THE Camellia REVIEW

A Publication of the Southern California Camellia Society

Descanso Gardens
La Canada, California

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Southern California Camellia Society Inc.

An organization devoted to the advancement of the Camellia for the benefit of mankind—physically, mentally, and inspirationally.

The Society holds open meetings on the Second Tuesday of every month, November to April, inclusive at the San Marino Women's Club House, 1800 Huntington Drive, San Marino. A cut-camellia blossom exhibit at 7:30 o'clock regularly precedes the program which starts at 8:00.

Application for membership may be made by letter. Annual dues: $6.00.

THE CAMELLIA REVIEW

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THE COVER PICTURE

The cover picture shows the first view that the visitor obtains of Descanso Gardens after he goes through the gate. The broad lawn gives the appearance of roominess and sets off the oak trees and camellias that surround it. The plastic covered tables for the camellia show are placed along the walks at the edge of the lawn and among the growing camellias.

THOUGHTS *from the editor*

Anybody who has read as thoroughly as I have the articles that have appeared in CAMELLIA REVIEW on camellia propagation and culture must have come to the conclusion that the growing of camellias is not an exact science. If a person had decided that he would observe all the admonitions and suggestions that are contained in the magazine, he would find himself in such a sea of confusion and contradiction that he would give up in despair. This does not mean that the articles contain incorrect statements or advice. It's just the fact that there is no single best way to grow camellias wherever camellias are grown. So much depends on the spot or area in which the camellias are being grown. And even in the same area different treatments are producing equally good plants and blooms.

Take the matter of soil composition for example. All people agree that there must be good drainage and that it should contain some humous. I believe that most people would agree that the soil that has built up over the years under oak or pine trees would be pretty close to the camellia growers soil heaven. But when it comes to mixing one's soil for container grown plants, we find endless numbers of different combinations of ingredients. The fun of growing camellias includes the opportunity to use one's own ingenuity and judgment in deciding what he wants to do in regard to his own collection of camellias. Which gets back to where I started with regard to seeming conflicts that show up among the articles in CAMELLIA REVIEW. These articles — whether about soil, fertilizing or other phases of camellia culture — are written on the basis of experience and are offered as guides to those who read. The reader must pick up the ball and run from that point. That is what makes this a hobby. If we were able to get all the specifications for our own camellia growing out of a book, it would cease to be a hobby.

With this background, I recommend the reading of the article by Lenard Brooks about the use of fir bark for soil mix. This article is based on his own experience in Modesto, California, which is in the heart of California's lush Sacramento-San Joaquin Valley. His article speaks for itself. What makes me recommend its reading is what I saw this week at Nuccio's Nursery in Altadena. Two years ago they transplanted some gallon size plants to egg cans with about 50% fir bark in the mix. Joe Nuccio told me that the plants when moved to the egg cans, were very ordinary looking plants. They are not ordinary looking now, but are thrifty plants with beautiful green leaves and flowers that would win blue ribbons in more than one camellia show.

Harold E. Dryden

DESCANSO GARDENS SHOW WILL BE HELD FEBRUARY 27-28, 1965

Harold E. Dryden

As plans are being completed for the 10th annual camellia show in Descanso Gardens, memories of those who participated in its inauguration in 1956 go back to its inception. It was the concensus of the camellia societies in the Los Angeles area that the American Camellia Society should be invited to hold its annual meeting in Los Angeles in 1956. The Pacific Camellia Society, Southern California Camellia Society and Temple City Camellia Society were then holding individual camellia shows. All agreed that a big show that would be sponsored by all societies in the area should be the center of interest in connection with an annual meeting of A. C. S.

Representatives of the four societies in the Los Angeles area — Alton Parker of Pacific Society, Douglas Thompson of Los Angeles Society, Harold Dryden of Southern California Society and the late Lawrence Bryant of Temple City Society — met at the home of the late Ralph Peer to review the subject and to formulate plans for such a program. The outgrowth of this meeting was the formation of Los Angeles Camellia Council, the initial members of which were the four societies represented

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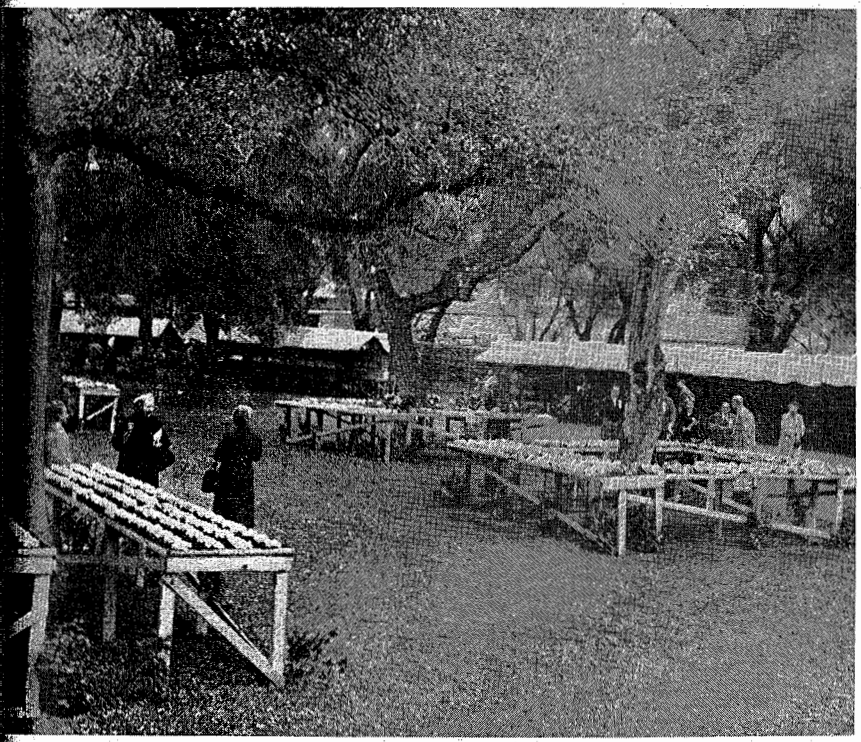
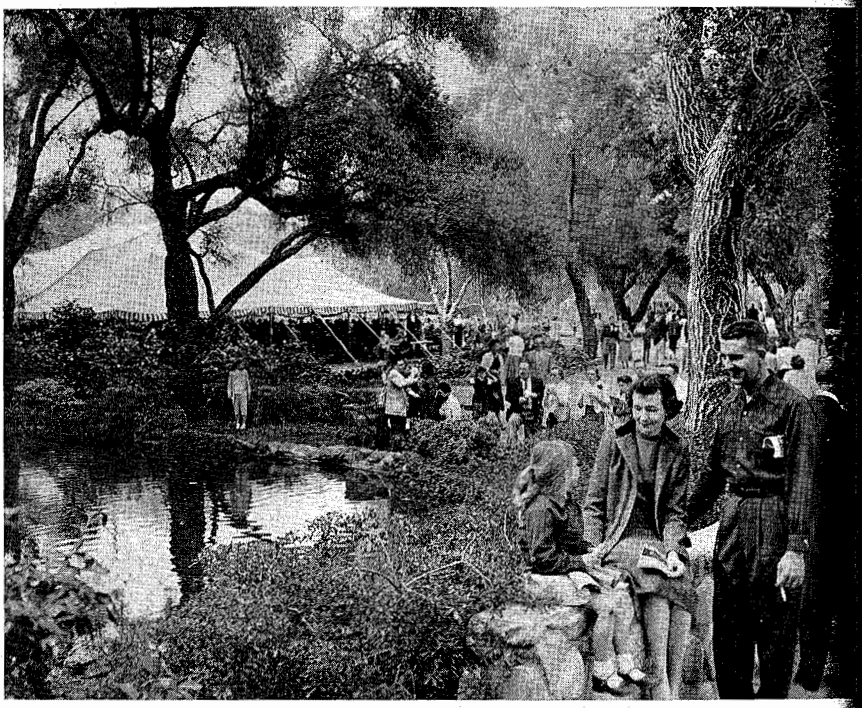


In the first Descanso Gardens Show, the blooms were placed on tables built around the trunks of oak trees.

at the first meeting. The Pomona and Orange County Societies became members at a later date. Ralph Peer was chosen as the first Council President.

Much thought was given to the selection of a location for the show. The locations that had been used by the three societies for their shows were not large enough for the plans that were visualized for the joint show. The feasibility of the Huntington Hotel in Pasadena (now the Huntington-Sheraton Hotel) for the show as well as for A. C. S. headquarters was investigated. Since the show would be held during the time of the Santa Anita Park horse racing season, however, rooms would not be available there for the visitors. Brookside Park in Pasadena, where the glorious camellia shows of the 1940 era were held, was considered. After every such location was discussed, the thoughts of the organizing group came back to the possibilities of holding the show in beautiful Descanso Gardens, in the open beneath the spreading oak trees and among the growing camellias. The Camellia Council recognized the weather hazard of an outdoor show but decided that the beautiful setting for a show would justify the risk of rain during the show. With the concurrence of the Parks Department of Los Angeles County, plans for holding the show in Descanso Gardens were finalized and Alton Parker was named as Show Chairman.

The accompanying picture shows how tables were built around the trunks of the oak trees for this first show. The morning of setting up the show was cool, but there was no rain and everybody was happy about the arrangements. As plans got under way for the next show in 1957, however,



A tent provided protection for the second Descanso Gardens Show in 1957.

he possibility of rain was again dis-ussed. Timidity won out in the dis-ussions and it was decided to erect large tent for the occasion. The ides of the tent were raised so that he visitors could see the camellias utside while they walked along the ables. But nobody was happy about t. Mark Anthony of the Descanso Gardens staff came up with the idea f a plastic covering for the tables hat would permit the outdoor dis-lays and yet provide a covering for oth flowers and people if the un-sual should occur in the form of rain.

This plan has been used continu-usly ever since. The possibility of ain during the last weekend of Feb-uary has always plagued the Show Committee as they have made their lans for the show ahead. Every year omeone has expressed the wish that "we would get our exhibit building n Descanso Gardens". But so far, though rain has threatened and there have been a few drops fall, weather has not interfered with a successful camellia show in the Gardens.

