but all worth saying again and again.

If there are points open to carping remarks, they are few. The reviewer detests roses close to paths or doors including gates and the illustrations of "Ideas for Rose Plantings," from photographs taken at ideal moments, doubtless, provide ample opportunity for scratching and tearing and weary barrenness in winter.

Although the writer for the South is from Alabama, he did not have space enough to really do the job, even if he quotes from several reporting centers.

B. Y. M.

Gardens Are For People.

Thomas D. Church. Reinhold Publishing Corporation, New York. 1955. 248 pages. Illustrated. \$10.00.

The author, a foremost American landscape architect, believes in designing highly individualized gardens principally to suit the purposes of the people living in them. He is well known to many for the articles he has prepared for *House Beautiful* over the past eight years. Over six hundred photographs and site plans, with short, interesting comments by Mr. Church, illustrate how to plan for outdoor living, as he takes you on a pictorial tour of sections of town, city, and country gardens, and typical backyards. Although many of the illustrations are on the West Coast, the same designs and suggestions can be applied elsewhere and will, of course, vary as affected by local climates, practices and plant material. Various sections are given to the entrance, terraces, beach plantings, swimming pools, and remodeling gardens, and such details as fences, steps, paving curb, and play places. Whether you have an eight- by twenty-foot city backyard or a suburban acre or more, you will enjoy and you will use this book.

M. C. L.

Ornamental Trees. An Illustrated Guide to Their Selection and Care.

Evelyn Maino and Frances Howard. University of California Press, Berkeley, California. 1955. 219 pages. Illustrated. \$3.75.

... A very delightful work on more than three hundred ornamental trees selected for various landscape purposes in each type of western climate. The latent tree characteristics are expertly presented in text (Howard) and pen and ink drawings (Maino), and are treated in four main sections: deciduous trees, broad-leaved evergreen trees, conifers, and palms. These selections are arranged alphabetically in each section. Unfortunately, the reviewer feels *Standardized Plant Names*, although being respected, was inadequate as a standard in reducing the botanical nomenclature to understandable language. The authors did also and appended a glossary to help on some words.

M. E.

Seeds of Life.

John Langdon-Davies. The Devin-Adair Company, New York. 1955. 172 pages. \$3.00. (Library).

Mr. Langdon-Davies theorizes the study of living things is to a great extent the study of sex. Their qualities and characteristics are closely tied up with the instinct to reproduce. And in reproducing, they are often associated with other living beings, always in their natural environment. An understanding of sex, therefore, is to be found in the study of nature; and an aid to the understanding of nature is to be found in the study of sex. His work is vividly written to give much light to this theory.

What Flowering Tree Is That?

Edwin A. Menninger. Stuart Daily News, Inc., Stuart, Florida. 1955. 100 pages. Illustrated. \$3.00. (Library).

Each time Mr. Menninger publishes, one is reminded of his constantly expanding project, his diversified interests and his wide reading.

One cannot be sure just how gardeners in general in Florida may feel about it all, but, unless they are completely devoid of horticultural curiosity and concern, they should be proud, and, moreover, delighted that some one has had the imagination and energy to do all this "first work."

It may well turn out that only a portion of the plants enumerated and described ever become a part of the Florida landscape. Some may be lost before the area suited to them is discovered. The result in any case should be stupendous.

Some few of the species described, the reviewer has seen in their native lands; some others in cultivation in Florida. Two factors control any further personal enthusiasms—the local temperature records and the long record of plants already dead in his hands because fundamentals were ignored.

B. Y. M.

Plant Propagation Practices

James S. Wells. The Macmillan Company, New York. 1955. Illustrated. \$7.50. (Library).

Mr. Wells is one author who can back up his discussion on the numerous phases of plant propagation with ample practical experience. The information in his new book is written primarily for the young nurseryman, although it is equally applicable to the amateur gardener. There is a good section on specific plant propagation requirements as well as some basic concepts and plans for various kinds of propagation equipment. The factor which sets this text apart from most propagation handbooks is that Mr. Wells has been able to draw upon practices followed by the nursery trade in organizing his material. It is a good book to have on hand.

Looking at the text critically, there are recommendations that the gardener might not choose to follow; for example, the sowing of deciduous azalea seed in the coldframe would be a risky business when one can follow the sphagnum moss method recommended for other Rhododendrons. Then, too, it is difficult for the reviewer to believe the comparative rooting results with azaleas portrayed for sand and sand-peat. Mr. Wells shows magnificent rooted cuttings in the latter, while the cuttings in sand are practically a failure. Could he be biased? These and other criticisms are minor and do not seriously affect the quality of the book. Certainly the intent is to provide an adequate yet cut-and-dried outline to the propagation of plants and Mr. Wells has accomplished that. The reviewer believes Mr. Wells' book is out counterpart to the text by Sheat reviewed a few years ago, but replaces the cumbersome techniques recommended to English gardeners by streamlined methods.

J. L. C.

An Introduction to Nature. (Birds, Wild Flowers, Trees.)

John Kieran. Hanover House, Garden City, New York. 1955. 224 pages. Illustrated (in color). \$6.00. (Library).

Full color illustrations include: 100 Birds by

Don Eckelberry; 100 Wild Flowers by Tabea Hofman; and 100 Trees by Michael H. Bevans.

Author Kieran, very interestingly, says: "The fact that it is illustrated with color plates by noted artists in their fields might lead to the conclusion that it is a 'picture book' primarily for children. This is not so. It is designed to help the ordinary person of any age who would like to know and name the more common birds, flowers, and trees of our cities and villages, our woods and fields, or seashore and mountain slopes."

The reviewer wholeheartedly agrees with the author and, while he is pleased to see this new edition which combines Mr. Kieran's three best sellers on the same subjects, (*An Introduction To Birds; An Introduction To Wild Flowers; & An Introduction To Trees*) he wonders why, since these three books remain current and on the market.

American Tomato Yearbook, 1955

Edited by John W. Carncross. Editorial Office at 8 Elm Street, Westfield, New Jersey. 1955. 40 pages. Illustrated. \$2.00. (Library).

