

THE *Camellia*  
REVIEW

A Publication of the Southern California Camellia Society



'Yule Tide'

Courtesy Nuccio's Nurseries

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One Dollar

# *Southern California Camellia Society Inc.*

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

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

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

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## THE COVER FLOWER

'Yule Tide', the Cover Flower, is a brilliant orange-red single sasanqua that blooms on a very bushy upright plant. Foliage is dark green. Nuccio's Nurseries introduced it with the expectation that it would be popular for landscaping, and their expectations have been realized. They built up a large stock before releasing it and at the end of the season had nothing left except gallon can sizes. Blooming time is October through December. . .

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This is the rambling thoughts of a man who through no wilful action of his own won a "Best Seedling" award in a camellia show. Some years ago I picked two seed pods from my 'Confucius' plant. The bees had done all the work of pollinating. I germinated the several seeds and started the process of watering, watering. Some of them had buds this year for the first time. Two produced beautiful flowers. One, with two buds on the plant, had a five inch formal flower with bud center. The other, with a single bud, had a stylish flower a little over five inches in diameter and three inches high. The color of both was about the same — a definite mauve pink.

Fortunately for me, the second formal flower was just ready for picking on the morning of the Descanso Gardens camellia show, so I picked it and took it to the show. To show how important the element of chance is in this blue ribbon competition, I would not have had a fully open bloom if the show had been one day earlier. Much to my surprise, not because it wasn't a good flower but because one doesn't ordinarily expect such things, it was awarded "Best Seedling Reticulata".

Now, after two paragraphs, I get to the point. People asked me "what will you name it," "will you name it after your wife," etc? I have answered that I shall not name it, that as a matter of fact I do not yet know if it will be worth naming. I hope that it will be worth a name but shall not know for at least two years. First, I want to see next year's blooms on the parent plant. Second, I grafted all that I thought the plant would stand in the way of scions taken without sacrificing next year's buds. I do not expect to see any blooms on these grafted plants for at least two years and I may need a third year to see the blooms on which I would want to pass judgment.

We shall never run out of good names for new camellias, consequently there need be no hurry to attach a name to a new seedling. The trouble has been that too many good names have been assigned prematurely, before the flower has been tested by years of growth. I think that such testing should include seeing how the flowers look on grafted plants. If the blooms on my seedling #51 look as good in 1967 as they did in 1965, I shall start to look for a name. I also made grafts of the other seedling that had only one bud, #53, and I hope that in 1967 I shall be looking for two names. Meanwhile, all I now want is that #53 has a flower open just in time that I may enter it in the 1966 Descanso Gardens show. It's thrilling to win a "Best Seedling" award even though the bees have done all the work of pollinating.

*Harold E. Oyler*

# SOME P's AND Q's OF CAMELLIA CULTURE

Douglas G. Thompson  
Los Angeles, California

*Outline of Talk by Mr. Thompson to Members  
of Los Angeles Camellia Society*

Growing camellias for competition blooms is a year-round job. We must mind our P's all year to have our Q's at the end. By applying the P of *Patience* we anticipate the Q of *Quality*.

We want *Plants* which when we:

1. *Prepare* them in Spring,
  2. *Protect* them during Summer,
  3. *Pamper* them through the Fall,
- will *Produce Quality in Quantity* in Winter!

Let us discuss our P's and next year judge our Q's.

First, a word about the *Plant*. There are *Performers* that *Please*. They appear on the show tables year after year. But there are also the *Prodigals* that *Provoke, Prima donnas, Poopouts*.

**Rule I — Plant Producers — Pitch out Prodigals!**

We should listen to all the experts and then evaluate for ourselves. The final proof of any variety for me must be in my garden — in my micro-weather. Blooms of *Producers* open well and hang on. They stay fresh and retain substance and texture when cut. They do well during most seasons. Blooms of *Prodigals* droop, wilt, blast, bullnose, are temperamentally unsuited to my weather and, even when they open correctly, lack size, substance and texture.

*1st Keynote: Tired plants produce poor flowers.* A camellia may take a long time to die. More important, a sick plant, even if it can be restored to health, may take years to recover enough vitality to produce show flowers. Structural defects in a root system can be permanent — for all practical purposes. A *Producer* must be kept growing vigorously. Any retardation

of vigorous annual growth is a sign of real and often irremedial trouble.

**Rule II — Prepare in Spring:** We have made captive a forest fruit tree — capable of living to a great age and achieving a vast size. It helps to visualize the native habitat. The camellia in its wild state flourishes in an Asiatic rain forest, hanging by its roots in the deep mold and loose soil of the rich and crumbling alluvial fan. In its fertile forest valley, the camellia is fed and watered every day.

*1st Keynote: Prepare the Soil.*

There are two musts:

- 1) There must be perfect drainage
- 2) The roots must be aerated in loose soil mix.

A good mix is the earnest guest of every serious hobbyist. There are several combinations of ingredients in successful use. In general, equal proportions of sand, clay-less loam and peat moss do well enough for container grown plants. Some people add about 10 percent rice hulls to further open the mix. Others are experimenting with redwood forest humus in place of the peat.

There are two must nots:

- 1) Never use wood shavings or partially decomposed leaf mold
- 2) Never plant too deep

Shavings and whole leaf mold rob nitrogen while decomposing. Too often they mat into soggy sour masses eventually restricting drainage. Planting too deep robs the cambium layer at the soil level and destroys the plant.

*2nd Keynote: Prepare by Pruning.* The camellia responds very well to the pruning techniques common to other fruit trees.

*(Continued on next page)*

There are two musts:

- 1) Prune to obtain well branched open symmetry
- 2) Prune to eliminate twiggi-ness

All the water required to form and open the bud and sustain the flower to its full size must travel upward from the roots. A flower will transpire a great deal of water per day. The pipeline from roots to flower must be short and unrestricted. Prune while the plant is in bloom — as we cut flowers. Plan to complete the basic heavy pruning before the first growth cycle in Spring. Prune for a good plant structure, eliminate legginess and balance top to roots especially when transplanting. Radical pruning may inhibit flower production the following year, but will pay off later in a well shaped plant. If pruning has been neglected for several years, severe pruning is necessary to bring the plant back under control. Twiggy inside branches rob the plant of water and vitality while producing inferior flowers.

*3rd Keynote: Prepare by Feeding.* A forest camellia is fed a little every day — every time it rains. Ideally we should do the same, each time we water.

There are two musts:

- 1) Feed only when the soil is wet
- 2) Use a persistent mealy food

It is very important to remember that liquid fertilizer may only be safely applied into wet soil. A persisting food will be absorbed slowly as we water, carrying nutrient to the roots continually in small amounts during the growing season.

There are two must nots:

- 1) Never feed a sick plant
- 2) Never shock with quick acting fertilizer

The object is to feed lightly and continually — to maintain a fairly constant moderate level of nutrition. A good fertilizing procedure is the

earnest quest of every serious hobbyist. Many have settled upon whole cottonseed meal, as used for livestock food, scattered on top of the soil and allowed to cake. Enough to last two months may be applied in April, June and August. Some people add 10 to 15 percent blood meal to the hot weather feeding in August.

**Rule III — Protect during Summer.** Recall again the native camellia habitat. Filtered sunlight, a little rain every day, cool mountain breezes and high humidity combine to make a natural nursery cool house — quite different from our Southern California quasi-arid, desert edge climate.

*1st Keynote: Protect from sun.* This seems so fundamental that little discussion should be necessary. However, many of us have experienced extensive leaf damage on very hot, dry summer days. We need to be alerted again sun damage.

*2nd Keynote: Protect from pests.* Use malathion for chewers and aphids — and for the ants that exploit the aphids and scale. Use a volk oil for the scale. Remember to do these chores at regular intervals to prevent re-infestation.

*3rd Keynote: Protect surface roots.* There are two schools of thought about mulching. A mulch will cool and protect surface roots. On the other hand, it is easier to tell when to water if we can see an unmulched soil surface. Some people mulch and others do not. This is largely a matter of personal preference. The surface of a properly constructed soil in itself is very much like a mulch.

*4th Keynote: Protect from dryness.* Many a bud fails in December because of a dry plant for a few days as much as six months previously. We forget the instance of the dry plant and complain unfairly about our precious ruined flowers.