After the first few shows, perpetual trophies were established for the major awards such as Best Flower, Sweepstakes, Best Seedling, etc. These trophies are now housed in a trophy cabinet in Hospitality House in the Gardens. The accompanying table shows the names of the japonica and reticulata varieties and of the Sweep-stakes winners that are engraved on these trophies.

The 10th Show in Descanso Gar-dens will be under the chairmanship of R. F. (Bob) Dickson, with the following serving as committee chair-men:

Asst. Show Chairman:
Judge Bayard Rhone
Advisor: Erni Pieri

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The present layout.

Clerks: Frances Butler
Commercial Exhibitors:
Mark Anthony
Education, Information & Membership:
Dr. Norman Palmer
Girl Scouts: Betty Robinson
Judges: Bill Woodroof
Placement: Bob Briggs
Publicity: Mark Anthony
Receiving: Pat Novak
Registration: Clarence Irvine
Rules & Schedules:
Edwards Metcalf
Signs & Posters: Erni Pieri
Social Hostess: Betty Robinson
Court of Honor: Ray Noyes
Tallying: Tom Hughes
Trophies: Irene Dickson

The Los Angeles Camellia Council has codified the Regulations for the Show and the Schedules, and they are being used this year by the Southern California societies that are conducting shows as a guide for their own regulations and schedules. Details that should be called to the attention of exhibitors are the following:

1. The separate Division for "Special Culture" (Gibbed) blooms has been continued.

2. A Division for Boutonnieres has been established, with separate classes for Miniature and Small.

3. Single bloom entries of japonicas will be limited to 60 entries. Entries in the multiple bloom classes of japonica (3's and 5's) will be limited to four entries in total.

4. Entries in the multiple bloom classes of reticulatas (3's and 5's) will be limited to four entries in total. There is no limit in number of reticulata single bloom entries.

5. Exhibitors may place their blooms on the display tables under the supervision of the Placement Committee, except that they may ask for assistance if they desire it.

6. Sweepstakes Award will be to the exhibitor having the greatest number of blue ribbons awards in the Divisions for Japonica, Reticulata, Hybrids, and Species other than japonica and reticulata, and in the Class under the Boutonnieres Division for Small, except that only those ribbons awarded where there are three or more entries of a variety in competition will be counted toward Sweepstakes.

7. A Miniature Sweepstakes Award will be made to the exhibitor having the greatest number of blue ribbons in the Class for Miniatures.

Entries may be placed between 7:00 and 10:00 A.M. on Saturday, February 27th. Judging will start promptly at 11:00 A.M. and will be finished at approximately 1 o'clock when the show will be opened to visitors.

WINNERS IN DESCANSO GARDENS SHOWS

Year	Best Japonica	Best Reticulata	Sweepstakes
1956	'Reg Ragland'	'Crimson Robe'	C. W. Lattin
1957	'Onetia Holland'	'Noble Pearl'	Reg W. Ragland
1958	'Guest of Honor'	'Cornelian'	Dr. Clark Hubbs
1959	'Reg Ragland Var'	'Tali Queen'	Dr. Cecil Eshelman
1960	'Guilio Nuccio'	'Noble Pearl'	Reg W. Ragland
1961	'Mrs. D. W. Davis'	'Buddha'	C. W. Lattin
1962	'Guest of Honor'	'Crimson Robe'	Fred Hamilton
1963	'Charlotte Bradford'	'Moutancha'	Fred Hamilton
1964	'Reg Ragland Var'	'Crimson Robe'	Dr. Leland E. Chow

CAMELLIA PERSONALITIES -- HAROLD L. PAIGE

"ONE MAN'S LOVE AFFAIR WITH LADY CAMELLIA"

Hugh Paterson
San Rafael, California

A dozen men, seated in a rough circle in the living-room of a distinguished ranch-style home in Lafayette, California, break off their conversation as the chairman calls the group to order. The Plant Experimentation Committee of the Northern California Camellia Society is in session. Listening carefully as each member reports his progress and problems — questioning, encouraging, stimulating discussion, as his wife Mary takes careful notes of the proceedings, Harold L. Paige lives his philosophy that amateur experimentation with camellias results immediately in friendship and fun, over and above its long-range contribution to the advancement of science.[1]

To appreciate his love for the genus Camellia, and to share his knowledge of its culture and habits — whether as a member of this select company or in friendly conversation at NCCS meetings — one could well believe he was born with a green thumb and grew up in a camellia nursery. NOT SO! Harold Paige's working career was spent as a General Contractor, building custom-designed homes noted for their beautiful materials and fine workmanship. Whatever one's personal convictions regarding the influence of character on career — or vice versa — it seems clear in this case that his innate drive for perfection found plenty of opportunity for

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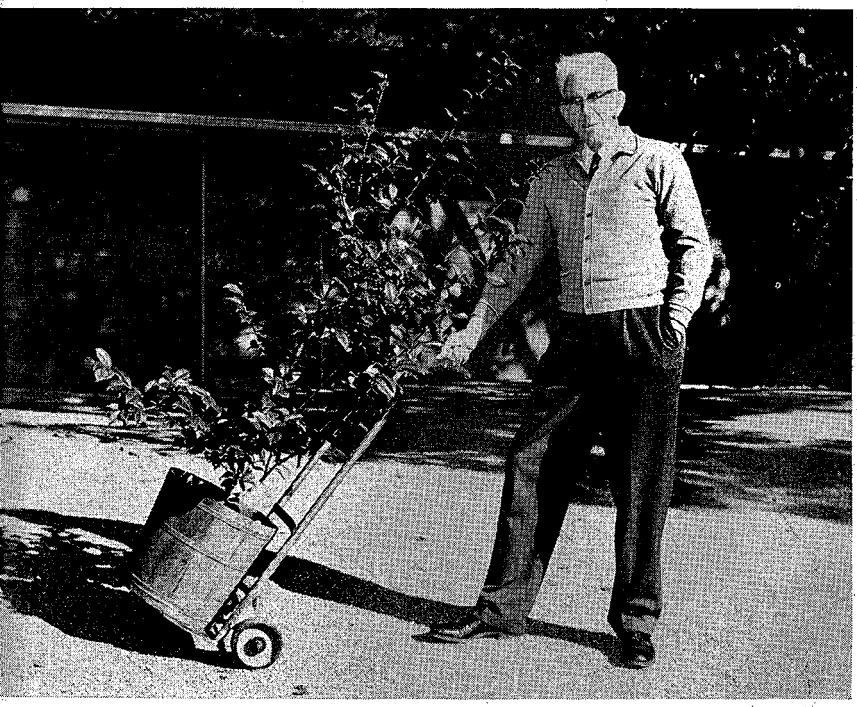

Harold L. Paige

growth and expression in his work. Each complimented the other beautifully.

Competition for its own sake did not particularly interest him, but he always had hobbies in which he ended up as a top-practitioner because he thoroughly enjoyed working at them. Loving music, he ended up singing professionally as a church soloist for six years. During 'the depression', when there was very little building to occup his time, Harold and Mary spent long week-ends skiing Sierra Club style (no fancy ski lodges, no ski lifts, etc.). Harold ended that hobby as president of the Recreation Commission for the City of Oakland. Too busy to go to the mountains when business picked-up again, they turned to ice-skating and dancing. Harold ended that hobby as president of St. Moritz Ice Skating Club, then the largest figure-skating club in the USA with a membership of 1000 skaters.

If you're wondering just how camellias fitted into Harold's life in those days, the answer is "they didn't". Some years earlier Mary had enlisted the services of a landscape architect to help her redesign HER garden. In the process, she ordered "about 15 camellias, some red, some pink, some white, but no spotted ones", plus the usual assortment of roses, border plants, annuals, and perennials. Frankly, she had long since ceased asking for his help in the garden, after the untimely demise of several shrubs near their front door following a pruning 'experiment'.

But, as the poet so aptly put it, "the best laid plans of mice and men gang aft agley". When she found herself incapacitated following orthopedic surgery in 1943, Mary ate crow and Harold took charge of the garden. He knew little about any of the plants consigned to his care; but, if he had to look after them, the perfectionist in him demanded that it be done right. He bought books and began to study 'horticulture'. He joined the Business Men's Garden Club of Oakland, in his determination to find out what was 100% for each of the varied plant materials now in his care.

In the Business Men's Garden Club Harold met O. E. Hopfer, from whom he learned that camellia varieties had names. Together they attended the first Camellia Show in the Bay Area, staged by Alfred Stettler in San Francisco, March 14-15, 1945. Harold came home a changed man. He had seen form and color and size in camellias that he hadn't dreamed of. He had visited a nursery and purchased a few small plants in gallon cans — that soon became an army as he pursued his objective to own every known variety. He was shocked! As her lawn began to be nibbled away, Mary protested, "We don't NEED any more camellias. We don't have ROOM for any more camellias". Harold reassured her, "Just wait, you haven't seen what I saw." The lawn continued to disappear, the cans accumulated, and Harold went about his gardening chores in a trance.

Harold and O.E. decided that the public needed to know more about this superlative flowering shrub, and the California Camellia Society was born December 9, 1945.[2] Three months later, as vice-president of the fledgling society, Harold was responsible for staging its first show, February 23, 1946. Other hobbies gradually went-by-the-board as he pressed his search for ALL the new varieties. Elected president of the society in the fall of 1946, the search took him to Southern California where Dr. Lloyd J. Taylor was presiding over his first meeting as president of

Non-dues-paying members will be cut from mailing list for March issue of CAMELLIA REVIEW.

the Southern California Camellia Society. As a courtesy to the new Bay Area society, the Paige's were honored guests at a delightful party in the Taylor's famous Flintridge mansion. There they met the directors of SCCS, and Dr. Walter Lammerts and Howard Asper who were then supervising the fabulous Descanso Gardens for Manchester Boddy. Here began the many warm friendships they have enjoyed with camellia colleagues through the years, and the annual Paige pilgrimage to Southern California shows.

As a grower, Harold's innate urge for perfection soon proved itself in the quality of his plants and flowers, and he became a consistent winner of ribbons and trophies. But competition, which he did not enjoy, palled with success; and he soon dropped out to devote himself to judging and other aspects of the camellia world. Talks about camellias and articles for camellia journals followed shortly — one such, on *pruning*, achieving such favorable notice that he was invited, with C. Norwood Hastie, Jr., to prepare the chapter entitled "Pruning The Camellia Plant" in the book "Camellia Culture", published by S C C S in 1958.