Once more Dr. Carncross of Rutgers University College of Agriculture has assembled the "latest" and the "mostest" data on the tomato industry. This year's edition has the usual information brought up to date and includes sections on bibliography (treating mainly culture, diseases, pests, etc.), research workers (their tasks and their stations), and current statistics on the great tomato industry (acreage, production, services, imports, exports, juice, pulp, catsup, et cetera).

Miscellany:

Guide To Popular Floras (of U. S. and Alaska). U.S.D.A. Bibliographical Bulletin No. 23, June 1954. S. F. Blake. An annotated, selected list of non-technical works for the identification of flowers, ferns, and trees. 25 cents.

Roses for the Home. U.S.D.A. Home and Garden Bulletin No. 25. S. L. Emsweller, W. D. McClellan, & F. F. Smith. 15 cents.

Motion Pictures of the U. S. Department of Agriculture. 1954. Agriculture Handbook No. 14. Contains a listing of titles on improved methods in agriculture and home economics which garden clubs, etc., may borrow for their meetings—write Motion Picture Service, Office of Information, U. S. Department of Agriculture, Washington 25, D. C. 25 cents.

Sphagnum Moss For Plant Propagation. U.S.D.A. Farmers' Bulletin No. 2085. July 1955. J. L. Creech, R. F. Dowdle, and W. O. Hawley. 10 cents.

Your congressman, or the U.S.D.A., might send you a free copy of any of the above four. They are available from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., for the price stated above.

The Gardeners' Pocketbook

Millettia—Jewels on a String

Millettia trees are almost unknown in cultivation in the United States, despite the fact that there are a hundred and twenty different species scattered through Burma and Assam, Malaya, Australia, and Tropical Africa, and many of them are exceedingly lovely in bloom. They were named after a French botanist, J. A. Millet, and are mostly tall evergreen forest trees that bear in spring delicate, drooping strings of the most daintily tinted flowers, usually mauve, steel blue, lazuli blue, or rose, much resembling Wisteria.

All the species described here and a few others unidentified are now in actual cultivation in the United States, but only the first two have bloomed. In California *Millettia caffra* from Natal, South Africa, is sparingly grown. It is a very ornamental small tree with striking purple flowers in summer followed by large velvet-brown seed pods.

Millettia ovalifolia. Native of the Promé district of Burma, has been flowering nicely in Florida the past several years, from the middle of March when the tree is bare, through the middle of April with the new leaves unfolding along with the blossoms. Benthall in *Trees of Calcutta* starts out by calling this "a very beautiful little tree" and then he goes on to say that it is "one of the most beautiful of trees when covered with its delicate sprays of flowers before the leaves appear." In Florida, it certainly lives up to this enthusiastic estimate of its worth. Much of the effectiveness of the bloom lies in the two-color effect, for the sepals are Garnet Lake 828 and the petals are Magenta Rose 027/1. (RHC). It has a rounded crown, neat growth habit, half-drooping branches, and elegant foliage consisting of seven thin, smooth, pointed, bright green leaflets arranged in three opposite pairs on either side of a slender midrib with a terminal leaflet at the tip.

The following species are growing in Stuart, Florida, but are not yet old enough to bloom:

M. dura. Fast-growing shrub or tree to 35 feet, with hanging clusters of lilac, Wisteria-like flowers, three or four strings together, 4 to 8 inches long. Eggeling: *Indigenous Trees of Uganda* says this "handsome" species is frequently planted in gardens. Jex-Blake: *Gardening in East Africa* says the tree is quick growing, flowers in three years, resists drought and white ants, flowers abundantly but is liable to damage by wind.

M. stuhlmanni. From Mozambique, Portuguese East Africa, is a tree to 15 feet high, irregular in shape, not too dense, with four pairs of oblong 5-inch leaflets, with "very attractive" lavender flowers, according to a letter from the Department of Agriculture at Inhambane. It adds: "Good for street planting."

Millettia sp. From Durban, South Africa, botanic garden, grown from seed received in 1944 with this description: "This un-named

[45]



Millettia ovalifolia



Millettia megasperma

small *Millettia* tree has rather an upright habit and bears spikes of pink flowers, somewhat like *Wisteria*."

M. pendula. An erect tree from Burma, with dull green leaves about 6 inches long, the leaflets 2 to 3 inches long. The white flowers are in short dense clusters in the leaf axils.

The plant called *M. reticulata* from China blooms in California, bright purple rose or red sweetpea blossoms in August larger than most, but it is a vigorous evergreen climber, not a tree, and it may not even be a *Millettia*. It seems to be the plant which *Hortus Second* refers to as *Wisteria megasperma*, and in the California vernacular the vine is always called "evergreen *Wisteria*." In Chittenden's *Dictionary of Gardening* this vine is called *Millettia megasperma*. It stands a good deal of frost.

Edwin A. Menninger, The Flowering Tree Man, Stuart, Florida.

Notes from the Pass Christian, Mississippi, Garden.

Elliottia racemosa

This is a rare native shrub that is hard to come by, and the two plants here were raised from a few seed given the writer years ago. Growth was very slow for the first three years but since then has been more rapid, though certainly not like that of common shrubs such as spirea or barberry. The plants tend to be "leggy" but now are starting to make a fair crop of small shoots from the crown or base.

It is deciduous and there are no special distinctions to the leaves.

The type of inflorescence is shown in the



Evelyn Reid Griffith

Elliottia racemosa

illustration and the glistening white blossoms suggest those of the native *Habenarias*, though they wear no spurs.

The two plants here are about of a size but only one flowered and, although insects visited the flowers constantly, very little seed set. If both plants flower another year, it will be of interest to see if there is a heavier fruiting. Bloom comes in July and the seed capsules are mostly ripe by the end of August.

Tumeric

To a newcomer in these parts, the various plants that are related to the *Hedychiums* are intriguing. The foliage habits show family kinship and provide a pleasant variety in mass plantings even when there are no flowers.

