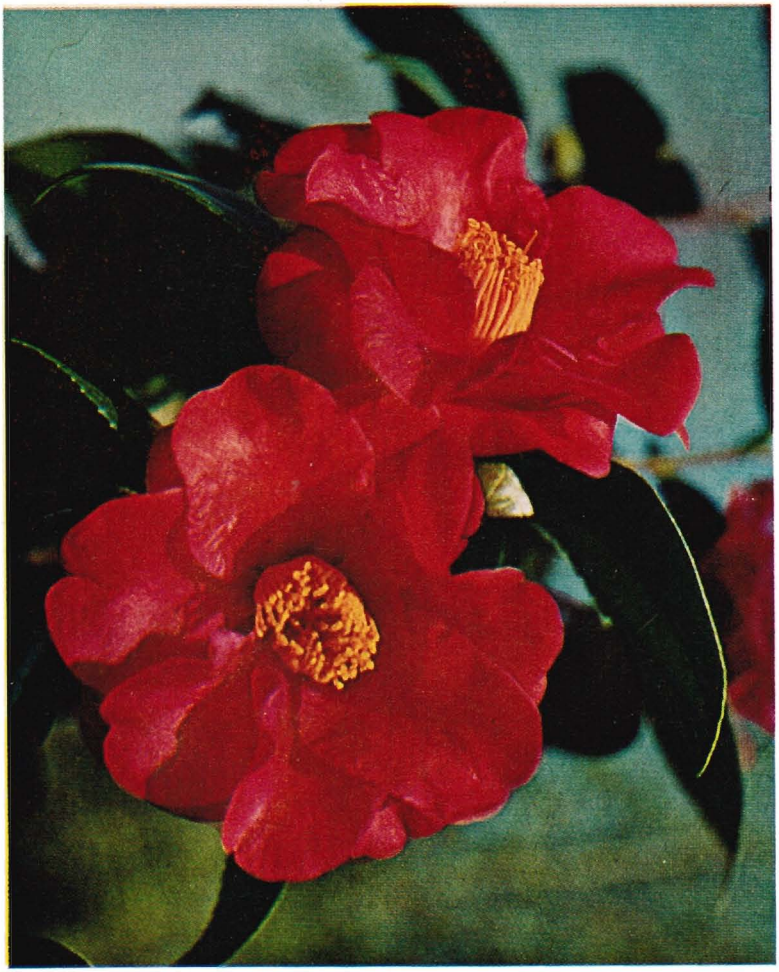
THE Camellia REVIEW

A Publication of the Southern California Camellia Society



'Wildfire'
Courtesy Nuccio's Nurseries

Vol. 25 *November 1963* *No. 2*

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. Annual dues: $6.00.

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THE CAMELLIA REVIEW

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CONTENTS

VOL. 25 NOVEMBER 1963 NO. 2

THE COVER FLOWER

C. japonica 'Wildwood'

This japonica seedling is a 1963 introduction of Nuccio's Nurseries of Altadena, California. According to Julius Nuccio, it is primarily a landscaping variety. Its beautiful orange red semi-double flowers bloom profusely on vigorous upright columnar plants. It is in full bloom at Christmas time and continues flowering through mid-season.

THOUGHTS *from the editor*

It's time again to talk about the use of gibberellic acid to stimulate camellia blooms. Frank Reed brought my wife a couple of good looking blooms on October 9th—a 'Debutante' and an 'Interlude'. He had been picking good looking blooms well before that date. All that I could show was a poor 'Kick-Off' and a 'Helen Kay' that the heat had taken toll of as it opened. I dropped in on Bill Goertz last Sunday, the 13th, and he was using an eye-dropper to put the mysterious stuff on some of his buds. I note that he has written about it in his new page "What to Do". Both of these men get a lot of pleasure from their early blooms.

First, I think that the use of gibberellic acid adds to the pleasure of growing camellias by producing blooms earlier than normal and, therefore, those who want earlier blooms should use it. My wife said, "why bring in camellia blooms before nature intended? We have roses and chrysanthemums and other fall flowers." But she is not a camellia nut. She just enjoys them and uses them. I have some of the stuff and next year I shall use it to bring in some good blooms in October and November. When one likes camellias, I see no reason why he should not extend the blooming period and thus the period of enjoyment by what I call artificial means. And incidentally there might be enough early blooms induced in this manner to hold a show in December.

Second, I can understand why people in areas subject to cold would use gibberellic acid to hasten blooms when there is the possibility that cold weather will destroy them later on. Greenhouses will protect the flowers, but that is not the answer for people who want to grow flowers out doors. This also is a question of personal enjoyment.

Third, I think that gib-treated flowers should not compete in open competition, any more than greenhouse grown flowers should compete with flowers grown in the open. It isn't a question of "morals" to me. It's just a matter of having proper classifications to equalize the competition. The Los Angeles Camellia Council set up a separate classification for last season's show at Descanso Gardens. S. C. C. S. has done the same thing for blooms exhibited at meetings. I hope that the Societies that sponsor camellia shows in Southern California in the 1963-1964 season will follow the example of the Camellia Council.

Harold E. Snyder

PRESIDENT'S MESSAGE

A. Wilkins Garner

Good wishes to each of you as we start the 1963-64 Camellia Season. I hope you have had a healthful summer. It is hoped your camellias have responded to your care and will produce blooms beyond your greatest expectations.

Most of you read in the October 1963 issue of CAMELLIA REVIEW of the new Registration and Nomenclature Agreement between the American Camellia Society and the Southern California Camellia Society. I want to express our sincere thanks to at least two people for their part in bringing about this agreement: Mr. William E. Woodroof, Editor of CAMELLIA NOMENCLATURE, for giving of his knowledge and counsel; and Mr. Aubrey C. Harris, President of ACS, for his enthusiastic presentation and follow-through to final adoption by The Board of Directors of ACS. They have rendered a lasting service to the cause of camellias everywhere.

We look forward to the first meeting of the season. To our members who live away from the Los Angeles area, we hope you will visit Los Angeles this year and plan your trip at a time when you can attend one or more of our meetings. As shown elsewhere in this issue, our meetings are held the second Tuesday of each month November through April, at the San Marino Women's Club, 1800 Huntington Dr., San Marino, Calif. We look forward to seeing you.

To our local members, I appoint each of you as a committee of one on Hospitality and Membership. May I request that you be in your regular place each meeting. Bring your flowers and your friends. Give your friends opportunity of learning to know and love camellias as you do. As your friends become more enthusiastic invite them to become members. We shall be glad to welcome them. May the quality of your blooms be a pleasant memory long after the effort of producing them is forgotten.

A. Wilkins Garner

IN THE INTEREST OF BETTER CAMELLIA SHOWS

David L. Feathers
Lafayette, California

Editor's Note: Dave Feathers, in addition to being Editor of THE CAMELLIA BULLETIN, the official publication of the Northern California Camellia Society, is a good camellia grower and a good judge of good camellia blooms. He is the originator of the camellia rating scale which is under study by the American Camellia Society. The following discussion on a new judging scale for use at camellia shows, with particular reference to "Condition", is reprinted from an article that Mr. Feathers wrote for and published in the May 1963 issue of THE CAMELLIA BULLETIN. If it seems to terminate abruptly, this is because the original article continued with other phases of camellia show awards.

It has been the writer's privilege to have attended six camellia shows this season on the Pacific Coast and to have judged in five of them. All except one were two-day shows and competitive. The quality of the shows and blooms and the manner in which they were conducted was outstanding, and we wish to congratulate all concerned for the excellent contributions they have made to camellia interest, enjoyment and knowledge.

If there might be one criticism, it would, in this observer's opinion, have to do with judging. All of us who have had a great deal of experience in such matters know that there never was a show and never will be one in which all of the participants believe the judging to be flawless — this simply is not possible, human nature being what it is. In our opinion it is, however, the most important single factor having to do with the success of a competitive show. As such, we should like to make a few comments on this subject, which relate particularly to two-day shows as that is the length of the great majority of camellia shows.

The most deplorable aftermath of judging (and certainly the most puzzling feature of all competitive camellia shows insofar as the general public is concerned) is that the Best Flower of its class and/or many of the blue-ribbon award blooms at the time of being viewed by the great majority of show visitors often has collapsed completely and would be a sorry spectacle even without being related to a high award. The attendance at all two-day camellia shows is always heaviest on the second day (usually Sunday) simply because this is the most convenient time for most people to attend. Thus it is of most importance to have everything connected with the show look its best when the condition of the blooms is most likely to be the worst. If the weather should happen to be warm and dry at the time, this problem is accentuated.

After giving this matter thorough consideration, the Directors of the Northern California Camellia Society this year authorized a change in the judging scale, which was called to the attention of exhibitors prior to the annual show and to the judges just prior to the judging of the show. This change was designed to alleviate some of the criticism and confusion in the minds of the viewing public without, however, penalizing the exhibitor. The following is a comparison of the judging scales recommended by the American Camellia Society with the new experimental scale used for the first time in the N.C.C.S. 1963 Show:

	ACS	*NCCS*
Form	20%	20%
Color and markings	20	20
Size	20	20
Texture and Substance	20	....
Freshness	....	20
Condition and Distinctiveness	15	....

Condition and Substance	....	20
Foliage	5	....

For space reasons, the N.C.C.S. Show does not permit foliage and on this point there is therefore no basis for comparison. In the case of the A.C.S. scale, it is felt that there is really no relationship between "Condition" and "Distinctiveness" and in the case of the N.C.C.S. scale, a second look would dictate dropping the words "and Substance," as this does not refer to "Condition" and probably should be related to "Freshness." We might observe here that, at such time as Foliage may be permitted in N.C.C.S. shows (which we would recommend both from the standpoint of enhancing the flower and helping its keeping qualities) we would reduce the points for Condition to 15.

It is felt that the inclusion of the word "Distinctiveness' is unfortunate in that it is not a physical attribute that can be pinpointed and thus tends both to confuse and leave too much to individual interpretation of what, exactly, is meant. Are not Form, Color and Size *all* there is to a camellia *that is typical* and does not a camellia become "outstanding" (as distinguished from "distinctive") when it possesses these features in highest degree? Actually, "distinctive" can mean both "characteristic" and "different" and it is this latter definition that bothers the writer because we are getting a bit far afield and away from the fundamental concept of "being typical" when we use such terminology. Let us take the example where a camellia which is normally a fairly flat flower throws some upstanding petals, which make it "distinctive" in the sense that it is unusual or different. This will often happen due to over-liberal application of fertilizer. Or where a camellia that is normally of a pale hue becomes vivid, or its markings exaggerated, usually for the same reason or because of the addition of iron in generous amount. Surely, these are "distinctive" flowers but, if we attach blue ribbons to them, is not the general public going to be fooled? In fact, is it not true that too many camellia show flowers are *exaggeration of type* due simply to feeding abnormally? One can produce some remarkable distortions of flower form, size and color through heavy feeding at blooming time(let alone gibberellic acid treatment). This does not require any particular amount of skill.

Condition: The writer is not wholly in accord with the interpretation of this feature as set forth in the A.C.S. Rules and Regulations relating to judging. In his view, "Condition" should relate solely and exclusively to *what happens* to the flower quite apart from the application of one's cultural skills — in other words, the "accidents" that happen to it — damage caused by the elements while it is on the bush and by humans afterward. Thus, if the weather has been unfavorable just prior to the show, the judges can be charged to make allowance for the Condition of the blooms accordingly. "Condition" is described in the Regulations as meaning "Freshness." Is the latter not the better, more definite word? If we say "Freshness" (possibly adding "and Substance") are these not enough to cover the vitality and well-being of the flower resulting from the exhibitor's cultural skill? And will this not be expected to result in the selection of "better lasting" blooms, which is such a vitally important matter in a two-day show? In other words, let us place more emphasis on *physical fitness* of the flower.

(Continued on page 29)

A camellia expert is a conceited camellia grower who thinks he knows as much as you do.—CAMELLIAN

What to Do

by W. F. GOERTZ

What to do? My answer to that normally would be: "Read the book—(Camellia Culture by E. C. Tourje—preferably) — because here the experts very beautifully tell you all about it." But the Editor says "this column is for the non-experts; you grow good camellias — so *you* tell what you do or what you think should be done."

