THE Camellia REVIEW

A Publication of the Southern California Camellia Society

'Valentine Day'
Courtesy Nuccio's Nurseries

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One Dollar

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 to the Secretary. Annual dues: $6.50.

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THE COVER FLOWER

C. Hybrid 'Valentine Day'

We have another of Howard Asper's controlled crosses in this month's cover flower. 'Valentine Day' is a cross of C. reticulata 'Crimson Robe' times C. japonica 'Tiffany', a worthy progeny of its illustrious parents. It should be pointed out for the gib minded that a gibbed bloom of it won "Best" in its Division at the recent Early Show at Descanso Gardens. The flower is a very large salmon pink formal double with a rosebud center. It is being released by Nuccio's Nurseries of Altadena and Kramer Bros. Nursery of Upland, both in California.

THOUGHTS *from the editor*

The start of camellia show time always starts me to thinking about what is "Best". The question is easy to answer academically because it means the best of the group, whether among a single variety or among single entries of a number of varieties. The problem, of course, is in the approach a person takes, whether as a judge, as one looking at flowers for his own enjoyment, or in reviewing what the judges have decided in a camellia show.

I have been reminded of this in connection with the reaction of television commentators to Vice President Agnew's comments regarding the reporting of Prsident Nixon's speeches. As I understand it, the Vice President is suggesting more objectivity and less injection of personal views in the commentators' reports. I thought that the position of the commentators was well expressed in a statement by a political reporter on a Los Angeles T.V. station when he said that he cannot be objective because to do so he would have to divorce himself from his reporting, and that he would find this difficult to do. I think that the same situation holds when a camellia judge sets out to decide what is "Best" among a group of camellias.

The job is not difficult in judging "Best" of a variety, because the best usually stands out like a sore thumb. But even here the personal likes of an individual influence his thinking. A team of judges at the recent Early Show was having difficulty in picking the blue ribbon flower of a popular variety from between two flowers of different form, and asked two standby judges to join them. The two differed in their choices. After the judging was completed, one of them said "I guess I just like that form better". He and most if not all camellia show judges have difficulty in divorcing themselves from their own personal likes.

I believe that the situation is different in choosing the "Best of the Division" from a number of varietal entries. Here we have a group of flowers in which every one is good in every respect. Two approaches can be taken in choosing "Best". First, choose the flower that one likes best. Second, choose the flower that in the judge's opinion comes closest to perfection when measured against the respective standards of the different varieties. The second approach would mean that a judge would have to divorce himself from his own preferences, such as that a bloom of variety A that is slightly less than perfect is better than a bloom of variety B that is as near perfect as can be grown. Maybe it is because of lack of time to objectively study all the flowers, or because camellia show judges are human and have difficulty in divorcing themselves from their deliberations. Regardless of the cause, it is here that I feel sometimes that the best of the group has not been selected as the "Best" of the Division or Class.

Harold E. Snyder

CAMELLIA CULTURAL PROGRAM

L. R. & Violet J. Shuey
Temple City, California

Outline of a talk that Mr. Shuey made at the October 1969 meeting of The Camellia Society of Kern County

There are many requisites involved in the propagation and growth of fine show quality camellias.

In so far as our gardens are concerned, we initially endeavor to secure varieties which are healthy, well proportioned plants. If the plant is in good condition, it is indicative of a strong and vigorous root system. Even though we are constantly grafting scions of new varieties on different types of rootstock (understock), our success factor is, for the most part, based on the quality and condition of the rootstock. Much of this rootstock does not have a well balanced root system, but consists of a tap root intertwined around the bottom of the container and a very few feeder roots. Obviously, such a root system does not make for a healthy plant. Prior to the grafting season, we attempt to bareroot our rootstock, principally to determine the subsurface condition of each stock, and, if some are in poor condition, we discard these plants. The remainder are repotted in a soil mixture consisting of 60% ground redwood bark, 40% sandy loam, some river washed sand and vermiculite. This soil mixture has given us the best results of the many used over a period of ten years. Needless to say, whenever we have occasion to transplant camellias from small to larger-sized containers, the same mixture is used. We do, however, endeavor to bareroot each plant before transplanting it, principally to revitalize it with new soil and, secondly, to determine the nature of the root structure.

In discussing camellia culture, we believe the most important aspects thereof are as follows: (1) Proper watering; (2) Fertilization; (3) Disbudding; (4) Pruning; and (5) Availability of sufficient sunlight. We shall attempt to individually discuss each of these cultural procedures inasmuch as they pertain to the plants in our garden and our remarks are intended to cover only the plants grown in the soil which have been planted for foundation or landscape purposes.

1. **Proper watering:**

Our soil is composed of sandy loam, intermingled with water worn pebbles and is extremely porous. Consequently, we are required to water whenever the top soil is dry, which is the case much of the time during the long hot summer months. In addition to providing water for the roots, we wash off the leaves of the entire plant, preferably late in the afternoon. A camellia plant breathes through its leaves; therefore, we believe that to free the plant of dust and smog contamination is a requisite for the maintenance of healthy plants.

No precise formula can be given for the proper watering of camellias as this would vary depending on geographical location and the type of soil in which the camellia plants are growing; however, caution should be exercised that plants are not overwatered. Stagnant and marshy conditions are created as the result of excess watering and could lead to serious root diseases and the eventual death of many plants.

2. **Fertilization:**

Much data and material is available concerning this matter. Each grower seems to have a fertilizing program different from that of his competitors. We commence our fertilizing program in February and before the commencement of new growth on our plants. Our initial feeding is an equal mixture of cottonseed and blood meal.

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These are slow acting fertilizers and do not become active until the advent of warm weather. This basic feeding is subsequently augmented by several applications of liquid fish fertilizers at 30 to 45 day intervals from May through July. The liquid fish is high in nitrogen content and is a stimulating agent for new and vigorous plant growth. Thereafter, we change to liquid fertilizers which are low in nitrogen, but high in phosphoric acid and potash. Even though a change to low nitrogen fertilizers is accomplished, many of our plants persist in making secondary growth during the fall months, which, in most cases, is rank and undesirable. As soon as this growth commences, it is promptly removed. Unless this is done, this secondary seasonal growth will cause the loss of many buds which will drop as the growth lengthens.

A great many successful camellia growers use high nitrogen liquid, fish fertilizers in lieu of the slower acting cottonseed and blood meal fertilizers. Other growers use a small amount of "Hoof and Horn" in their particular soil mix — enough to stimulate healthy root growth, but not enough to harm or injure the roots.

3. **Disbudding:**

One of the most essential and important requirements in so far as the procurement of show quality blooms is concerned is the careful disbudding of each plant. Most of the plants growing in our garden are mature or specimen sized plants. Since we are more interested in the quality than in the quantity of blooms, we carefully disbul each plant, leaving but one flower bud to each stem or branch, except in the case of miniature or small japonicas. As to each of these types, we leave two buds, but not more than this number on each branch or stem. Disbudding apparently does not materially influence the size and quality of the boutonniere camellias as is the case of the larger japonica varieties.

We disbud as early as possible. Whenever we can distinguish between flower and growth buds, we commence this all-important work. Subsequent to disbudding a plant, we continued to watch it, for new flower buds persist in replacing those that have previously been removed and these are also eliminated. Proper disbudding entails keeping the bud that is relatively free of foliage and, if possible, is the one which is horizontal or faces downward, rather than the one which opens toward the sky. Since so many camellias open during the rainy season, the flowers that face upward are in the majority of cases spoiled or rendered unfit for show competition or table decoration; whereas, those that face downward may be able to survive a heavy rainstorm. We have in fact been able to win many blue ribbons with such blooms in the various camellia shows. This would not have been possible had we originally taken the wrong bud from the branch.

4. **Pruning:**

This subject has been brought to the attention of camellia growers through both the medium of oral and written expression and by pruning demonstrations. It is mainly practiced by those desiring show quality blooms or by those who endeavor to keep their mature plants from covering windows or from reaching the rooftop.