The subject of this note was given the writer with no other name than "Hidden Lily," a name known to many garden visitors. Obviously, it was no lily as it had rhizomes, not bulbs, even of the type of scaly lily bulb that elongates year by year.

The rhizomes are much like those of ginger and the foliage appears to be that of an herbaceous perennial, dying to the ground rather late in the season, with no new growth showing until the soil is really warm, sometimes even in May. Then the shoots with their handsome leaves, the bases clasping



I. N. Anderson

Curcuma longa

about the stem, rise rapidly. In August, the flower spikes appear and in our plants do not rise much above the level of the petioles, above which the blades may rise to more than two feet, making a canopy over the blooms. The conspicuous part of the inflorescence is the clothing of bracts. These are small at the lower part of the spike and white in our species, which seems to be *Curcuma longa*. The upper bracts are longer, white but flushed with a clear light pink. The flowers that fit closely in the bracts are dull yellow with some brownish markings. They are much visited by bees, here chiefly bumblebees.

I. N. Anderson

Our plants are growing on the margins of an azalea bed, with deeply prepared, humus-rich soil, and get daily waterings. They show every sign of a desire for swift increase, against which I was warned by the donor. If one can find that there is an "easy" method of preparing the roots, for tumeric production, possibly that can be held in check.

The Climbing Fern

In a former note on the now well established Japanese fern, *Lygodium japonicum*, it was stated that it had been reported as a weed in some parts of Alabama. Mr. Ken Yashiroda, writing from the Brooklyn Botanic Garden, confirms the opinion and says that it is very troublesome in some parts of Japan.

On this place there has been but one specimen for years, growing on a porch on the west side of the house. The few young ferns that appeared always came up in the brick-paved path on the east side of the house. A few of these were lifted, potted and grown on, and planted later on a fence where all plants are subject to the depredations of wandering cattle. No misfortune has befallen them and in two years they bid fair to mantle not only the fence but every shrub they can touch. Possibly all will be removed to some spot where they can have a fence of their own. In the present sunnier location growth is not so luxuriant but strong enough.

Lygodium japonicum



Evelyn Reid Griffith

Cycas revoluta

Some alarm is felt, however, as many plants are now appearing in several places where the soil is kept moist, locations equally distant from the parent plants. As compared to the prolific reproduction through the spores, increase from the base of the plant is slow.

The illustration shows the non-spore-bearing portions of the frond (lower right) and the more dissected, spore-bearing portion (middle left).

In spite of all its faults, the writer would like to risk growing more of it, as well as some of the other species mentioned in *Hortus Second*.

Cycas revoluta

The single plant in the garden here flowered last year for the first time and proved to be a male plant. The inflorescence that appeared to be terminal developed slowly, in the early stages creamy buff in color, later the ultimate dull brown. After about two weeks it broke off at the base, cleanly, where there was still no sign of new leaf growth. Two weeks more elapsed and then a small side branch developed a little crown of leaves

and finally there came a magnificent crown of new leaves on the main axis.

In our plant the inflorescence was much more slender than that figured in Bailey's *Cyclopedia* as Plate XXXIII, although our photograph was taken at what appears a later stage in development.

There are many plants in the neighborhood with female inflorescences but as yet we do not have a picture, being a little loath to invade others' gardens unbidden.

Iris tuberosa

Although this is no longer the proper name for the plant in question it is too well known to be overlooked. Here it bloomed between the two severe frosts that have played havoc with so much garden blooming. The curious roots, that remind one in a way of the roots of *Gloriosa*, no kin, were planted last autumn and early in the winter the first spear point of the leaves showed up but grew slowly enough to show that they were not deceived by early warmth. Flowering actually came in late February, with bloom from every root. No effort was made to pollinate the blooms but apparently all were pollinated, for seed set on each root. These are carried in rather swollen-looking pods that are heavy enough to hang down almost to touch the ground. Should the seed develop into new roots in a reasonable time, this will be a valuable addition to the early-flowering small bulbous plants for the area.

Brodiaea uniflora

This small plant that has borne so many names and is usually offered in lists as *Milla uniflora* is another bulb that has taken hold nicely in the new garden. The roots bought were supposed to be of the white and violet-colored forms, but, as far as one could see, they must have come out of the same bin, and it was not the "white" one. The old clump, from the old home garden, has now increased to a grassy tuft, and started to make enough offsets to warrant a little pilfering to establish new clumps. Seed forms here too, but none has been gathered.

Zephyranthes and Others

Zephyranthes grandiflora is practically a staple in all gardens here and performs wonderfully well, with crops of flowers inter-

mittently through the summer from early April on. *Z. rosea*, that makes foliage rather early in the year, fares less well, as the tips of the leaves are often ruined by light frosts. *Z. simpsoni*, although like the last in leaf habit, seems a bit more hardy and flowered well enough in April. The plant bought as *Z. Treatiae*, but not that species, is also tough and self seeding. *Z. candida*, however, is the common form in these parts and establishes itself well even in rough grass. In the garden here, however, it is *Habranthus robustus*, if one may believe local naming, that really takes over. This plant blooms freely throughout the year, with larger flowers than in most *Zephyranthes*, but the color is a pale rose pink that fades out to a white throat, rather than the deep rose mentioned in books. It sets seed from every bloom and the papery black seeds fall to the ground and germinate almost at once, with progress at a slower rate thereafter. The seedlings in time come to blooming and if one wants masses of it, all that is needful is to gather the seed as the pod opens, and scatter the seed where bulbs will be wanted later on. Planted in a flat, the germination is equally swift, with fresh seed, but the ordeal of separating the small bulbs and getting them into a nursery bed for further development seems prodigious.

Bulbs of *Sprekelia* planted outside have not been happy. They have not died but one almost wishes that they would for it takes only a slight frost in winter to ruin them to the neck of the bulb. Even the partial protection of nearby evergreen shrubs and excellent drainage have not helped.