For November and December there are a few "Must Do's" and a lot of "Can Do's". In Southern California it is entirely possible that we may get little or no rain and three-or-four-day hot spells can come at any time. Most important, don't neglect the watering. If you go on a trip for a week or two — make sure someone will be around to pour on the water, especially in the event of a hot streak. You should have been dis-budding for three or fourth months — but better late than never: If you want quality blooms — don't leave more than one flower bud on a branch tip. Even if you have so-called ordinary plants just for garden color — pull off the excess buds and avoid constant picking and raking up of excessive dead blooms later on. Don't be afraid to do a bit of pruning now also — get rid of those surplus twigs and cross branches which will interfere with the flowers.

To beginners or amateurs, I want to stress one important phase of getting more fun out of your camellia hobby. Experts or so-called "old timers" consider it a compliment when you ask to visit their garden to see their plants. At the next camellia society meeting, make it a point to visit with several such people and get yourself invited to their gardens. Ask a lot of questions and particularly check on camellias that bloom early in the season. Don't be afraid to ask for a scion. (We will get onto the grafting subject in the next issue.) The true camellia hobbyist will be pleased — and yet not ashamed to say "no" if there are no scions to give. If you haven't been doing this, you haven't gotten the most pleasure out of your hobby.

December is the ideal month to move up those last winter one-gallon grafts to larger containers. You will have better luck if you use nothing bigger than two-gallon containers now (and it also saves on space). One-half sandy soil and one-half damp peatmoss makes a good mix. Don't fertilize these transplants for about three months. If you have a large plant in the ground to move to a new location — pick a cool day in December. If you lose some of the roots, cut back the plant to compensate.

Want to have some fun with Gibberellic Acid for early king size blooms? Now is the time; and apparently many hobbyists are using it this year for the first time. I am treating one or several buds on most every one of our plants every two weeks during November and December. Tie a short piece of colored yarn to indicate treated bud — (different color

(Continued on page 40)

S. C. C. S. OPENS CAMELLIA SEASON ON NOVEMBER 12 WITH TALK BY JULIUS NUCCIO

S. C. C. S. opens the 1963-1964 camellia season at the November 12th meeting with a talk by Julius Nuccio of Nuccio's Nurseries on "Growing Camellias From Seeds." Joe and Julius Nuccio seem to have the knack of growing good seedlings that the camellia buying public likes. They insist that they let the bees and nature do the work, but whatever the reason they are successful in the results of their seed planting. Following Mr. Nuccio's talk, he will answer questions. This will be an excellent opportunity for those who have planted their seeds to get help on what to do from here on, and for those who have not planted to get the inspiration to engage in this most exciting phase of the camellia hobby.

Edwards H. Metcalf, Program Chairman, announces that something new will be done this year to make it easy for people to ask questions and have them answered. At every meeting there will be at the door what he calls a "grab bag," into which may be deposited questions for answer during the meeting. He will put the question to a person in the audience who he feels is qualified to answer it. Having in mind the diversity, camelliawise, of the people who attend S. C. C. S. meetings, he believes this will be a good plan for members to have their questions answered, particularly those people who hesitate to have attention called to themselves when they have to stand up and ask questions.

There will be the usual refreshments at intermission and the time for looking at the blooms and talking with people. The meeting will conclude with the plant drawing which has become an established part of all camellia society meetings.

Speaker at the December meeting will be Dr. Clifford R. Parks of the Los Angeles County Arboretum staff. Dr. Parks, a plant geneticist, is working actively on the program of the Camellia Research Advisory Committee[1]. In collaboration with his associate Dr. Albert E. Longley, he has written two articles for CAMELLIA REVIEW on phases of his work on this project[2]. More such articles will be forthcoming. The subject of Dr. Parks' talk at the December meeting will be "Fingerprinting Camellias."

It takes work on the part of many people to make the meetings interesting and to conduct affairs of the Society that do not show up in meetings. President Wilkins Garner has announced the following Committee Chairmen who are in charge of these different functions:

Program—Edwards H. Metcalf
Hospitality—Wilber Foss
Placement of Blooms—Alvin L. Gunn
Judges of Blooms—
Robert F. Dickson, Jr.
Plant Procurement—Pat Novak
Ticket Sales—Walter C. Scott
Refreshments—Berkeley M. Pace
Membership—John C. Robinson
Inter-Society Relations—
Douglas G. Thompson
Nomenclature—William E. Woodroof
Awards—Caryll W. Pitkin
Huntington Botanical Gardens—
A. H. Dekker

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(1) See February 1962 issue of CAMELLIA REVIEW, page 22, "Camellia Research Advisory Committee, A New Approach to Camellia Research."

(2) See May 1963 and October 1963 issues of CAMELLIA REVIEW.

CAMELLIAS: THEIR FEMININE PROTAGONISTS

Margaret Howard Thompson
Los Angeles, California

II

Continuing our journey around the world to visit camellia women, let's stop next in Australia. Camellias thrive on this island continent in the Southern Hemisphere where historical records indicate that the first camellia plants probably arrived around 1830. The Macarthur family is credited with arranging for their shipment to Australia and their further propagation. Their estate, Camden Park, was the first source of home supply for plants. From this early beginning, interest in camellias grew, and today the shrub is found in almost every garden. As also happened here in the United States, groups of camellia enthusiasts emerged; and Australia now boasts a strong camellia research society.

Two ladies from down under have been selected to represent the many Australian women who enjoy growing and using camellias. We stop first at the home of Mrs. E. G. Waterhouse at Enjldere, Gordon, New South Wales (near Sydney). Janet Waterhouse became interested in camellias in 1914 when she and her husband planted their first. Professor Waterhouse, a second generation Australian and now in his 82nd year, loved camellias from early childhood and introduced his Scottish bride to them when he brought her to Sydney in 1912. In 1914 they built their own home, a lovely colonial bungalow with white walls and grey shutters, and landscaped their garden with the formal camellia shrubs. On 7/8th of an acre they now raise hundreds of plants —many in tubs to conserve space.

Although Mrs. Waterhouse is not the famous member of the family for camellia propagation and research, she is famous for her floral arrangements. Over the years she has been invited to place exhibits in countless places: private homes, halls, horticultural societies, schools, government buildings, camellia shows, and television programs. An illustration of her recognized competence is found in the invitation she received a few years ago from the Director of the Art Gallery of New South Wales. He invited Mrs. Waterhouse to make several camellia arrangements in conjunction with a special showing of Japanese prints. At the same time she made flower arrangements for Kimbelli House where the Japanese Prime Minister stayed while in Sydney for the exhibit. Her arrangements are noted for their simple effect with emphasis on line as stressed by the Japanese. Over the past quarter of

Margaret Howard Thompson

a century, Janet Waterhouse's non-competitive arrangements have been inspired by examples found in Sadler's *The Art of Flower Arrangement in Japan*, the first book on flower arranging to come into her possession.

In 1940 the Waterhouses and two friends were responsible for staging the first camellia show ever held in Sydney. Friends were skeptical of its success, thinking there were not enough varieties to make an interesting show. Working diligently, the Waterhouses and other camellia hobbyists displayed some 65 varieties collected from private gardens and public parks, where some of the plants are well over 100 years old. Through the years, the Waterhouses have exhibited blooms, introduced new seedlings and hybrids, and won many awards. And at every show, visitors are inspired by the beauty of Mrs. Waterhouse's non-competitive exhibit of flower arrangements.

Quite by accident I learned that the National Council Books, Inc., Philadelphia, printed one of Mrs. Waterhouse's arrangements in their 1962 calendar and asked her to submit another for the 1963 issue. Arrangement No. 22 of the National Flower and Garden Calendar for 1962 is titled "Rhythm and Balance." The fresh-cut bamboo cylinder on a teak stand contains green and yellow fruit of the banana passion vine balanced by wisteria which has been strengthened with ivy. Green and yellow kumquats, wired to the top of the cylinder, help to balance the weight of the larger fruit. Another piece of wisteria rises in a graceful line from the container to give height and rhythm — a beautiful illustration of a symmetrical arrangement with balance and rhythm. Because of her artistic talent, Mrs. Waterhouse is asked by many clubs to lecture and demonstrate flower arranging. She also talks about the origin of camellias and the hybrids developed by her husband. She is vice-president of The Garden Club of Australia, Patroness of the Flower Club of New South Wales, and was the first President of the Sydney chapter of Ikebane International. The Waterhouses are members of the New South Wales branch of the Australian Camellia Research Society, the International Camellia Society, the American Camellia Society and the Southern California Camellia Society.

As an enthusiastic companion on her husband's camellia research trips, she has seen most of Australia and New Zealand. In 1949-50 the Waterhouses journeyed to Europe for the first Magnolia and Camellia Conference in London. They visited many gardens in the British Isles and were especially favored to see the gardens in Cornwall in full bloom. The Waterhouses also spent a weekend at Bamwell Manor, the home of their Royal Highnesses, the Duke and Duchess of Gloucester, who visited them twice while on trips to Australia. They also stopped at the Nantes camellia gardens in France while on their way to Italy. The Waterhouses enjoy traveling and as recently as 1962 spent several weeks in the Orient visiting Japan, Hong Kong and Taiwan. Although they have met many leading authorities in the camellia world on their travels, they especially cherish the visits from world-wide camellia friends to their home in Australia. As Mrs. Waterhouse says so beautifully in her letter:

"Our experiences in connection with camellias have been innumerable. It is difficult to isolate one — perhaps, the friendships engendered in all parts of the world is the most outstanding and the most lasting of all."

The mutual love of camellias does seem to foster bonds of friendship, and we reluctantly leave our new friend, Janet Waterhouse, who so graciously shared her experiences with us.

Next, let's visit the home of Mrs. Catherine G. Fairley at Glen Iris,

(Continued on next page)

Victoria, Australia. As one of the two "lady growers" in the Melbourne camellia society, she innocently began to raise a few camellias — twelve smallish plants — in 1954. On a suburban lot (55′ x 200′) she propagates hundreds of plants. At first she specialized in Japanese flower arrangements. Now she spends more time working with the plants and lecturing several times a year on camellia culture and travel. She is a member of the Royal Horticultural Society; Australian, New Zealand, American and International Camellia Societies; Committee of the Victorian Branch of the Australian Camellia Society; and for five years horticultural leader of the Australian-American Association in Melbourne. Her story is so interesting that we must begin at the beginning.

Two things fostered her interest in horticulture: an inherent love of the outdoors and the desire to do something with her time. Her husband died as a result of World War II when their children were three and fifteen months old. Kay Fairley took care of the garden for the first few years and then had a glasshouse built and floundered into growing cymbidiums in which she was never very interested. As she says, they flowered with a few spikes and that was that. Friends suggested that she grow camellias. Remembering as a child in the country the sight of a large old white formal double camellia bush in all its glory, she began to grow a few camellias in the glasshouse. The orchids gradually found their way to shady spots in the garden. As the plants and their blooms multiplied, Mrs. Fairley joined the Australia Camellia Society and listened to the "eternal ///// from the men members, and am now pleased to add that I, too, can /// with the best of them." In 1955 she visited Japan where she became interested in studying flower arranging. On her return to Melbourne, she could not find a teacher of Japanese flower arranging so she took a complete 12-month florist course, learning to make bridal bouquets, wreaths, arrangements for the home, etc. After graduation, she took over the role of teacher until it became too time consuming for a hobby. She next turned her energy to the cultural side of growing: propagating from seeds and cuttings, and grafting.