There are two musts:

- 1) Water often
- 2) Water enough

The forest rain was saturated with carbon dioxide — making it slightly acid. It was also free of harmful chemicals. Where we use domestic water, as contrasted to natural water, there is likely to be sodium or other water softening agents present in solution. These added chemicals are fine for obtaining good dish washing suds, but they are poison for plants. The sodium will deposit salts at the roots and lock up the soil nutrients. We must water not only to wet but also to leach away these salts. Otherwise we risk losing not only our flowers but also our plants.

There are two must nots:

- 1) Never let roots dry
- 2) Never let roots water log

Actually, if the mix is correct, neither of these extremes should occur. The soil should be tight enough to hold moisture between waterings without making a soggy mess of the root ball. This is just a reminder that *all* the P's are important. We cannot correct a poor soil condition by being extra conscientious in watering.

**Rule IV — Pamper through the Fall.** It has been said in many ways of many kinds of flowers, that good flowers come from plants that know we love them. Perhaps this only means that a green thumb is a product of a loving heart. But it does seem that people who love camellias are sensitive to their every need — and the plant in turn responds with true affection.

*1st Keynote: Continue summer care.* In southern California we often have hot dry weather right on through Christmas.

*2nd Keynote: Pamper by Disbudding.* Think back and consider the great number of superfluous flowers we allowed our plants to bear last winter. Many never developed correctly. One bud well flowered is better than an overloaded plant full of half-sized flowers. One bloom will transpire a tablespoonful of water on a

dry day — a considerable tax on the plant's pumping capacity.

After all, the flower is incidental to the cycle of fruiting. For this function, flower size is less important and an abundance of flowers is more important. We go contrary to the plant's nature when we prize large flowers and spurn the fruit.

There are two musts

- 1) Disbud thoroughly
- 2) Prune while disbudding

There are two must nots:

- 1) Never leave more than one bud per terminal
- 2) Never leave inside buds with insufficient space

It took all year to make a flower. We started with a healthy *Plant* of a known good variety. We prepared it, protected it, and pampered it so that it would *produce pleasure in perfection*. We captured a forest tree and conditioned it to *Quality*. We couldn't leave the work to nature because we grew a captive — not as a slave but as a cherished possession. We lavished our care upon it. And another year, as we mind our P's faithfully, we look forward to repayment of the Q's in season.

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## **Do S. C. C. S. Members Want Summer Program?**

President Alvin Gunn asks for views of S. C. C. S. members regarding a program of Summer and early Fall activities. Illustrative but not all-inclusive are such affairs as a summer grafting session; a breakfast or barbecue lunch; a visit to the Huntington Botanical Gardens; a bus trip to the ball game (either Dodgers or Angels) with dinner say at Little Joe's (a popular Italian restaurant near Dodger Stadium). He asks that members drop him a post card and express their views. His address is 12022 Gertrude Drive, Lynwood, California 90263.

# THE CENTRAL CALIFORNIA CAMELLIA SOCIETY

Mrs. Kean Westphal, Publicity Chairman  
Fresno, California

Editor's Note: The Central California Camellia Society is an active society of about 55 members, counting a family as a single member. They meet in Fresno but their membership embraces a larger area of which Fresno is the center.

The 1964-65 season has been a very active, satisfactory and enjoyable year for our society, and we believe that other societies might be interested in what we have accomplished.

The officers, directors and the show chairman were the guiding lights but we could not have accomplished what we did without the whole-hearted help and support of all the members.

A yearly program is set up by the directors and published at the beginning of each season in September. At each regular meeting refreshments are served and camellia plants are raffled to keep the society solvent. Members bring blossoms to be judged and ribbons are presented to the winners. At the end of the year the winner of the most points receives a grand prize. This really encourages people to show their blooms.

To begin the season we have an annual kickoff breakfast in a member's camellia garden. A committee does the cooking, a charge is made for the meal and we make extra money for the treasury.

In February, we instigated a joint dinner meeting of northern California societies. It was held in Modesto and Fresno had enough interested members to charter a bus for the trip. It proved to be very enjoyable. After dinner a member of each society made a short speech and an informal camellia show was held. The flowers were judged and there were prizes for the winners. We hope that this meeting will lead to the establishment of a Northern California Camellia Council which will set up show dates and standardize procedures and entry forms for shows.

Working with the Fresno City Parks Department, our society sponsored a new community camellia garden. It is in Roeding Park under large live oaks and is fenced in but open to the public during daylight hours. We have more than 150 plants of bloom size, given by members and friends and by nurseries here and in other parts of California. Beside each plant is a raised cement block to which is attached a ceramic plate inscribed with the name of the plant and its donor. The garden was dedicated on Sunday, February 28, and named "The Homer C. Wilson Camellia Garden."

On the evening before our show, the judges and the officers and directors of the society were entertained at dinner at the home of one of our members.

The show on March 14 was, of course, the high point of the year. It was held in the McLane High School cafeteria. The court of honor and awards were at one end of the room and garden displays set up by local retail nurseries were at the opposite end. The tables were covered with black plastic which draped over the ends and sides. For the first time, all blooms were shown in footed glass dishes and it was a beautiful sight. The initial cost was rather high but we were compensated by the time saved in setting up and dismantling the show. From the comments of the judges at the basket lunch held after the judging, we feel it was money well spent.

Our annual camellia garden tour was held on March 21 and we visited three camellia gardens in the east section of Fresno. We are all interested in finding out how these hobbyists grow prize-winning blossoms.

The last meeting of the year on  
*(Continued on page 7)*



## FALL SHOW IN SOUTHERN CALIFORNIA FOR GIBBED BLOOMS

The Los Angeles Camellia Council will hold a camellia show on the week-end of December 4-5, 1965, primarily for the display of gibbed early season blooms. It will be held in the Lecture Hall of the Los Angeles County Arboretum. Harold Dryden will be Show Chairman.

While the use of gibberellic acid to induce early blooming of camellias had its early impetus in Southern California, only a relative few people in the area have been using it. This may have been due to the fact that there has been no need to beat the cold weather as has been the situation in the Gulf Coast States. Whatever the reason, the Gulf Coast area seems to have outdistanced California in the use of and enjoyment of the fruits of gib. It is hoped that the early show in December will be an inducement for its broader use to produce the early blooms.

Because of the limited use of gib, many people have stated that they are uncertain as to how to proceed with a gibbing project, and, particularly, when they should gib with the expectation of having blooms for a December 4th show. To meet this requirement for guidance and possibly actual assistance in the first steps, Bill Goertz has been named Chairman of a Committee to help people who wish such help. Others on the Committee are Frank Reed and Caryll Pitkin. A call to any of these three will bring prompt help.

Lack of broad experience in gibbing and the disinclination of many who gib to maintain records of time lags make it impossible to state with certainty how much lead time should be provided for the different varieties to assure blooms on December 4th. Frank Reed has been very methodical in maintaining records and has gathered data from others who have been

willing to maintain and supply it. His article in this issue of CAMELLIA REVIEW will be helpful to those who are seeking advice and will answer questions relative to lead time.

The Pacific Camellia Society will cooperate in the encouragement of the December 4th show by giving, either free or for a very nominal charge, gibberellic acid powder to all who attend their picnic in Descanso Gardens on July 24, 1965. The powder will be available at standard prices at other locations in the Los Angeles area, which will be known by the Committee named above.

Full details of the show will be given in the October 1965 issue of CAMELLIA REVIEW. Since it will be necessary to start gibbing before the date of delivery of this issue (see Chart 2 that accompanies Frank Reed's article), people who wish to enter the show and who have not had gibbing experience should call for assistance during the summer months.

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### CENTRAL CALIFORNIA (Contd)

March 24 was the annual no-host barbecue dinner at the Ornamental Horticulture Building at Fresno State College. It was very well attended — extra tables had to be set up to accommodate about one hundred members and friends. To say that every one was happy and enthusiastic would be putting it mildly. New directors were elected and everyone went home with the feeling that we have had a satisfactory and pleasant year with many jobs well done.

In connection with Easter festivities, the Downtown Association of Fresno asked the Society to place an exhibit in the new Mall and we did so. Members who still had camellias in bloom gave their usual fine cooperation.