During his second term as president, Harold pioneered the development of amateur experimentation with camellias when he persuaded Dr. Gordon Richmond to become the first chairman of the Plant Experimentation Committee. A year later, after Dr. Richmond has been sentenced by Standard Oil to a 10-year term in Iran, Harold was appointed chairman of the group — an office he has served with distinction ever since. Now in his 18th year as 'example-setter', mentor, even 'needler' when occasion requires, he participates joyfully in all the varied projects of this talented group — which is currently immersed, among other things, in the search for more effective hybridizing techniques, especially japonica x reticulata. Ironically enough, for all his long interest in hybrids and the production of many promising hybrid seedlings, he finds a wry humor in the fact that the only camellia seedling he has been willing to name and register, namely MARY PAIGE, is probably a japonica, not a hybrid.[3]

Which brings us back just about where we started this account of "One Man's Love Affair With Lady Camellia". Few men have contributed so much to public appreciation of her 'personality', and enjoyed themselves so much in the process. Small wonder then, that a little gold plaque on the wall at 1212 Monticello Road reads:

N. C. C. S.
H O N O R S
H A R O L D L. P A I G E
FOR TWENTY YEARS OF DEDICATED SERVICE
AND FOR HIS CONTRIBUTIONS TO CAMELLIA CULTURE
MAY 1964

1. See "The Place of the Amateur in Plant Experimentation," ACS Yearbook 1965, pp. 130-142.
2. California Camellia Society was reorganized and incorporated as Northern California Camellia Society, February 1948.
3. See the front cover of NCCS Bulletin, November 1964; also ACS Yearbook 1965, opposite p. 180. In this connection, it should be noted that, contrary to some reports, MONTICELLO is Dave Feather's hybrid, not Harold's. Long before camellia hybridizing achieved its present status, Dr. Walker M. Wells gave Harold a plant of 'Sylvia May' which he had imported from England. Harold gave some seeds to Dave. Dave thoughtfully named the outstanding offspring MONTICELLO—the street on which the Paiges live.

What's Behind The Green Thumb

ALVIN L. GUNN

The early varieties have been in bloom for a few months, and watching the buds swell and bloom, particularly on new varieties, is one of the real pleasures of this hobby. When the camellia bug first hits you, there is a tendency to see a good bloom at one of the meetings or shows which is a must. The flowers on the head table are unfortunately not always the most satisfactory plants to rush out and buy for a beginning collection. Most of the varieties purchased at local grocery stores at bargain prices and so called bread and butter varieties will end up as understock as your collection increases in number. Before you rush out and buy a number of plants, visit some of the camellia hobbyist homes and get their advice on varieties. Visit the nurseries which specialize in camellias, and get their views on the vareties which have good growth habits, that bloom without bull-nosing or shattering when they fall. Select some varieties which will give you flowers for the full season. There are many of the older varieties which have excellent habits, and are still top notch show flowers. Many of the highly touted new varieties have their heads chopped off after a couple of years. Read "If I Were Limited to 20 Varieties", page 22 of the November 1964 CAMELLIA REVIEW.

The growing of seedlings or cuttings is a fascinating phase of the camellia hobby. The area taken up and the time and effort to build a cold frame will be repaid many times in starting seed and cuttings. There are many materials a frame can be made with — redwood, brick, cement blocks, etc. I have found cement blocks excellent for a number of reasons. Their permanence goes without saying. They hold both heat and moisture. You can walk on them, or rest heavy flats without fear of breaking the walls. They are easy to form into the size required. Decide on the approximate size, get a lid for the frame, then build the frame to fit the top. Flat or corrugated sheet plastic of a light color or surplus window frames white washed are excellent. Pour a cement footing four inches deep and two inches wider than the block. If you buy the blocks, the 4 x 4 x 12 are easy to work with and plenty sturdy for this purpose. The corners on every other course will need 10" and 14" blocks or the difference can be made up with thick mortor joints. The number of courses high will depend on your use of the frame. If grafts will be put in, it should be high enough to put an egg can with a jar on top. The dirt inside should be cut 6" below the footing so the frame can be flooded weekly in the summer to keep the humidity high. The top doesn't have to fit air tight. If you want to go deluxe, get a lead cable heater with a thermostat control. The cables are placed in the bottom, with an inch of sand on top of them. Bottom heat will start cuttings, seed and grafts in much less time.

Don't neglect the picking of old flowers, off of the bushes and from the ground. This is the season for flower blight. The rotting flowers on the ground will start it, and it is heck to control. If you have flower blight, get some Terraclor in powder or liquid form and use it according to

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THE HYBRID CAMELLIA

TALK GIVEN BY EDWARDS H. METCALF TO TEMPLE CITY CAMELLIA SOCIETY ON NOVEMBER 20, 1964

Reported by **Laurence R. Shuey**

A great deal of work is now being done by technically trained men and also by amateurs in hybridizing and crossing various species of camellias.

Ten years ago, the hybrid camellia meant little, if anything, to the connoiseur and had not been introduced to the public by the commercial growers. All of the emphasis at that time had been placed on the introduction of new and worthwhile japonica and sasanqua seedlings, or sport mutations; however, a few years later, the Williamsii hybrids began to appear in the commercial nurseries. These early hybrids were crosses between the species saluenensis and various varieties of camellia japonica. Most of these hybrid introductions were a light pink to orchid pink in color and were single to semi-double in form.

The propagation and development of hybrids today is proceeding at a rapid and accelerated pace throughout the camellia world. Experts and amateurs are busily engaged in this work and are utilizing the pollen from every available species in an attempt to obtain new and better hybrids.

Hybrids are important because of the ever present chance of developing something better than we have today. The hybridizer is endeavoring to obtain a new form, a different shading in color, earlier blooming varieties, and camellias that are resistant to cold climates. The latter goal is especially desired in the South where frigid and cold weather have ruined many of their shows in recent years.

Fragrance is another characteristic that is considered important. A few japonicas, such as 'Fragrant Jonquil' and 'Scented Treasure', have some degree of fragrance. These varieties are being used in hybridization and pollenation programs in the hope of finding many more fragrant and highly scented varieties.

Recent Howard Asper crosses are the forerunner of better things to come. Howard's 1963-1964 hybrid introduction of 'Howard Asper' (japonica 'Coronation' x reticulata 'Lionhead') has set the stage for the miracle flowers of tomorrow. Some of Howard's new and most exciting hybrids have been crosses between sasanqua 'Narumi-gata' and several varieties of reticulata.

In hybridizing, it is essential that ripe pollen be used and when transmitting this pollen to the stigma of the parent flower, the stigma must have a little liquor in order to accept the pollen. Before using the pollen, be sure and cut the anthers from the parent flower. After the desired bloom has been pollenated, a small plastic bag should be placed over the flower and securely tied. This is necessary in order that bees and other insects can not distribute pollen from other flowers to the one which has been pollenized. The parent flower should always be one that is approximately one day from blooming. In selecting the desired flower, the bud should be opened and the petals pulled back and partially cut away before transmitting pollen to the stigma.

One should not become discouraged if the flowers obtained from seeds from your first cross do not have all of the desired characteristics which you had hoped to obtain. These characteristics may not appear until the second or third generation crosses are bloomed. Since this is a time con-

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COMMENTS ON CAMELLIA BREEDING*

Dr. Clifford R. Parks
Geneticist, Los Angeles State & County Arboretum, Arcadia, California

No professional in horticulture or plant breeding, particularly where woody ornamentals are concerned, underestimates the contribution of the amateur breeder to varietal development; and further, none underestimates the volume of labor these hobbyist breeders contribute to their work. In many cases, however, shortcuts could be taken without hampering the quality of the product. This article has been prepared to point out a few breeding shortcuts, as well as to remind amateurs that their potential contribution to the improvement of the camellia is to be encouraged. This same point can be made for the breeder of any woody ornamental crop.

Through observation and discussion with amateur breeders, it is my belief that much too much time is often spent in making controlled pollinations. A controlled pollination is one in which both the female (seed) and the male (pollen) parents are known by virtue of the fact that the pollination is carried out by man. This might be contrasted with an open pollination (OP), where the female or seed parent is known but the male (pollen) parent is unknown. In this latter case pollination is carried out by insects, other agents or even such things as gardeners accidentally brushing from one flower to the next.

For that matter, some would argue —why make controlled pollinations at all? And for some purposes OP's are quite useful and even adequate. For instance, if we are looking for a variety resistant to a particular characteristic, and we have very few clues as to what a "good cross" would be, it is most efficient to screen a large population of open-pollinated seedlings through selecting for the characteristic under consideration. The point is that when one is breeding for a particular objective, it might be more efficient to start from a large number of open-pollinated seed rather than from fewer cross-pollinated seed. It is desirable to first clearly understand if cross-pollination is necessary at all. It is not necessarily "unscientific" to base phases of a breeding program on open-pollinated progenies. In fact, OP's are often used in the breeding program in progress here.

On the other hand we often have some information on the characteristics of the seedling progeny of a given variety. In the cases where we have this information about the breeding behavior of a variety, we likely will make more progress by selecting our parent varieties and hybridizing them. Often this information comes from open-pollinated progenies which have been grown to flowering for other purposes. We may even deliberately grow out OP progenies before proceeding to develop a hybridization program. To summarize, when we have very little or no information regarding the breeding behavior of our varieties, then we can obtain some very general—but very valuable—information by growing OP seedlings; from the information gained from OP seedling groups, we can then predict which cross-pollinations would best move us toward our horticultural goals.

The first problem to be considered regarding controlled pollinations is the choice of parents. Two factors

* This article is substantially the same as the one under the same title in the August 1964 issue of THE CAMELLIA BULLETIN, the publication of the Northern California Camellia Society. — Ed.

must be considered in this choice—horticultural desirability and fertility. Many varieties which make good pollen parents are totally unacceptable as seed parents. Any variety which produces nearly any amount of pollen can be used as a male parent and this would include many forms of double and semi-double flowers, since even formal flowers occasionally produce a few anthers with viable pollen; on the other hand, it has been our experience that if a plant will not set open-pollinated seed, then likely it will not set seed from cross-pollination. As I have pointed out before, it is not enough to choose a variety known to be a good seed setter; it is also advisable to pick individual seed parent plants which are known to set seed well. Often plants of the same variety set seed in quantity in one location, but set none nearby. At Descanso Gardens in La Canada, for example, considerable shade and increased humidity seem to enhance seed set.