In 1959 Kay Fairley attended the American Camellia Society Convention in Norfolk, Virginia. From the day of arrival and for the following six weeks, she was completely overwhelmed by the wonderfully kind and hospitable camellia folk in the south and eastern part of the United States. As one of the highlights of her life, she is forever humbly grateful for the friendliness and love she received. She also stored away enough "matter" camelliawise, gardenwise, and folkwise to receive her biggest push along the camellia trail. From the ACS

Convention, she went to the Chelsea Flower Show in London where she became interested in obtaining misting jets to provide the right conditions for growing cuttings in Australia. She found a super-salesman of jets who sold her enough equipment for her large glasshouse, supplied the plans, and sent her back to Australia to attempt to tell plumbers and electricians how to assemble automatic solenoid valves, transformer boxes, miles of electrical cable, and miscellaneous parts. Needless to say, the whole experience was comical and expensive. As soon as the jets worked, Mrs. Fairley began growing cuttings by the score; but the operation was not as successful as the book said it should be. The mist was supposed to keep fungus and insects at bay. In Australia, Kay Fairley bred everything in bigger quantities: dieback, red spider, aphids. She finally enrolled in horticultural school where for the last two years she has studied botany, science of soils, and plant pathology. She now *knows* what she doesn't know. She still propagates but selectively. Occasionally a few plants are sold to keep her hobby from being too much of a financial burden. Many of her plants, however, arrive as gifts at school fetes, raffles, church functions, and other charitable events. Her children, now 14 and 13, have been through these experiences with her, helping with bags of dirt manure and learning to pick up anything and everything of value in the country to enrich a suburban soil. They have learned to accept beauty as a part of life to be enjoyed and valued as an attainable thing for all. Along with their mother, they've also learned the ordered laws of nature, the magnificence of soil structure, the balance of predators.

Kay Fairley feels her camellia hobby has added much to her life through physical activity in the outdoors, shared experiences with her children, fine friends, personal interest in the history of the East, knowledge of genetics, and pride in being tagged as the lady "who grows camellias." She is a camellia friend we would all enjoy visiting. May I share with you this personal word from a warm-hearted camellia friend from Melbourne:

"Have you ever walked out on a frosty morning and found the blooms making their first appearance from a little scion some kind person on the other side of the world sent in a packet? It makes you think — think of the folk who sent it, think of the assistance you gave nature to grow it, and thinking about good things is the best therapy I know."

Next month will find us in New Zealand; but before we leave Aus-

(Continued on page 29)

THE SALUENENSIS-PITARDII-RETICULATA COMPLEX

Clifford R. Parks and Austin Griffiths, Jr.[1]

Taxonomic Introduction*:

According to current taxonomic understanding (Sealy, 1958), the theaceous genus *Camellia* comprises eighty-two recognized species ranging throughout southeastern Asia. This taxon is arranged into twelve sections aligned upon morphological and geographical criteria. It is noteworthy that — excepting the growing influence of *C. sasanqua* and recent impact of *C. granthamiana* — the major contribution to horticulture has been derived from species common to the generic-type section, Camellia: *C. japonica*, ranging from southern Korea and Japan down through the Ryukyu Islands and Taiwan; *C. pitardii*, from Hunan, Kwangsi, Kweichow, Sikang, Szechwan and Yunnan, China; *C. reticulata*, from extreme-western Yunnan; and *C. saluenensis*, from Sikang, Szechwan and Yunnan. This taxonomic section of the genus also includes another four recognized species: *C. edithae* from Fukien and Kwangtung, *C. heterophylla* from Yunnan, *C. hongkongensis* from Hong Kong, and *C. mairei* from Kwangsi and Yunnan, China. *C. semiserrata* is yet another species in this section which is not known in cultivation, and its taxonomic relationships are obscure. Of these nine species comprising the section, Camellia, all but three are now represented within domestic cultivation; the exceptions are *C. edithae, C. Mairei* and *C. semiserrata.*

Among the cultivated species in this section is a group of plants, represented particularly within the southern California region, that has become seriously confused and consequently misunderstood in relation to its allied species; this group had its origin in a series of seed importations made during 1948-49 by E. C. Tourje, then of La Canada, California, from the Lushan Botanical Garden in Kuling, Kiangsi, China (Tourje, 1962). These seed were secured, reportedly, within the Kunming region of eastern-central Yunnan; the different seed shipments were identified as *C. saluenensis, C. pitardii* and *C. reticulata,* and more than one shipment of seed labeled *C. pitardii,* at least, was received. Seed from these importations were distributed to several institutions and private growers in this country. A few seedlings were produced and survived at various locations, primarily in the Los Angeles area. By the time these plants came into flower, however, most or all had become confused in identification or records no longer were available; consequently, these became known as the so-called "Tourje Saluenensis," " Tourje Pitardii" or "Tourje Reticulata," without direct reference to original seed identities. A few of these particular plants later became parental sources for some of the hybrid camellias produced in the area. In an effort to clarify the taxonomic identity and position of these plants and their relationships to species allies, this so-called *seluenensis - pitardii - reticulata* complex has been studied in some detail.

Wild forms of both *C. saluenensis* and *C. reticulata* were introduced to this country in the early-1940's by Armstrong Nurseries of Ontario, California.[2] This material was secured from England, where these species

*Taxonomy is the study of species relationship and nomenclature. Taxon is a taxonomic group such as a species.—Ed.

[1]Staff Geneticist, Camellia Research Advisory Committee, and Associate Taxonomist and Geneticist, Research Division, Los Angeles State and County Arboretum, Arcadia. California, respectively.

had become established in cultivation twenty years earlier as a result of direct introduction from southwestern China by George Forrest (Cowan, 1952).

Sealy has recognized *C. pitardii* as composed of two morphological taxa — the type-varietal population, *C. pitardii* var. pitardii (the typical species), with an extensive northeastward distribution range from southern Yunnan; and *C. pitardii* var. *yunnanica*, the population ranging northwestward through central Yunnan. The typical species *(C. pitardii* var. *pitardii)* has never been introduced to cultivation in England, apparently; at least it has not been recognized to date as extant within any of the collections of Chinese camellias established from the Forrest introductions. Conversely, *C. pitardii* var. *yunnanica* is represented within the English collections, both from early Forrest introductions and later introduction directly from extreme-western Yunnan. It is this Yunnanese variety of *C. pitardii* that was introduced into domestic commerce during the early-1950's by the late Ralph Peer of Los Angeles and became distributed in the trade simply as *C. pitardii*. At the present time, then, the following taxa of the complex in question are represented in cultivation: *C. pitardii* var. *yunnanica*, *C. reticulata*, *C. saluenensis* and the so-called "Tourje Pitardii" and "Tourje Reticulata." No plants have been located surviving in cultivation that are directly attributable to labeled introductions of the Tourje *C. saluenensis* seed. The name "Tourje Saluenensis" became applied in the period following 1955, when flowering seedlings of the "Tourje Pitardii" were identified as *C. saluenensis*, rather than *C. pitardii*. In addition, therefore, the name "Tourje Saluenensis" has come into use relative to some of the cultivated materials resulting from these Tourje seed importations. Actually, only two taxa are considered to be represented among these particular Tourje seed introductions — what was received as *C. saluenensis* failed to survive, was later lost or became confused with the following; what was received in later shipments as *C. pitardii* proved to be *C. saluenensis;* and what is apparently the single surviving plant from seed received either as *C. reticulata* or as *C. pitardii* in the first of these seed shipments proved to be a taxon somewhat intermediate between *C. saluenensis* and *C. reticulata*, and this plant most nearly agrees with what Sealy recognizes as the typical *C. pitardii* (the type variety, *C. pitardii* var. *pitardii*). This plant has been referred to as the "Tourje Reticulata," the "Red-anther Pitardii" and other convenient but taxonomically meaningless name variations. Although herbarium-specimen material *(Griffiths 4123)* from this camellia has been identified as *C. saluenensis* by Sealy, in morphological character it fits reasonably well within the range of *C. pitardii* var. *pitardii* as delimited by him; and cytologically, the plant is hexaploid in agreement with *C. pitardii*

(Continued on next page)

[2]Other forms of *C. reticulata* had been and later became available: *C. reticulata* 'Capt. Rawes' and the "Kunming Reticulata" cultivars, respectively.

[3]Longley and Tourje (1959) report six chromosome counts of *C. pitardii*. Three of these were incorrectly identified: the first, listed simply as *C. pitardii;* the second and fifth, listed as *C. pitardii* var. *pitardii*. These counts actually refer to *C. saluenensis*, then being grown as the "Tourje Pitardii." The remaining three counts, *C. pitardii* var. *yunnanica*, were correctly identified.

[4]Longley and Tourje (1960) report two chromosome counts of *C. pitardii*. The first of these was properly identified as *C. pitardii* var. *yunnanica;* the second was incorrectly identified—actually, the material reported in this count was *C. pitardii* var. *pitardii* 'Descanso Form'.

var. *yunnanica*, rather than diploid in agreement with *C. saluenensis* (Longley and Tourje, 1959[3] and 1960[4]; Griffiths and Parks, unpublished). It has been here tentatively identified as a marginal representative of *C. pitardii* var. *pitardii*; in addition, it is considered advisable to apply the cultivar name 'Descanso Form' for ease of reference. This plant then becomes *C. pitardii* var. *pitardii* 'Descanso Form', *C. pitardii* 'Descanso Form' or simply camellia 'Descanso Form'. The parent plant of this camellia is located in the old collection of species materials at Descanso Gardens in La Canada, California. It has developed into a rather narrow-conical shrub about eight feet high and four feet across at the base; the branching is quite stiff and ascending; the foliage and flowers appear somewhat intermediate between *C. saluenensis* and *C. reticulata*, with orange-red young anthers characterizing the single, pale-blush-pink flower.

Experimental Materials:

Since any advance in understanding the *saluenensis-pitardii-reticulata* complex depends upon application of taxonomic techniques beyond those basic to classical gross morphology, a series of investigations was designed to sample variation in this complex for other diagnostic criteria. Collections of six to twelve current-year shoots of matured vegetative growth were selected from each of seventeen camellias within this complex; in addition, many extra leaves from comparable shoots of each taxon were collected. These extra leaves were used as source material for chemical analysis by chromatographic techniques and the determination of sclereid-distribution patterns, whereas the complete shoots were matrically analyzed according to methods developed and refined by Anderson (1949 and 1953) and others (Davidson, 1947; *et al.*).

The camellias included within this analytical study were of the following taxa: two wild-form seedlings of *C. japonica*, one red-flowered and the other white-flowered; three clones of wild-form *C. saluenensis*, including the Tourje form at Descanso Gardens[5]; one clone of wild-form *C. pitardii* var. *pitardii* ('Descanso Form'); three similar clones of wild-form *C. pitardii* var. *yunnanica;* two similar clones of wild-form *C. reticulata; C. reticulata* 'Capt. Rawes'; three cultivars of the "Kunming Reticulata" group selected for range in leaf variation, 'Noble Pearl', 'Osmanthus Leaf' and 'Shot Silk'; and two cultivars of *C. xwilliamsii (C. japonica* x *C. saluenensis)*, 'J. C. Williams' and 'Mary Christian'.

Sclereid Distribution:

As has been shown by Barua *et al.* (1958 and 1959) and Foard and Lewis (1961), the leaf distribution of sclereids possesses some diagnostic value in camellia taxonomy, especially as supportive evidence of putative hybridity. In the present study, five or more leaves from each of the taxa selected for analysis were prepared for determination of sclereid-distribution patterns. These preparations were made by the standard, whole-mount method (Arnott, 1959) with slight modifications for preliminary leaf decolorization and final staining. In this and earlier unreported work, it was found that camellia leaves require extended periods of treatment (several days to weeks) with clearing agents to provide material adequate for careful scoring of gross sclereid distribution. The results of this survey of sclereid-distribution patterns within those camellias selected are portrayed in Table I. A conveniently available classification scheme for

[5]Since identification of this particular clone in future hybridization may become desirable, it will be distinguished as the 'Tourje Form' of *C. saluenensis.*

scoring the pattern of sclereid distribution in camellia leaves is that suggested by Foard and Lewis. The categories of their system follow: Class I — sclereids mainly marginal and along midrib, sparsely scattered to absent in blade; Class II — sclereids concentrated along margins and midrib, frequent throughout blade; Class III — sclereids along midrib only; Class IV — sclereids abundant throughout leaf; Class V — sclereids rare. None of the materials here surveyed fell within Class III or Class V.