# GIBBING FOR THE DECEMBER SHOW

Frank F. Reed  
Pasadena, California

Due to increased experience, we can improve on the crystal ball technique in determining the proper time to gib given varieties in order to have blooms on a specified show date. The accompanying two charts have been prepared for guidance to indicate lead times that will be appropriate for a December 4th show. On these charts, each plotted point ( $\times$ 's and  $+$ 's) represents a calculation of such lead times on the basis of the experiences of different people who have been gibbing in the Los Angeles area ( $\times$ 's) and elsewhere in the United States ( $+$ 's). The "Gib for Dec. 4th" line is the "best representative line" that can be prepared on the basis of existing knowledge. The use of this line in preparing for the December 4th show that will be staged by the Los Angeles Camellia Council at the Los Angeles County Arboretum, will be explained below.

## Mixing and Applying Gib

The Charts are based on using a 1% aqueous solution (10,000 parts per million) of gibberellic acid and the method of knocking off the growth bud at a terminal where there is also a bloom bud. One drop of the solution is put into the remaining cup or stump. The solution is made from an estimated  $\frac{1}{3}$  gram of gib powder and a fluid ounce of distilled water put in a 2-ounce bottle. The addition of 12 to 15 drops of household ammonia forces the gib into solution. Exact quantities are immaterial. Store your solution in the refrigerator so that it will not lose its strength for several weeks. The powder needs no special storage.

For further information and precautions, you are referred to Reed's article in the October 1964 CAMELLIA REVIEW and Racoff's article in the 1964 ACS YEARBOOK.

## Preparing the Charts

Our general gibbing experience has shown that it takes approximately 12 days more lead time on August 15th than on September 15th; 7 more days on September 15th than on October 15th; and about 5 more days on October 15th than on November 15th. Using these rules and the curve in the Reed article in the May 1964 CAMELLIA REVIEW, we can transpose our data to get lead times for a given show date. Here are some examples for the December 4th show:

- a. It took a 'Debutante' gibbed on October 15th 33 days to bloom. It should take 3 days less or 30 days to bloom if gibbed in the first few days of November. Now if we come back 30 days from December 4th we get November 5th for one of the 'Debutante' points on the chart.
- b. When 'Tiffany' was gibbed on October 15th it took 59 days to bloom. It should take 3 days more time or 62 days to bloom had it been gibbed in the first few days of October. If we come back 62 days from December 4th, we get October 3rd as one of our 'Tiffany' points on the chart.
- c. When 'Guilio Nuccio' was gibbed on September 7th it took 64 days to bloom. It should take about 13 days less time or 51 days to bloom if gibbed about October 10th. 51 days before December 4th gives October 13th as one of the 'Guilio Nuccio' points on the chart.

All other points on the charts were calculated and transposed to December 4th lead times in a similar manner.

For correlation we have plotted the "normal blooming starts." Each point

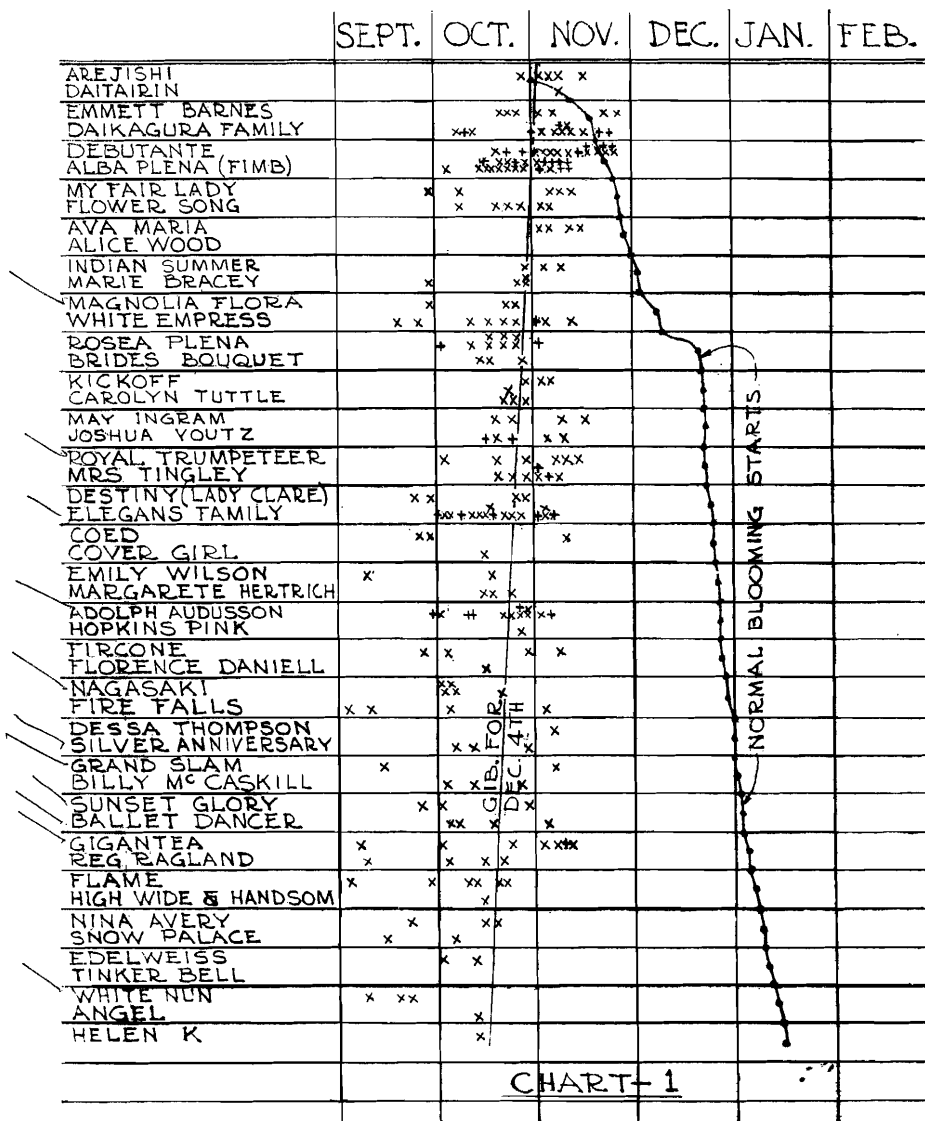
represents the median of the starting dates over the period of 6 to 9 years. A plant has been considered to start when it had 2 concurrent blooms.

### Using the Charts

Rather than doing all the gibbing on one day, it is well to spread it out. One reason for doing this is that our data are not yet complete or exact enough for us to use only one date

for gibbing to meet a specific show date. Another factor is that it is better to have blooms ahead of time instead of having them after the show. A suggested method is to observe the "December 4th Gib Line," then to gib some terminals ahead of that date and some afterward. Some varieties will need a greater spread than others,

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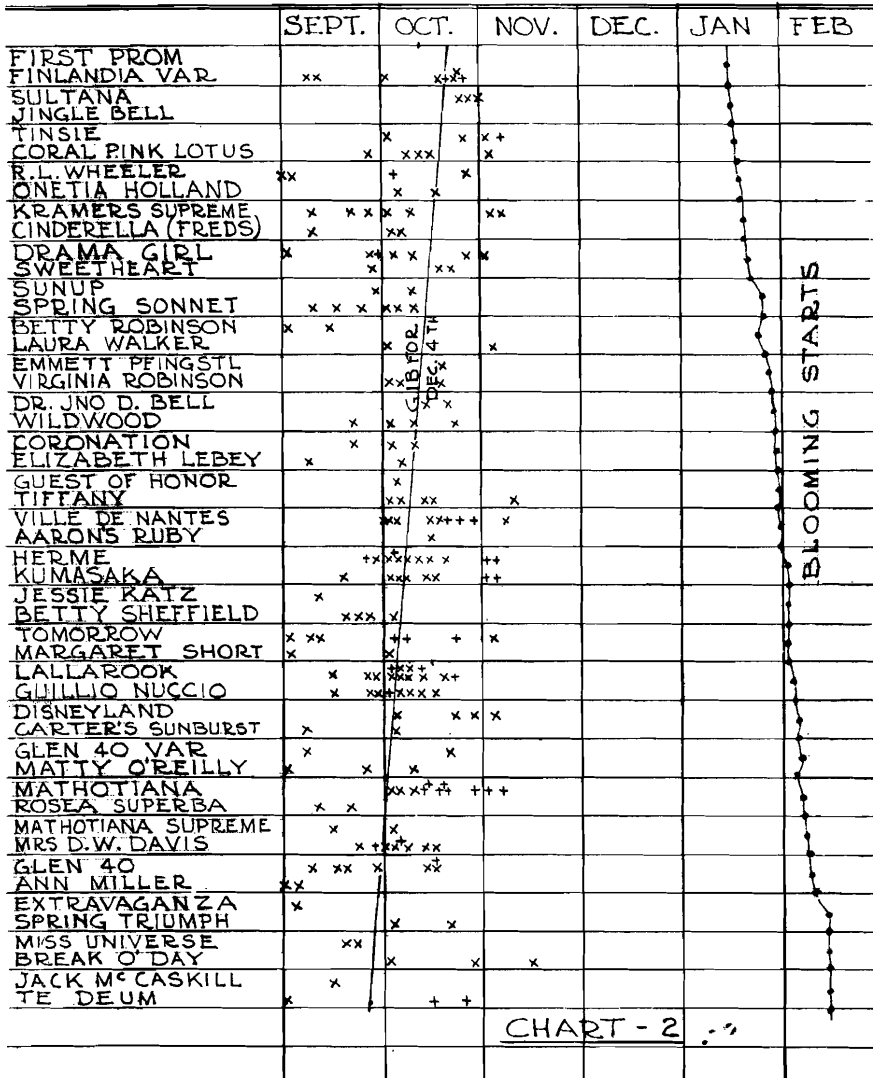