In addition to climatic factors which affect seed set, varieties with single or semi-double flowers can be expected to regularly set seed and serve as satisfactory seed parents.

Of course, there are exceptions to this. A few, quite double Camellias regularly set some seed; and almost any variety will rarely set a capsule or two. But the chance of a controlled pollination setting on a variety that regularly does *not* set OP seed is slight; and only in cases where it is obvious that a cross with such a plant would be valuable, should time be spent making such "long-shot" crosses. So in the choice of parents for breeding, we must carefully consider the limitations of the cross we plan.

Good seed setters possessing the characteristics we desire are at a premium. Often times one has to accept a seed parent that is horticulturally second best, since the horticulturally superior plant is simply too female-sterile. There are cases where the potential hybrid is so interesting that the cross is extensively tried, even though the breeder is not optimistic that the cross can be carried out. Such a potential cross is Kunming *C. reticulata* x *C. lutchuensis*. We will try this one again this year.

We need to also consider which part of the blooming season is optimum for seed set. Based on data collected from crosses made in February, March and early April at Descanso Gardens in the Los Angeles area in 1963, it appears that seed set was approximately equal throughout this three-month period. It should be pointed out that many different types of crosses are being compared as a basis for this generalization and in any case this conclusion has little meaning for different climates. More extensive data from the 1963-1964 crosses have been compiled and compared with the spring 1963 results. (See 1965 *American Camellia Society*

(Continued on next page)

Yearbook.) It appears that February, March and early April are about equally good times to make crosses, at least at Descanso Gardens.

Now we come to the actual process of the pollination. Basically, this consists of three steps: removing the pollen-bearing parts from the flower to be used (emasculation), applying the desired pollen to the stigma and then protecting the pollinated bud from pollen contamination by bees and the like. The basic rule in emasculation is to keep damage to the bud to a reasonable minimum. While efficiency must be considered, it is particularly important not to loosen the bud. I find that the bud can be kept in place with the thumb and index finger of one hand, while the castration is carried out with a sharp instrument manipulated by the other hand. I prefer a sharp-pointed surgical scissors. Dr. A. E. Longley used a single-edge razor blade—it is a matter of personal preference. The upper one-third to one-half of the flower bud is removed (sepals, petals and ALL anthers), while the pistil is left untouched by the process—this latter point is most important. With a little practice, an emasculation can be done in a few snips and should only take a fraction of a minute.

The actual process of pollination is even simpler. Except for the case of stored pollen (which can be done most easily from a small gelatin capsule), I select a fresh-opening flower just shedding pollen for the pollen source. The pollen can be rubbed directly from the anther onto the stigmas of the receptive flower. It is important to use male flowers that have not been long open and thus are free of bee contamination. One male flower, depending on the amount of pollen it has, can be used to pollinate from a few to hundreds of stigmas. There is, as all know, a great volume of lore about proper pollination technique. There is much talk about camels-hair brushes, vials for pollen and the like. Some people have even designed pollination kits. One cactus breeder developed a technique which required a living cat's tail (attached to the cat) to transfer the pollen. This is mostly nonsense, since carrying the desired pollen in the "male" flower is faster and probably offers less chance of contamination. (I apologize for removing the breeder's art.) I suggest that it is a good habit to label (carefully and completely) the cross at the time of pollination. Plastic twist-lock labels are fast, cheap and quite dependable.

Once pollination has been carried out, it is important to cover the bud to prevent pollen contamination by bees and other insects. There has been much said as to whether or not one should cover crosses, and if so—what is best to cover them with. It is likely that once the stigmas are heavily covered with pollen from the same species in an artificial cross-pollination, more pollen added later by an insect will not contaminate the cross. Where the artificial pollination is with a species different from the species of the seed parent, it is quite possible that pollen from the seed-parent species could very easily contaminate the cross. In any case, there is very little information or data from controlled experiments regarding this problem of contamination after crossing. Since bee activity in our camellia gardens is quite apparent and since bees have been observed to visit emasculated buds, I think it is a good practice to cover all crosses after pollination. Covering pollinations does not seem to seriously hinder seed set, and at least in some instances, covering the pollinated buds may increase the chance of seed set. Brown-paper grocery sacks (6¾"x3½") are inexpensive, easy to use and surprisingly resistant to wind and rain. These sacks can be easily held in place by 1 and 5/16 inch long paper clips. I

think that the paper sacks should be left over the cross until the flower would normally wither, which (to be on the safe side) indicates a period of from ten days to two weeks. In one test we found (1964, *American Camellia Yearbook*, Camellia Breeding Progress Report, page 163 and following) that camellia stigmas are receptive over a long period, thus contamination could occur over a long period. This last spring a test was carried out by Dr. Robert Cutter and myself to determine whether plastic, brown-paper or waxpaper sacks were superior covering materials. We found wax paper to be inferior to the other two. Whatever covering device may eventually prove best, it should only require a few seconds to perform. It should be possible to complete all the steps in making a pollination in five minutes, and with practice one should be able to make a cross in two minutes.

The choice of the buds for pollination presents some selective decisions. I found in some preliminary tests (1964, *American Camellia Yearbook*, Camellia Breeding Progress Report, page 163 and following) that the size of the bud is not too critical, since tight buds showing considerable color were as effective in crosses as loose buds one day away from opening; however, large buds are easier to work with. The placement of the bud on the plant is not too critical, but it appears (not without exception) that neither little buds buried at the bottom of the bush nor large buds on vigorous shoots are likely to set seed.

How many crosses should be made as to a certain objective? There is no formula for answering this question. If the cross is difficult, then one must make more pollinations. For example, in the effort to cross *C. sasanqua* and *C. japonica* this past season, over 1000 pollinations were made; but in an effort to recombine the cold-hardy characteristics of the two *C. japonica* varieties BERENICE BODDY and DONCKELAARI we averaged one or more seed per pollination, thus—far fewer pollinations of this latter cross were made. Most actual crosses desired fall between these two examples in terms of difficulty of obtaining seed. One has to judge from personal experience and that of others as to how many crosses are required to get a seed. To determine how many seeds of a given cross the breeder wants, the number for which growing facilities are available must be balanced against the number required to show reasonable sampling in the recombination of inheritable traits.

It is my opinion that amateurs will contribute much in the future to the breeding of the camellia and other woody ornamentals (see the excellent article on this subject by Harold L. Paige in the 1965 *American Camellia Society Yearbook*) and this is written in an effort to assist, possibly, these people in their efforts. Much of the material in this article represents subjective observations and only partially tested conclusions. I do not intend to imply that other ways are not as good, or even perhaps better, than the methods I suggest. I only point out what seems to work reasonably well for us here. There are obviously many technique variations which the breeder can apply; indeed, there are likely as many variations as breeders. In short, one method is as good as another if it is fast, contamination does not occur and SEED DOES SET.

Good luck this spring, and remember, camels-hair brushes are for painters!

Non-dues-paying members will be cut from mailing list for March issue of CAMELLIA REVIEW.

HOW THE CAMELLIA GETS ITS FOOD*

L. K. Stromberg, Farm Advisor
County of Fresno, Fresno, California

How do camellias get their food? Pretty much in the same way as any other perennial plant.

Carbon, of course, comes from the small amount of carbon dioxide in the air while the hydrogen and oxygen come from the water. These are never in short supply — so they shouldn't concern us.

The other 13 elements known to be needed by plants come from the soil or planter mix. The chemistry of each of these plant nutrients is different but they can be placed roughly into two broad groups — the metals and the non-metals. The metals are potassium (K), calcium (Ca), iron (Fe), magnesium (Mg), manganese (Mn), copper (Cu) and zinc (Zn). Molybdenum (Mo) is also a metal but in soils and plant nutrition it acts more like a non-metal.

These materials are not found in very large amounts in the soil solution — that thin film of water which surrounds each particle of a moist soil. Instead they are firmly held on the surfaces of clay particles and on some of the organic matter in the soil. For this reason, they are not leached out of the soil by ordinary irrigations. They are, in fact, held so tightly that they don't move very far within the soil.

If materials are held by the soil so firmly, how can a plant get them? It gets them by exchanging hydrogen ions from the weak acids given off by the plant roots for the metals held by the soil particles. This phenomenon of exchange is responsible for the growth of all higher plants grown in soil.

The fine, active root hairs of a plant "snuggles up" next to a clay particle, gives off an ion of hydrogen. The hydrogen displaces an ion of a metal — say potassium. The hydrogen is then fixed on the clay particle and the potassium enters the plant root system. The potassium is then free to move within the plant to carry out its functions in plant growth.

The roots must go to these nutrients. These nutrients are not transported very far in the soil moisture. This makes it necessary for the planting mix to be loose and open which permits roots to contact as much soil as possible.

The non-metals act in quite a different manner. They are held largely in the soil moisture and are picked up directly by the root hairs. Some of these non-metals are in a form they can move freely in the soil — while others are found in relatively insoluble compounds that are quite immobile. The chemistry of many of these compounds is exceedingly complex and much of it is not well understood.

To further complicate matters nitrogen (N) — the most commonly used plant food — is applied in the ammonia form which acts like a metal, in the nitrate form which acts like a non-metal and is applied in the organic form (urea) which is not directly used by plants. If that is not confusing enough, nitrogen can and does change from one form to another within the soil.

Let's take it one step at a time. Suppose we add urea to the soil as a fertilizer. In this form it is soluble and can move down into the root zone by irrigation or rain water. Plants do not use urea as such — but fortunately, urea is rapidly converted into ammonium carbonate by the action

* This is the substance of a talk made by Mr. Stromberg to the Central California Camellia Society in Fresno.

of an enzyme found in nearly all soils. This conversion takes place within a few days. In the ammonia form, nitrogen is held in the exchange complex of the soil just as if it were a metal. While it is attached to the clay particles it may be picked up by the plant roots just as they picked up the potassium discussed above.