It was found that in all but one instance *C. saluenensis* and *C. japon-*

TABLE I - SCLEREID LEAF-DISTRIBUTION PATTERN

PLANT MATERIALS & COLLECTION NUMBERS (LASCA)	DISTRIBUTION-PATTERN CLASS[6]			
	I	II	II - IV	IV
C. japonica "Red-flowered" (Griffiths & Parks 4809)	X			
C. japonica "White-flowered" (Griffiths & Parks 4815)	X			
C. xwilliamsii 'J. C. Williams' (Griffiths & Parks 4804)	X			
C. xwilliamsii 'Mary Christian' (Griffiths & Parks 4805)	X			
C. saluenensis (Griffiths & Parks 4799)	X			
C. saluenensis (Griffiths & Parks 4811)	X			
C. saluenensis 'Tourje Form' (Griffiths & Parks 4802)		X		
C. pitardii var. yunnanica (Griffiths & Parks 4810)			X	
C. pitardii var. yunnanica (Griffiths & Parks 4812)			X	
C. pitardii var. yunnanica (Griffiths & Parks 4814)			X	
C. pitardii var. pitardii 'Descanso Form' (Griffiths & Parks 4803)				X
C. reticulata "Wild Form" (Griffiths & Parks 4800)				X
C. reticulata "Wild Form" (Griffiths & Parks 4813)				X
C. reticulata 'Capt. Rawes' (Griffiths & Parks 4801)		X		
C. reticulata 'Noble Pearl' (Griffiths & Parks 4806)	X			
C. reticulata 'Osmanthus Leaf' (Griffiths & Parks 4807)	X			
C. reticulata 'Shot Silk' (Griffiths & Parks 4808)				X

[6]These distribution-pattern classes of leaf sclereids are defined in the adjoining textual material. Class II-IV identifies a category intermediate between Class II and Class IV but not inclusive of Class III.

ica, along with their two hybrids examined, displayed a Class I pattern of sclereid distribution in the leaves; this exception is *C. saluenensis* 'Tourje Form', with a sparse to frequent sclereid-distribution pattern in the blade closely approaching that of *C. pitardii* var. *yunnanica.* The pattern in this latter camellia is intermediate to but approaching the wild-form *C. reticulata.* Material of *C. pitardii* var. *pitardii* 'Descanso Form' showed the most densely abundant, sclereid-distribution pattern within the group examined. Sclereid patterns in the "Kunming Reticulata" cultivars were quite group-inconstant, only one showing the Class IV type of distribution characterizing wild-form *C. reticulata.* This variation may provide additional support to the possibility that intra-sectional hybridization has been important in the developmental history of these "Kunming Reticulata" camellias. It is apparent from reference to the table of sclereid-distribution patterns that density of sclereids in blade tissue may vary independently of ploidy level.

It should be emphasized here that some observed comments relative to the diagnostic value of sclereid patterns are prematurely optimistic. This taxonomic tool may provide supplemental evidence of validity; but only rarely, as in the case of first-generation hybrids of parents with markedly dissimilar sclereid patterns, will this technique prove at all decisive. It was found that the degree of sclereid density not infrequently varied considerably among the leaves of any single taxon. As an example, the sclereid-distribution pattern among leaves collected from a single specimen of *C. reticulata* 'Capt. Rawes' ranged from Class I to Class IV; however, the predominant pattern among these leaves examined fell within Class II as shown.

Leaf Pigments:

The use of plant chemical constituents as an aid in defining the relationships between species is becoming a very useful taxonomic tool. Studies by a number of workers in this field (Alston and Turner, 1963; Bate-Smith, 1959; *et al.*) have demonstrated that genera, species, subspecies and other taxonomic categories can be distinguished from related taxa by their characteristic chemical components as well as by gross morphology. The concept of chemotaxonomy is by no means new, but only within recent years has the analytical methodology become available that could be practically applied in taxonomic studies. While classical chemical analysis yielded a great deal of information about the relationships between some groups of plants, as in the early studies on the essential oils of *Eucalyptus,* for the most part these techniques were too cumbersome to be of extensive value and application. The broad scope of analytic means currently making chemotaxonomy feasible is collectively termed "chromatography." In general, chromatography is the array of techniques by which very small quantities of complex mixtures of closely related chemicals can be separated readily into the component fractions. This type of complex mixture is precisely that encountered in plant tissues, as in the case of camellia leaves. There is growing indication that, as chromatographic techniques gain sophistication, chemotaxonomy will become the critical means of delimiting taxa and resolving phylogenetic problems. This will be particularly true where such studies are carefully integrated with the other taxonomic techniques available.

The high degree of gross similarity among the species within the taxonomic section presently under consideration, Camellia, was noted at the very outset of these studies. Only *C. japonica* can be readily distinguished from the cultivated group

under survey here, especially when the array of materials includes a broad spectrum of intra-sectional hybrids. Only gross relative size readily distinguishes the members of the *saluenensis - pitardii - reticulata* complex, and there is strong indication that more extensive wild collections would obscure that difference were they to become available. Certainly, the increasing numbers of intra-complex hybrids now being produced will obscure and confuse any discreet differences within the group. In an effort to determine some means of distinguishing species within the complex, if indeed there are valid specific distinctions at all, a preliminary chromatographic survey was made of the leaf pigments from seventeen camellias identified earlier in this paper.

The chromatographic techniques employed are briefly noted: current-year, mature leaves were macerated in methyl alcohol with a Waring Blender and the resulting solutions concentrated *in vacuo;* after filtration, the extracts were applied directly to large sheets of chromatographic filter paper; organic and aqueous developing reagents were used in the two-way paper separation; and estimates of concentration were made from absorption spectra of the individual pigments separated. For the need here, it is sufficient to point out that chromatographic separation distributes the individual pigments comprising the original leaf mixture over the filter paper; and this pigment array can then be studied by its component parts. After separation, the filter papers are examined with "black" (ultraviolet) light; and in a dark room under black light, the separated pigments appear as colored spots on the filter paper. It is according to this color under ultraviolet light that the polyphenolic pigments will be classified into two broad groups.

Pigments appearing as black spots under the ultraviolet light are flavonoids. These pigments appear yellow in daylight; and certain pigments in the flavonoid class are responsible for the yellow color of some flower petals, as in the case of snapdragon and cotton. The flavonoid pigments will be symbolized as "B" for black-under-ultraviolet-light pigments.

The second set of pigments observed on the filter papers under ultra-violet light appear as blue, blue-violet or blue-yellow fluorescent spots. The fluorescent pigments are usually chemically simpler than the flavonoids, and they impart no particular color to the plant organs in which they occur. This latter class of pigments will be symbolized as "F" for fluorescent-under-ultraviolet-light pigments.

The concentration of the flavonoid, or "B," pigments was estimated from the amount of light absorbed by the particular pigment extracts; this

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amount of light absorbed is proportional to the pigment concentration in solution. In the case of the fluorescent, or "F," pigments, it was merely noted whether the particular "F" spot was present or not in any of the leaf extracts studied. In those instances where the "F" spots from one or more of the leaf extracts examined were especially large, this occurrence was noted. Table II lists the results of this chromatographic study. Technical details of the study along with more extensive data will be eventually published.

Camellia leaves, as in leaves of all green plants, contain chlorophyllous and carotenoid pigments that are vital to plant growth; however, these particular pigments were ignored in the present survey. Leaves of the *Camellia* species analyzed were very rich in polyphenolic pigments. Note that twenty-seven pigments were found in all among the seventeen plants analyzed; in addition, there were other minor components present, but these have been omitted from consideration here for the sake of relative simplicity. Although the chemical com-

Table II - Leaf pigments of four Camellia species including the flavonoid (B) pigments and the fluorescent, polyphenolic (F) pigments.[7]

Species Analysed	Pigments and Concentration											
	B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-10	B-11	B-12
C. japonica	+	++			++		+++				+++	+
C. xwilliamsii	+	+			+		+++	+	++	+	++	+
C. saluenensis	+	++			+		+++	++	++	+	+	+
C. saluenensis 'Tourje Form'	+	++			+	+	+++	+	++	+	+	+
C. pitardii var. yunnanica	+	++	+	+	++	++	+++	+	+++	+	+	?
C. pitardii var. pitardii 'Descanso Form'	+	+	+	?	+	++	++	++	+++	+	+	+
C. reticulata "Wild Form"	?	+	++	?	?	++	++	+	+++	?	+	+
C. reticulata 'Capt. Rawes'	?	+	++	+	+	++	++	+	+++	+	+	?
C. reticulata "Kunming" Group	+	+	+	+	+	++	++	+	+++	+	+	+

7. In the case of the "B" components: "?" indicates pigment probably present, but in minute concentration; "+" indicates a low, but measurable concentration; "++" indicates intermediate concentration; while "+++" indicates high

plexity portrayed may be initially confusing, it is obvious that there is a large amount of variation available for study. This variation provides valuable information regarding the difference between these *Camellia* species. It may be noted from the table that *C. japonica* contains twelve of the twenty-seven pigments, while *C. saluenensis* contains sixteen or seventeen of the twenty-seven pigments present within the materials surveyed. The hexaploids among the group studied, *C. pitardii* and the *C. reticulata* taxa, are all chemically richer than the diploid representatives; these hexaploids contain twenty-two of the twenty-seven pigments recorded.

Since species-hybrids are usually intermediate between the parent species, chemically as well as morphologically, it is to be expected that the *C. xwilliamsii* cultivars are pigmentally intermediate between *C. japonica* and *C. saluenensis*. Such intermediacy is observed. While the hybrids show *saluenensis*-specific pigments predominating, but in reduced quantities, influence of *C. japonica* can be ob-

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Table II, Continued

Pigments and Concentration, Continued														
B-13	B-14	B-15	B-16	B-17	F-1	F-2	F-3	F-4	F-5	F-6	F-7	F-8	F-9	F-10
			+				o			o		oo	oo	o
			+	?						o	?	oo	oo	o
			+	+		o	?			o	o		o	o
			+			o	o			o	o			o
?	+	+			oo	o	o	o	o	o				o
+	+	+			oo	o	o	o	o	o				o
+	+	+			?	o	o	o	o	o				o
+	+	+			oo	o	o	o	o	o				o
+	+	+			oo	o	o	o	o	o				o

concentration. In the case of "F" components: "?" indicates pigment probably present, but in minute concentration; "o" indicates pigment conspicuously present; while "oo" indicates pigment occurring in conspicuously high concentration.

erved in the case of pigments "B-11," "F-8" and "F-9." In terms of subtle differences in pigment quantity between *C. xwilliamsii* and its parental species, the hybrids are quite intermediate; but this degree of detail and its significance will be presented in another discussion of relationships between *C. japonica* and *C. saluenensis*. It is noteworthy, however, that the component "B-7" in *C. japonica* probably has been largely introduced into that species from occasional hybridization with *C. saluenensis*. The pigment identified as "F-9" is a very large, prominent fluorescence strongly characteristic of *C. japonica*. It is probable that the occurrence of this pigment in all but the 'Tourje Form' of *C. saluenensis* is a result of "genetic contamination" by *C. japonica*. In deliberate efforts to preclude the effects of hybridization through man, "wild types" of camellias were selected where possible for analysis; however, it now appears that many, if not most, of the cultivated forms of *C. saluenensis* have been hybridized to a limited degree with *C. japonica* (Longley and Tourje, 1960). In fact, there is some evidence that such introgression has occurred, in turn, among "wild type" *C. japonica*. Since pigment analysis appears to provide reliable indication of limited and ancient hybridization, a study is now in progress to determine the extent of this introgression bidirectionally between *C. japonica* and *C. saluenensis*. This investigation has become possible with the recent availability of *C. japonica* collections free of contemporary influence from *C. saluenensis*, and with the Tourje introductions of *C. saluenensis* apparently showing no influence from *C. japonica*.

The pigment composition of the hexaploid camellias included within this study is marked by similarity among these taxa. This relative uniformity in the polyphenolic pigmentation of *C. pitardii* and *C. reticulata* supports the hypothesis that specific distinction here may be entirely artificial. Here again, however, there is indication that hybridization has complicated matters. The occurrence of pigment "B-6" in the Tourje introduction of *C. saluenensis*, the large amount of "B-7" present in *C. pitardii* var. *yunnanica* and other more subtle pigmentation differences suggest that there may have been a limited amount of hybridization between these two taxa. Such introgression would explain some of the difficulty and confusion in taxonomic identification of the Tourje introductions. In addition, the consideration was introduced that *C. reticulata* has been hybridized to a limited degree with *C. japonica*, but further analysis is necessary before any conclusions can be drawn.