We prune as one of the primary basics of good camellia culture and prune more severly than do most growers. This pruning commences as soon as the early blooming varieties have ceased flowering and continues until all plants have had unnecessary growth removed. In a camellia garden containing a great many plants, this pruning may take several weeks. The majority of experts recommend that all camellias be pruned annually to achieve the best results. The severity of pruning is a matter of personal choice. In so far as plants growing in the ground are concerned, pruning is a more important basic require-

ment than many others essential for good camellia culture. Pruning will enhance the appearance of your camellias in the garden and make them more attractive landscape subjects.

Pruning should be done prior to the commencement of new spring growth. In addition to this growth, there is a secondary growth which occurs in the fall. Much of this growth is rank and should be promptly removed, or as pointed out above, it will cause a loss of many buds.

5. **Availability of Sufficient Sunlight:**

For many years the average homeowner was led to believe that a camellia is a shade plant. Consequently, many camellias have been planted in portions of the yard where little, if any, sunlight is present. This is unfortunate because while some ferns, begonias, and other shade plants are receptive to dense shade, camellias do not do well in such locations. When grown in too much shade, their branches become stringy, ragged and cascading. The quantity of flowers is materially decreased as well as the quality and size of the few on the shrub. We have had several mature plants growing in dense shade and while the plants were healthy, they failed to set any buds. It was only when we eliminated the condition that caused the denseness of shade that the plants responded by developing sturdy new branches and subsequently set an ample supply of flower buds.

None of our plants are grown under lath or seran. We have endeavored to grow the majority of our collection under partially shaded locations derived from careful tree planting in our garden. Some of our plantings, however, did not turn out well. Approximately nine or ten years ago, we planted a Modesto Ash in order to furnish shade for camellias, as well as other types of plants. This tree grew so well that it eventually reached a maximum height of 80 feet and a top spread of 35 feet. By this time, it had blanketed all camellias growing under it and they received little, if any, direct sunlight. Since many of our better varieties were affected (including reticulatas which demand more than the usual amount of sunlight), we had the tree removed at considerable expense. We did so with trepidation because we realized that its removal would place a great many of our plants in direct sunlight. Our home in Temple City is located in the San Gabriel Valley and the leaves of camellias exposed to more than the required amount of sunlight will severely burn when temperatures of 100 or more degrees, coupled with low humidity, are experienced during the hot summer months. The severity of burning is dependent upon the particular variety. Notwithstanding this danger to our plants, we nevertheless decided not to shelter or cover any of them, but to wait and see what happened. Several of our japonica plants suffered severe burning and bud dropping. This burning, however, occurred on only four days when the temperature rose above 100° and the humidity was low. Some of the plants showed only minor leaf damage; whereas, to our surprise the majority of plants were undamaged and showed only minor leaf discoloration from dark green to a yellowish green. Fortunately, we had the tree removed in the early spring so that by the time the real hot weather arrived, most of the plants had become acclimated to the lack of any shade. All of them showed unusually heavy bud development due to their maximum exposure to sunlight. Several of our choice reticulatas were exposed to 90% sunlight. None of them except 'Butterfly Wings' suffered any damage. The leaves of 'Butterfly Wings' were partially damaged but the buds remained on the plant. Therefore, whenever the question arises as to whether a camellia should be planted in shade or

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EARLY SHOW RESULTS

Fred Hamilton of Santa Maria won the Award of Excellence at the Early Show that was held at Descanso Gardens on December 6-7, 1969. This is a new Award that is based on winning blooms that reach the Court of Honor; i.e., Best and Best Runner-up in the different Classes and the so-called Court of Honor Blooms. Five points were given for Best, 3 points for Best Runner-up and 1 point for the other blooms. It was the view of the Directors of the Los Angeles Camellia Council, sponsors of the Early Show, that this new award might be a good replacement of the old Sweepstakes Award which was discontinued because it was based only on number of blue ribbon flowers.

1040 blooms were entered, of which 496 were treated and 162 untreated japonica large and medium sized blooms. There were 107 boutonniere japonica blooms (small and miniature) and 100 hybrid blooms. The remainder were scattered among the other Divisions.

Following are the results.

Best Large Treated Japonica — 'Clark Hubbs', Mr. and Mrs. Dennis Shubin, Bell

Best Large Treated Japonica Runner-up — 'Grand Slam', Mr. and Mrs. W. F. Goertz, San Marino

Best Medium Treated Japonica — 'Pink Pagoda', Lee Gaeta, El Monte

Best Medium Treated Japonica Runner-up — 'Dixie Knight', Wilber Foss, San Marino

Best Large Untreated Japonica — 'Marie Bracey', Mr. and Mrs. Carey Bliss, San Gabriel

Best Large Untreated Japonica Runner-up — 'Sunset Glory', Fred Hamilton, Santa Maria

Best Medium Untreated Japonica — 'Daikagura', Mrs. L. E. Jermy, La Canada

Best Group of 3 Treated Japonicas — 'Dr. Burnside', Mr. and Mrs. John Movich, Pomona

Best Group of 3 Untreated Japonicas — 'R. L. Wheeler', Fred Hamilton, Santa Maria

Best Boutonniere Japonica (open competition) — 'Pearl's Pet', Mr. and Mrs. Pat Novak, Van Nuys

Best Boutonniere Japonica Runner-up — 'Dryade', Mr. and Mrs. A. W. Garner, Glendale

Best Group of 3 Boutonniere Japonicas — 'Pearl's Pet', Mr. and Mrs. John Movich

Best Hybrid With Reticulata Parentage (open competition) — 'Valentine Day', Mr. and Mrs. W. F. Goertz, San Marino

Best Hybrid With Reticulata Parentage Runner-up — 'Howard Asper', Mr. and Mrs. L. R. Shuey, Temple City

Best Hybrid With Other Than Reticulata Parentage (open) — 'Elsie Jury', Fred Hamilton

Best Flower in Division for Heimalis, Sasanquas, and Other Species — 'Les Marshall', Ernie Pieri, San Gabriel

Best Group of 3 in Division for Heimalis, etc. — 'Yuletide', Frank Reed, Pasadena

Best Treated Seedling — Harvey Short, La Mesa

Best Collectors Tray — Mr. and Mrs. Caryll Pitkin, San Marino

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CALIFORNIA CAMELLIA SHOW SCHEDULE

1969-1970 SEASON

Date	Sponsor	Location
Feb. 7-8, 1970*	Temple City Camellia Society	L.A. County Arboretum Lecture Hall, Arcadia
Feb. 14-15, 1970	Peninsula Camellia Society	Veterans Memorial Bldg., 1455 Madison Ave., Redwood City
Feb. 14-15, 1970	Pomona Valley Camellia Society	Pomona First Federal Savings & Loan Assn. 399 N. Garey Ave., Pomona
Feb. 21-22, 1970	Delta Camellia Society	Pittsburg High School, Pittsburg
Feb. 21-22, 1970	San Diego Camellia Society	Conference Bldg., Balboa Park, San Diego
Feb. 21-22, 1970	Santa Clara Co. Camellia Society	Student Union Bldg., San Jose City College, San Jose
Feb. 28-Mar. 1, 1970	Los Angeles Camellia Council	Descanso Gardens La Canada
Mar. 7-8, 1970	Camellia Society of Sacramento	Memorial Auditorium 15th & J Sts., Sacramento
Mar. 7-8, 1970	Camellia Society of Kern County	Bakersfield High School Cafeteria, Bakersfield
Mar. 8, 1970	Central California Camellia Society	Cafeteria, McLane High School, Fresno
Mar. 14-15, 1970	Northern California Camellia Society	Sun Valley Shopping Center, Concord
Mar. 21-22, 1970	Camellia Society of Modesto	Palm Court of E. & J. Gallo Administration Bldg., Modesto
Mar. 28-29, 1970	Sonoma County Camellia Society	Santa Rosa Junior College, Santa Rosa

* Change from date shown in November 1969 issue

EARLY SHOW RESULTS *(Continued)*

Japonica Blooms on Court of Honor —

'Adolphe Audusson Special', Grady Perigan; 'Dr. Burnside', L. R. Shuey; 'Ecclefield', Thomas Hughes; 'Flame', W. F. Goertz; 'Midnight', Caryll W. Pitkin; 'Tiffany', W. F. Goertz

Hybrid and Reticulata Blooms on Court of Honor —

'Fire Chief', R. C. McNeil; 'Waltz Dream', L. R. Shuey; 'Treasure Isle', Harvey Short; 'Francie L', A. L. Gunn; 'Lila Naff', Pat Novak; 'Mounchang', M. L. Gum; 'Confucius', Fred Hamilton

WILL YOUR GRAFT TAKE?