But good planting soils are not sterile. They are teeming with bacteria that work on the ammonium nitrogen on the soil particles and convert it to the nitrate form. Plants can also use this form of nitrogen — and furthermore, these nitrates can and will move freely with the water in the soil. Nearly all the nitrogen applied to the soil sooner or later ends up in this nitrate form. Much of it is washed below the root zone or out of containers and is lost to the plants if excessive irrigation water is used. Under good growing conditions nitrate will not revert to ammonia nitrogen.

Phosphorus (P) moves very slowly in the soil because it is continually being "tied up" as insoluble calcium, iron or aluminum compounds. Plants pick up phosphorus that is held in the soil moisture. Very little of it is held in the soil solution at any one time but, as it is extracted by the plant roots, more of it is brought into solution.

One of the mechanisms that plants have for getting phosphorus is to chelate or make inactive the calcium and aluminum which may render the phosphorus insoluble. Perennial plants are less apt to respond to phosphorus fertilizer than annuals, possibly because they have established root systems throughout the year which can make available some of this insoluble phosphorus.

Boron (B), which is needed by plants in minute amounts, is found in soluble forms and is moved slowly in the soil solution. Most natural waters contain enough boron to supply plant needs. Therefore, it is rarely a problem. Excessive amounts of boron are sometimes found in irrigation water but fortunately this is not a common occurrence.

Molybdenum is a metal but is found in soils as molybdates and they act like a non-metal. These compounds move slowly in the soil water much like those of boron.

The forms of sulfur (S) and chlorine (Cl) found in soils move freely in the soil moisture and are readily available to plant roots. These elements are commonly found in irrigation water and unless the soils are well drained or the plant containers flushed out occasionally they can accumulate in the planting medium and cause problems of excessive salts. Chlorine in large amounts is toxic to camellias. To be on the safe side, care should be taken if we apply mixed

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FIR BARK AS A GROOMING MEDIUM FOR CAMELLIAS

Lenard L. Brooks
Modesto, California

There are a lot of pros and cons floating around in both amateur and professional camellia circles on the merits or demerits of fir bark as a growing medium for camellias. Having had wonderful success with this material over a period of nine years in commercial growing of azaleas, camellias and other acid plants and now having joined the ranks of the amateurs, with camellias as my principal hobby, I shall speak from the pro side of the question.

I am sure some of the difficulty arises from two sources. First, using material that is so fine that it does not allow proper aeration. The second is just the opposite, material that is so coarse that it is impossible to retain sufficient moisture to satisfy the needs of the plant. Camellias resent "wet feet" and for best performance, proper drainage and aeration must be provided, yet the moisture retention must be such that the medium is a practical one.

The answer to successful use of fir bark for camellias lies in between the two extremes noted above. Fortunately, when we started to use fir bark in our growing nine years ago, the one producer at the time was "accidentally" producing a material that had about the proper percentage of fine and coarse particles. Since that time there has been a vast change in the bark business. Many producers have entered the field and no two of them produce the same type of material. One thing they all have in common, the great demand for the decorative grades has forced them all to give top priority to the production of these grades. The next most lucrative market is the lawn dressing field, which demands a grade too fine to be useful as a growing medium for camellias and other acid plants. The latest demand is found for the grade that is properly balanced between coarse and fine particles to make it suitable for a growing medium. These economic facts have forced the producers to neglect the growing medium field.

The author, demonstrating the ease of handling bark grown plants.

Fortunately, there is a way to solve this problem for those who want to use fir bark in their camellia growing and it is quite simple: I solve it by mixing the two grades commonly available to get the balance I want between the two. The rule I follow is to use sufficient fines to fill in the air spaces around the larger chunks. The amount to use depends entirely on the size of the decorative bark used. I use one called "Pea Pebble" and I

find that one part of this grade and two parts of the fine grade gives me just about what I want. This of course will vary with the grades of material used and a little experimenting will be necessary to arrive at the proper proportion of each grade.

Fortunately for camellia lovers, this peer of all shrubs will adapt itself to a wide range of cultural conditions and in my more than twenty years of

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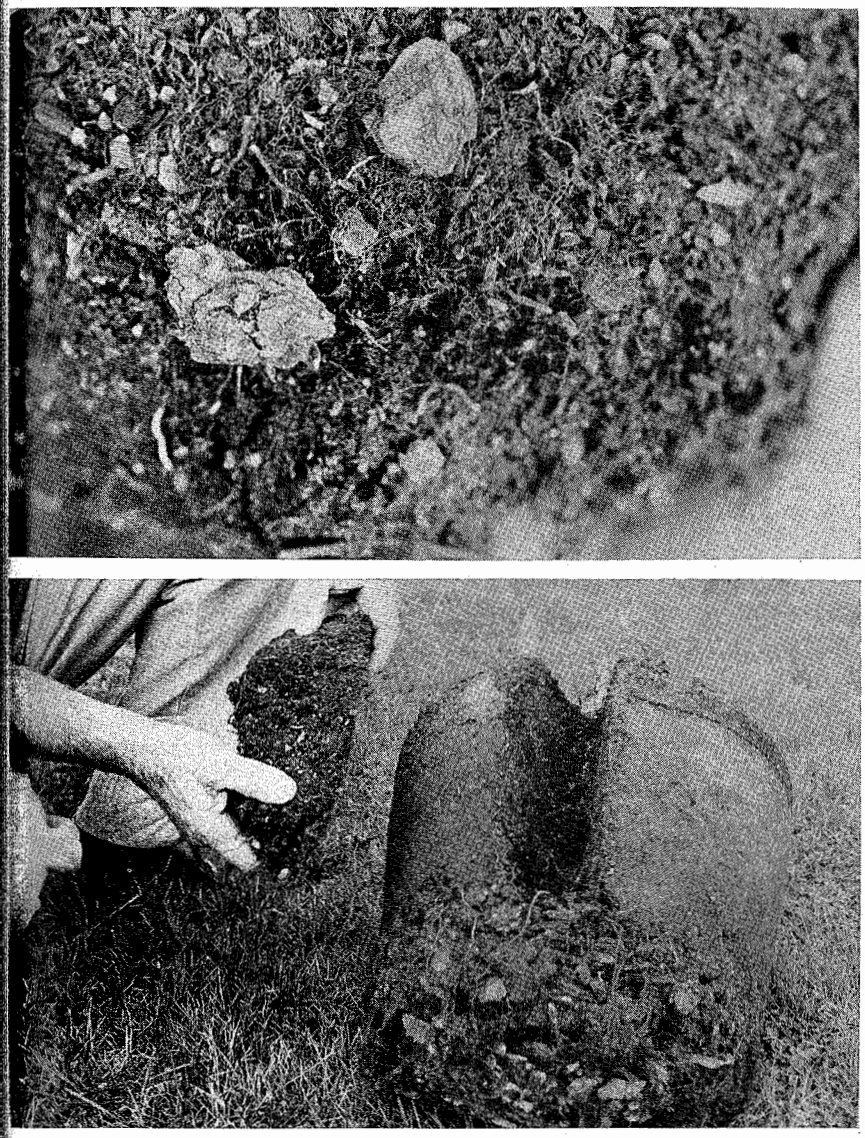

Upper: Root ball of azalea after 9 years in bark. The bark is still in good condition and looks like it is good for many more years of service. Note the coarse bark at bottom. This was used to improve drainage. Lower: Close-up of the picture above. Note the coarse bark particles that still provide aeration and drainage after 9 years.

association with this marvelous shrub (or tree) I have seen more mixes than it would be possible to enumerate and most of them doing a good job. My own mix before going to fir bark as a growing medium was made of peat moss, leaf mold and loam and it did a good job for me; in fact, I still have some of my original plants that are more than twenty years old (they were transplanted to fir bark beds nine years ago) and they still have the old mix at the roots. They are very good plants as will be seen by looking at the pictures of 'Alba Plena' and 'Glen 40' that accompany this article.

I am a tub enthusiast and while my old mix did a good job for me, it was just too heavy when I wanted to move a large container plant. My first try for a lighter medium was peat moss, but this did not satisfy me. When we started to use fir bark for our azaleas, I tried it on camellias and liked it so well that no other material has been used since that time. Actually, my enthusiasm for this material as a camellia growing medium can be summed up in a very few words: it gives me the lightness I want for my container growing, the long life that is so important for a camellia mix and at the same time I get better root development, which in turn gives me better overall performance.

A few cautions and suggestions would seem to be in order for those who have never had experience with fir bark. Never plant in dry fir bark; if it is dry when you get it, spread it out and wet it. It takes water slowly so sprinkle on a small amount of water and turn it. Continue this until all particles appear wet. If you have used coarse bark in the mix, it is best to let it set in a pile for several days to allow the moisture to penetrate through the large particles. During this process one may add a pint of cotton or castor seed meal for each cubic foot of material. This will improve the medium, but when this is done it should be left to age for at least three weeks before it is used. Adding about ten percent peat moss will assist in holding moisture. After breakdown gets under way moisture retention is no problem. I often let my deep ground beds go two to three weeks between deep waterings in the middle of our San Juaquin Valley summers (but don't forget that these have been in bark beds for nine years, this can not be done with new beds).

Those who wish may add some soil or loam and still come up with a good medium. I don't like it because this adds weight and I like the root development and the general performance better where bark alone is used.

Some have the idea that when using fir bark as a growing medium the feeding program must be stepped up. This has not proved true in my case. In fact, when we changed from peat moss to fir bark, we found it necessary to cut back the amount of fertilizer required by peat moss; however, I do feel that feeding should commence at planting time. But this is a time for caution. Only water soluble elements in available form should be used at this time. The seed meals and other organic elements should not be used, except when they are added and allowed to compost in the mix as noted above. Fortunately there are many plant foods suitable for camellia and over the years I have used many of them, including the seed meals with good results. My favorite and the only one I am using now is a 10% nitrogen, 50% phosphorus and 15% potassium food that is completely soluble in water and immediately available to the plant. I use it as a transplanting solution rather than the hormone solutions. It is a lot cheaper and I think the results are much better. (A similar product is used very extensively in certain areas when

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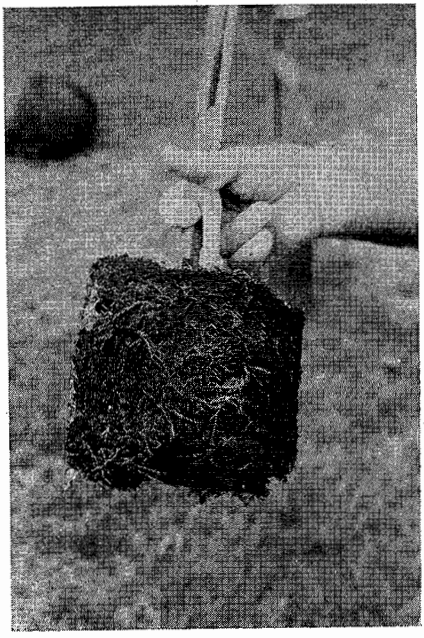

Upper left: The old 'Alba Plena' with its azalea neighbors; Upper right: Close up of the 'Alba Plena' showing the good quality of the foliage; Lower left: two-year graft of C. reticulata 'Moutancha'; Lower right: two-year graft of C. reticulata 'Moutancha' tapped out of gallon can (not removed by cutting can), showing root development.

field transplanting tomatoes. These hard headed growers report less losses, earlier and better quality fruit, this from one treatment at transplanting time.) Used as a general camellia food it has given me outstanding results. I get larger and deeper green leaves, more branches and the flowers seem to last longer and the colors seem a bit better.