In summary it should be emphasized that the taxa among this pigmentation survey fall into three chemical classes: *C. japonica*, *C. saluenen-*

sis and the hexaploids *(C. pitardii* and *C. reticulata)*. Even the confusion apparently resulting from limited hybridization between these taxa does not obscure the three basic *Camellia* types.

Species Interfertility:

Much information regarding the interrelationships of a group of species within a genus can be gained from observation of interfertility among the taxa involved. Data recorded upon the relative ease of hybrid-seed formation, the viability and fertility of second-generation progenies are all informative. While there is no "rule of thumb" that can be applied for determining the critical level of interfertility that distinguishes taxa, there are a few generalities worth noting. When hybrid seed form readily, the resultant hybrids are vigorous and fertile and a second generation is also vigorous and fertile, there is then some reason to doubt the validity of specific distinctions in the parental taxa involved. In cases where hybrids show relative sterility and second-generation progenies are weak, then there is reason to consider the taxa under consideration distinct at the species level. Since sterility can be the result of many different factors, an inability to produce hybrids or the rare occurrence of weak hybrids basically indicates only that the parental taxa involved are likely distinct and valid species. In many instances, crossability data are invaluable; but this evidence should never be considered to the exclusion of other sources of information regarding species relationships.

A diagram incorporating all crossability data available for the *Camellia* species under discussion in this paper has been prepared.[8]. The most well-known hybrids within this group are the *C. japonica* x *C. saluenensis* or *C. xwilliamsii* hybrids. These hy-

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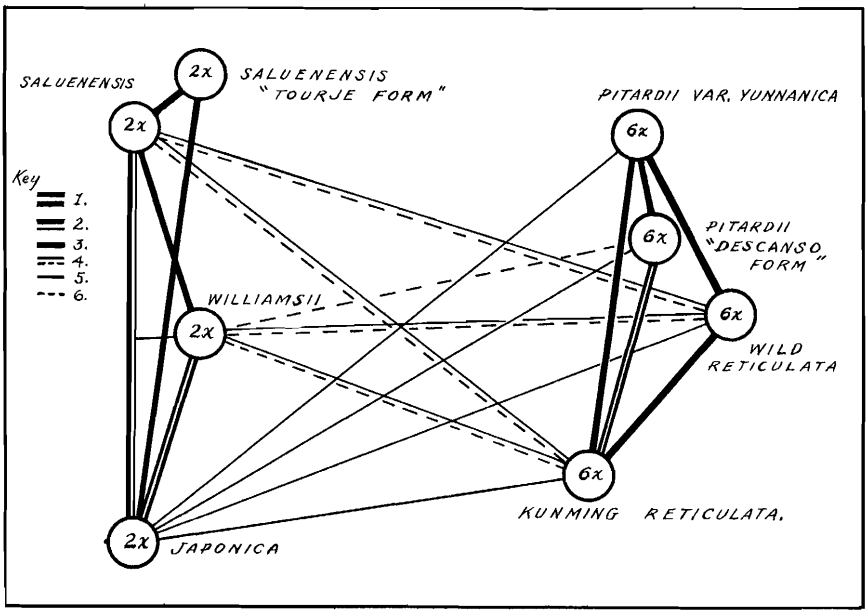
brids are readily produced and relative vigor is usually present; but considerable variation in fertility and some sterility are generally observed. In the second-generation progenies, growth response is quite variable with both vigorous and very weak plants being noted. In unpublished studies, however, it has been found that self-pollination in camellias is difficult to effect; and camellias "in captivity" tend to outcross selectively. An open-pollinated progeny from one *C. xwilliamsii* contained more weak and chlorotic members than is observed in open-pollinated progenies from *C. japonica* or *C. saluenensis;* and in another case, a relatively high percentage of the seed from one rather fertile *C. xwilliamsii* had aborted or were malformed. Although evidence from second-generation progenies is scanty, there is indication that some genetic "deterioration" is taking place. However closely related, all this provides additional weight to the recognition of *C. japonica* and *C. saluenensis* as clearly distinct species based upon morphological and geographical discontinuity.

One-year-old progenies from crosses between *C. saluenensis* and the "Tourje Pitardii," now identified as *C. saluenensis* 'Tourje Form', are extremely vigorous and uniform. Until second-generation material is available for observation, definite conclusions regarding the significance of this progeny cannot be made; however, the heterotic response now evident certainly supports the identification of this taxon as *C. saluenensis.*



1—Cross readily made; F_1 highly vigorous, fertile; F_2 variable but vigorous.
2—Cross readily made; F_1 highly vigorous, sometimes fertile; F_2 cross possible, vigor highly variable.
3—Cross readily made; F_1 highly vigorous; F_2 unknown.
4—Cross difficult; F_1 more or less vigorous; F_2 unknown.
5—Cross difficult; F_1 variable, often weak or inviable; F_2 unknown.
6—Cross difficult; F_1 vigor unknown; F_2 unknown.

[8]Vigor estimates of progenies expressed diagrammatically in this crossability ideogram are based entirely upon own-root materials.

Interfertility between the various hexaploids seems to be very high, necessarily taking into account the fact that non-single flowers usually are partially or completely female sterile. It can be seen from the crossability diagram that the combinations between the hexaploids that have been attempted were easily accomplished and the resulting hybrids are vigorous. Very little second-generation observations are available; but in two known instances, the hybrids are very fertile and produce vigorous offspring. There is no indication of genetic deterioration in the second generation. These limited data support the ever-growing conviction that *C. pitardii* and *C. reticulata*, as represented in cultivation currently, express themselves only as apparent taxonomic discontinuities because of too-restrictive "wild" collections from southwestern China; most likely when these taxa become fully understood, they will no longer be considered distinct from one another at the species level.

Crosses between the diploid and hexaploid members of the group under consideration have been a matter of disputed recognition over the past decade. It has recently become evident that such putative parentage is well within the range of accomplishment. While crosses between *C. japonica* and the hexaploids are about as difficult as are crosses between *C. saluenensis* and the hexaploids, the hybrids with *C. saluenensis* usually appear more vigorous than those with *C. japonica;* but exceptions to this general observation have been noted. Despite the fact that these interploid crosses have been recognized and made in numbers only within recent years, some reports are already available that these hybrids exhibit limited fertility. It has been recorded by Doak (1958) that hybrids of *C. reticulata* x *C. saluenensis* produced only few, often weak or inviable second-generation progeny. More observations and data are required, however, before definite conclusions regarding the fertility level of these interploid hybrids can be made.

It is most interesting to note that 'Barbara Hillier', an English putative hybrid of *C. japonica* x *C. reticulata*, has been determined as *C. heterophylla* (Hillier, 1955), recognized and named as a new species in 1937 from a single collection of cultivated material in a Yunnanese templeyard. Since this cultivar that Sealy has recognized as representing *C. heterophylla* is available at the Park Hill collections in Los Angeles, multi-approach taxonomic analysis can now be applied to the taxon for determination of its hybrid alliances. Should 'Barbara Hillier' prove to be, in fact, a hybrid of *C. japonica* and *C. reticulata*, then *C. heterophylla* becomes *C. xheterophylla* and represents the "hybrid-species" of *C. japonica* and *C. reticulata* — as *C. xwilliamsii* represents the "hybrid-species" of *C. japonica* and *C. saluenensis*. In addition, the Asper, Feathers, Jury and some other seedlings of this parentage would become cultivars of *C. xheterophylla*.

General Observations:

Despite the fact that this study was originally initiated simply as an exploratory effort to determine the availability of means by which the species and hybrids in cultivation from this taxonomic section, Camellia, might become distinguishable from one another or placed in their proper alliance, and despite the fact that "wild" collections are limitingly incomplete, some tentative conclusions can be made from the information gained. It was indicated early in the paper that statistical analyses were made on leaf shape, proportion and serration; in general, this approach showed that trends in the variation of leaf shape, at least, followed trends in variation portrayed by leaf-pigment analysis —

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with the notable exception that the "Kunming Reticulata" group displayed, in some respects, *japonica*-like leaf measurements. Since large variations in leaf shape occur in single-clone leaves, however, this line of investigation should not be discussed in detail until analyses of more extensive samples are available.

The most significant intra-taxon split that can be made within this section of *Camellia* is one based upon chromosome numbers. This distinction places *C. japonica* and *C. saluenensis* into a single, diploid group; it places *C. pitardii* and *C. reticulata* into the other, hexaploid group. Fertility relationships and the chromatographic analysis of leaf pigments quite clearly support this division, while the metric and sclereid analyses provide less-conclusive support. The striking deviation is the diploid-like sclereid patterns observed in all but one of the *C. reticulata* cultivars examined and the *japonica*-like leaf shape, not texture, present in some of these same hexaploid cultivars.

While the crossability relationships between the diploids *C. japonica* and *C. saluenensis* indicate these species to be closely related, the significant percentage of weak plants in the progenies of interspecific hybrids between these two parents provides additional evidence that they are validly considered distinct at the species level. While the similarity of leaf-sclereid patterns suggests close relationship between *C. japonica* and *C. saluenensis*, gross morphology shows many striking distinctions; and in addition, the metric and pigment analyses also indicate considerable distinction between the two taxa. Additionally strong evidence for the valid taxonomic distinction of these two species is provided in their natural range of geographical distribution, which never overlaps aside from human intervention in the form of introduced cultivated plants; the wild-range approach of these species apparently never exceeds the Formosa Straight and approximately five-hundred miles of eastern Chinese mainland. This factor of human intervention, contemporary and ancient, in the natural distribution patterns of *C. japonica* and *C. saluenensis* has been of major significance, however, as the genetic contamination noted in cultivated materials has been emphasized earlier. Characteristic for characteristic with few exceptions, the first-generation hybrids between these two species are intermediate with respect to the parental taxa.

Conversely, there are no such clear distinctions between *C. pitardii* and *C. reticulata*. The few existing progenies of interhexaploid hybrids between these taxa show high variability, but no obvious genetic breakdown is observed. The hexaploid camellias discussed in this paper all have a similar leaf-pigment composition. This same group also agree in leaf-dimension ratios, excepting obvious variations in gross size and the *japonica*-like ratios of some of the cultivated *C. reticulata*. The sclereid patterns of these same hexaploids differ from one another only in the quantity of sclereids in the leaf blade, again excepting those same cultivars which variously possess diploid-like sclereid patterns. Excepting these *C. reticulata* cultivars, which seem to express some degree of affinity to the diploids, the wild-like hexaploids are all disturbingly similar to one another — indeed, differing among themselves to a notable degree only in gross size and other tenuous features. There are many convincing reason to question the validity of considering *C. pitardii* and *C. reticulata* as distinct species. This particular study is being continued in efforts to determine the level of relationship between these two camellias.