Clytemnestra Again

Although I do not have the latest edition of *Modern Roses* beside me, (only the 1940 Volume II), I have been intrigued in looking back over the parentage of this excellent rose, to see if I could discover why it is called a hybrid Musk. If one writes out the pedigree lines, there are the ultimate end clones for which no parentage is known. It may be that they have hidden in them the blood of *Rosa moschata*, elsewhere it does not show.

June is the traditional month for roses in many parts of the country, but here we have already had two flushes of growth and bloom

and are coming into a third, for such as will, mostly Tea and China varieties.

Clytemnestra, which was a little slow in starting, has been giving bloom since early April and now, when the thermometer rises daily to the middle nineties, is covered from top to bottom with its typical small clusters of bloom, the buds deep yellow tinged with salmon, the open flowers the first day warm yellowish-pink (cantaloupe color), the next day almost white on the upper surfaces and retaining the color on the reverse where the sun does not reach it.

The scent, which is distinctive and quite unlike that of any other rose here, is strongest in the morning and evening hours. Seed appears to be forming naturally and a few will be allowed to determine the color of the hips.

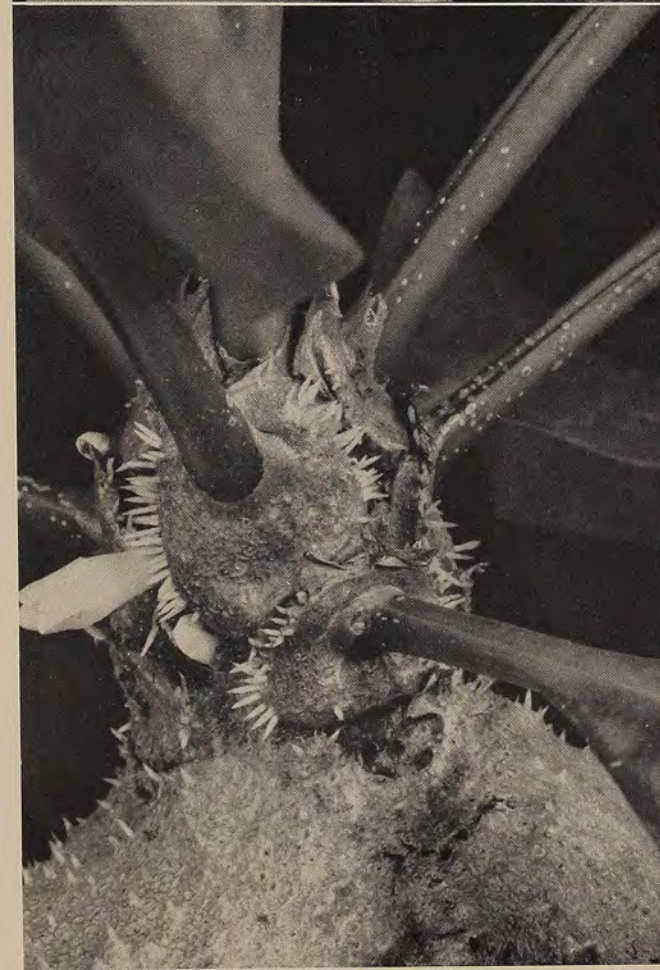
Its only rival here in continual flowering is the rose sold as "mutabilis." This, also mentioned in a previous note, has continued to grow luxuriantly, throwing one cane after another, all widely branched at the top, and crowned with the single, rather ragged blooms. As noted before, the buds are coppery yellow, the first day the bloom is pale yellow flushed with pink, the second deep rose, and the third day deep crimson red. All of this in contrast with the bronze of the new foliage makes a charming sight. It too is forming seed capsules but none as yet is ripe enough to show color.

B. Y. Morrison

Myrmecodia and Hydnophytum in Flower

Close association of plants with ants is much more common in nature, especially in tropical countries, than is generally realized and extends to the species of many families and genera. Some plants even produce special excretions which attract ants and which the latter collect as food, in addition to providing homes for the ants in hollow stems, hollow thorns or swollen hollow leaf bases. The entrances into these hollow spaces which the ants do not have to open themselves are in many instances protected very ingeniously so as to prevent rain water from entering.

The most obvious benefit derived by the plants from this association is that the ants protect them against damage by other animals. As soon as anything or anyone touches such a plant, the ants swarm out ready for



war, and nobody wants to have anything to do with belligerent ants. It is well possible, however, that more than this is involved, and under certain circumstances at least the debris of dead insects, plant parts, etc., discarded by the ants and piled up around the plant as well as perhaps the excrements of the ants themselves, may actually contribute importantly to the nutrition of the plant.

The ants, as stated, profit by the shelter and in some instances by the excretions which the plants provide, but there are certain epiphytic plants which as far as one can see provide neither, and which in nature are nearly always surrounded by ant heaps. In what their attraction for the ants consists, still remains obscure. One of these is the strange "Bucket-orchid," *Coryanthes*, which is rather difficult to collect because of the fiercely biting ants which make their nest around it and which defend it. In the greenhouse also, ants single it out and manage to build a road to it, even if the plant is suspended from the roof. The fact that *Coryanthes* flowers only rarely in cultivation when no ants are present but can be induced to flower through an application of fresh horse manure which would kill most other plants heightens the mystery. Are certain hormones involved? Nobody knows.

The two plants here illustrated belong to the genera *Myrmecodia* and *Hydnophytum* and to the family Rubiaceae. They are native to Malaysia, Indonesia, the Fiji Islands, New Guinea and Australia, *Myrmecodia* with 18 and *Hydnophytum* with 30 known species. Their strangely swollen stems or stem-bases contain an intricate system of hollow galleries which the ants do not create, but in which they establish themselves. In nature these plants are always inhabited by ants but they do not appear to require them for their well-being because they grow luxuriantly in cultivation and even flower and fruit freely entirely without ants.

Both are strictly epiphytic, meaning that they always grow perched on the branches

of trees, but curiously enough *Myrmecodia* thrives best in tightly packed sphagnum moss, while *Hydnophytum* appears to object to sphagnum moss and succeeds best in rather loosely packed osmunda fiber. We treat both regularly with a very mild nutrient solution. Their odd adaptation to a close association with ants renders them of special interest in any public plant collection, yet both appear to be rare in cultivation in North America.