depending on the nature of the spread of the points that are plotted on the charts.

Take for example the 'Elegance' family (middle of Chart 1) which has quite concentrated plotted points. It hits the "gib line" about October 26th. Gib on that date then a couple of terminals on October 16th and a couple more on October 30th.

Consider 'Tomorrow' (middle of

Chart 2) with its scattered experience data. It hits the "gib line" at October 3rd. It appears here that a spread of gibbing is in order because of the spread in the experience factors. As a pattern, gib 2 terminals on September 15th, 2 about October 1st and a couple on October 10th in addition to the "gib line" date. You can see from the charts that there are other varieties, especially those that norm-



ally start to bloom after January 1st, that will need this sort of treatment.

To generalize, for varieties that are shown on the charts, use the "gib line" as a starting point for gibbing. If the plotted points are close together, gib also some 10 days before the "gib line" date and a few days after that date. If the points are scattered, spread the gibbing.

For a variety not shown on the charts, relate it to one that has approximately the same normal date for starting to bloom, then follow the schedule for that related variety. For example, for 'Cardinal', which normally starts to bloom around January 20th, use 'Sweetheart' data.

The work of marking terminals and keeping books on performance is far more than that of just gibbing the terminals. In order to save time you may mark a branch with plastic tape or string around the gibbed sector rather than marking individual terminals. It will simplify the second or third go-around if you have the gibbed sector in the same orientation (as in Northeast) on all plants.

The gibbing of *reticulatas* seems to be a forgotten (or never learned) art. If there be a gib class for them in the December 4th show, it is suggested that *at your own risk* you use the following dates for 2 terminals each:

'Buddha' — September 18 and 25, October 2 and 9

All others — September 4, 11, 18 and 25.

My records indicate that 'Dawn', 'Interlude', 'Little Gem' and 'Hiryu' do not always get into full bloom by December 4th. If these go into a gib class for the show and the buds indicate a late blooming year, it might be well to gib 5 or 6 terminals about November 15th.

#### Discussion

In analyzing the normal blooming starting dates it was found that every variety varied from year to year. In

light of this inherent character of the camellia, the variation in lead time for gibbing does not look too bad. In trying for blooms for December 4th, the late blooming varieties require longer lead time on their gibbing than the early varieties. This is to be expected because, at any given time, the early variety is more mature and closer to normal blooming.

We wish you much success! If you have bad results, the box office will return your money. And don't suspect that Greek who will come bearing you a gift of gib at the Pacific Society picnic on July 24th.

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## S. C. C. S. Will

### Entertain

### A. C. S. Members

The Southern California Camellia Society will have a program for entertainment of A. C. S. members who stop off in Southern California enroute to or from the Annual A. C. S. Meeting at Sacramento during the first week of March 1966. A Committee of Wilkins Garner, Chairman, Wilber Foss and Harold Dryden has been appointed to develop plans for such a program.

The Annual Meeting will be held during the week ending Saturday, March 5th, the latter being the date of the Sacramento Camellia Show. The annual Descanso Gardens camellia show will be held on the week-end of February 26 and 27, and it is expected that this show and the desire to see the Southern California area will be an inducement for many people to stop off on their way to Sacramento. Members of the Southern California Society will make every effort to have these people enjoy their few days in this area, whether on their way to or from Sacramento. Details of the program will be provided in the October 1965 issue of CAMELLIA REVIEW.

# THE GENETICS OF CAMELLIAS AND THE AMATEURS<sup>1</sup>

Clifford R. Parks<sup>2</sup>

Although many of us have grown out dozens, even hundreds or thousands, of camellia seedlings, we still have very little idea of what to expect when our seedlings bloom. If we could predict the outcome with reasonable certainty, we could achieve the end product with far fewer seedlings. This ability to predict demands a knowledge of camellia heredity. Very little that is definite is known of the heredity of camellias. If we could establish a knowledge of the manner in which characteristics are inherited in camellias we could be much more systematic in our development of new horticultural types. The science which deals with the understanding of heredity is genetics.

The hereditary message is passed from generation to generation through the genes. These genes are arranged like beads on a string. This string is the chromosome. During the process of sexual reproduction the combination of beads, or genes, is rearranged. Each gene usually controls the expression of a particular trait or characteristic. This is complicated by the fact that more than one gene can be involved in the expression of a characteristic, and sometimes one gene can modify or cancel the message of another gene. Normally in plants, as in *C. japonica*, the genes come in pairs, one on each of the duplicated sets of chromosomes. (Plants with more than two sets of chromosomes such as the hexaploid *reticulatas* will not be considered in this discussion.) These pairs of genes are referred to as alleles. Both of the alleles will determine the same characteristic in the living organism, but they need not

both have precisely the same influence. For example, if one set of alleles or genes control flower color in a plant, say cotton, one form of the gene (or one of the alleles) will give a message that says to the metabolism of the plant "yellow petals", while the alternate gene or other allele carries a message that says "white petals." If the cotton plant produces yellow flowers and ignores the message to produce white flowers, we say that the gene for yellow pigmentation is dominant to the gene for white pigmentation. Similarly, in many plants we have found many characteristics dominant to alternative characteristics controlled by allelic genes. For example, cases are known where tallness is dominant over dwarfness (tomato), where cut leaves are dominant over entire leaves (tomato), where yellow kernels are dominant over white kernels (corn), where green leaves are dominant over albino leaves (most plants), and so forth. We could draw many similar examples from the animal kingdom.

Not all characteristics are inherited as simple dominants over their allelic alternatives. It should be noted that most of the thousands of gene pairs in a plant carry identical messages. Often we are confronted with partial or incomplete dominance, which simply means that each allelic gene expresses itself partially. An example (over simplified) from camellias will clarify this point. If we cross a variety that carries both flower pigment genes of the allelic gene pair with the message "red" (we have a flower of the color of 'Ville de Nantes') with a variety that carries both flower pigment genes with the message "white" (most white flowered varieties), then we do not observe dominance of either the red or white genes, but rather both genes express themselves par-

1. This article is based on a talk given to the Northern California Camellia Society.

2. Geneticist, Los Angeles State and County Arboretum, 301 North Baldwin Avenue, Arcadia, California.

tially in the offspring — the result is a rose-pink flower. Now, I mentioned earlier that real life is not always as simple as our text book examples of cotton, corn and tomatoes since often two or more allelic pairs of genes contribute to the outward characteristic we observe. Since we know there are more than red, rose-pink and white camellias we can be certain that there are more than one gene pair involved in this hereditary pattern. If two allelic gene pairs were showing incomplete dominance, we could have a maximum of nine shades between red and white; and if we had three gene pairs acting in this manner we would arrive at twenty-seven shades of color between red and white. Our data suggests that we have more than one pair of genes acting, and at least one gene pair is showing incomplete dominance while some other allelic pairs of genes influencing flower pigmentation may be acting as simple dominants. At present we do not have enough data to answer this question.

After considering this introduction, we might study some data on *Camellia japonica* heredity. Although most of the hybrids involved were not made for the purpose of studying heredity, this data on inheritance is accumulating and some of the results are quite interesting. Most of what can be said here is inconclusive since only fractions of each progeny have bloomed in every case.\* The following discussion is not intended to be a conclusion, but rather it is a series of observations — conclusions will have to wait a year or more.