E. C. Tourje

Reprinted from January 1952 edition of Camellia Review

This is not an article on grafting. Nor is it intended to be. There are many splendid papers on the art and practice of grafting available to all who wish to acquaint themselves with the methods employed. Our books and periodicals abound with them. Newcomers who wish to "try their hand" have but to refer to these many and well written articles.

What the author wishes to present here is not what we do, nor why we do it, but why Nature "permits" us to tamper with her processes and then comes to our aid with a miracle which all of us should know about and understand.

At the risk of being charged with having violated the statement that this article is not one on the art and practice of grafting. I wish to discuss briefly the mechanical procedure pursued in the preliminary stages of a successful graft. The reason for the digression into what might seem to be the practical phases of grafting is that we must have a foundation for the subject under discussion. The purpose therefore of the ensuing paragraph is that we may have the necessary background for the paragraph to follow.

When we make a successful graft we follow substantially the following procedure: We select a healthy plant for use as understock, and we cut off that plant at the desired height above the root. We then shape the stump by cutting it, not straight across, but, sloping down from the point at which the scion is to be inserted. The practical reason for this is that the condensation of moisture will readily remove itself from the stump and not remain to hasten rot of the heartwood. Moreover, it will make for a more shapely stump after the graft has become established. We then remove the tip of the slope at the point at which the scion is to be inserted and split the stump vertically to permit the insertion of the scion (see Figure I).

There are various theories on the most desirable angle at which this split should be made, but because of the controversial nature of the differences I will not discuss them. They tend to detract from rather than add to the subject under discussion. We then select the desired scion and shape it in the form of a wedge, and insert this scion in the cleft caused by splitting the stump. You are urged to leave a portion of the cut surface of the wedge above the surface of the stump (see Figure II). The value of this will be discussed later. Of course, the bark of the inserted scion will be approximately level, or even, with that of the understock unless the understock is large and the bark thick in which event the scion will be slightly depressed in order that the cambium layer of the scion may meet the cam-

Fig. I

bium of the understock. The necessity for this will be discussed later and in detail, as well as the necessity for shaping the scion and the surface of the understock in the manner as recommended. This completes the description of the preliminary stages of a camellia graft, and you can now sit back and hope that the scion and the understock will get together and your graft will "take."

Strange as it may seem, Nature does not seek to unite the scion with the stump of the root stock. In fact, in the true sense, the scion and the understock never are really united, and what appears to be a union of the two is purely co-incidental and a by-product, so to speak, of Nature's effort to heal the wounds on both the scion and the stump, and to perpetuate the life of each. What takes place on the scion inserted in the stump is substantially what would take place on the same scion if it were inserted in sand or some other rooting medium as a cutting. If it is kept alive and vigorous, it calluses. So does the stump, and if the callusing of the two unite it forms what is inaccurately but generally described as a "union" between the scion and stump and results in what can become a succcssful graft. The reason for this phenomenon is that the callusing of the stump meets and unites with the callusing of the scion, thereby forming what is known as the "union." It is to aid this process that the cut surfaces of the wedge of the scion are left above the insert into the understock so that the growth of the callus of the understock, coming up, may meet the growth of the callus of the scion coming down. To understand this thoroughly it is necessary to delve slightly into plant anatomy and physiology, tiresome as it may be to those interested only in the mechanics, in order that we may understand that the calluses come from the plant tissue known as the cambium without which there can be no callus.

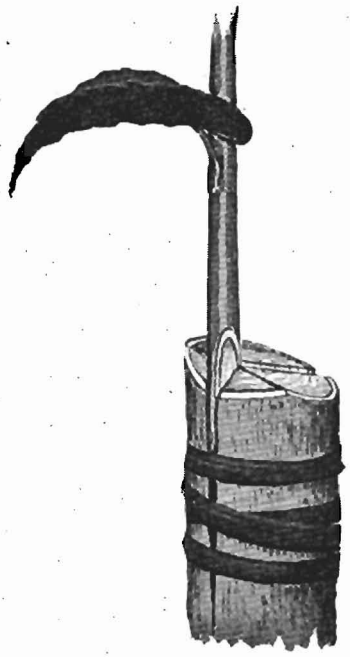

Fig. II

Of course, we all know that the cambium of the scion must meet the cambium of the understock, and that the more contact which is made the better will be the graft. *But why?* Why does the contact of cambium with cambium result in a "take"? *In the first place do we know what the cambium is?* Before we proceed further let us honestly ask ourselves, What is the cambium layer? Where is it? Why is it? What is its purpose? And what is its function? These are not easy questions to answer and many of us who have glibly referred to the cambium layer will pause before undertaking an answer to those questions, if, indeed, we answer them at all.

The botany books tell us that the cambium is an extremely thin layer

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of soft tissue lying immediately under the bark of the camellia plant (and all other plants of similar structure), whether the bark be on trunk or twig. This thing we call the cambium is one of Nature's marvels. It contains one of the secrets of Life itself—a secret as yet known only to the Creator of all plant and animal life.

The cambium layer is composed of microscopic cells not unlike the cells in honeycomb which the bees fill with honey. These minute cells are bound together and are rich in that life giving substance without which no life, plant or animal, can endure—protoplasm. *These cells,* not unlike the single celled amoeba in the realm of the fauna, *possess the power of reproduction through cell division.* Not only do these cells through their cellular division continue the growth of the cambium layer (and, incidentally, the growth of the plant of which the cambium is a part), but it is the growing cambium which hastens, by means of its cellular divisions, to repair the damage which man has done to both the scion and the stump in his efforts to create a graft. It is this cellular division which causes what we know as the callus. It is the joining of the callus on the stump with the callus on the scion which creates what we refer to as the graft union.

The cambium layer continues its growth year after year, but the growth is in diameter, with the growth of the plant, and there is little or no increase in thickness of the cambium. In fact, throughout the entire life of the plant the cambium retains its same thickness, relatively, although increasing in diameter and, of course, longitudinally with the growth of the plant which it makes possible through its cellular division. (Do not confuse with this statement the fact that in periods of lush growth the annual rings are slightly thicker than in less favorable years.)

We have seen that the cambium of the plant remains approximately the same thickness throughout its life. Therefore, the cambium of the scion and that of the stump into which it is to be inserted is of relatively the same thickness. These cambiums must be in contact in order to make a successful graft. The more the contact, the better the graft. Never forget this.

The cambium, being quite thin, is not nourished directly by sap flow. It is, therefore, necessary to ascertain how the cambium—the tissue which gives life and growth, and forms the callus necessary to the success of any graft—derives the nourishment which enables it to perform its functions in life.

On each side of the cambium layer and immediately next to it—one on the outer surface and one on the inner surface of the cambium—is a microscopic layer of tissue containing what is known as the fibro vascular tubes through which flow substances nourishing the cambium and therefore the plant. The inside set of tubes are those which carry sap from the root to the foliage, there to be processed into plant food. The outside series of vascular tubes are known as the phloem, and carry the processed food down from the foliage. This food as it courses downward nourishes the plant by means of inter-cellular flow into the cambium. Thus the life and vigor of the plant is sustained and replenished.

Of course, there is more to the transition than just this. Nature, in her effort to remedy the wrongs which we have done her, expects—nay, demands—that we cooperate with her in many particulars. We must observe the rules laid down by Nature before we can hope to have a successful graft. Next only to the necessity for having cambium contact cambium, the most important single factor in the success of the graft is that we

keep alive the spark of life in the scion during the period that Nature forms the callus, by maintaining the scion in a condition of high humidity. Dehydration is destructive. It is only through some method which prevents dehydration (desiccation is the word given to this by the botanists, and we shall therefore use it) that the life cells of the cambium may continue to function and form the callus through which the life of the understock may ultimately flow. Desiccation must therefore be retarded, if not stopped, by some artificial means. There are several methods. Perhaps the one most universally used is the inverted jar to prevent loss of humidity. But this, or some other method of preventing the scion from exhausting itself through transpiration, must be employed.