It might be of interest here to mention another species in this taxo-

nomic section, *C. mairei*, including the varietal type and two additional varieties. Unfortunately, *C. mairei* or its varieties are not known to be in cultivation and, consequently, have been unavailable for detailed study. This taxon differs very little from *C. pitardii*. Its single major difference is one known to display single-gene inheritance within some species of other plant genera; and Sealy (1958) further points out that *C. mairei* is sometimes indistinguishable from *C. pitardii* when in fruit. In addition, *C. mairei* overlaps *C. pitardii* in at least part of its distribution range. It appears quite possible that a rather

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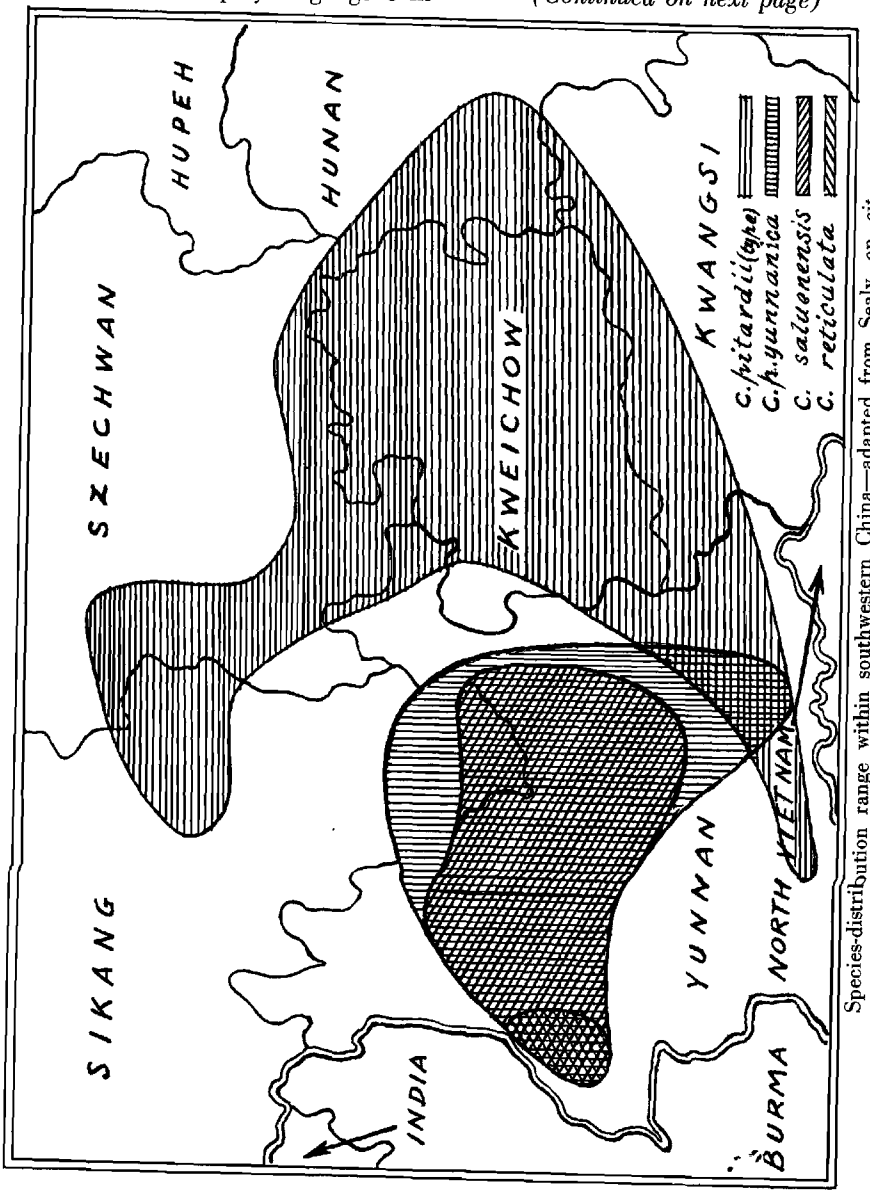

Species-distribution range within southwestern China—adapted from Sealy, *op. cit.*

widely distributed and variable hexaploid species, *C. pitardii*, has been split into several species as a result of very fragmentary collections from its range through southwestern China. The taxonomic discontinuity may only be apparent rather than actual. Variation in *C. pitardii* has been further misunderstood, perhaps, through effects of hybridization within cultivation in its native range. Could it be that *C. mairei* and its varieties are simply other, and discontinuous, collections of the variable *C. pitardii?*

Much of the fragmentary evidence available suggests that *C. reticulata* is a product of human selection. It is doubtful that this "species" ever occurs in the wild state except as relatively fertile escapes from cultivation, and then its distribution is extremely limited. The species type is a virtually sterile triploid, *C. reticulata* 'Capt. Rawes'. A *japonica*-like influence permeates all of the *C. reticulata* materials with respect to leaf ratios, while such an influence does not express itself in *C. pitardii*. With respect to sclereid patterns, some of the cultivars of the "Kunming Reticulata" group also show this influence. Subtle differences in the various leaf pigments suggest influence from the diploids. Only one of the cultivars of the "Kunming Reticulata" group shows reasonable high female-fertility; and this is 'Buddha', reputed to be a hybrid with *C. pitardii. Camellia heterophylla* was described from a plant growing in cultivation; and *C. heterophylla* has been determined by Sealy (1958) as nothing more than a *C. japonica* x *C. reticulata* hybrid. It is well to constantly keep in mind that *C. japonica* has long been grown in cultivation with *C. reticulata* and occurs as an escape also in extreme-western Yunnan. At Descanso Gardens in La Canada, an extensive planting of the wild-form *C. reticulata* surrounded by diploid cultivars occasionally produces open-pollinated seedlings that appear to have had a diploid pollen-parent. The tendency for outcrossing shown by this clonal population of *C. reticulata* probably increases the likelihood of such interploid crosses. Although interploid hybrids are highly sterile, there is much evidence that they occasionally produce good seed; and a few of these seedlings show some vigor. Considering the length of time camellias have been in cultivation in China, it has been long enough for diploid-hexaploid hybrids to introgress with hexaploid types. Such introgressed hexaploids would show basically a hexaploid type, but with some degree of the characteristics of the diploid — particularly, if man has selected and propagated more intermediate types. If this is the case, then original man-made selections of *C. pitardii* from the wild hybridized in cultivation with, presumably, *C. japonica.* In time these hybrids have become re-infused with *C. pitardii*, and a third horticultural type has evolved through human selection — namely, *C. reticulata.* Certain fertile forms of the cultivated *C. reticulata* selections have then, subsequently, escaped to the wild state and would explain *C. reticulata* forma *simplex*, or the so-called "Wild Form." Thus, *C. reticulata* would be an introgressed form of *C. pitardii*, developed in cultivation; and thus, in its species composition *C. reticulata* would be largely *C. pitardii* but fractionally introgressed with *C. japonica.* Considering the high interfertility between *C. pitardii* and *C. reticulata*, it is difficult to envision how else this could occur; and certainly, all other considerations point to just such an explanation.

What of the hexaploids themselves? How could this condition have arisen? The fact that the chromosomes of the triploid *C. reticulata* 'Capt. Rawes' do not pair at meiosis (Longley and Tourje, 1960) is indication that the hexaploids *as a group* are hybrid-

species. If these hexaploid types are hybrids, what species could have hybridized then to form these hybrid-species? No direct evidence is presently available; but there are some indirect sources of information. It can be noted from the leaf-pigment data that *C. saluenensis* has few pigments that are not encountered in the hexaploids; while the two major components of *C. japonica* are not found in the hexaploids, except as possible traces in some of the *C. reticulata* cultivars. If one or both of the diploids in this section, Camellia, are parent species of the hexaploids, then the diploids would not be expected to carry high quantities of pigments which the hexaploids do not have. *Camellia saluenensis* fits this criterion, while *C. japonica* does not. Morphologically, *C. saluenensis* is much more similar to the hexaploids than is *C. japonica*. Hybrids between the two diploid species are not particularly similar to the hexaploids and argue against *C. xwilliamsii* as a path to this possible hybrid derivation. In terms of the scanty data presently available, *C. saluenensis* seems to be a promising candidate — while *C. japonica* is not — for one of the parents of the hexaploids. This parentage would partially explain the frustrating gross similarity between *C. saluenensis* and *C. pitardii*.

After surveying the morphological and geographical characteristics of a number of potentially allied *Camellia* species, an interesting apparent correlation can be noted. A hypothetical hybrid between *C. saluenensis* and one or more species (probably *C. yunnanensis* or *C. henryana*) from a near-related section, § Heterogenea, quite possibly might approach *C. pitardii* rather closely. Speculatively, there is much in this to consider: many morphological features in common, largely overlapping distribution ranges and the suggestion of a cytological fit. It is noteworthy that the single sectional representative of Heterogenea, currently and only recently, in cultivation is *C. granthamiana* — a tetraploid. Although there is some reservation with respect to the placing of *C. granthamiana* in section Heterogenea, and also this species is not as good a morphological fit for a parent of the hexaploids as are *C. henryana* and particularly *C. yunnanensis*, yet tetraploidy in *C. granthamiana* leaves the possibility open for similar tetraploidy in other parts of the section Heterogenea. A diploid X tetraploid cross would fit the pattern for hexaploid development. Tetraploidy has been reported elsewhere in the genus only rarely to date, and all of these instances but two are of probable synthetic-hybrid derivation. The potentially interesting hybrid between *C. saluenensis* and *C. granthamiana* can be made without difficulty, since both of these species make intersectional hybrids. Since it has been postulated that *C. pitardii* is the stock from which *C. reticulata* was largely selected, then a model for the evolution of these hexaploids becomes apparent — for proof or disproof. It might be noted that currently-available materials with proper analysis will strongly support or greatly attenuate the possibility of *C. saluenensis* parentage being basic for the related hexaploids.

Considering the data here presented and discussed, and the observations introduced, it is possible to diagram a tentative evolutionary scheme for the species discussed in this paper. It must be pointed out that this scheme is highly speculative, and formalized only to stimulate thought — not memory.

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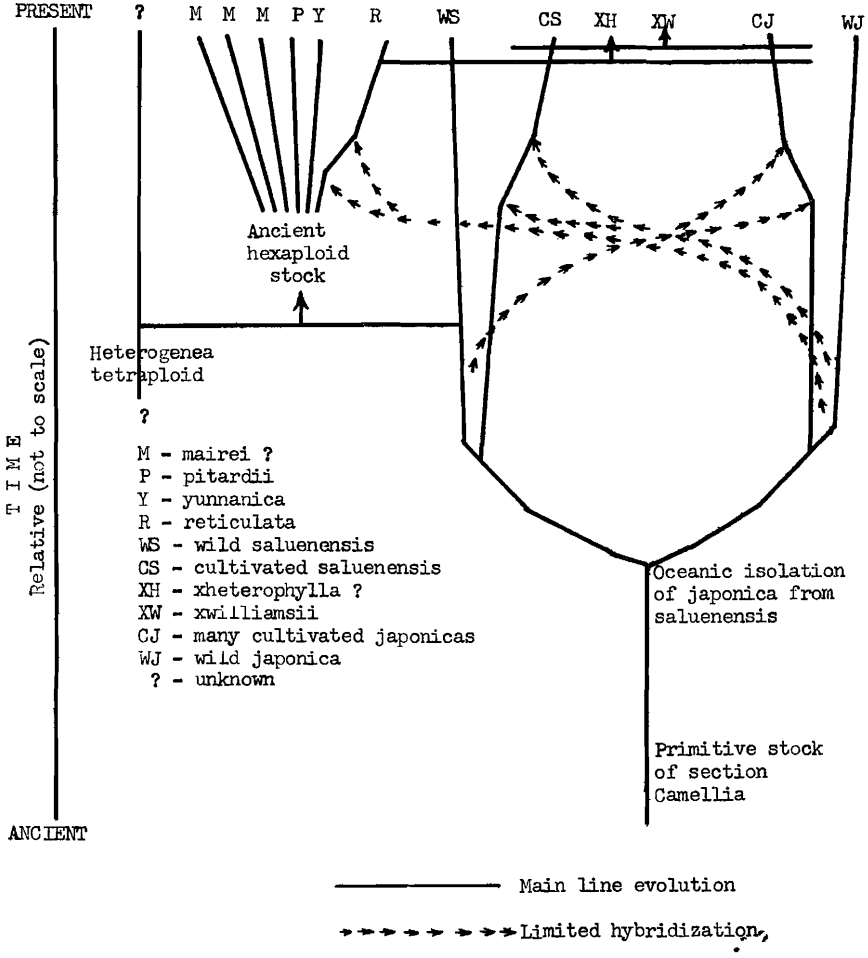

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FEMININE PROTAGONISTS

(Continued)

tralia, we salute, along with Kay Fairley, those "assistant growers" who water all summer whilst father is at work, weed when things get too bad, stand around (at show time) from 4 a.m. with boxes to place blooms in, find all the right places on the show tables for each bloom, and then watch rather than take credit when the prizes come up. To these stalwarts, the really wonderful ladies of the camellia world, three cheers!