The 'Alba Plena' shown in the picture had received but little food for a number of years prior to 1964, consequently, it had deteriorated a bit and after the flowers were cleaned off in the spring it looked very "ratty". During the season it received 7½ ounces of the high analysis food mentioned above in three feedings of 2½ ounces each in five gallons of water, the first one applied just after the flowers were cleaned off. As can be noted in the picture, it no longer looks "ratty"; in fact, within three weeks after the first feeding, many of the numerous bare branches had sent out new breaks. A good example of what fir bark and feeding will do took place in 1963. In March of that year friends brought me a camellia about four feet high that was so near dead it had only about a dozen leaves. All the material was washed from the roots, it was replanted in fir bark, fed with my favorite plant food three or four times during the season and when they picked it up in October it had nearly fifty new breaks, some of them nearly two feet long and foliage as fine as any one could desire.

My enthusiasm for the high analysis water soluble plant foods developed over a period of years. In the early years of our commercial growing we used the organic plant foods. We found them not only expensive to apply but it was hard to determine just how much to use, and due to the unknown factors of how long it took them to become available and how long they would last it was quite a problem. This led us to the immediately available water soluble elements, which could be applied with the irrigation water and being water soluble, what the plants did not use was leached out with subsequent irrigations with no build up to worry about.

Temple City Camellia Society

The next regular meeting of the Society will be held on Thursday evening, February 25th in the Lecture Hall of the Los Angeles County Arboretum, 301 N. Baldwin Ave., Arcadia. CAMELLIA REVIEW Editor Harold E. Dryden will show colored slides of his recent trip to the Orient, which should be a pleasant diversification from the regular type of meeting and be of interest to all who enjoy travel in countries other than our own.

TEMPLE CITY SOCIETY SHOW FEBRUARY 20-21

Edwards H. Metcalf, Show Chairman

The Temple City Camellia Society invites all camellia flower enthusiasts to view and to display their blooms in the many divisions that will be open to the amateur camellia grower and garden hobbyists. This show will be in the pleasant surroundings of the Lecture Hall of the Los Angeles County and State Arboretum at 301 North Baldwin Avenue, Arcadia on Saturday, February 20th and Sunday, February 21st. Blooms for display will be accepted Saturday morning between 7 A.M. and 10:15 A.M. Entry and registration cards will be available at the show on Saturday, but people who live some distance from Arcadia are urged to obtain the forms in advance from Mr. Carey Bliss, 9544 Kennerly St., Temple City, Calif., the Registration and Receiving Chairman, or from the Society Secretary, Mrs. Violet Shuey, 5813 N. Golden West Ave., Temple City. Your completing the cards at home will allow you more time to arrange your blooms at the show. Entry cards will be the same as those that will be used the following week at the Descanso Gardens Show.

The Rules and Regulations will be the same as those for the Descanso Gardens Show except (1) there will be no Division VII (Collectors' Table), (2) the limit per entrant in the multiple blooms Classes will be one tray of 3 japonicas and one tray of 3 reticulatas, and (3) Judges will not be permitted to enter blooms in the open divisions. Instead, there will be special tables for judges' entries, which will consist of 6 japonica blooms and 3 reticulata blooms. The Judges' blooms will be judged by a special team of three professional camellia growers. Blooms thus entered by the Judges will compete for Best Flower of the show in both the japonica and reticulata classes.

The trophies to be awarded in each Division and the major trophies for Best Flowers and Sweepstakes will be high in quality and practical for use in the home. We expect that this show will maintain its reputation for being complete with outstanding displays of blooms in all divisions.

WHAT'S BEHIND THE GREN THUMB *(Continued)*

directions. In picking the flowers from the bush, lift them off carefully instead of twisting them off if you want to save any seed which may have started to form.

Don't overlook the watering. We still have some warm dry days in Southern California. Eliminate any foliage sprinkling of plants in bloom as the water will spot the flowers.

Keep a pocket full of clothes pins to pin back leaves which will interfere with the flower opening.

If you have understock which isn't in the best of condition, get it transplanted now so it will have a couple of months in the new mix before grafting time. It is a waste of good scions and time to graft on poor understock.

You people who are new in this hobby will become known faster if you go to all of the shows and camellia doings. Volunteer when help is needed (it always is at show time), and enter flowers even if you have only a few. Being part of the shows will give you added enjoyment in the camellia hobby.

Don't be afraid to telephone and ask to visit the officers of the society. They are proud of their plants, and scion trading is part of the fun.

CAMELLIA PROPAGATION BY GRAFTING

PART II

Part I of this two-part series on camellia propagation by grafting (CAMELLIA REVIEW, Jan. 1965) treated only with the cleft graft method and covered the steps in the process up to the point of covering the graft. Part II will cover the remaining steps in the operation.

It is important to maintain the scion humidity in order to prevent evaporation of moisture from it. While some people cover the juncture of scion and rootstock with such as tree seal or wax, it is the general view that this is unnecessary, and that healing takes place quickly and satisfactorily with only the protection of a widemouth jar placed over the graft with its edges tightly sealed with damp earth or sand, or a polyethelene bag securely fastened so that the outside air will be excluded. Both of these methods of covering the graft are being used satisfactorily.

The size of the jar is not important if one may judge by the appearance of the grafts in a nursery where all sizes are seen, with the proviso, of course, that it be large enough to cover the graft without disturbing the scion. If one grafts on several inches of understock, as was suggested in Part I, a tall jar is necessary. The gallon jar provides this height as well as a large mouth for the benefit of him who might desire a little latitude in space while he covers the graft. Another factor in the size of the jar is the method of uncovering the graft. This will be discussed later. The important consideration is that the graft be sealed off from the outside air, which is effectively done by placing sand or dirt around the edge of the jar.

It should be needless to say that only clean jars should be used; otherwise the possibility of fungus being in the jar might be the starting point in the loss of the graft. Some people use Captan or other reliable fungicide, in proper dilution, applied to the inner surface of the jar, the graft itself and its surrounding soil before the jar is set in place to avoid damage done by molds and fungi.

Polyethelene bags are used instead of jars by many people to cover their grafts. These bags are available from wholesale paper companies, freezer locker plants and sometimes from markets. Caryll W. Pitkin wrote an article for the January 1961 issue of CAMELLIA REVIEW in which he described the method used by Harvey Short at the Huntington Botanical Gardens in his use of polyethelene bags. Pitkin wrote: "Harvey starts

with the usual cleft graft. But then he fastens a small stick about eight inches long and extending three inches above the scion on each side of the understock. Then over the scion and these supporting sticks he places a 6" by 12" polyethelene bag which is tightly tied around the understock. He advises string rather than rubber bands which may rot, both for tying on the sticks and fastening the bags. This creates a miniature greenhouse around the scion." Another method is to build a simple wire frame which is stuck into the soil within the can, then the bag is pulled over the frame and over the top part of the can and tied with string.

How about water? It cannot be stressed too often that excessive moisture is no help and may promote the growth of damaging fungi. On the other hand, grafts must have moisture in the soil and must not be permitted to dry out. If the soil is damp when the graft is made, no extra moisture need be applied before putting the jar or bag in place. If the soil is dry, however, when the graft is made, some water should be applied to provide the moisture for the humidity that must be created. Since with a jar some of the soil is exposed, there will be a tendency for it to dry out and the cans should be watched carefully and water given in small amounts as necessary. With bags that protect the soil as well as the graft from the outside air, few if any of them should require additional water before they are uncovered. A glance at the jar or bag during the morning hours will usually reveal a film of moisture condensed on the inner surface and drops collecting on the top surface; this moisture, some of which arises from the bleeding of the sap from the stock, is quite sufficient to maintain the scion. If, for some reason, the air inside the jar has actually lost its moisture, the jar or bag can be removed and filled with water, then inverted, leaving the sides wet, and replaced and resealed as before.

Then comes the time of waiting. It is important to be able to see clearly within the jar or bag. Any mold that forms must be removed promptly or it will destroy the growth buds and perhaps the graft itself. If mold appears, remove the jar (or bag), wipe away the mold with a cotton tipped stick (a tooth pick is good) that has been dipped in a weak vinegar solution, and replace and seal the jar. Some people advocate leaving the jar off long enough for the juncture to become completely dry. Any scions that have died and are turning black should be removed at once so as not to infect the stock. Ants should be eliminated with a light application of chlordane.

There is a tendency among amateur

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growers to want to look under the jar and see if callus is forming. This defeats the purpose of sealing the graft against the outside air and should be avoided. This, incidentally, is an advantage of the polyethelene bag over the jar, because it takes more time and care to remove a bag than it does to remove a jar. There is an added reason against removing a jar to look. Probably more grafts are lost by carelessly breaking off the scion while "looking" than from mold and fungi.