The urge to discuss some of the practical phases of grafting, without which no graft can be brought to a successful conclusion, is almost irresistible. The seasons of the year during which grafts should be made; the various types of grafts, especially as those types are applied to the seasons of the year; the necessity for clean, sharp instruments and frequent honing of the knife used; the kind (variety and vigor) of understock to be used and the size of understock most suitable for the purpose desired; the preparation of the understocks preliminary to grafting; the type of scion to use and the cycle of growth from which it should come; the preparation of the scion—to cut or not to cut its leaves; the shaping of the scion to produce best results; the insertion of the scion; the amount of light, heat and air (oxygen) to be given the new graft; the amount of moisture; the treatment for possible fungus; determination of the time when the graft is prepared to withstand unprotected the normal fluctua-

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INFECTIOUS DISEASES IN COMMON WITH CAMELLIA AND OTHER ORNAMENTALS*

Felice C. Movich
Plant Pathologist
Orange County Department of Agriculture

Many of the infectious diseases of camellia may originate or spread through infected garden plants. These infectious diseases are soil-borne (spread in the soil) and/or air-borne (wind moves them to other plants). Infectious diseases in common with camellia and other ornamentals are primarily caused by fungi. Other infective agents are nematodes, bacteria, and viruses.

Soil-borne Diseases Caused by Fungi

Of the soil-borne diseases Root Rot, caused by the watermold fungi, is most common. The Watermolds include *Phytophthora* and *Pythium* species. The Cinnamon fungus, *Phytophthora cinnamomi*, can be spread to and from camellia through soil by infected avocado, arborvitae, azalea, cedar, peach, pine, and other woody plants. Like the Cinnamon fungus, *Pythium* species are widespread in our soils and in their host range. Both of these watermolds can cause other diseases besides Root Rot of mature plants, as Damping-off of seedlings, and Gummosis or Crown Rot.

Frequently Rhizoctonia is found with the Watermolds causing Root Rot. This soil inhabiting fungus also attacks many ornamentals. You may recognize Rhizoc. by its descriptive names of diseases it can cause: Wire Stem, Damping-off, or Brown Patch of lawns.

Another soil-borne disease is Armillaria Root Rot. The fungus, *Armillaria mellea*, paradoxically produces edible mushrooms and causes deadly plant diseases on numerous trees and shrubs, including the camellia.

All of the diseases thus discussed— the watermolds, Rhizoc., and Armillaria — are distinct soil inhabiting fungi having extensive host ranges. These infectious diseases may cause above-ground damage of yellowing, dieback, and bud drop. Unless the rootzone is checked, the soil-borne diseases can be mistaken for other causal agents. Root rots due to fungi can be prevented by proper cultural practice—avoiding excess water, and having good soil drainage. A chemical effective against watermolds is Dexon. Terraclor (PCNB) is effective against Rhizoc. Dexon and Terraclor or Panogen plus Terraclor may be applied if both Rhizoc. and watermolds are involved. There is no practical chemical control against Armillaria in a residential garden. Control of Armillaria may be achieved by resistant plants such as acacias, incense cedar, English holly, heavenly bamboo, and others.

Sclerotinia Flower Blight is the most destructive disease of camellia. This fungus has spore stages which are respectively soil-borne and air-borne. Being so destructive, in a meager sense it is fortunate that this Sclerotinia Blight is restricted in attacking only camellia. Sclerotinia Flower Blight may be controlled by removing blighted flowers and drenching the soil with Terraclor.

Air-borne Diseases Caused by Fungi

Unlike Sclerotinia Blight of camellia, Botrytis or Gray Mold attacks not only the camellia, but chrysanthemum, dahlia, geranium, orchid, snapdragon, and many other ornamentals. Gray Mold, distinguished by the gray masses of spores, may also affect leaves or stems. Botrytis control may be achieved by a sanitation program to remove plant refuse, and by spac-

* Miss Movich talked on this subject at the December 1969 meeting of the Southern California Camellia Society.

ing plants to improve air circulation.

Another air-borne infectious disease of camellias is Pestalotia, attacking twigs and leaves. It usually is not of sufficient economic importance to warrant chemical control. Avoiding injuries from insects, sunburn, and diseases by other fungi will prevent this disease.

Nematode, Bacterial, and Virus Diseases

Root-knot Nematode is so common in the garden that it is also known as garden nematode. The above-ground symptoms on some plants resemble Root Rot caused by fungi, Nutrient Deficiency, or Crown Gall. Examination of the roots will reveal warty growths or knots. Camellia, although a host of Root-knot Nematode, is tolerant and shows little effect from it. Suggested control of infected ornamentals may include use of tolerant or resistant plants as camellia, or azalea, oleander, or African marigold. Nematicides, Nemagon or Fumazone, or capsulated Ethylene Dibromide, may be applied safely to soil where infected plants are growing. Other fumigants can only be used in fallow soil.

Crown Gall, a bacterial disease, attacks roses, fig, euonymous, peach, and many other plants. It can be differentiated from other diseases by the galls or swellings that occur at or near the ground level, i.e., the crown, or on twigs. Preventing introduction is the key to control of Crown Gall. Check plants for disease before planting in your garden. Since infection occurs through wounds, protect plants from injury. When injury has occurred, seal wounds and wrap grafts carefully to avoid Crown Gall and other diseases. In infested soils in the garden where soil sterilization is impractical, replant with grass or dichondra or to conifers, as arborvitae, where landscaping allows.

Leaf and flower variegation may be due to infectious diseases caused by viruses. Virus infected camellias obtain the disease through grafting or budding.

Infectious diseases in common with the camellia and other ornamentals are primarily caused by fungi. Other infectious diseases are caused by nematodes, bacteria, and viruses. Some are spread through the soil (soil-borne) and/or spread through the air (air-borne). All can be man-borne, i.e., spread by man. Protect against diseases in your garden by awareness that infectious diseases are disseminated to and from the camellia and other ornamentals. Resolve this coming year to have a Happy, Healthy, Disease-free New Year!

NEW BOOK "CAMELLIAS OF JAPAN"

Harold E. Dryden

Takasi Tuyama, Professor of Botany at Ochanomizu University, Tokyo, Japan, has undertaken the monumental task of editing, and Takeda Science Foundation of Osaka, Japan has published a two-volume book which they have titled "Camellias of Japan". While Japan is usually credited with having been the source of the camellias that were first brought into the Western World and many of the varieties of *C. japonica* that are still popular had their origin there, less is known of the Japanese camellia story than of any other part of the camellia growing areas, excepting of course China. Professor Tuyama's two-volume book should go a long ways toward correcting this situation.

A quotation from the book's preface best tells why Professor Tuyama wrote the book: "A desire to advance the botanical and horticultural knowledge of *Camellia japonica*, especially in Japan, together with an aim to make generally known the Japanese efforts in these fields up to the present, are the motives which have induced the editor to attempt the laborious but gratifying task of compiling this book. Aided by many contributors working in their fields of special skill, he has drawn upon every available source of information in an effort to put together a publication which will almost fully cover the subject.

"The mother land of *Camellia japonica* is, indeed, Japan, where even before the first introduction of the plant to the occidental world, many successes had been achieved in camellia horticulture. Little has been known outside the country, however, except for fragmentary information which was able to penetrate the barrier of language, combined, especially in the early days, with that of distance. This is still partially true even at present, as most of the literature concerning camellias, including very important works, is written in Japanese, often appearing in obscure periodicals which have only a local circulation . ."

The first volume consists essentially of two parts. The first part is narrative and covers the following subjects in eleven chapters.

A Short History of *Camellia japonica* in Japan
Differentiation of the Wild *Camellia japonica*
Ecology of the Wild *Camellia japonica*
Vegetation of the Snow Camellia
On Some Physiological Aspects of the Buch and Snow Camellias
Cytogenetics in the Genus *Camellia*

Taxonomy and Nomenclature of the Wild *Camellia japonica*

Origin and Distribution of Camellia Cultivars in Japan

Culture and Propagation of *Camellia japonica* in Japan

Diseases of *Camellia japonica*

Injurious Insects of *Camellia japonica*

The second part of the first volume consists of descriptions of 420 cultivars, mostly of *Camellia japonica* but also including some of other species. To quote from the book, "Efforts were made to establish a first approach from the Japanese side to be in accordance with the International Code of Nomenclature for Cultivated Plants Published in 1961." With very few exceptions, the earliest published dates of the cultivars in the Japanese literatures are given. This can best be illustrated by quoting the description of *C. japonica* 'Dai-kagura' familiar to most camellia growers in the United States:

"DAI-KAGURA 1879

Leaves thick in texture, ovate to rhombeo-elliptic, plicated along the midvein, veinlets impressed, dull on the upper surface, gross crenate-serrate at the margin, petioles glabrous. Flowers of peony type, petals strongly wavy, inner petals comparatively large and much more irregularly wavy, making as a whole ball-like form, deep red (Cardinal red 822/1 to 822/3), petals blotched white in varying degree. The trees cultivated in Kanto District are, in general, much less blotched compared with this."