IN THE INTEREST *(Continued)*

This writer would advocate adoption of the following scale of point awards for all camellia shows:

Form	20%
Color and Markings	20
Size	20
Freshness and Substance	20
Condition	15
Foliage	5

No deviation from this scale would be permitted except that the Chairman of Judges may charge them to make allowance for unfavorable weather conditions preceding the show, as to condition only. A further suggestion might be that any blue ribbon flower must score say 85 points under *any* conditions. This suggestion arises from the feeling that the distinction of winning a blue ribbon is becoming rather dulled due to the unwarranted generosity of the judges in awarding some blooms that would not score over 75 points overall (if that much) top honors in their class.

In connection with the foregoing, the writer would define these new terms thusly:

Freshness and Substance — the *youth and vitality* of the flower as exemplified by the firm quality and brightness of petals, stamens, pollen and sepals, to the utmost degree consistent with the inherent character of the variety.

Condition — the cleanliness of the bloom based solely upon the extent to which it is free from any physical damage — freedom from blemishes. (No flower with *any* visible blemish shall score the full 15 points.)

RULES FOR FLOWER COMPETITION AT S. C. C. S. MEETINGS

Robert F. Dickson, Jr., Chairman

In order to increase the pleasure that we all have at the competition on meeting nights, we have made some changes in the rules.

The principle changes are the addition of class VIII and the elimination of the small collector's trophy. A definition of special culture blooms seems to be in order. Special culture blooms are: blooms from plants grown under solid cover or from plants treated with a material causing blooms that are abnormal in blooming period, size, substance, or any combination of these.

The rules for this year's competition are as follows:

Classes

I	Japonica—large and very large
II	Japonica—small and medium
III	Japonica—miniature
IV	Reticulata
V	Sasanqua
VI	Other species
VII	Hybrids
VIII	Special culture blooms

Class VIII will be divided by species and otherwise as necessary to accommodate entries in the class.

Rules

1. Flowers will be placed in the correct class according to the edition of CAMELLIA NOMENCLATURE that is current on the date of the meeting. (1962 edition before and 1964 edition after January 1, 1964)

2. Each member and guest may place as many flowers as he wishes; however, he is limited to one award per variety.

3. Awards will be limited and will be based on the number of flowers displayed in each class. The total available will be as follows:

5 or less flowers—	none
6-10 flowers—	1
11-15 flowers—	2
16-25 flowers—	3
Over 25 flowers—	5

4. A flower will be judged against the standard for the variety and the awards given will be based on this standard. If in the opinion of the judges no flower displayed in a class warrants an award, none will be given.

5. Awards available and point values are as follows:

1st place— Blue ribbon	5 points
2nd place— Red ribbon	4 points
3rd place— White ribbon	3 points
4th place— Yellow ribbon	2 points
5th place— Green ribbon	1 point

6. The total points awarded to each member and guest at each meeting will be accumulated for the 1963-64 year. The top three winners of Class I to VII will be awarded trophies at the April 1964 meeting. One trophy will be awarded, to the winner, in Class VIII.

S C C S Members who have paid their 1964 dues will receive the 1964 edition of "Camellia Nomenclature" early in December 1963. Others will receive it as they pay their dues.

1964 CALIFORNIA CAMELLIA SHOW SCHEDULE

Date	Society	Show Location	Registration Chrm.
Feb. 8-9	San Diego Camellia Society	Conference Bldg., Balboa Park, San Diego	Mrs. Evelyn Henry P.O. Box 522 Chula Vista
Feb. 15-16	Pomona Valley Camellia Society	California Bank, 321 E. Holt Ave., Pomona	Bancroft Benner, Jr. 170 N. Monte Vista Ave. San Dimas
Feb. 15-16	Peninsula Camellia Society	Hillsdale Community Room, 48 Hillsdale Blvd., San Mateo	E. P. Tenney 1903 Oak Knoll Dr. Belmont
Feb. 22-23	Temple City Camellia Society	Lecture Hall, L. A. County Arboretum, Arcadia	Ernest Pieri 601 E. Elm St. San Gabriel
Feb. 23	Camellia Society of Santa Clara	Civic Auditorium, San Jose	Show is non-competitive
Feb. 29-Mar. 1	Los Angeles Camellia Council	Descanso Gardens, La Canada	Karl E. Blank 1211 N. Edgemont Los Angeles 27
Feb. 29-Mar. 1	Northern California Camellia Society	Diablo Valley College, Colf Club Rd., Pleasant Hills	Ernest M. Parmiani 3786 Raap Martinez
Mar. 7-8	Camellia Society of Kern County	San Joaquin Tractor Bldg., Bakersfield	Charlotte Johnson 1902 Niles St. Bakersfield
Mar. 7-8	Camellia Society of Sacramento	Memorial Auditorium, 15th & J Streets, Sacramento	Mrs. J. Carroll Reiners 6160 S. Land Park Dr. Sacramento 31
Mar. 8	Central California Camellia Society	McLane High School, 2727 N. Cedar, Fresno	John Juergens 625 E. Brown Fresno
Mar. 14-15	Modesto Camellia Society	Modesto Junior College Library, Modesto	Mrs. A. R. Silver 337 Severin Ave. Modesto

NOTES ON THE AFTER CARE OF GRAFTED PLANTS

Tom Parramore
Wahroonga, New South Wales, Australia

Editor's Note: After I had included an article on grafting in my tentative outline of subjects for this issue of CAMELLIA REVIEW, I again read Mr. Parramore's article in the March 1962 issue of CAMELLIA NEWS, the publication of the Australian Camellia Research Society. It covered the subject in mind so completely that I decided to reprint this article rather than to induce someone in the United States to write on the subject.

There are innumerable articles on the grafting of camellias and it is not difficult to learn how to do the actual job in a way that can succeed. Failures are usually put down to the beginners lack of skill or to "mould." However, if the learner follows a few basic rules his inexperience need not result in misses, and losses due to fungi can in practice be minimized. It is a fact, I think, that after-care of the grafted plants has a greater bearing on the success or failure of the operation than does the skill with which the actual graft is carried out.

Before describing how to care for your grafted plants there are a few points related to the grafting procedure that have a bearing on the success of the operation and these are outlined first:

The Stock: Dr. H. H. Hume does not approve of the term "understock"; being always underneath, the "under" is redundant. Whatever you like to call it, the stock is important for the long-term success of the graft. This will be the root system of your plant and there is no such thing as a healthy plant which does not have a healthy and vigorous root system. Ideally the stock should have been grown especially for the purpose, should not have been pot-bound at any stage of its growth, should have a well established root, should be growing in free-draining fertile soil which is free of noxious weeds (oxalis, nut grass, onion weed, etc.) and free of pests such as nematodes, grubs, etc. and free of pathogens such as root-rotting fungi. (How to prepare such a soil mix is a story which must be told another time.) In practice, vigorous sasanqua seedlings (not all seedlings are vigorous) grown on quickly in 1 gallon tins make excellent stocks. Most species, including the reticulatas, take well on sasanqua stocks. Sasanquas have vigorous root systems which are resistant to disease and, being seedlings, they should be free of virus which could cause bloching of self-coloured varieties grafted onto them. A stem of pencil thickness is sufficient.

Collection and care of scion material: The scion is the piece of the required variety which is to be grafted onto the stock. The sooner the graft is done after the scion has been removed from the parent tree the greater the chance of success. Take a young vigorous shoot (as soon as the bark turns brown is mature enough) at least four or five feet from the ground. This is more likely to be free of fungus. Soil which has been splashed from the ground can contaminate a scion growing low on the plant. If any time is to elapse before grafting, moisten the scions, place them in a clean polythene bag and keep them cool. When several varieties are taken the name may be written on the underside of the leaf with a ball point pen to avoid confusion. Never rely on memory.

Treatment of stock and scion with fungicide before grafting. It has been shown that dipping the scions into a fungicide reduces the number of failures.* Captan (1 level teaspoon per pint of water) is a suitable fungicide and the scions may be soaked for half a minute or so. The stem of the stock above and below the

point of severance should also be well cleaned with a piece of cotton wool dipped into the Captan solution, a fresh piece of cotton wool being used each time.

Making the graft. It is generally agreed that the cleft graft is the best type to use under our conditions. The scion may vary from a small wedge of stem with one eye and a leaf at the top to a piece of stem six inches long with up to four leaves on it. The point of major importance is that the cambial regions of stock and scion should be in contact as much as possible. The cambium is a microscopic layer of cells located between the bark and the wood. Allow for the generally thicker bark of the stock in lining up the cambium layers. Sealing the graft is not necessary and is often undesirable. Tying is unnecessary with thicker stocks. With these, the pressure of the wood tends to close the cleft and this is sufficient to hold the scion firmly in place. Tying material should not cover more of the cleft than necessary as fungus can be active under sealing and/or tying materials.

Covering the graft. Having completed the graft, cover it with a *clean* glass jar or tent of polythene. The jar is better as it is easily removed to inspect the graft and then replaced. The tent of plastic film is more difficult to remove and you can't admire your graft through the plastic due to the heavy condensation of moisture which always occurs. A layer of clean sand over the soil of the stock is a possible refinement, as a sanitary measure. Water the sand with some of the Captan solution.

Exposure of the grafted plants to light. The amount of light is very important, I think. Avoid all direct sunlight. In a glass-house with light shading it would be desirable to cover the newly grafted plants for a few weeks with a layer of newspaper or hessian. For the home grower, a position on the shady side of the house (even under four foot eaves) is excellent. Make sure the late afternoon sun does not shine on the chosen position in summer. Additional shade from trees might be undesirable. In other words, out of any direct sun but with plenty of sky works well in practice.

Watering. Some experts keep their plants very dry, others water copiously even to the extent of keeping plants under constant mist. Of these practices, withholding moisture seems to me to be less desirable. It is admitted that root-rotting fungi are encouraged by excess moisture, but only when these fungi are present. The mist treatment is very effective in place of a covering of glass or polythene. In each case the aim is to prevent the leaves from falling off before the graft takes. In practice I

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find that keeping the soil just moist with a light watering once or twice a week works very well. The amount of water will depend upon the weather and the season. It should be remembered that the roots of a newly grafted plant remove very little water from the soil because most or all of the leaves have been cut off. Place the grafted plant, container and all, in a polythene bag and no water at all should be necessary. I like to see plenty of shoots coming from adventitious buds on sasanqua stocks. These shoots are easily nipped back if they become too vigorous and are removed gradually as the scion commences to grow. This may not occur until the following spring in the case of summer and winter grafts. In all cases the aim should be to keep the roots of the stock in good condition. These roots will not necessarily die when the top of the stock is removed but neither will they make much growth. (N.B. I have not had any casualties due to bleeding from the cut on the severed stock and I doubt if this is an important point.)

Pests: Defoliation of the scion caused by mite or thrips damage commonly results in loss of the graft. Re-work the same stock and see that it does not happen again. Scale is undesirable, but less serious. If in doubt, the appropriate action is to spray the parent tree before taking the scion.

Prevention of mould: Some growers like to remove the jars or other covering for a few minutes each day to allow the insides to dry as a precaution against the development of moulds. I don't bother to do this but make regular inspections. At the first sign of infection action must be taken; but what action? In one urgent case (a scion of one of the Kunming reticulatas) nothing seemed to check the fungus until I swabbed the bark of the scion with methylated spirit and evaporated it by blowing on it. I had no further trouble and noticed that the spirit did not appear to damage the newly forming callus.

Removing the tie: When the union between the stock and scion has partly callused it is generally safe to remove the tying material. The dangers in leaving it on are the possible development of fungus underneath materials such as waxed tape or electricians insulating tape (both otherwise excellent) and, more rarely, girdling of a rapidly expanding stock by strong waxed twine. If in doubt, the typing material may be removed and replaced less tightly.

Removal of glass cover. It does not appear to be harmful to leave this on for some time unless, of course, the scion is growing up against the top of the jar. Jars may be gradually lifted by placing something under the edge to admit some air or removed for an increased time each day. It is quite satisfactory, however, to remove the jars entirely as soon as the scion had made a few inches of growth. Watch during the first few days for any signs of wilting. This occurs very occasionally and when it does the covers should be replaced immediately and then removed gradually over a period.