First the information that has been obtained on flower color heredity will be outlined. In all cases so far two white flowered parents will give all white flowered offspring. In one cross although the flowers were white there

\* The author would like to point out that this discussion is possible because his wife, Mrs. Kai-Mei Parks, spent many hours each week all winter taking data on individual flowers.

was a small amount of pink on the sepals, and it is supposed that one of the parents of that seedling had the same trace of pink. When a medium red flower (such as 'Ville de Nantes') is crossed with a white the progeny are, with one exception, shades of red-pink, rose-pink or light red. These colors could all be called the red-pink shades. Although only a few of the progeny from the same rose-pink flower color crossed with white have bloomed, there have been about an equal number of rose-pink flowers and white flowers. Similarly medium red crosses with rose-pink gives about equal numbers of medium red and rose-pink seedlings. This pattern of inheritance suggests that there is one allelic gene pair acting in *Camellia japonica* which controls the flower colors — medium red, rose-pink and white. A separate allelic gene pair probably controls striping and may otherwise modify the above red to white system. We have very little data on the "striping" genes so far. An "orange-red" flowered type ('Yosemite') when crossed with a pink flowered variety has given an "orange-red" seedling, and the same result has been obtained in a similar cross with a white flowered type. This complete dominance behavior is different from the "medium-red" gene in 'Ville de Nantes'. This result is further complicated by the fact that a single seedling of 'Yosemite' X 'Ville de Nantes' has had a rose-pink flower. This information suggests that 'Yosemite' and perhaps other red varieties like it have a genetic system different from the red varieties like 'Ville de Nantes'. It will be most interesting to watch large numbers from the above crosses bloom next season. The pink coloration pattern of varieties like 'Berenice Boddy' and 'Magnoliaeflora' are yet under a different control, but their control is not necessarily independent of the red-determining genes. 'Bere-

(Continued on next page)

nice Boddy' times a white variety gives hybrids with colors mostly like 'Berenice Boddy' with a very few hybrids having faint shell pink colors. 'Magnoliaeflora' times a white variety gives seedlings that have about one-half 'Magnoliaeflora' colored flowers and about one-half white flowers. Usually in crosses between a medium or light pink variety and a red variety the pink parent appears to contribute about as much to the offspring as a white parent would, but there may be exceptions to this. So we have some general ideas as to the breeding behavior of red, pink and white in *Camellia japonica*, but it will be a year or more before we have complete breeding data and can predict flower colors accurately from any given cross; however the above information gives some general clues.

The inheritance of flower form may not be as complicated as the inheritance of flower color. In any case, form is not as strongly genetically controlled as flower color. We have all observed the variation in the number of petals in camellia flowers and some examples will exemplify this point. Among six seedlings which had from two to eight blooms, the number of petals varied from two to four petals on different flowers of the same plant, while the petaloids (smaller petals in the center of camellia flowers) varied at the least from six and up to twenty-three petaloids on different flowers of the same plant. This variation is typical of that observed in variously (all degrees of) double camellia flowers. It is clear from this that the environment in which the plant grows has something to do with the degree of doubleness; however overall form is relatively constant. If we cross a semi-double flowered variety with another variety of that same form, we will encounter seedlings with from single to formal flowers and nearly all of the intermediates.

From a large number of seedlings, we consistently note about three

double flowers for each single flower in our progenies. Doubleness is not fully dominant, however, since only about one in four of the progeny are full doubles (full peony or formal types). In the crosses of semi-double types times peony flower types we find the same seedling ratio as above with true formal flowers occurring only one in about every fifteen seedlings. Full peony types can be expected with a slightly greater frequency than the formals. The tendency to produce the variously shaped petaloids or "rabbit ears" seems associated with the appearance of doubleness, but more than one allelic gene pair may be involved. Actually, it would seem that at least two allelic gene pairs interacting (and perhaps more) are necessary to explain all of the flower forms we observe in camellias. From a practical point of view, we observe that a large progeny from the cross of a semidouble times a peony flowered type will give us nearly all of the flower forms observed in camellias. As in the case of flower color, this discussion is based on a limited sample, and with luck a very large sample will be studied next season — perhaps answering the question of the inheritance of flower form in *Camellia japonica*.

With all of the camellias that are grown, why have we been so slow in obtaining this basic genetic information that is known for so many other cultivated plants? The problem is time and space — few research groups or institutions have the time or facilities to grow out and study the genetics of woody plants. The problem is further complicated by the fact that a camellia flower can only be pollinated with difficulty with pollen from the same bush (due to a considerable degree of self-sterility) — this procedure is one of the chief approaches in studying higher plant heredity. Dr. Lammerts came to some of the same tentative conclusions about camellia



heredity that I have discussed, but the camellia project he ran was abandoned before he could complete all of his genetic studies.

If this information is obtained with difficulty, and if few institutions will carry out genetic or breeding studies with camellias or other long-cycle woody plants, who will use this information? The answer is amateurs! They have introduced most of the camellia varieties in the past — and they will likely continue to do so. The information from genetic studies will allow their work to be more directed and systematic.

We will now consider some breeding programs that could be undertaken by amateurs; and because of the number of years involved, probably only an amateur could carry out these projects. First let us consider the attempt to develop a white reticulata, *Camellia reticulata* and its close relative *C. pitardii* never have white flowers, so we are going to have to introduce the white color from another species which has white flowers. Up to this point in this article, we have been discussing hybridization within a species, but now we must consider interspecific hybridization or hybridization between species. Genetic dominance and other effects that we have discussed as occurring within the species *C. japonica* do not necessarily hold up any longer, but the *C. japonica* analysis will give us some clues. From our experience with *C. japonica* and other plants we can suspect that colored flowers in all camellias are always partially dominant or dominant over white flowered types. We have observed that first generation hybrids of *C. reticulata* X white *C. japonica* and *C. reticulata* X *C. granthamiana* have flower colors which are more or less *C. reticulata* like. Although most of these hybrids will be relatively infertile, there is indication that some will have considerable fertility, and can be used as female parents. A small percentage

(perhaps 1-10%) of the hybrids between (*C. reticulata* X *C. japonica*) X (*C. reticulata* X *C. granthamiana*) will have white flowers. Before we can make that cross, we have to select fertile types from the first generation hybrids and grow these to a size adequate to be used as the parents of the second generation hybrids. Among these, we should particularly grow those that we know are hybrid, but favor in their outward characteristics the *C. reticulata* parent. Because genes of one species tend to group together in second generation hybrids, we will observe plants and flowers in our complex second generation hybrids that look like *C. reticulata*; however, due to a limited shuffling of genes, we should obtain a very small percentage that look like *C. reticulata* in most respects but have white flowers. There are other, but equally time-consuming approaches to the solution of this problem. In this project it will be a few years before we have large fertile first generation hybrids, and a few more years before the second generation can be observed. One can be certain that in the process of selecting a white type that looks like *C. reticulata*, many seedlings will have to be observed.

Fragrance is another problem that will require some years of work. We now know that the hybrid of *C. japonica* times *C. lutchuensis* can be strikingly fragrant, but the flower is also rather small. To increase size, substance and color, we will have to observe many offspring from the cross of the *C. japonica* X *C. lutchuensis* hybrids times our better *C. japonica* types. Since we may lose much of the fragrance in many of these crosses, we will have to observe large numbers of seedlings from this backcross. Fragrance in camellias is worth the effort.

Harold Paige of Lafayette, California, has found that second generation Williamsii seedlings often have  
(Continued on page 22)

# What's Behind The Green Thumb

ALVIN L. GUNN

The trash collectors have quit banging dents in the cans to get even for all of the flowers, camellia prunings, and sad plants that couldn't live under the code of survival of the fittest. Now that summer is almost here, we can relax as there isn't much doing camellia wise, except moving a few dozen plants into larger containers. The fertilizing isn't too time consuming, as a light feeding once a month takes only a little over a half a day. With the heavy pruning done, an occasional clipping of a branch or growth bud headed the wrong direction takes care of the pruning. The container plants take about three hours to water. I usually set aside Friday night to do this chore, then I ground water on Saturday morning, and am finished about noon if the alarm goes off at 6:00 A.M. These chores leave plenty of time to vacuum the pool, cut and trim the lawn and kick at a few weeds as I step over them. There is usually time enough to do a little summer grafting of those (as Al Parker would say) "Ya Gotta Haves," but then come the looper worms to spray, and the time consuming job of disbudding. The Goertz's have a parrot which en-

joys fresh camellia buds. I wonder if a parrot can be trained to nip off the right buds? Taking off all of the buds excepting one per branch isn't so bad if it only had to be done once. There are a few varieties which seem to form new buds as fast as they are flicked off. These varieties are not disbudded until late September or October.