Following the descriptions of the 420 cultivars are 44 pages of illustrations of camellia leaves, all numbered to agree with the numbers assigned in the descriptive section.

Volume 2 consists entirely of color illustrations of the 420 cultivars that are described in the first volume. The color reproductions are excellent. They also are numbered to agree with the numbers used in the descriptive section.

This two-volume book is worthy of any library of camellia literature, because of the information it contains and of the quality of the printing job. It is printed and distributed by Hirokawa Publishing Company, Inc., 27-14, Hongo-3, Bunkyo-ku, Tokyo 113, Japan. The price is U.S. $50.00.

Vintage Year

1970 will be a "vintage year" for overseas camellia enthusiasts to visit Australia. Apart from the national Bi-Centenary celebrations of Captain Cook's landing at Bontany Bay, there'll be inaugural ceremonies for Australia's new national Camellia Garden — to be named for our remarkable 88-year-old Professor E. G. Waterhouse.

During July — the northern hemisphere vacation season — there'll be at least four spectacular camellia shows in Sydney. There's a possibility that the N. S. W. Branch show, generally the highlight of the season, will become an International Camellia Festival.

American friends thinking of visiting Japan's Espo 1970 should think of doubling the enjoyment of their vacation by travelling via Australia.

—Australia "Camellia News"

Northern California Camellia Council

The Northern California Camellia Council will have its 6th annual kick-off dinner and unofficial show on Friday, February 6, 1970 at 8 P.M. at Carmen's, McHenry Village, Modesto. The price of the dinner, including tax and tip, will be $3.25 per person. Trophies will be presented for Best Japonica, Best Reticulata or Reticulata Hybrid, and Best Gibbed. Everybody is invited. All who attend are urged to bring flowers.

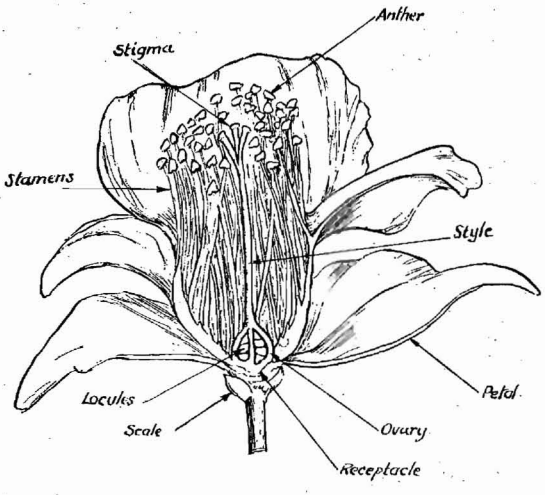
SIMPLE STEPS FOR HAND POLLINATING CAMELLIAS

1. Have an objective

One *can* hand pollinate just for the fun of doing it. It is much better, however, to have an objective because the fun is just as great and the results will be much more satisfying. For example: early or late varieties; particular shades such as, for example, the shadings of 'Ballet Dancer' or the red of 'Flame'; interspecific hybridizing (between different species) such as reticulata X japonica.

2. Select proper seed bearing or female parent

A great deal of time and labor can be wasted if hand pollinations are made on plants that do not produce seeds. A good rule is to use only plants which have in previous seasons been observed to set seed regularly. These will be usually single or semi-double varieties. 'Donckelarii', 'Berenice Boddy', and 'Lady Vansittart' are among the favorites as seed bearing parents. Other varietal forms do set seeds occasionally; for example, 'Elegans' has been a seed parent. For one who wishes to hand pollinate on a limited scale, however, he should seek the highest expectancy of obtaining seeds from his efforts.



3. Select the pollen parent

Pollen can be taken from any variety that ripens the pollen. This will be most varieties, but there are some in which the anthers do not open and pollen is not available. A dusty pollen is wanted, one that will spread easily. Obviously, the pollen parent will possess the qualities that one is seeking in the new seedling.

4. Emasculate the flower on the seed parent that is to be pollinated

Select a bud that is just ready to open. If the bud has opened, even just a little bit, a bee may have crawled in and deposited some pollen. Take off the petals down to the calex, using fingers or scissors. Then remove all stamens to the same level.

5. Place pollen on the emasculated flower

The pollen from the pollen parent is placed on the stigma (the sticky substance that appears on the end of the pistil) of the emasculated flower. Pollen may be transferred from one flower to the other with a brush, a match stick, one's finger, or what have you. The important things are that the stigma is thoroughly covered with the pollen and that before pollinating with another variety, the old pollen is completely removed from the instrument used. Alcohol should be used for cleaning a brush. A man can rub a match stick or his finger on the seat of his pants. At least one person who gets excellent results in large numbers uses his fore finger. It should be pointed out that this is written for the person who uses live pollen. The use of stored pollen is another subject.

Steps 4 and 5 should be done during the warm part

of a warm day if the work is to be done on outdoor plants; i.e., not in green houses. Temperatures above 65 degrees or even above 70 degrees are necessary for best results. It has been established in actual operation in the Los Angeles area that the per cent takes from December pollinations is very low compared with per cent takes from work done in February and March.

6. Cover the pollinated flower?

There are different views on this. The purpose of covering is to prevent the bees from depositing other pollen. Most successful hybridizers have concluded that the bees do not add foreign pollen to the stigma often enough, if at all, to warrant the time required to cover the flower. Those who do cover the flower use a small manila bag, tied securely around the pollinated flower. A plastic bag should not be used because it is too hot.

7. Keep records of what has been done

Since the purpose of hand pollinating is to achieve results from known varieties, full records should be kept. Attach to the seed parent a plastic inter-locking label or any other that cannot be removed. In one case string was used for tying on the label. Birds wanted the string for building their nests and they took the string. The labels were found on the ground. Record on the label the name of the pollen parent. Code numbers can be used to simplify the record work. The label should be left on until the seed is harvested, then, of course, the seeds themselves will be identified both before and after they are planted.

8. After care

The seeds will start to form soon after pollinating has taken place. Excessive heat can cause the seed capsules to drop. If the plants are outdoors, they should be given extra shade during hot spells in early summer. Plants that have been pollinated should not be kept in a green house after the beginning of hot weather.

Also, watch out for squirrels, blue jays and whatever else likes tender young seed pods. Paper bags will not keep out such creatures. Use a netting around the seed pod. Seran cloth would be excellent. This also allows one to leave the seed pods on until they are fully ripe, without fear of danger or loss.

Other than such after care, the results are in the laps of the Gods. Then comes seed harvesting and planting time and the beginning of a new chapter.

QUESTION BOX

Conducted by **Adam Lang**

Reprinted from NEWSLETTER, published by the New South Wales Branch of The Australian Camellia Research Society

Q. **Do bees inure Camellia flowers?**

A. Yes. Bees often enter the flower buds before they are fully open. They bruise the petals and discolour the stamens, often smear pollen over the petals.

Q. **What is meant by root pruning?**

A. Roots may be pruned in several ways. If planted in the ground, the roots are pruned by cutting into the soil to a depth of 12″ to 18″ and from 6″ to 12″ from the stem with a sharp spade. If in a container, the plants may be lifted and some of the roots pruned with shears then repotted in a large container if necessary.

When nursery plants are balled and burlapped, roots are generally pruned in moving. The top branches above the ground should be pruned to compensate for the loss of roots.

Q. **Is there any advantage in refrigeration of scions before grafting?**

A. Refrigeration of a week, two weeks or longer induces dormancy and as a result one gets a better take of scions. It is a good practice to hold some scions in your refrigerator hydrator for late grafting when the earlier graft does not take. Store in polyethene bags with very little moisture. Place in lower part of refrigerator so as not to freeze. Scions may be thus stored for 2 or more months.