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New 1964 edition of CAMELLIA NOMENCLATURE will be off the press in early December and will be sent promptly to all S. C. C. S. members who have paid 1964 dues.

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* American Camellia Society Yearbook 1956, p 74: "The Use of Fungicides in Camellia Grafting." A. G. Plakidas and Louis Anzalone.

TRANSPLANTING CAMELLIAS

Alvin L. Gunn
Lynwood, California

The transplanting of container grown plants into other containers or into the ground can be done any time of the year. There are many indications that a plant should be transplanted. If the leaves have small brown spots on the outer edges, or the tips of the leaves dry up, this is usually an indicttion that the soil isn't porous enough, and has built up an accumulation of salts from the water or from fertilizers. This accumulation burns the tips of the feeder roots. Poor color of the leaves or weak growth and the loss of foliage in the center of the plant indicates the plant is root bound, or the soil isn't good. This may happen to a plant which is in too large a container for the roots. A plant which dries out rapidly may have used up all the soil, and be root bound. A container which is rusted out and full of holes will ruin a good plant. Many collectors will re-pot all new plants that they obtain so that all soil is consistent for watering and fertilizing.

An easy way to remove the roots from the can is to hit the can on all sides with a mallet. This will usually loosen the roots enough to pull the can off. If the roots look healthy with lots of white feeder roots, shake the roots or hit the root ball with the hands to loosen the soil around the roots. If the ball is a solid mass of brown roots or the roots do not look healthy, it is wise to bare root the plant. Wash all of the soil from the roots with a course spray, then with a sharp knife and clippers cut off any rusted parts of the can which have stuck to the roots.

The size of the root ball will dictate the size of container it is to be put into. The ideal movement of camellias is from the 4″ pot or quart can to a "1" gallon, then to the "2" gallon, then into the egg can, etc. A healthy vigorous plant should be moved about every two years.

Now the soil the plant is to grow in. There are many different types of soil mixes that can be used, but it is hard to beat the old stand by of two parts sandy loam, two parts peat moss and one part coarse sand. This will give a porous mix which will grow healthy plants.

Plan the planting of the plant so there is not more than two inches from the top of the roots to the top of the container. The soil should be moist before starting. Pack the soil firmly around the roots so that there aren't any air pockets. Flood the plant three or four times to make sure the soil is wet and firmly settled. The top roots of the plant should not have more than a quarter of an inch of soil on them regardless of the depth the plant may have been planted.

This is an excellent time to prune away any dead branches or any branches which cross through the center of the plant. Cut back any weak or spindly growth. Take off any of the flower buds which will not be able to open normally. It is not necessary to prune a container grown plant heavily, because of transplanting. A daily wetting of the leaves is beneficial to all camellias and particularly a newly transplanted one. Water the plant only when it needs it with an occasional double watering to flood out the accumulated salts. If the roots over balance the foliage, such as in a new graft, over watering can cause the roots to rot, and the new foliage to drop.

(Continued on next page)

Do not fertilize the bare rooted plant for at least three months, and then only lightly the first time. After the first feeding any of the prescribed feeding schedules would be good. A couple of applications of Vitamin "B" at monthly intervals is said to be beneficial.

Watch the plant to see that there isn't any major foliage drop or loss of color in the foliage. If this happens, prune away ⅓ of the plant, and put the plant where no sun will be on it until it is established. Do not worry about new growth drooping on a warm day if the soil is moist and the new growth is back to normal the next morning.

There are several steps which are different in transplanting a ground grown plant. The first of course is the time of year a plant should be taken out of the ground and replanted elsewhere. In Southern California the plants are dormant from November through February. The best time to transplant is after the summer growth has hardened, as the plant has a few months to get used to the new area before it starts to grow in March or April. If the plant is large and it is known months ahead it is to be moved, allow for a good sized root ball and dig a two inch trench a foot or two deep around one quarter of the plant. If the time is available, do a quarter of the plant at two month intervals. If the plant is more than five and one half or six feet tall, the roots should probably be boxed and moved by a professional or a person experienced in moving camellias.

When the time comes to move the plant have everything ready. Dig the new hole to the approximate size needed. Have the soil mixture damp and available to pack around the roots. The mixture should be the same as described for container plants. Obtain a piece of heavy plastic or burlap about four feet square. Mark a heavy line around the dampened plant to indicate the size of the root ball. Start digging a trench at least a foot and a half wide on the outside perimeter of the root ball. The size of the root ball can often be cut smaller on one or more sides if there aren't many surface roots. Usually the main roots of a camellia are confined in the top foot and one-half to two feet of soil, except in the case of a seedling with a tap root. If the plant could be a seedling, it should be tunneled underneath to determine if there are tap roots. If there are one or more tap roots they should be severed, and a piece cut out of them so there is not a possibility of them growing back together. The tap roots should be cut six months to a year ahead of transplanting.

If there is any grafting to be done to have the variety, cut the scions while they are fresh, don't wait until the plant looks lifeless. If there is

considerable foliage drop or loss of sheen or color in the leaves, prune drastically and protect the plant from the sun. The seedling with the tap roots cut months ahead of time is then treated the same as any other camellia to be transplanted. Dig away the soil under the main part of the roots, then dig out most of the soil until the plant is standing on a pillar. Take the piece of heavy plastic or burlap and roll up two feet of it on one side placing the roll next to the pillar. Scoop out enough soil to weaken the pillar until the plant can be tipped over onto the plastic. Pull the rolled part of the plastic under the root ball and up the opposite side. One person on either side of the plant can lift or slide the plant out of the hole by holding the four corners of the plastic. Do not push or pull the trunk of the plant, as this can break the root ball. If the plant has to be moved a considerable distance or cannot be planted immediately, pack wet peat moss or wood shavings around the root ball and pull the plastic up tight around the ball and tie it to the trunk of the plant with heavy twine. Leave the plant cradled or tied in the plastic until the plant is lowered into the new hole and the correct depth is determined. Plant a couple of inches higher than the surrounding area, as a heavy plant will usually settle somewhat. The plastic must be removed before packing soil around the roots. If burlap is used, do not remove it, just untie it from around the trunk of the plant as it will soon rot away.

If it was necessary to cut off considerable roots from the plant, the foliage should be trimmed heavily. This can be done by cutting off a few inches from each branch, taking off the top foot or so and a general cutting out of weak or spindly growth. Do not fertilize or spray with insecticides for at least six months, and only then if the plant has not shown any set back.

The care of transplanted camellias is basically the same for ground or container grown plants.

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"Camellia Nomenclature" 1964 Edition Will Be Ready in December

As announced in last month's issue of CAMELLIA REVIEW, the new 1964 edition of CAMELLIA NOMENCLATURE will be ready for mailing early next month (December). All S. C. C. S. members who have paid their 1964 dues will receive the book as promptly as possible after the supply is received from the printer. Other S. C. C. S. members will receive the book as they pay their dues.

The new edition has several features which will be attractive to its users. It will be up-to-the-minute insofar as new varieties are concerned. It will contain for all varieties, to the extent that the information has been obtainable, the date and location of origin and the name of the originator. Of advantage to the frequent user of the book, the binding has been improved. This has necessitated the use of a heavier cover stock and an improved method of binding. There will be nine color pictures of new camellias, including the cover, compared with seven in the 1962 edition.

The larger book, the improvement in binding and higher prices since two years ago have made it necessary to increase prices. Purchases in quantities of less than twelve will be at the rate of $2.25 per copy, compared with $1.75 per copy for the 1962 edition. Purchases in quantity lots (12 and over) will be at the rate of $1.70 per copy. Members of S. C. C. S. of course receive the book as a part of their membership in the Southern California Camellia Society.

SASANQUAS ARE VERSATILE

While japonicas and reticulatas will always catch the eye with most people insofar as the blooms are concerned, both on the exhibit table and on the plant, they do not have the flexibility of use in the garden that is found in sasanquas. In fact, the bloom is of secondary importance, even though desirable, when sasanquas are used as background material in the garden. In such cases foliage is the important thing, and sasanqua foliage is unsurpassed with respect to brightness, texture and the ease with which it can be trained to cover a fence or wall. Since the flower is not the most important thing, some people have used their own seedlings in the interest of saving a few dollars, selecting the seedling plants that have acceptable flowers, the brightest foliage and have started to grow in the desired manner.

While the sasanqua is probably best suited for training on a wall or fence, this does not preclude its use as a specimen plant in the ground or in a container. Some varieties seem to grow naturally into specimen plants. The accompanying picture of 'Interlude' illustrates the use of a sasanqua as a specimen plant. 'Little Gem' likes to grow straight up rather than espaliered. New sasanqua varieties are being introduced in which the flowers have more substance and do not fall apart so easily. It is suggested that when there is need for foliage in the yard, thought be given to the use of sasanquas rather than to some other plant that has neither flower nor the bright green year around foliage.

These sasanqua plants on the wall provide green background for the japonicas and reticulatas under lath. Seedling plants with acceptable flowers and bright leaves were selected from seedlings grown primarily for grafting stock.

Sasanquas make an ideal covering for lattice fences that separate yards.

Upright growing sasanquas that hold their blooms, such as 'Interlude' shown in this picture, can be used where japonicas are ordinarily planted in the landscaping.

Temple City Society

The Temple City Camellia Society will hold its initial meeting of the 1963-1964 year in the Lecture Hall of the Los Angeles County Arboretum at 8:00 P.M., Friday, November 29.

The guest speaker of the evening will be Dr. William E. Stewart, Director, County of Los Angeles, Dept. of Arboreta and Botanic Gardens, whose topic will be "Program and Activities of the Los Angeles Arboreta and Botanic Gardens."

Due to the interest shown last year in Dr. Stewart's illustrated talk on his trip to Africa, and in view of many requests to have him speak again, the Society was fortunate in procuring Dr. Stewart as the first speaker of the year. Dr. Stewart and his staff have long been friends of and associated with the various Southern California Camellia Societies. The Temple City Society extends a cordial invitation to the membership of these Societies and their friends to be present at this meeting.

The usual flower show will be held in conjunction with the meeting and flowers may be placed on the tables at 7:30 P.M.

WHAT TO DO *(Continued)*

each date). It takes six to eight weeks for results, which will get them ready for the winter meetings and shows. I don't intend to treat more than one-half of the buds on any plant, with the exception of our late bloomers like 'Te Deum', 'Glen 40', 'Purity', et cetera, which will be "gibbed" 100% before December 1; also, at least one-half of whatever buds I find on new seedlings — so these can be catalogued for saving or grafting at the earliest possible time.

Correction on Origin of 'Mona Monique'

I received in the mail just as this issue of CAMELLIA REVIEW went to press two letters correcting a statement made in the October 1963 issue to the effect that the new variety 'Mona Monique' originated in the garden of Ralph Peer in Hollywood. J. Norwood Hastie, Jr. of Magnolia Gardens in South Carolina and Frank Griffin, editor of the magazine CAMELLIAN, have informed me that this camellia originated in Japan and was "discovered" there by Mr. Eikichi Satomi. This statement is confirmed in the new 1964 edition of CAMELLIA NOMENCLATURE which is now being printed. I hasten to correct the misstatement in the October issue.

H. E. D.

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: Paul McClelland; Secretary: Mrs. George T. Butler, 1121 Orange, Santa Ana.
Meetings held first Tuesday of month, October through April, in Orange County Farm Buerau Building, 1916 W. Chapman, Orange.

Central California Camellia Society.....Fresno
President: Mert Weymouth; Secretary: Mrs. Karen Ahrens, 1144 Saginaw, Fresno 4.
Meetings held at Heaton School, Del Mar Ave., Fresno on Nov. 20, Dec. 18, Jan. 22, Feb. 26, Mar. 25.

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; Secretary: Mrs. Soby Yamamoto, 1081 Weber St., Pomona.
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. J. O. Henry, P.O. Box 522, Chula Vista.
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: A. Wilkins Garner; 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. Peter Folino, 708 W. Pepper Dr., Arcadia.
Meetings held Friday, November 29th and thereafter December thru March on 4th Thursday in Lecture Hall of L.A. County Arboretum, 301 N. Baldwin Ave., Arcadia.

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