H. Teuscher, Curator of the Montreal Botanical Garden.

Three Japanese Hollies

Based on observations made during an exploration trip for plants native to Japan, I have concluded that three evergreen species of *Ilex* should provide an interesting distribution study in relation to their limits of adaptation in the United States. These are *Ilex crenata*, *I. sugeroki*, and *I. rugosa*. Although the first is a well-known plant in American gardens, we know little concerning the origin of the introduced garden varieties and such plants are scarcely hardy as far north as Rehder's Zone VI. When we come to understand that *I. crenata* occurs wild in the mountains from southern Kyushu to central Hokkaido, it seems that it should be cultivated over a wider range than we presently encounter. *I. sugeroki* and *I. rugosa* are so little known that evaluation must be projected from the natural distribution of these species and Japan's climatic analogues in North America.¹ Since all three species are found in Hokkaido, the northernmost island, we should expect a rather similar degree of adaptation in our own country. Rehder lists *I. sugeroki* in Zone V and *I. rugosa* in Zone III.

I. crenata is a forest shrub, usually occurring at altitudes between 3000 and 6000 feet. The mountain forests of Japan exist on thin and infertile soils, consisting of freshly weathered fragments of volcanic rock, with some humus derived from decaying vegetation. Where mountain bogs occur, sphagnum forms a part of the forest floor and the hollies root into this medium. A typical as-

Top: Hydnophytum formicarium, close-up of flower and forming fruit, and general view of plant and swollen base.

Bottom: Myrmecodia platyrea, close-up of flower, and general view of plant and swollen base.

¹ Nuttonson, M. Y. 1951. *Ecological Geography of Japan*, Japan's natural vegetation and agroclimatic analogues in North America. American Institute of Crop Ecology, Washington, D. C. 213 pages.

sociation of plants in such a forest is that found in the Adzuma Mountains of north-central Honshu. The climax forest consists of cool temperate plants, largely *Fagus crenata* with *Pinus pentaphylla*, *Thuja standishi*, and *Abies mariesi* occurring sporadically. The undergrowth associated with *I. crenata* includes such familiar plants as *Clethra barbinervis*, *Rhododendron faurei*, *R. kaempferi*, *Aucuba japonica* var. *borealis*, *Cornus controversa*, and the ever-present bamboos of the genus *Sasa*. Winter is initiated by frosts in early October and the minimum temperatures go below zero Fahrenheit in December and January. The snow attains 6-9 feet at the higher elevations and the last frosts occur in late April. Here, *I. crenata* is a loose, upright shrub, 4-5 feet tall, seldom as large and well-formed as in cultivation but it is typical of the plant we grow in most respects. This same type can be found in most of the forests of southern Japan and was collected in the mountains at Fuji-yama; in the broad-leaved evergreen forests of Mt. Ishidzuchi, of Shikoku; and in the Yatsugatake Mountains, of central Honshu.

An entirely different type of *I. crenata* grows in the Kirishima mountain group of Kyushu. On Karakuni (5000 feet elevation), this holly grows in open, wind-swept meadows along with *Rhododendron obtusum* f. *japonicum* and a low-growing sort of *Sasa* bamboo. Owing to the chilly climate of these peaks, the poor volcanic soil, and the exposed, often dry location, the plants are dense and twiggy with small leaves. They attain only about three feet but many are as small as six inches in height yet have enormous root systems that are so well anchored into the rocky soil that collecting is a difficult task. At Mt. Unsen (4500 feet elevation), also in Kyushu, the vegetation at the summit is considerably more lush than at Kirishima. The hollies, azaleas, and bamboo, still the dominant plants, produce much larger specimens. *I. crenata* particularly shows the effect of the lower altitude and less rigorous climate. Here, a wide variation in habit and leaf type occurs. Likely one can find most of the forms that are cultivated among the seedlings that grow at Mt. Unsen. This is one of the outstanding natural associations of two most useful ornamental plants

and in May when the hills are flamed with the masses of flowering azaleas, the dark sentinels of Japanese holly create a rich background against which to view these kurume-like azaleas.

In northern Honshu and in Hokkaido, there is a distinct holly called *I. crenata* var. *radicans* (also known as *I. radicans* Nakai). This is the hardiest variety of *I. crenata* that grows wild in Japan. It is a spreading shrub, growing in the mountain forests and sub-alpine bogs such as occur in the Hakoda Mountains, near Aomori. The northernmost locality in which I collected this variety was at Nopporo, Hokkaido, a National Forest between Sapporo and the coldest spot in Japan, Asahigawa. There do not appear to have been any previous introductions from this region and the prospects of *I. crenata* var. *radicans* would appear to be rather promising. I particularly noted that it thrives and makes a well-formed foundation plant in the Botanic Garden of Sapporo while *I. pedunculosa*, a Japanese species which we often regard as being unusually hardy, will not grow satisfactorily.

Ilex sugeroki was unknown to me prior to the present exploration but, after seeing it in the wild and in the one or two locations where it was grown as a landscape plant, it impressed me as having considerable merit as an ornamental. It is similar to *I. crenata* in distribution, particularly with respect to the northern limit. *I. sugeroki* resembles the Japanese holly somewhat in foliage and habit but has bright red berries and the leaves are shiny. In the wild these two hollies inter-mixed so much that sometimes I dug them simultaneously. *I. sugeroki* does not occur in the forests around Nopporo but it can be found along with *I. crenata* and *I. rugosa* in eastern Hokkaido, on the Shiretoko Peninsula. It is interesting to speculate on the fact that these three hollies are the only ones which occur in this part of Japan.