The important factor in determining the progress of the graft toward maturity and the time when the jar or bag should be removed is the formation of sufficient callus to unite the scion with the understock, and not the amount of growth exhibited by the scion. It is impossible to estimate with accuracy the number of days required for callus formation. Grafts made on the same day may vary greatly in the length of time before callus forms. There are two schools of thought with regard to when the jar should be removed. One school believes it best to uncover well-callused grafts when the growth bud has been fully elongated but has not yet unfurled its leaves. Where the atmosphere is humid, better results have been obtained by lifting the jar at this point and exposing the graft to full air before long growth has appeared. The leaves accustom themselves to the outside air as they form. The other school of thought leaves on the jar until substantial growth has been made. At this time, say at the end of the first cycle of growth, the jar is gradually raised until the growing scion has become acclimated to the atmosphere outside the jar. This may take several days or but a few, dependent on whether the days are hot and dry or cool and humid. When this method is followed, the jar must be tall enough to provide room for the growth that takes place before the jar is raised. With the polyethelene bag, the admission of outside air is accomplished by punching a hole in the bag, then progressively tearing the bag to let in more air. Both of these methods will work satisfactorily. The method that allows for growth before raising the jar has the advantage of giving the amateur more opportunity to play with his grafts — to look at them both morning and evening (and during the day if he is at home) to determine their progress, to restore the jar if he has raised or removed it too soon, and the other "motherly" acts that make grafting so much fun. The former method is used by people whose objective is to get the job done with a minimum of effort.

When the grafts have been under a protective covering, such as burlap or muslin, and particularly where the atmosphere is dry, the new plant should be given a few days under the covering after the jar has been removed to adjust itself to the outside atmosphere before moving it where it will receive the sun. This will be only a few days if the jar is removed after adequate callus has formed. With the second method of permitting growth before removing the jar, a longer time of adjustment is necessary. The grafts should be moved to locations where they will receive sun (filtered, not full sun) as soon as they will take the sun, because better growth will occur with sun than without it.

Care during the first summer consists almost entirely of watching the young plant for: (1) sprouts and adventitious growth along the understock, which should be removed; (2) damage from insects which may be prevented by use of light sprinkling of chlordane or some other good insecticide; (3) aphids, which should be removed by hand, and (4) ants which should be exterminated. The

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"FLOWER ARRANGEMENTS" IS SUBJECT OF JANUARY SCCS MEETING

Mrs. Marjorie Riley, a protegé of SCCS member Rose Gish, talked about and demonstrated flower arrangements with camellias at the January 12th SCCS meeting. Her talk was particularly interesting from two points of view, in addition to the attractiveness of the arrangements which she made while she talked. Many flower arrangers who talk and demonstrate rely on rather standard bases, bowls and bottles — articles that can be obtained at a store, or if not there, from the professional arrangers who conduct classes and usually carry such items. Not so Mrs. Riley. To use her own term, she "scrounges" for these items — in junk piles, auto wrecking establishments, along the roadside, in antique stores, in the mountains, at the sea shore, in fact, any place to which she can persuade her cooperative husband to take her on "pleasure drives". These items added interest to her arrangements. Second, she named the accessory materials of foliage that she used, in contrast to a custom used by some speakers who rely on the prior knowledge or imagination of the audience for this information.

It will not be the purpose of this report to attempt to describe Mrs. Riley's arrangements, but rather to name the adjuncts (often obtained in her scrounging expeditions) and the foliage she used. The following numerals indicate different arrangements that she made.

1. She started the arrangement with an interestingly curved branch of Cedris Atlanticus which she placed in a tall container on a black glass base. Strap leaves and the leaves of wild geraniums were used for variety. The bluish gray of the Cedris Atlanticus emphasized the pink of the 'Debutante' which she placed at the neck of the container.

2. The containers were three knobs (large, medium and small) from old brass bedsteads, which were placed on a black glass base. Foliage consisted of wild geranium, succulents and thyme. Sasanqua blooms were used for color.

3. The container was a shocking pink compote. The foliage was mint geranium, peppermint geranium and Asparagus Rectofractus.

4. A flat moss and lichen covered rock that Mrs. Riley picked up in the mountains was placed in a black plastic bowl that was made by SCCS member Raymond Noyes. Foliage was sasanqua branches. Mrs. Riley keeps the rock moist so that the moss will not die.

5. The arrangement was built around an azalea branch, with strawberry begonia for added interest. Instead of the usual rocks to conceal the kenzon, she used shattered Hercolite safety glass, which has the appearance of ice, so much so that at one of Mrs. Riley's talks a woman in the audience asked what happens when the ice melts.

6. A black fan was placed in a striking white bowl that was also made by Raymond Noyes. The red 'Flame' made a striking contrast to the black fan and the white bowl. Gray flat rocks were used to cover the kenzon.

7. The container was an "ancient" gourd, in which she placed small curved branches of nandina (heavenly bamboo). Herb pine was used at the base. While she was having a little difficulty in getting the nandina anchored, she said that she sometimes used Equisitum (joint grass)

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WOOD PRODUCTS USED IN PLANTING MEDIUM

Lynn B. Stitt, D.D.S.
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(Reprinted from Bulletin of Texas Camellia Society)

We plant our camellias in many different, favorite, and pet mixtures. It is only natural we use, and will continue to use and try to improve, those mixtures in which our camellias do best and have been proved to be the most successful. Seldom do we stop and think of the important role that wood products play in our mixtures. Seldom do we think of peat as a wood product — *but it is.* It is a by-product of both soft and hard woods. It has been used for many years and has even become increasingly popular in the past ten to twelve years. Peat has been used in many combinations with loam, sandy loam, sand of different textures and even alone as a planting medium for our camellias.

Overhearing the remark "our top soils, without proper conservation, are wasting away more and more each year and we should try using more waste wood products as a planting medium" led to the search of saw and lumber mills for all types of waste wood products. Different textures of redwood and pine sawdust, shavings, pine bark, and peat were used. Composts of grass, cotton seed hulls, leaves and the like are soft wood products and often used but should be considered as a part of the organic fertilization program because of their more rapid breakdown and use as a food. Cotton seed meal, often used to feed our camellias, is a refined soft wood product. For quicker results the first tests with all wood products were with faster growing plants, as geraniums and begonias, and were very encouraging.

Curiosity prompted the close examination of several camellias purchased about six years ago. Upon removal of the containers, it was found the bottom one third of the potting mix was nothing but one half inch wide and very long pine shavings. The top soil was very poor and coarse. The root system in the soil was small, hard, and brown and immediately upon passing into the shavings increased in size several times, changed to a light cream color, and was the very picture of health. Here was the chance to bare root from the poor soil and repot and test camellias with nothing but wood products. This was done, the response was good, and today the plants are still in the best condition but have graduated to sixteen inch tubs.

Perlite, a very light weight, inert material had been used in combinations with sand along with the wood products at the beginning of these tests but all sand was discontinued. It was felt that Perlite accomplished the same purpose as sand but without its back-breaking weight. In using so many combinations to find that perfect textured mix, the mixing and storage became a major problem. Also, inasmuch as all wastewood products have little or no food value and all are slightly acid, it was realized the use of so many types accomplished nothing more than one alone could do — if it were the right mixture. It was about this time that a composted shredded pine bark product "Miracle Mulch" was introduced to the market in this area. It had the texture I had been searching for and I have used it alone (very little or no Perlite) ever since. Approximately one hundred seedlings have been planted in this product each year for the past five years and all are in the very best condition.

In considering the requirements

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PLANT NUTRIENTS

NOTES FROM "SOIL", THE YEARBOOK OF AGRICULTURE, 1957, U. S. DEPARTMENT OF AGRICULTURE

Bacterial and other micro-organisms living in the soil convert nitrogen, sulfur, and phosphorus from organic compounds, in which these nutrients are unavailable to plants, to simpler inorganic forms that plants can take up. Page 71, para. 1.

Phosphate availability in many soils is highest when the soil is neutral or slightly acid, and it declines as the soil becomes either strongly acid or alkaline. Pg. 71, para. 5.

In organic soils (peats and mucks), the relationship between pH and nutrient availability are not the same as for mineral soils. Copper, for example, may be deficient in acid organic soils but is rarely so in acid mineral soils. Pg. 71, para. 7.

The organic matter of soils is a potential source of nitrogen, phosphorus, and sulphur. It contains more than 95 percent of the total nitrogen, 5 to 60 percent of the total phosphorus, and 10 to 80 percent of the total sulphur.

Biological processes are required to convert these organic sources to an ionic state that is available to plants. Pg. 81, para. 6, 7.

Crops usually require greater amounts of nutrients than the soil solution contains at any given time. Pg. 83, para. 4.

Ammonium, potassium, and nitrate ions are loosely held by the soil, and plants readily absorb them. Pg. 84, para. 12.

The normal physiological function of plants may be upset by accumulations of some nutrients. Excessive nitrogen, for example, may prolong the vegetative cycle or even prevent flowering. Pg. 84, para. 13.

If more than a single nutrient, two for instance, are in limiting supply, the addition of either alone may produce but small increases in growth as compared with a combination of both.

A field experiment with oats conducted at the Iowa Agricultural Experiment Station illustrates such a nutrient interaction. The results from the treatments, expressed as bushels per acre, are listed thus: No fertilizer, 15; nitrogen only, 20; phosphorus only, 28; nitrogen and phosphorus combined, 54.

This example illustrates the importance of maintaining a reasonable balance of nutrients. Pg. 85, para. 4, 5 & 6.

Nitrogen occurs chiefly in the young tender parts of plant tissues, such as tips of shoots, buds, and the opening leaves. This nitrogen, present chiefly as protein, is constantly moving and undergoing chemical changes. As new cells form, much of the protein may move from the older cells to the newer ones, especially when the total nitrogen supply of the plant is too low. Then the plant makes the maximum use of a minimum supply.

The transfer of nitrogen from cell to cell may proceed to such an extent that only the growing tips still are functioning properly. The older cells may turn yellow, and many of them, even whole leaves, die and drop off. This yellowing and dropping of the leaves farthest from the growing shoots is the main symptom of nitrogen deficiency.

(Continued on next page)

The proper functioning of nitrogen in plant nutrition requires that the other essential elements, particularly phosphorus, potassium, calcium, and magnesium, be present in adequate supply. If the supply of one or more of them is inadequate, the addition of much nitrogen to most common crops may produce limited growth, and this may be very abnormal. Such plants often are unusually susceptible to diseases, and they mature late. But if the nutrient supply and balance have been adequate from the seedling stage, plants throughout show the stocky growth and dark-green foliage that is a mark of health and vigor.