Q. **What precautions should be taken to minimise the occurence of fungus on a graft?**

A. Wipe stock and dip scions in Captan.

Q. **What should be done if a furry fungus appears on a graft?**

A. Apply with a camel-hair brush a solution of 1 part vinegar to two parts water daily.

Q. **Should first year grafts be fertilized?**

A. Preferably no.

Shipping Camellia Plants

Julius Nuccio told the members of the Pacific Camellia Society the steps that his nursery takes in preparing camellia plants for shipment to out of state points. He stated that the nursery ships plants to all parts of the camellia-growing areas of the world, with good results in practically all cases.

They first bare root the plant, washing the roots thoroughly. This gives them an opportunity to check the roots and to discard a plant that does not have good roots. They then ball the roots with peat, for shipments within the United States only, the peat having been wet well before balling. The balled roots are wrapped in burlap, then in polyethelyn paper. Care is taken to assure that the roots do not dry out in the process. They lock the plant in the bottom of a crate so that it will not be hurt regardless of how it is handled. They have learned that indication of "top" has no effect on the handling of the plant in shipment.

Most of their shipments go by air. They have learned that by their delivering the shipment to Los Angeles International Airport, the shipments go through in a minimum time, and particularly so when the assignee arranges to pick them up at the airport.

It has been their experience that camellia plants hold up well in shipment under this method from the first of October through March. They discourage shipments during the Christmas rush.

In response to a question, Mr. Nuccio stated that they leave all the top on the plant, and do not use B1, etc.

CAMELLIA PERSONALITIES -- ARISTOCRATS OF THE SOUTHERN CALIFORNIA CAMELLIA SHOW TRAIL

Harold E. Dryden

As I pondered the choice of a Camellia Personality for this issue of CAMELLIA REVIEW, it occurred to me that it would be appropriate at the time of starting a new camellia season to write collectively about the people who have been winning the camellia shows in Southern California in recents years. Once upon a time, "winning the show" meant Sweepstakes winner. Since we discontinued the Sweepstakes award, the winners have been those who have received Best Flower awards in the different Divisions of the show. I decided to go through the show results for 1967, 1968 and 1969 and determine who among the many camellia growers in Southern California could be considered to be the aristocrats of the group.

It has been necessary, of course, to make some ground rules for this study. I chose the five shows that we choose to call the Southern California shows — San Diego, Pomona, Temple City, Descanso Gardens and Bakersfield. While all the exhibitors do not enter all five shows, there is a nucleus of the more active exhibitors who do, if for no other reason than they enjoy the sociability of participating in camellia shows, and travel distance is not a disturbing factor for any of these shows except possibly between the San Diego and Bakersfield areas.

I have chosen winners of Best single bloom in three Divisions; namely, japonica (all sizes in which Best award was given), reticulata, and hybrid (both classes, retic. and non-retic. parentage). I have thus excluded species, seedlings and all multiple classes, believing that the single bloom entries are representative of the entire camellia growing fraternity to a greater extent than are these other Divisions.

Following are the winners, the aristocrats if you will, with the number of Best Flower awards they have won in the five shows during the three years and, in parenthesis, the number of shows in which they have won the awards.

Melvin Canfield, Bakersfield	8(4)
Fred Hamilton, Santa Maria	7(4)
Tom Stull, Bakersfield	5(2)
John Movich, Pomona	4(3)
W. F. (Bill) Goertz, San Marino	4(3)
Berkeley Pace, Upland	4(4)
Edwards Metcalf, San Marino	4(3)
Leland Chow, Bakersfield	4(3)
Alvin Gunn, Lynwood	3(2)
Harold & Lou Rowe, Upland	3(2)
Amos Kleinsasser, Bakersfield	3(2)

Twelve exhibitors won Best two times and 21 won it once. The award of Best in the three main Divisions was thus well distributed with 44 experiencing the thrill of having their blooms on the Honor Table with the related "Best" trophy.

CAMELLIA CULTURE *(Cont.)*

partial shade, we can, based on experience, report that it should be planted in a location where it will obtain more sunlight throughout the day than shade. The reds and particularly the deep red varieties can, however, withstand more direct sunlight than can the fragile white, the sweet pea and light pink varieties.

No specific planting location formula will apply to camellias planted in various geographical locations of the State. While our home does not enjoy a sub-tropical climate, its summer temperatures do not approach those found in various semi-desert areas or portions of the San Joaquin or Sacramento Valleys. Camellias planted in such areas will require more protection from direct sunlight than those planted in the San Gabriel Valley or coastal beach areas.

WHEN IS THE BEST TIME TO MAKE A POLLINATION?

Clifford R. Parks

Reprinted from November 1965 issue of CAMELLIA REVIEW

In the effort to make camellia hybrids, there are a number of uncertainties concerning how and when to make the pollinations. This article concerns the "when" of pollination. The question we wish answered centers about what the optimum condition might be for the camellia plant to set seed. It must be pointed out that the specific conditions which surround any particular plant vary greatly. Just consider the climatic differences experienced by two camellias — one in the shade and the other in the full sun. We also know that there are great differences in temperature and wind movements in very localized areas. These are referred to as microclimatic differences. "Frost pockets" and "wind tunnel effects" are well known examples of microclimate. It seems apparent that moderate shade and high humidity are desirable for camellia seed-set, and it also would seem that severe frost pockets are to be avoided. However, in this discussion we are more concerned with the effect that macroclimate (the overall climate affecting a region) has on the capacity for any given camellia to set seed.

In discussion, some workers have strongly recommended that the camellia sets seed only at the end of its bloom period in Southern California. This would mean that *C. japonica* would set seed best in late March and April, and a fall-blooming species such as *C. sasanqua* would set seed best in December at the end of its bloom season. Other workers, including the writer, have questioned this observation. This article is an attempt based on day by day seed-set data to determine if camellia seed-set is grossly affected by the normal climate in Southern California (this, of course, is different every year).

For every group of pollinations made in our project here at the Arboretum, records are kept on the date of pollination, the number of pollinations made on any particular camellia variety (species, variety or cultivar), the number of capsules (camellia fruit) which result from these pollinations and the number of seed in each group of capsules. This information allows us to calculate the percentage capsule set for a given variety on a given day, and also the average number of seeds in each capsule from pollinations made on that day. Thus we have data for every day upon which pollinations were made for the years in which this project has been running, and the conclusions from the years 1963, 1964 and 1965 will be reported here. The listings of crosses and the resulting graphs will not be included here, but anyone wishing to see these at the Arboretum may do so. Also, there has been no attempt to correlate this data with specific weather phenomena such as wind storms, rain storms, heat "waves" or cold "waves". Anyone wishing to do so for his own amusement is invited to come and correlate the seed-set data to the San Gabriel weather records. In fact, this would be an interesting project for someone interested in figures and percentages, and judging from the irregular nature of the graphs there is something affecting seed-set sporadically.

Another consideration that must be mentioned is the problem of cross-comparison of data. It is not reasonable to compare *C. japonica* X *C. japonica* seed-set data with *C. reticulata* X *C. sasanqua* seed-set data. For

this reason all comparisons are grouped according to similarity of parentage. This has produced a number of problems in the comparisons since a number of the best parents are poor seed-setters, and some of the most interesting crosses involve distantly related types of camellias. The rather sterile types and the wide crosses will be considered separately.

In the 1963-1964 camellia flowering season the varieties of *C. japonica* 'Berenice Boddy', 'Donckelarii' and 'Ville de Nantes' were used extensively as seed parents in the program to develop cold-resistant types for the eastern part of the country. Pollinations were started as soon as the first flowers occurred on these varieties in December and were continued until flowering stopped in April. This gives us data on fruit set from the onset to the end of flowering for that season. While crosses were not made every day of the period, they were made every few days. So that the reader will fully understand how this data is analyzed, one cross from the 1964 season will be fully analyzed as follows:

Date: 3-28-64
Seed Parent X Pollen Parent:
'Donckelarii' X 'Herme'
Crosses Made: 25
Resulting Fruits (Capsules): 14
% Fruit (Capsule) Set:
$14/25 \times 100 = 56$
Total # of Seed in 14 Capsules: 43
Ave. # of Seed per Capsule:
$43/14 = 3.1$

The above is an example from one group of pollinations showing how the data is kept and analyzed. The reader may repeat the arithmetic to discover how the numbers are derived. This same calculation has been done for every group of pollinations.