Finally, we must not overlook *I. rugosa*, a prostrate species with rugose, evergreen foliage and red fruit. This species tends to inhabit more boglike localities than the two previously discussed and, as one approached the alpine regions, it was usually the last holly species encountered. In the Adzuma Mountains, Yatsugatake, Hakoda, and at Nopporo, *I. rugosa* was common but finding

this lone species growing in the desolate, foggy lowlands of Nemuro at the eastern tip of Hokkaido was a surprise. This is a region that can best be compared with maritime Nova Scotia. Here, summer temperatures rarely exceed 85 degrees and the winters are bleak, damp and very severe. Other plants observed in the same swamps were *Rhododendron parvifolium*, *Ledum palustre*, *Iris kaempferi*, and *Hosta rectifolia*. The Rugosa holly was also found along with *I. crenata* var. *radicans* in the mountains of east-central Hokkaido around Teshikaga and the Bihoro Pass.

With exceptions noted, the three hollies discussed have a rather extensive distribution. Certainly they thrive under similar conditions and were often associated. Their range indicates that we might find them amenable over a much larger part of the United States than we have previously considered. In addition, the present collections of *I. crenata*, *I. sugeroki*, and *I. rugosa* may serve to correct some of the descriptive inaccuracies that exist. By augmenting our present meager information with data based on collections from localities throughout their range we should arrive at a more complete indication of the possible cultural adaptation of these hollies in the United States.

John L. Creech, Glenn Dale, Maryland

Machaeranthera

Over the years I have enjoyed *Machaerantheras* growing wild in the mountains of many states and wondered why they were not grown more extensively in gardens. This genus is so close to aster that some authorities lump them under that name. Many *Machaerantheras* are annual or biennial but here under cultivation (or rather in captivity for I never cultivate) *Machaeranthera canescens* has proved a perennial. In western mountains the plant is a lovely alpine of four inches; at lower levels it may be a two-foot bush and very wide. The gray-green stems and sparse foliage make a delicate tracery for the prodigious number of inch-wide lavender or violet, yellow-centered daisies.

Though *Machaerantheras* can stand cold, they cannot stand cold and wet at the same time and in the East are best grown as annuals. Sow them when the ground is warm and where the plants are to grow. Give them full sun, light stony soil and perfect drainage.

Another species, *M. tanacetifolia*, has of late been advertised as Tahoka Daisy and I was glad to see it performing creditably in eastern nurseries. This one is equally lovely in the garden as well as in the field and all are splendid for July and August bloom.

Lester Rowntree, Carmel, California

Machaeranthera tanacetifolia

Lester Rowntree



*Novelties From Wayside Gardens,
Mentor, Ohio
Bulgarian Ivy*

This fine hardy Ivy was obtained by us from the Botanic Gardens of St. Louis. Its foliage is much the same shape as that of *Hedera gracilis*, differing particularly in its shiny leaves which are also more closely set along the stem. Its hardiness equals that of the common Baltic Ivy.

Pfitzer's New Dwarf Cannas

A few years ago, we received from that fine German hybridizer, Wilhelm Pfitzer of Stuttgart, a few tubers of Cannas.

Mr. Pfitzer wrote us that these were a very dwarf-growing form of Cannas he had finally been successful in developing after several years of effort. His object was to obtain a form so dwarf it could be used in tubs for porch, terrace, or roof garden decoration as well as find a place in the flower border or in front of shrubs where some color was needed.

We were most enthusiastic with the results. When they first flowered here, several people visiting our nursery wanted to take them with them right then and there.

After careful propagation, we now have sufficient stock of several varieties to offer our customers. They still are an exclusive item with Wayside Gardens.

Their colors are soft and pleasing. Flowers are produced all summer long in abundance. Fine foliage helps to make them handsome, colorful plants.

Instead of offering dormant roots of Pfitzer's new Cannas, we have decided to send growing plants in pots this year while they are still very scarce. Potted plants bloom sooner and will give a longer display if grown in tubs and also eliminate any possible chance of failure.

*Three New English Veronica spicata
Varieties*

Baccarole. It grows compactly to about 10 inches. The flower spikes are solidly covered with deep rose-pink flowers. Vigor and freedom leave nothing to be desired. It produced over 20 spikes on 2-year old plants. Flowers are from late June until the end of August. This new English Hybrid bids well to become a great favorite border plant in this country.

Minuet. Its silvery gray foliage and dusty

pink spikes of flowers make this one of the outstanding Veronicas. In bloom in July and August, it gives a beautiful cool effect. The flowers and foliage of this fine plant are so distinct one cannot miss it. It is easy of culture, perfectly hardy and free blooming. All it asks is a sunny place. Height about 15 inches.

Pavane. This new English introduction will be well received over here. Its lovely 18-inch spikes are rigidly erect and of a fine shade of clear pink. It has performed beautifully at our nursery where it flowered from late June and throughout August. As many as 20 spikes on one plant. Like *Baccarole*, it withstands heat and drought remarkably well and is of easiest culture.

Abeliophyllum distichum

The popularity of early-flowering shrubs has greatly increased during recent years, and they give us a foretaste of the glories of Spring. A welcome addition to those that brighten the dull days of February and March is the recently discovered *Abeliophyllum distichum*. It is a native of Central Korea where it was found in 1919 but was not introduced to England until 1932.

It is quite hardy and an excellent deciduous shrub for the small garden, seldom reaching more than 3 feet in height, and, despite its strong growth, a compact grower. The branches tend to arch over when the leaves appear. The deep purple flower buds are produced in the autumn in a mild climate. They open in February and transform the bush into a mass of white blossoms similar to that of the Forsythias. The flowers are actually pale pink when they open but soon fade to white. It needs a background of evergreens to be seen at its best and, although its flowers will stand some frost, avoid exposure to cold winds. This should be borne in mind when planting.

Deutzia Kalmiflora

A low-growing bushy shrub. The branches are slender and slightly arching. Covered in late May and early June with Kalmia-like pink flowers. It does not grow over 3 feet and, therefore, is an excellent shrub for the small garden or in the foreground of the shrub border. Of easiest culture. Give it a sunny spot or light high shade. Again, we repeat, a nice small shrub for the small garden.