There has to be a continuous formation and release of available nitrogen from soil organic matter or it must be supplied from outside sources to insure a steady rate of growth and an adequate supply later for the synthesis of storage protein for producing seed. Pg. 86, para. 3,4,5,6.

The release of soil nitrogen to crops occurs as a result of the activities of many kinds of micro-organisms. Two broad groups are primarily responsible for making it available to higher plants, the ammonifiers and the nitrifiers. The ammonifiers comprise most of the bacteria and fungi that live in soil. They decompose soil organic matter primarily in order to obtain a supply of energy for growth. In the process they liberate ammonia, some of which they use themselves. The rest is set free as a by-product. The nitrifiers then oxidize the ammonia to nitrites and then to nitrates. Some chemical oxidation of nitrites to nitrates may occur also in acid soils. Ammonia and nitrates are the main sources of nitrogen for plants and hence do not accumulate in the presence of an actively growing crop.

Little ammonification and nitrification take place in the Temperate zone during the winter. The rate of activity of micro-organisms above 45 degrees F. increases two or threefold for each rise of 18 degrees if moisture is adequate and the soil is not highly acid. Pg. 92, para. 1,2.

Leaching removes large amounts of nitrates from soils but no more than traces of other forms of nitrogen. Pg. 93, para. 6.

Losses of nitrogen from soils in the form of free nitrogen gas and oxides of nitrogen are chiefly the result of bacterial action. Such losses are of considerable economic importance. Denitrifying bacteria that produce these gases are widely distributed. Ordinarily they use atmospheric oxygen for growth, but if the supply is deficient they can obtain oxygen from nitrates. In doing so they release gaseous nitrogen. The losses are greatest if soil aeration is poor and if nitrate fertilizers are applied in the presence of masses of plant materials that are undergoing decomposition. Pg. 93, para. 9.

Phosphorus is present in all living tissue. It is particularly concentrated in the younger parts of the plant and in the flowers and the seed. Pg. 94, para. 10.

It (phosphorus) is necessary for such life processes as photo-synthesis, the synthesis and breakdown of carbohydrates, and the transfer of energy within the plant.

It is a major part of the nucleus of the cell and is present in the cytoplasm, where it is involved in the organization of cells and the transfer of hereditary characteristics. Pg. 94, para. 11, 12.

Growth is arrested when the supply of phosphorus in the soil is too low, and phosphorus from the older tissues moves to the younger tissues. Usually, therefore, signs of too little phosphor-

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HYBRID CAMELLIA *(Continued)*

suming process, everything possible is done to speed the flowering of the hybrid seedling.

There is question in the minds of many of our foremost hybridizers as to whether some of our japonica, sasanqua and reticulata varieties are true varieties of these three species of camellias. It is possible that some of them may be hybrids. 'Kuru-Tsubaki' is a very controversial flower and may, in fact, be a hybrid or another species of camellia. In any event, its pollen is highly prized and used in attempting to obtain dark red crosses. Also, granthamiana is believed by many not to be a true species but, instead, a hybrid. It will cross fairly well with many varieties of japonica. Dr. Clifford R. Parks' use of chromatography in plant identification may be able to solve some of these controversial problems for us in the near future.

The climatic conditions vary the flowers of hybrids in several parts of the United States; however, consistant show winners in both the South and West have been (1) 'E. G. Waterhouse', (2) 'Phyl Doak', (3) 'Bonnie Marie', and (4) 'Monticello'. Other show winners loom on the horizon as evidenced by new hybrid introductions such as 'Charlean', 'Elsie Jury', 'Dorothy James' and 'Howard Asper'.

Few hybrids to date have had good lasting qualities. Most of them, when picked and placed on show tables, do not last through the second day. Therefore, most of them have been condemned by the buying public and the connoiseur. Hybridists must accept the challenge of producing flowers with better substance in order to bring them into favor with the public. No matter how many hybrids are introduced, the public will carefully sort out and will discard the varieties that do not perform as well as the best of the japonicas in their gardens.

And, in conclusion, do not plant more seeds than you are able to take care of. Do not attempt to compete with the professional hybridizer who, undoubtedly, has more time than you and who makes it a business as well as a scientific hobby.

ARRANGEMENTS *(Continued)*

for anchoring tiny stems in kenzons.

8. She used a manzanita burl on a beige formica board. The burl illustrated the extent to which Mrs. Riley goes to obtain her materials, since she had picked up a manzanita stump in the mountains and spent the good part of a day in finding someone who would use his band saw to cut the hard wood. Instead of the usual kenzons, she used kenzon cups to hold water as well as provide support for the foliage.

As will have been noticed in reading the above, Mrs. Riley makes frequent use of black glass as bases, or as she put it, as frames for the arrangements which, she said, are as necessary as frames for pictures.

Her sense of humor made her talk entertaining for people who usually are not particularly interested in talks on flower arrangements.

WOOD PRODUCTS *(Continued)*

for a good planting medium, I would say shredded pine bark "Miracle Mulch" is available, inexpensive, light in weight, has low fertility and has good moisture retention yet good drainage.

It is a *must* that a complete fertilization program be worked out. There are some fifteen minerals considered essential for life in our higher plants. This includes those minerals needed only in minute quantities and are known as the trace minerals. Our camellias will live without all of the essential minerals but they will respond and show their gratitude when we provide them with that well balanced diet. I'll bet this is true regardless of what type planting medium we use.

Winning Blooms at S. C. C. S. Meetings

JANUARY 12, 1965

Non-gib group

Japonica — large and very large
'Guilio Nuccio Var', 'R. L. Wheeler', 'Reg Ragland', 'Onetia Holland', 'Flame'

Japonica — small and medium
'Debutante', 'Prince Eugene Napoleon', 'Magnoliaeflora', 'Finlandia Var', 'Jingle Bells'

Japonica — Miniature
'Hopkin's Pink', 'Fircone'

Sasanqua
'Yule Tide', 'Chansonette', 'Interlude', 'Hiryu'

Other Species
'Dawn', 'Elfin Rose', 'Shishi-Gashira'

Hybrids
'Donation', 'Monticello'

Gib group

Japonica — large and very large
'Betty Sheffield Supreme', 'Flame Var', 'Elizabeth LeBey', 'Onetia Holland', 'Guilio Nuccio Var'

Japonica — small and medium
'Elena Nobile', 'Herme', 'Prince Eugene Napoleon', 'Spring Sonnet', 'Alba Plena'

HOW THE CAMELLIA *(Contd.)*

fertilizers to camellias to see that the potassium comes from potassium sulfate (sulfate of potash) and not from potassium chloride (muriate of potash). The fine print on the fertilizer sack will show the source.

Perhaps we worry too much about some of these plant nutrients. If we make up a planter mix that will permit roots to spread easily; if we include soil or organic matter which has a reasonable capacity to hold plant nutrients; if we provide adequate drainage which will prevent the accumulation of salts in the root zone — we probably can produce well fed camellias.

After all, camellias like other plants, evolved to be produced in soils. Soils are a versatile and forgiving medium of plant growth — use it.

PROPAGATION *(Continued)*

young plant needs no more watering than is normally given other plants in the particular area; the root system of the understock already well established in the soil will not need extra help in supporting the comparatively small amount of top growth of the growing graft. For the same reason no fertilizer is required during the first year, but in soil markedly deficient in essential minerals a fall dressing of nitrogen-free fertilizer will help to harden the new growth. It is well to use tree seal or wax to fill in the cleft which has not been filled out by the callus.

PLANT NUTRIENTS *(Contd.)*

us appear first in the lower leaves, which are the older ones. The symptoms may be lack of chlorophyll, a deepening of the green color, or a red color in the leaves. Usually also the roots are stunted and poorly branched. A deficiency of phosphorus may delay maturity of the plant. Pg. 95, para. 1.

(To be concluded in next issue)

Marjorie Washburne of Port Arthur, Texas writes as follows in connection with their January 16-17 show: "Sunday I went back over to compare the durability of the treated and untreated flowers, and it appeared that the treated flowers, on the whole, were in better condition." This conforms to the view held by Southern California people who are gibbing, that the treated flowers they are picking for their own pleasure are lasting longer than are the untreated blooms.

Directory of Affiliated Societies

Camellia Society of Kern County.....Bakersfield
President: Melvin G. Canfield; Secretary: Mrs. Charlotte Johnson, 1902 Niles St., Bakersfield.
Meetings held 2nd Monday of the month, October through April, in Police Building, 1620 Truxton Ave., Bakersfield.

Camellia Society of Orange County.....Santa Ana
President: Warren Woody; Secretary: Mrs. George T. Butler, 1121 Orange, Santa Ana.
Meetings held first Thursday of month, October through April, in Orange County Farm Bureau Building, 1916 W. Chapman, Orange.

Central California Camellia Society.....Fresno
President: Mert Weymouth; Secretary: Mrs. Glen S. Wise, 5493 E. Liberty, Fresno.
Meetings held at Heaton School, Del Mar Ave., Fresno on Nov. 18, Dec. 16, Jan. 27, Feb. 24, Mar. 24.

Huntington Camellia Garden.....San Marino
Henry E. Huntington Library and Art Gallery, Oxford Road, San Marino.

Pomona Valley Camellia Society.....Pomona
President: I. John Movich, 932 N. Park Ave., Pomona; Secretary: Alvin E. Anderson, 743 Calspar St., Claremont
Meetings held 2nd Thursday of each month, November through April, in the Pomona First Federal Savings & Loan Assn. Bldg., Garey Ave. & Center St., Pomona (1 block South of Holt).

San Diego Camellia Society.....San Diego
President: Mrs. Althea T. Hebert; Secretary: Mrs. Carol Bradford, 5707 Jackson Dr., La Mesa.
Meetings held 2nd Friday of the month, November through May, in Floral Association Building, Balboa Park, San Diego.

Southern California Camellia Society.....San Marino
President: Robert F. Dickson; Secretary: Harold E. Dryden, 820 Winston Ave., San Marino.
Meetings held Second Tuesday of every month, November to April, inclusive at the San Marino Women's Club House, 1800 Huntington Drive, San Marino.

Temple City Camellia Society.....Temple City
President: Harry S. Putnam; Secretary: Mrs. Violet Shuey, 5813 N. Golden West Ave., Temple City.
Meetings held on 3rd Friday of November and December and 4th Thursday January through March in Lecture Hall of Los Angeles County Arboretum.

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