Pollinations involving combinations only within the species *Camellia japonica* were analyzed as above for the 1963-1964 bloom season, and all of these crosses are reported in the 1965 *American Camellia Yearbook* (see pages 218-223). Each cross is reported there, but here we will only cite the monthly averages as reported there. They are shown in Table 1. It was concluded in that particular year that February and particularly March was the best time to make camellia pollinations. Either very early or very late in the season was less desirable at Descanso Gardens, La Canada, California.

	Total # crosses	Ave. % capsule set	Ave. # seed per capsule
December	461	13.6	1.5
January	777	25.2	1.7
February	655	39.8	2.2
March	680	54.0	2.4
April	575	31.7	1.8

Table 1.

In order to find out if the above data fits all year, all *C. japonica* X *C. japonica* crosses were plotted on a graph for the 1962-1963 and the 1964-1965 bloom seasons. In the 1962-1963 seasons only February, March and April crosses were made, and most crosses were made in March. While there does not seem to be a great difference, the percent capsule set seems to climb slightly throughout March, and it remains high in the first few days of April after which no more pollinations were made. So in 1963 the end of the flowering season seemed to be slightly better than earlier, but the difference is not likely highly significant. Most of these pollinations were made at Descanso Gardens, but a few were made at Huntington Gardens.

For the 1964-1965 bloom season we will first consider the percent capsule set for the varieties 'Donckelarii' and 'Ville de Nantes'. Both of these seem to have set seed best in late February and early March, and percent capsule set dropped off slightly in later March and dropped more in April. For these two varieties the average number of

(Continued on next page)

seed per capsule remains rather constant throughout the period in which crosses were made. The variety 'Berenice Boddy' also set seed best in late February and early March in 1965, and the value dropped in late March and even more so in April. The average number of seed per capsule remained rather constant throughout March and April, but dropped off some in April. From these crosses made at Descanso Gardens in 1965 it would appear that late February and early March was the best time to make pollinations. Crosses on the *C. japonica* 'Snow Bell' at Huntington Gardens in San Marino, California have also been compared for the above data. 'Snow Bell' maintained a rather constant seed-set percentage throughout February and March; while fragmentary data suggested that the percentage dropped in April, the latter is not conclusive. The average number of seed per capsule seemed rather constant throughout the period discussed. It would seem in 1965 that if any period was better it would be late February and early March, but percentages of seed set were nearly as high in all periods when pollinations were made. April was a little less desirable than the two earlier months, but even this difference is not too extreme. In 1965 varieties of *C. japonica* which are rather sterile set seed occasionally throughout March — perhaps doing better in the latter part of the month.

When, can we conclude, is the best time to hybridize two varieties of *C. japonica?* It would seem that hybridization can best be carried out during the peak bloom in February and March. While there is a chance of capsule set on any flower, the data suggest that the chance of set is lower at the onset of flowering in December and January and this chance again drops at the end of flowering in April in the San Gabriel Valley. Apparently, there is some difference from year to year in the optimum time of seed-set on *C. japonica* plants.

A number of species other than *C. japonica* will be considered as to their optimum time of capsule-set. *Camellia saluenensis* in 1963 seemed to set seed best in late February, but the drop in percentage in March was not likely significant. In the 1963-1964 bloom season, *C. saluenensis* set a limited number of capsules in November, but not in December or January. During the major portion of the *C. saluenensis* bloom season (February, March and April), the percentage of capsule set remained rather constant. On the other hand, in the early spring of 1965 the percentage capsule-set was highest in early February and dropped off in March to the degree that in late March *C. saluenensis* was nearly sterile. From this information it would seem that February is the best time to make pollinations with *C. saluenensis,* but this is not true each year. Adequate information on January seed-set is not available for *C. saluenensis.*

A *C. Xwilliamsii* used as a seed parent for the last three years, mostly during the month of March, has set capsules at a more or less constant rate each year during the period the plant was used, but this only involves a few weeks each year.

The fragmentary data we have from pollinations on the varieties of the species *C. reticulata* suggest that either February or March give about the same results. Pollinations have not been made earlier or later with this species.

In the spring of 1964 and also in 1965 *C. pitardii* var. *pitardii* set seed rather constantly showing only a slight decrease in 1964 and a slight increase in 1965 in each case as the season progressed — thus averaging to a constant rate for the two seasons. In 1965 *C. fraterna* seemed to set seed as well in late January as it did

in late March. *Camellia cuspidata* in 1965 seemed to set best in February, but a few crosses were made successfully in April. In the case of all of the species discussed in this paragraph it seems that crosses can be made when the plant has blooms to pollinate — perhaps the first and last blooms should be avoided, but this is not obvious from the data. The data for all of these is only fragmentary.

In the 1963-1964 season, *C. sasanqua* varieties were pollinated over the full period of *C. sasanqua* bloom. For most of these, crosses made at the peak of *C. sasanqua* bloom had the best chance of setting seed, but only crosses made very early or very late seemed to have far less chance of setting seed. In the 1964-1965 bloom season *C. sasanqua* varieties were only crossed over a short period, and while there may have been a slight decline in seed-set into December, this was not clear-cut. In the fall of 1963 the first crosses made in October set seed quite well, but perhaps not as well as crosses made at the peak of bloom in November. Despite the fact that this data is based on a lot of pollinations, there is a clear-cut conclusion, for the

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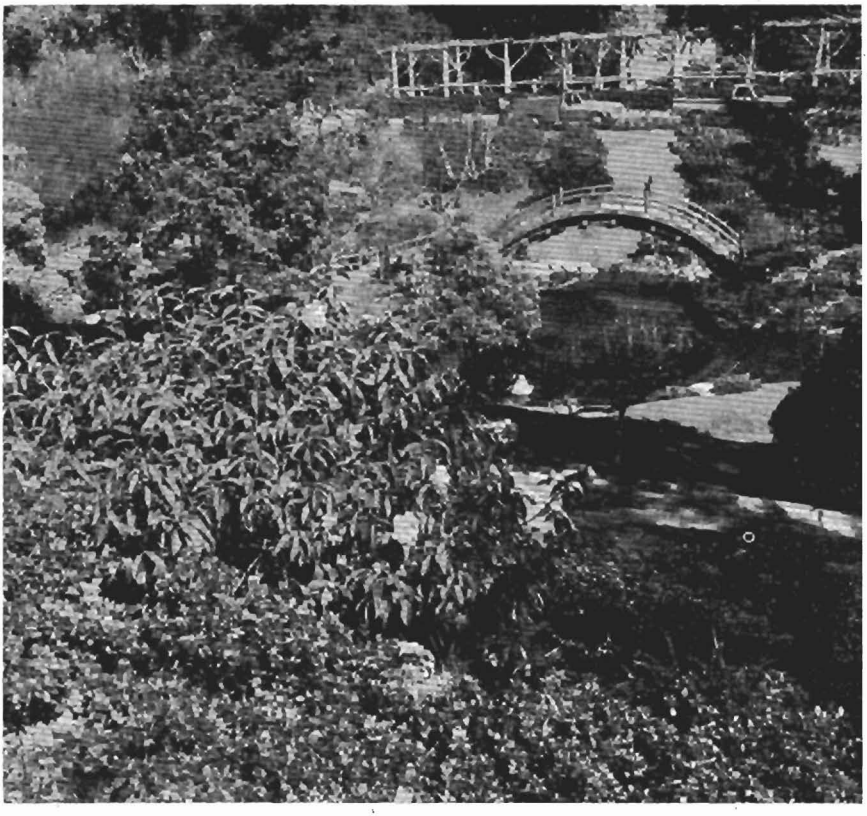