Treatment of Freeze Damage On Azalea Plants

The 1955 spring season will be one long remembered by plantsmen throughout the South. The unusual early Spring season was followed, on March 27, by a drop of fifty degrees to a low seventeen degrees. Kurume azaleas, dogwoods, and numerous other plants were in bloom and other plants were forcing new vegetation and Spring growth. The sudden drop in temperature caused a great many basal cracks on plants and killed off all new vegetation.

Planted out at the Gardens, we had over two hundred tall, leggy, graceful, plants of Kurume Azaleas, five feet or better in height. All of these plants showed basal bark damage, many running in length from 15 to 18 inches. It would have been very difficult to accept the procedure of cutting these plants back to the ground in order to save them, so that we tried a treatment of applying a coat of melted paraffin over the crack or injured portions of the stem. A simple double-boiler arrangement was made, using a No. 10 can, which contained hot coals with a smaller can setting in the center in which to keep the paraffin. The paraffin was simply brushed onto the injured portion and pine straw was then heeled up around the injured area.

At the end of the season, we had saved the tops of one hundred and ninety-five plants, thus treated, and had to cut back only five of them. As a check for this treatment, we left some smaller azaleas without the paraffin treatment and these continued to die back throughout the entire summer and many of them were lost in the drouth that followed in late July and August. The photograph is of one of the many plants and shows typical sort of injury and the healing over which occurred after the paraffin had been placed over the stem. It was felt that the paraffin kept the bark from being exposed and stopped the continued drying and complete peeling off of the bark around the stem as is typical of freeze damage on azalea plants.

The same paraffin treatment was also used

on one of our new varieties of *Ilex cornuta*. We had numerous one year old plants that had considerable stem damage and all of them were given a paraffin treatment. Unfortunately, we left no plants for a check or control, but we were well impressed with the overgrowth of callus on the injured areas. It was much more rapid than on other varieties of holly that were not similarly treated. While this treatment cannot be proved on the experimental basis, it certainly was worthwhile and worthy of repeating, if such injuries should again occur on similar types of plants.

A grafting wax might be much better to use than common paraffin, but we, unfortunately, had no grafting wax available at the time of the winter injury, so that we used the best thing that we thought might work and was available to us.

We are forwarding our observation and method of treatment so that others might treat and apply this information to other plants similarly injured in the future.

As the presses are ready for printing, it has been discovered that the engraving for the illustration that was to have been used here has disappeared. Unfortunately, also, the photograph from which the engraving was made has been returned and the engraving proof is unsatisfactory for making a new engraving. Rather than delay the issue until the photograph could be recalled and another engraving could be made, it has been decided to publish the illustration in the next issue.

Ed.

American Plants in the 16th Century

From the historian, the research-scientist, and the novelist one is able to gain a pretty accurate idea of the kind of world that made up our yesterdays. One writer takes us back to ancient Rome, another to the Middle Ages and others reconstruct our own Colonial days. But for the interested horticulturist there is but little literature really to satisfy his curiosity as to what farming and gardening were really like, or as to what current thought was regarding new introductions in this or that country. One of the questions that has interested a great many gardeners, and especially myself, is about the knowledge and use by the Old World of the discoveries of Columbus and his successors.

I was much pleased, therefore, when there recently fell into my hands a slim volume written in Italian in 1584, less than 100 years after Columbus came to our shores, which devotes many pages to plants of the "Indies." The title of the book is *La Minero del Mondo* (The Mine of the World) written by Giovanni Marie Bonardo, the edition under discussion having been printed in Venice in 1611. The book tells of many interesting natural wonders of both the mineral and the plant world, mixing fact and fiction in the manner of the time. There is much of interest in the book but I shall report here only a few of the tales of the reputed plant wonders that travelers had brought to the then world-conscious Venetians. The parenthetical guesses which I have made by way of identification are waiting for better guesses which I trust some knowing reader will make.

Tobacco, of course, was of prime interest. Bonardo says that in addition to making the smoker "feel warm like a stove inside," one was subjected to happy dreams and hallucinations. Perhaps it was that some report of the use of the "mescal buttons" we have recently been hearing about had become mixed with the tobacco story.

Our writer further states that in "America" they have turnips that are

"sexual." Round turnips are male and flat ones female. But, he goes on, the native Indians have a root which looks something like turnip which is used for the baking of biscuits. (*Manihot esculenta*—Cassava).

Again in the West Indies there is a plant growing wild which, if one touches it while it is growing, he is immediately killed. However, if the plant is lying on the ground separated from the stock and one touches it, the leaves fold up immediately. (*Hippomane mancinella*—Manchineel).

Bonardo writes that there is a tree which produces apples on the leaves of the tree and the branches produce wool. (Cotton tree—*Bombax ceiba*) Another tree is one called *bi-os* and this plant the natives use for roofing material for their houses and as material for baskets, hats, etc. (*Calathea* sp.)

Quite accurate seem to be the stories anent chocolate production. In free translation he says, "In America there is a tree from which they get what they call *Cacauat*. This is such a delicate tree that it does not stand the rays of the sun even though it needs a warm climate. Therefore, to make the tree survive, it must be planted in the shade of other trees. The fruits of this tree resemble almonds and they are used to make a drink, and produce a tan or wine-colored drink. This is very refreshing, tasty and in time past this fruit was used as currency." (*Theobroma cacao*—Chocolate).

Then is described the Maguey plant spelled in the book *Megueí*. He says, "The Indians plant many of these plants because from them they make shoes, they write on the leaves, and from the sap they produce wine, vinegar, sugar and honey. Both the fruits and the roots are edible. The plant has very sharp thorns which make a good marmalade. The roots when mixed with "assentio (?)" are very good as an antidote for poisons. (*Agave* sp.—Maguey).

And as we might well expect, there was mention of that important cure-all, Sassafras, the search for which is said to have caused so much original

exploration including the discovery of New England by Gosnold. The author says of it that Sassafras is "a very good remedy against every illness to which human creatures are subject." This a large order indeed, but apparently that is what the European world thought at the time. (*Sassafras officinale*).