The habit of turning container plants  $\frac{1}{4}$  of a turn each month to even the light to all sides of the plant is also very helpful in the disbudding program. Watch for the containers which have rusted holes, and drain the water off before the roots get overwatered. Also another problem is the root bound plant which dries out in a day or two. You can't judge the number of roots in a container by the size of the trunk of the plant.

We have found no problems in transplanting (including bare rooting) camellias any month of the year in California. If a plant needs transplanting, get it done even in 90° weather. Protect it from the direct sun until it is established. A good camellia mix is two parts German  
*(Continued on page 29)*

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# Show Results

## DELTA CAMELLIA SOCIETY

Antioch, California — February 27-28, 1965

- Sweepstakes — Mr. and Mrs. George Stewart, Sacramento  
Best Japonica — 'Guilio Nuccio', Mr. and Mrs. Sal B. Davi, Pittsburgh  
Best Japonica Runner-up — 'Betty Sheffield Pink', Mr. and Mrs. John Caneda, Antioch  
Best 3 Japonicas — 'Mrs. D. W. Davis', Dr. F. E. Heitman, Lafayette  
Best 5 Japonicas — 'Shiro Chan', Mr. and Mrs. Eugene G. Busse, Lafayette  
Best 10 Japonicas — 'Jessie Katz', Dr. F. E. Heitman, Lafayette  
Best Collection of 25 Japonicas — Mrs. E. A. Grebitus, Sacramento  
Best Reticulata — 'Buddha', Mr. and Mrs. Eugene G. Busse, Lafayette  
Best 3 Reticulatas — Mr. and Mrs. George Stewart, Sacramento  
Best Hybrid — 'Howard Asper', A. S. Eckendorf, San Jose  
Best 3 Hybrids — 'Donation Var', Frank T. Bartucco, Sacramento  
Best Miniature — 'Sugar Babe', Mr. and Mrs. Harold C. Rambath, Sacramento  
Best Collection of 10 Miniatures — W. O. Addicott, Portola Valley  
Best Seedling — Newton Pratt, Sacramento  
Best Hybrid Seedling — David L. Feathers, Lafayette  
Blooms on Court of Honor — 'Carter's Sunburst', 'China Doll', 'Evalina', 'Kick Off', 'Mathotiana', 'Silver Anniversary', 'Spring Sonnet', 'Tiffany'

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## CAMELLIA SOCIETY OF KERN COUNTY

Bakersfield, California — March 6-7, 1965

- Sweepstakes — Fred Hamilton, Santa Maria  
Sweepstakes Runner-up — Frank Anderson, Bakersfield  
Best Large Japonica — 'Marie Bracey', Melvin G. Canfield, Bakersfield  
Best Large Japonica Runner-up — 'Kramer's Supreme', Amos Kleinsasser, Bakersfield  
Best Small and Medium Japonica — 'Dr. Tinsley', M. W. Abramson, Tulare  
Best Small and Medium Japonica Runner-up — 'Sam Barranco', John C. Robinson, La Canada  
Best 3 Japonicas — 'Ballet Dancer', J. C. Reiley, Fresno  
Best 5 Japonicas — 'Kramer's Supreme', Tom Stull, Bakersfield  
Best Reticulata — 'Crimson Robe Var', Tom Stull, Bakersfield  
Best 3 Reticulatas — 'Noble Pearl', Caryll W. Pitkin, San Marino  
Best Hybrid — 'Howard Asper', Fred Hamilton, Santa Maria  
Best Miniature — 'Fircone Var', Mrs. Dale H. Smith, Bakersfield  
Best Collector's Table — Fred Hamilton, Santa Maria  
Large Japonica Blooms on Court of Honor —  
'Angel', 'Betty Sheffield Blush', 'Carter's Sunburst', 'Dr. John D. Bell', 'Elizabeth LeBey', 'Guilio Nuccio', 'Iwani', 'Mathotiana Supreme'  
Small and Medium Blooms on Court of Honor —  
'Berenice Boddy', 'Cardinal's Cap', 'Horkan', 'Kitty', 'Kuro-Tsubaki', 'Lynn Woodroof'  
Reticulata Blooms on Court of Honor —  
'Crimson Robe', 'Moutancha', 'Tali Queen'

(Continued on next page)

## CAMELLIA SOCIETY OF MODESTO

Modesto, California — March 13-14, 1965

- Sweepstakes — Newton Pratt, Sacramento  
Sweepstakes Runner-up — Warren Addicott, Portola Valley  
Best Japonica — 'Mrs. D. W. Davis Peony', Thomas H. Stull, Bakersfield  
Best Japonica Runner-up — 'Guilio Nuccio Var', S. B. Davi, Pittsburg  
Best 3 Japonicas — 'Ballet Dancer', Mrs. George McKee, Sacramento  
Best 6 Japonicas — 'White Nun', Tom Sertich, Sacramento  
Best Reticulata — 'Purple Gown', Howard Burnette, Castro Valley  
Best Reticulata Runner-up — 'Tali Queen', Herbert Martin, Sacramento  
Best 3 Reticulatas — 'Moutancha', Richard Roggia, San Jose  
Best Hybrid — 'Brigadoon', J. Holtzman, Crows Landing  
Best Miniature — 'Hopkins Pink', Jack Hansen, Sacramento  
Best Seedling — Harold Paige, Lafayette  
Best Collection of 30-40 Blooms — Dr. D. J. Faustman, Sacramento  
Best Collection of 15 Blooms — Mrs. E. A. Grebitus, Sacramento  
Judges Competition, 10 Blooms — Dr. Fred Heitman, Lafayette  
Blooms on Court of Honor —  
Single Japonica — 'Clarise Carleton', 'Country Doctor', 'Kramer's Supreme', 'Lady Kay', 'Lady Loch', 'Moonlight Sonata', 'Silver Anniversary', 'Spring Sonnet', 'Margaret Short', 'Tiffany', 'Tomorrow Supreme'  
3 Japonicas — 'C. M. Wilson', 'Carter's Sunburst', 'Edelweiss', 'Fred Sanders Var', 'Gigantea', 'Glamour Girl', 'Guilio Nuccio', 'Guilio Nuccio Var', 'Mrs. D. W. Davis', 'Silver Anniversary', 'White Nun'  
6 Japonicas — 'Fred Sanders Var', 'Geisha Girl', 'Spring Sonnet'  
Miniature — 'Little Un', 'Pearl's Pet'  
Single Reticulata — 'Crimson Robe', 'William Hertrich'  
3 Reticulatas — 'Crimson Robe', 'Purple Gown'  
Hybrid — 'E. G. Waterhouse', 'Howard Asper'

## CENTRAL CALIFORNIA CAMELLIA SOCIETY

Fresno, California — March 14, 1965

- Sweepstakes — Mr. and Mrs. Frank B. Anderson, Bakersfield  
Sweepstakes Runner-up — Mr. and Mrs. H. H. Collier, Chowchilla  
Best Japonica — 'Betty Sheffield Supreme', John C. Reily, Fresno  
Best Japonica Runner-up — 'Clark Hubbs', Carroll Baird, Fresno  
Best 3 Japonicas — 'Jessie Katz', Mr. and Mrs. Rey Merino, Fresno  
Best Group of 25 Japonicas — Silas A. Jones IV, Fresno  
Best Chemically Treated Bloom — 'Cara Mia', Mr. and Mrs. H. H. Collier, Chowchilla  
Best Reticulata — 'Noble Pearl', Mr. and Mrs. Frank B. Anderson, Bakersfield  
Best 3 Reticulatas — 'Buddha', Charles Ahrens, Fresno  
Best Hybrid — 'Howard Asper', Silas A. Jones IV, Fresno  
Best Miniature — 'Memento', Betty and John Robinson, La Canada  
Best Seedling — #633 (Hybrid), Harold Paige, Lafayette  
Japonica Blooms on Court of Honor —  
'Ballet Dancer', 'Cara Mia', 'Carter's Sunburst', 'Dixie Knight', 'Drama Girl', 'Edwin Folk', 'Elegans', 'Extravaganza', 'Flame', 'Funny Face Betty', 'Guilio Nuccio Var', 'Lady Macon', 'Richard Nixon', 'Tiffany', 'Tomorrow', 'Tomorrow's Dawn'