Photo by T. Durrant

C. Reticulata 'Buddha' in full sun at Huntington Botanical Gardens

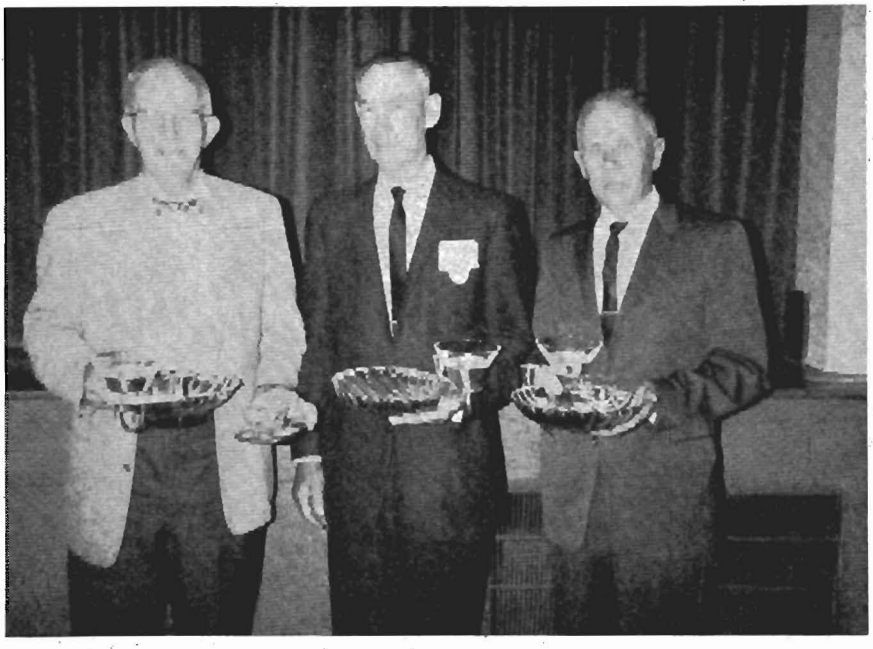
WHEN IS THE BEST *(Cont.)*

species *C. sasanqua*, which is — the time of pollination is not critical. Perhaps the last flowers in December should be avoided, but if an important cross should be made — make it.

From all of the charts on all species, one conclusion can be made. The time of pollination is not highly critical, and one cannot go too far wrong by making pollinations during the period of peak bloom. On any given variety there is some evidence that the very first or last flowers are less likely to set seed than the flowers at peak bloom, but the relationship is not clear-cut. When flower buds are available, and pollen and labor are available — it is a good time to make hybridizations. If possible, avoid flowers that are at the extreme periods of the bloom season for the species being worked on.

WILL YOUR GRAFT *(Continued)*

tions of temperature and humidity; the subject of fertilization and irrigation: These and many other factors enter into successful results in grafting. These many factors are all, in a sense, related and pertinent to the subject under discussion because each well considered step on the road to a successful graft is a material aid to Nature in her effort to right the injury which we do to her when we destroy the upper structure of a healthy, normal plant and substitute therefor a scion which has been removed from another plant. All of these factors which enter into successful grafting cry out for discussion but are rejected and left for discussion in other articles because of the fact that their value is largely practical and that they merely contribute to the reasons "Why your graft will take."



Still winning! Frank Reed (left), Fred Hamilton and Caryll Pitkin were first, second and third place winners in the S.C.C.S. meeting flower competition of the 1961-1962 season. They were also among those whose flowers reached the Court of Honor at the Early Show, with Fred Hamilton winning The Award of Excellence.

Directory of California Camellia Societies

Societies with asterisk (*) are Affiliates of Southern California Camellia Society

*CAMELLIA SOCIETY OF KERN COUNTY
President: John J. Fortenberry; Secretary: Lemuel Freeman, 209 S. Garnsey Ave., Bakersfield 93309
Meetings: 2nd Monday Oct. through Apr. at Franklin School, Truxton and A St., Bakersfield

*CAMELLIA SOCIETY OF ORANGE COUNTY
President: Ronald Cowan; Secretary, Mrs. George T. Butler, 1813 Windsor Lane, Santa Ana 97205
Meetings: 1st Thursday October through April at Altadena Savings and Loan Assn., 2400 E. 17th St., Santa Ana.

CAMELLIA SOCIETY OF SACRAMENTO
President: Fred E. Carnie, Jr.; Secretary, Mrs. Frank P. Mack, 2222 G. St., Sacramento 95816
Meetings: 4th Wednesday October through May in Garden & Art Center, McKinley Park, Sacramento

*CENTRAL CALIFORNIA CAMELLIA SOCIETY
President: Richard Pozdol; Secretary: Mrs. Glenn S. Wise, 5493 E. Liberty Ave., Fresno 93702
Meetings: Nov. 19, Dec. 17, Jan. 21, Feb. 18

DELTA CAMELLIA SOCIETY
President: Wm. H. Hayes; Secretary: Mrs. Anita Abernethy, 2962 Boies Dr., Pleasant Hill 94523
Meetings: 4th Tuesday October through April in School Adm. Bldg., 510 G St., Antioch

JOAQUIN CAMELLIA SOCIETY
President: Joseph H. Baker; Secretary: Mrs. Ethel S. Willits, 502 W. Pleasant Ave., Lodi 95240
Meetings: 1st Tuesday November through April in Micke Grove Memorial Bldg., Lodi

LOS ANGELES CAMELLIA SOCIETY
President: George K. Bulk; Secretary: Mrs. Robert Jackson, 415 N. Plymouth Blvd., Los Angeles 90004.
Meetings: 1st Tues., Dec. through April, Hollywood Women's Club, 1749 N. La Brea, Hollywood

MODESTO CAMELLIA SOCIETY
President: Anthony F. Pinheiro; Secretary: Mrs. Hazel Grosso, 1424 Encina Ave., Modesto 95351
Meetings: 2nd Monday October through May in "Ag" Bldg. of Modesto Junior College

NORTHERN CALIFORNIA CAMELLIA SOCIETY
President: Harvey L. Morton; Secretary: Robert E. Ehrhart, 2108 Hadden Rd., Walnut Creek 94596
Meetings: 1st Mon. Nov. through May in Claremont Jr. High School, 5750 College Ave., Oakland

PACIFIC CAMELLIA SOCIETY
President: Albert H. Dekker; Secretary: Mrs. A. L. Summerson, 1370 San Luis Rey Dr., Glendale 91208
Meetings 1st Thursday November through April in Tuesday Afternoon Club House, 400 N. Central Ave., Glendale

PENINSULA CAMELLIA SOCIETY
President: Cullen Coates; Secretary: Mrs. Charles F. O'Malley, 65 Robles Drive, Woodside 94062
Meetings: 4th Tuesday September through April in First Federal Savings & Loan Bldg., 700 El Camino Real, Redwood City, Calif. 94061

*POMONA VALLEY CAMELLIA SOCIETY
President: Walter Harmsen; Secretary: Mrs. Janet Meyers, 744 E. Dover, Glendora
Meetings: 2nd Thursday October through April in First Federal Savings & Loan Bldg., 399 N. Garey Ave., Pomona

*SAN DIEGO CAMELLIA SOCIETY
President: Charles B. Persing; Secretary: Mrs. William Schmitt, 101 Minot St., Chula Vista
Meetings: 2nd Friday (except February which is 1st Friday) November through May in Floral Assn. Bldg., Balboa Park, San Diego

SANTA CLARA COUNTY CAMELLIA SOCIETY
President: Abe D'Innocenti; Secretary: Miss Pat McIntyre, 1810 Olive Ave., Apt. 4, San Jose 95128
Meetings: 2nd Thursday at Willow Glen Branch, American S/L, San Jose

SONOMA COUNTY CAMELLIA SOCIETY
President: C. O. McCorkle; Secretary: Miss Joy Monteleone, 505 Olive St., Santa Rosa 95401
Meetings: 4th Thursday, except Nov. (3rd Thursday) and Dec. (to be decided) in Redwood Empire S/L Assn., 1201 Guerneyville Rd., Santa Rosa

SOUTHERN CALIFORNIA CAMELLIA SOCIETY
See inside front cover of this issue of CAMELLIA REVIEW

*TEMPLE CITY CAMELLIA SOCIETY
President: Grady L. Perigan; Secretary: Mrs. Marie Perigan, 1147 Daines Dr., Arcadia 91006
Meetings: 3rd Friday Nov. and Dec. and 4th Thursday Jan. through April in Lecture Hall of Los Angeles County Arboretum, Arcadia

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