Another medicinal tree was called *Zilo* which, he said, produced a sap which heals wounds without leaving a scar. "Therefore they call it the balsam" (*Zanthoxylum* sp.). There is also a plant in the West Indies from which the natives make bread but the sap of which is poisonous. (The suggestion has been made that this is Courbaril—*Hymenaea courbaril*).

Not strange is the fact that word had passed around about the use of the Coca leaves which he says "drives away thirst and hunger. The leaves may be picked at any time of year. The natives call it *cocahe*" (Coca—*Erythroxylon coca*).

Finally there were a number of plants for which no identification seems possible on the given descriptions. Here are two such quotations:

"In America there is the tree of the unworthy which they call *Vacalsuth* of which the flowers are white and heart shaped and only good people wear them. The flowers have a fine aromatic perfume."

"In America there is a tree, the smoke of which if it touches a person will produce sterility and it is called the tree of Sterility."(?).

There is in this 16th century book much more of great interest to the curious and the student of science history, but examples given are the principal references to American plants.

Nelson Coon, Librarian, Perkins Institution For The Blind, Watertown, Massachusetts

Late-flowering Japanese Azaleas

In the group of Japanese azaleas introduced into this country through the Division of Plant Exploration and Introduction of the U. S. Department of Agriculture some years ago, and slowly

making a place for itself in this country under the name of "Chugai azaleas," there is a wider range of flowering time than one might suppose from the general catalogue notes. It is true that nearly all bloom in late May and June with straggling flowers well into July, but there is considerable difference among the named clones, so that if one wanted only those that came at the very end of the group it would be possible to choose such. They would have no competition in gardens except from a few other named "macrantha" forms and a few of the Glenn Dale Azaleas that have the same genetic background.

The azalea commonly known in gardens as "macrantha," which botanically is *Rhododendron indicum* in the strict sense of that term, is native to Japan, where it is known as "Satsuki" or "Fifth Month Azalea." Its cultivation falls into two major practices, the use of certain forms in what must be called topiary work for want of a better term and the use of specimens specially grown and trained for pot use.

In the first use, one commonly finds it in gardens where it is used almost as a ground cover, being sheared to whatever level surfaces, or undulating surfaces, the garden scene requires. In such places, the flowering is largely sacrificed, but the effects obtained are well worth while, once one is accustomed to the idea.

In the second use, the plant becomes the almost "sacred object" of a cult, and huge shows are held yearly in which proud owners exhibit their specimens that have been trained in various forms to suggest poetic ideas. Many years of training may have passed before any plant is shown, and the plants as they develop are subjected to pruning, to tying to stakes, to wiring on forms, until the essential skeleton of growth is fixed by the maturing woody stems. After that, pruning is largely resorted to in order to determine the size and location of the foliage masses.

Of the Glenn Dale varieties that are in full show of bloom, now in early

June, one can report only 'Fountain' and 'Stunner.' 'Fountain' is a little more than a glorified "macrantha" but 'Stunner' has a larger flower with wider and more overlapping lobes, as well as a stunning rich rose-red color. Other Glenn Dales that flower into June in the North have gone by here, notably Eros, Sterling, Sagittarius, and Pearl Bradford, with Aztec as the most important of them all.

At this writing, June fifth, the "Chugai" varieties that are in showy flower are: 'Shinnyo-no-tsuki,' 'Musashino,' 'Sakura-yama,' 'Otome,' 'Shin-sei,' 'Shun-Rei,' 'Shun-un,' and 'Joh-ga.'

Of these, the most spectacular is 'Shinnyo-no-tsuki,' which has large flowers with a wide border of deep crimson about the white centers. It is one of the more tender, however, or, perhaps better stated, more affected by cold, for here, where there rarely are temperatures that would injure its dormant wood, there are temperatures that seem to affect the undeveloped flower buds, so that the blooms appear imperfectly, often not opening as they should and with malformed stamens and pistil. Just what the low temperature may be has not been determined.

'Joh-ga,' which is sometimes catalogued as 'Vo-gah,' is one of the clones that is imperfectly fixed, so that cuttings from one plant may yield several forms. The typical form appears to be a rounded flower of faintly tinted white, with a blush stain on the upper lobe with a varying number of deeper rose-pink dots. We have here a plant raised as a cutting from a shoot that maintains pale pink flowers with the same tinting in a deeper degree, and another plant that has dark rose-pink flowers.

'Shun-rei' bears very flat-faced flowers that are essentially white in garden effect, but that carry a few stripes and a little "sanding" of coral-red color.

'Shun-un' is much like it but gives a considerable number of flowers in

which there are six lobes instead of the normal five of the corolla. Its striping and sanding are of Nopal Red which is a slightly browned red.

'Otome' gives both five- and six-lobed flowers of normal azalea form, pure white in color but with occasional sectors, and always a few stripes and a little sanding of rose color.

'Musashino' is much like 'Otome,' but the lobes are more overlapping and there are fewer flowers with sectors of color, and very little striping of rose.

'Sakura-yama,' in its normal form, is a flower with pale coral-pink ground color, so completely covered with sandings and stripes of a color that lies between Ridgway's Old Rose and Eugenia Red, that it makes a very gay appearance. Old Rose in the color chart is a dull pinkish-rose color and Eugenia Red tends toward a brownish tonality. Branches sometimes appear with flowers of solid red.

In the collection here, there seems to be some confusion among the plants under the name 'Shin-sei.' One plant flowers about three weeks ahead of the others, so that it may be the stray or accident. It is pure white with marvellous substance and very little color in odd flakes of rose. The plant now in bloom has a ground color of white, edged with Jasper Red, a slightly neutralized red. If one could imagine the color as having been applied to the edges of the lobes and then having gradually soaked in toward the center of the flower, one will get an idea of the tinting. There is no sharply defined border as in 'Shinnyo-no-tsuki,' 'Row getsu,' and others of that type.

None of these varieties has the almost prostrate growth that has become familiar in the earlier flowering clones as 'Gunrei,' 'Gunbi,' and their like. But in no case does there seem much likelihood that the plants will ever become large bushes, so that foreground planting is quite safe.

B. Y. Morrison, Pass Christian, Mississippi



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