Reticulata Blooms on Court of Honor —  
    'Buddha', 'Moutancha', 'William Hertrich'  
Hybrid Blooms on Court of Honor — 'Brian'

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## NORTHERN CALIFORNIA CAMELLIA SOCIETY

Pleasant Hills, California — March 20-21, 1965

Sweepstakes — Mr. and Mrs. Frank Anderson, Bakersfield  
Sweepstakes Runner-up — Mr. and Mrs. A. M. Patterson, Livermore  
Best Japonica — 'Ecclefield', Jack Mandarich, Menlo Park  
Best Miniature Japonica — 'Fleurette', Dr. and Mrs. D. Jackson Faustman,  
    Sacramento  
Best 3 Japonicas — 'Lady Kay', Mary and Irving Nair, West Sacramento  
Best 7 Japonicas — 'Lady Kay', Mr. and Mrs. Wm. A. Rusher, Lodi  
Best 12 Different Japonicas — Dr. and Mrs. D. Jackson Faustman, Sacramento  
Best Reticulata — 'Butterfly Wings', Mr. and Mrs. H. E. Burnette,  
    Castro Valley  
Best 3 Reticulatas — 'Lionhead', Mr. and Mrs. George Stewart, Sacramento  
Best 7 Reticulatas — 'Purple Gown', Mr. and Mrs. H. E. Burnette,  
    Castro Valley  
Best Hybrid — 'Howard Asper', Thomas H. Stull, Bakersfield  
Best Seedling — Dr. C. C. Wright, Sacramento  
    (Provisional A. C. S. Highly Commended Certificate)  
Best Group of 12 Judge's Flowers — Dr. Ralph Gladen, Modesto  
Flowers in Court of Honor —  
    Single Japonica — 'Adolphe Audusson', 'Carter's Sunburst', 'Edeleweiss',  
    'Kramer's Supreme', 'Margaret Ratcliffe', 'Mrs. D. W. Davis Peony',  
    'Julia France', 'Mathotiana', 'Nagasaki', 'New Horizons', 'Reg Ragland',  
    'Sawada's Dream', 'Tiffany', 'Tomorrow Supreme', 'Tinsley Smith',  
    'Vulcan Var'  
    3 Japonicas — 'Yours Truly', 'R. L. Wheeler', 'Mathotiana', 'La Pepper-  
    mint', 'Pink Perfection'  
    Single Reticulata — 'Lionhead', 'Crimson Robe', 'Purple Gown',  
    'Moutancha'  
    3 Reticulatas — 'Noble Pearl'  
    7 Reticulatas — 'Willow Wand'  
    Miniature Japonica — 'Snow Nymph', 'Bon Bon'  
    Hybrid — 'E. G. Waterhouse'

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# IS *CAMELLIA HETEROPHYLLA* TRULY A SPECIES?

Malcolm McLeod\*

A number of techniques are used today in the study of relationships between plants. The study of the overall physical appearance is the classical approach. Biochemistry has recently come into use largely through the study of leaf and flower pigments. A process known as paper chromatography<sup>1</sup> is used to separate the pigments in such a way that concentrations of the various pigments may be measured. The relative types and amounts of the pigments are indicative of relationships. A third method used in the classification of plants is the study of chromosomes. We are concerned here with this latter method.

Many genera of plants have species which are questionable. The genus *Camellia* has some particularly difficult problems to solve because of the fact that species in the genus have been cultivated for their beverage producing leaves (tea) or their ornamental beauty for at least 1200 years.<sup>2</sup> This means that scientists engaged in taxonomic studies must deal with selected plants, rather than the original naturally occurring groups.

*Camellia heterophylla* is a species which has questionable status. This species was identified by Dr. H. H. Hu in 1937 from herbarium material collected from a plant growing in a temple garden in Shunning hsien, Yunnan province southwestern China.<sup>3</sup> The characteristics used in identification show a great similarity to those of *C. reticulata*. The main point of difference is seen in the leaf shape. Another variation is the presence of cork warts on the lower sides of the

leaves. These characteristics which are not seen in *C. reticulata* are seen in *C. japonica*. This has led to the speculation that the species *C. heterophylla* is not truly a species but a hybrid between *C. reticulata* and *C. japonica*.

The question of the hybridity of *C. heterophylla* would have remained unanswered were it not for a plant which appeared in England in the early 1950's. H. G. Hillier<sup>4</sup> made the determination that a plant of unknown origin was synonymous with *C. heterophylla*. Material was sent to Kew Gardens and the determination corroborated by J. R. Sealy. This plant which Hillier termed 'Barbara Hillier' became the only cultivar listed under the species *C. heterophylla*.<sup>5</sup> Material then became available through vegetative propagation with which to make further studies.

The importance of the chromosomes in a study such as this is quickly made evident. The basic number of chromosomes in the genus *Camellia* is 15 in the sex cells. *C. japonica* contains this basic number so that when pollen grains fertilize the ovules, the number in the cells formed by this union is 30 chromosomes. In other words *C. japonica* is diploid. *C. reticulata* has a chromosome number three times this diploid number which is referred to as hexaploid.<sup>6</sup> A hybrid between these species would have a chromosome number between the two extremes. Sixty chromosomes would be the probable number.<sup>7</sup>

It is advantageous when dealing with microscopic entities, to work with the smallest number possible. For this reason, the anthers where the pollen grains develop are an important source of material. The number of chromosomes is halved by a process known as reduction division or meiosis. The cells in which this special division takes place are known

\* Senior student, California Polytechnic College, Pomona, California. This study received the 1965 Beta Beta Beta Biological Honor Society Frank G. Brooks Annual Regional Award for undergraduate study. Mr. McLeod will continue his graduate studies on *Camellia* cytology.

as pollen mother cells. The chromosomes are visible during this process and may be counted if just the right stage is found. As reduction division progresses the chromosomes shorten and pair, making them visible in the basic or diploid number for the species; 15 for *C. japonica*, 45 for *C. reticulata*.

In detecting the right stage for seeing these chromosomes, bud size is not a good criterion. As development proceeds in these buds the color of the anthers changes from white to a final orange yellow color. The moment for seeing the chromosomes advantageously is seen as a light yellow shade in the anthers. The buds must be collected between August 15 and October 15 as this is when reduction division occurs.

The other generally used source of material in which chromosomes are seen is root tips. The cell divisions which occur in these rapidly growing parts make the full double complement of chromosomes visible. The disadvantage of the larger number may be overcome to a certain extent by treating these tips in chemicals which will serve to shorten the chromosomes. This will eliminate some overlap between chromosomes and also make them more readily visible.

Both the buds and the root tips receive a preliminary treatment in an acetic acid absolute alcohol mixture. This serves to stop any continuing development and to harden the material for storage. These materials may be stored indefinitely in 70% alcohol.

In obtaining the slides used in counting the chromosomes the procedure as outlined by Beeks<sup>8</sup> was closely adhered to. This included staining with aceto carmine, macerating with hydrochloric acid, and adding a drop of Hoyer's solution to make the slide permanent. A great amount of pressure was then applied with a rolling motion of the thumb.

This served to squash the chromosomes from their enclosing membranes in the pollen mother cells, and spread them out in one plane.

After a good slide had been obtained, it was necessary to use a method of counting the chromosomes which would be exact. The camera lucida was tried in an attempt to draw the chromosomes as they appeared through the microscope at 970 magnification. This was abandoned as unsatisfactory for the purposes of the project. Drawing of the chromosomes was accomplished through projecting photographic slides onto a piece of paper. Various focuses of the microscope were used in order to compensate for the very shallow depth of field at this magnification. The resultant drawing was a composite of the several photomicrographs taken. This drawing was then compared to the original slide.

The count obtained was 30 chromosomes. This agrees with the evidence in the leaves that *C. heterophylla* may indeed be a hybrid. In the case of a similar cross between *C. japonica* and *C. saluenensis* originally known as *C. williamsii*, an X was employed making the hybrid *C. Xwilliamsii*. A similar designation has been suggested for *C. heterophylla*.<sup>9</sup> This further evidence makes the change to *C. Xheterophylla* a little more sure. The cultivar 'Barbara Hillier' and others as they appear would then belong to this new designation. Another piece has been added to a fascinating puzzle.

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## WINNING BLOOMS AT S. C. C. S. MEETINGS

Frank Reed of Pasadena won the honors in the S. C. C. S. Meeting Flower Competition for the 1964-1965 season in both the Non-Gib and Gib divisions. In the Non-Gib division the scores were Reed 123 points, Harold Rowe of Upland 54 points and Berkeley Pace of Upland 41 points. The scores in the Gib division were Reed 68 points, Bill Goertz of San Marino 26 points and Caryll Pitkin of San Marino 9 points. The S. C. C. S. Board of Directors voted at their last meeting to set up a Collector's Division for the 1965-1966 season in which prior winners in meeting competition will compete. Details of the 1965-1966 competition rules will be published in the October 1965 issue of CAMELLIA REVIEW.

### Winning Blooms at March 9, 1965 Meeting Non-gib group

*Sumner*  
Japonica — large and very large  
'Tomorrow', 'Lady in Red', 'White Nun', 'R. L. Wheeler', 'Kramer's Supreme'

Japonica — small and medium  
'Magic Moments', 'Silver Chalice', 'Peter Pan', 'Hishi-Karaito', 'Thomas D. Pitts'

Japonica — miniature  
'Snow Fairy', 'Angel's Blush', 'Fircone Var', 'Fircone', 'Red Buttons'

Reticulata —  
'Moutancha', 'Purple Gown', 'Noble Pearl', 'Moutancha', 'Crimson Robe'

Hybrids —  
'Howard Asper', 'Brigadoon', 'Elsie Jury', 'Diamond Head', 'Waltz Time Var'

### Gib group

Japonica — large and very large  
'Carter's Sunburst', 'Tomorrow's Dawn', 'Arlene Marshall'

### Winning Blooms at April 13, 1965 Meeting Non-gib group

Japonica — large and very large  
'Lady in Red', 'Fred Sanders', 'Carter's Sunburst', 'Mrs. D. W. Davis', 'Glen 40'

Japonica — small and medium  
'Chow Chow', 'Eleanor Hagood', *Sumner*  
*S. J.* 'Magnoliaeflora', 'Frances McLanahan', 'Spring Sonnet'

Japonica — miniature  
'Kitty', 'Little 'Un', 'Black Domino', 'Suzie', 'Pearl's Pet'

Reticulata —  
'William Hertrich', 'Capt. Rawes', 'Noble Pearl'

Hybrids —  
'Howard Asper', 'Brigadoon', 'E. G. Waterhouse'

## GENETICS (Continued)

much increased substance. Backcrossing many of our hybrids to one or the other of their parent species will result in some very interesting cultivars. Backcrossing *C. sasanqua* X *C. reticulata* hybrids back to *C. sasanqua* should give us earlier high quality flowers. Development of a white flowered reticulata could be approached by backcrossing also.

The long life cycle involved in camellia breeding makes it a good project for amateurs working over a many year period. The above problems are some that could be attempted by individuals or amateur research groups. The Northern California Camellia Society Research Committee is an outstanding example of a group of amateurs carrying out camellia research. As time goes on we will be able to provide this and other groups with experimental plants and always lots of suggestions. I might repeat that most likely in the future as in the past, most of the new camellia varieties will be introduced by amateur breeders.



## BILL WOODROOF REPORTS ON NEW VARIETIES

Bill Woodroof gave his annual report on new varieties to the members of Pacific Camellia Society at their March 4th meeting. In these reports he gives his conclusions about new varieties on the basis of what he finds in his own yard, which is in Sherman Oaks at the southern edge of the San Fernando Valley. He made it clear, as he always does in these annual reports, that he does not attempt to grade these new varieties. Neither does he mean to question their descriptions in CAMELLIA NOMENCLATURE, which are always according to the descriptions which the originators of the varieties give when registering them. His report is "as he finds them where he grows them."

He receives scions of about 100 new varieties a year. He checks the blooms against the descriptions in CAMELLIA NOMENCLATURE, ob-

serving size, color, form, how they open, etc. All the varieties on which he expresses an opinion are growing in two-gallon or larger containers. When the blooms agree with the description or fail to even approach the description, he usually reaches a conclusion in the first year of bloom. When he has any question, however, he reserves judgment until he is sure that the new variety has established itself sufficiently at his location to warrant a conclusion. In most years a high percentage of the varieties on which he reaches conclusions provide understock for his next year's grafts. (He always starts high on a new understock so that he can cut it off two or three times.) He has to get rid of 100 plants a year to make way for the 100 new scions he will receive the next year.

Here is his report:

ARTHUR WEISNER — Large, irregular, semi-double dark red.

Comment: Needs further watching.

BETTY SHEFFIELD BLUSH SUPREME — Blush pink with narrow picotee edge of deep pink to red. Sport of 'Betty Sheffield Supreme'.

Comment: Very good.

BUDDY BILLINGS — Red, very large semi-double with stamens interspersed among petals.

Comment: Good, but doubts if it will reach very large size.

CARE FREE — Salmon pink, large semi-double to loose peony form.

Comment: Good, but adds nothing new.

CHINA DOLL — Sweet pea type, large, loose high centered peony form.

Comment: Good. One of the best of the sweet pea type on an excellent plant.

CHRISTIAN McSWEEN — Deep pink. Large, semi-double with ruffled inner petals.

Comment: Good, but does not add anything new.

COOPER POWERS — Shell pink, large semi-double with slightly curved petals.

Comment: Good

DOTTIE LYNCH — Pink, spotted white, very large loose peony form.

Comment: No value, either in form, color or size.

DR. BILL HARRISON — Coral pink, very large irregular semi-double.

Comment: Good.

EARL KLINE — Red. Very large, semi-double with fluted petals.

Comment: Good, but similar to a 'Guilio Nuccio' that is not up to size.

*(Continued on next page)*

- ED ANDERSON — Red. Very large loose peony form.  
 Comment: Good, but similar to and not as good as 'Tomorrow'.
- ELEANOR GRANT — Rose, very large, semi-double to loose peony form.  
 Comment: Questionable value. Does not always open well or attain size.
- ELEANOR MARTIN SUPREME — Red moire to white, Large semi-double.  
 Comment: Good.
- ELEGANS SUPREME — Sport of Elegans. Rose pink with deep petal serrations.  
 Comment: Excellent. Some flowers with white center petaloids. Some people have found it hard to graft.
- ELIZABETH DOWD — White with small dashes of pink on some petals.  
 Large rose form double.  
 Comment: Good.
- ERIN FARMER — Sweet pea type. Large, semi-double to loose peony form.  
 Comment: Excellent.
- FIRSTBORN — Bright red. Large semi-double.  
 Comment: Not good enough.
- FLETCHER PEARSON CROWN — Rose pink. Large anemone form.  
 Comment: No value. Unusual color but nothing else.
- FRANCES GARONI — Soft rose pink. Large, loose peony form.  
 Comment: No value as yet.
- FUNNY FACE BETTY — Sport of 'Betty Sheffield'. Pale pink, turning darker pink then pale pink again.  
 Comment: Good.
- GLORIA STUART — White. Very large, fluted semi-double.  
 Comment: Has possibilities but will have to attain more size.
- GRANDEUR — Coral rose. Very large, semi-double.  
 Comment: Very good.
- HERCULES — Red. Large, semi-double.  
 Comment: Adds nothing new.
- ISABEL HERMANN — Dark antique red. Large peony form.  
 Comment: Not good enough.
- JUDGE W. T. RAGLAND — Red. Large, semi-double with upright petals.  
 Comment: Good.
- JUDY MATHEWS — Blush pink. Large, loose peony form.  
 Comment: Good reputation but will have to do better.
- JUNE STEWART — Deep rose pink. Large, loose peony form.  
 Comment: Good.
- MARGUERITE CANNON — Clear pink. Large, semi-double with large fluted petals.  
 Comment: Good reputation but will have to do much better.
- MARION HARRISON — Rose pink. Large, irregular semi-double to peony form.  
 Comment: Good, but similar to and not as good as 'Tomorrow'.
- MARY BUTLER — Pale pink. Large, full peony form.  
 Comment: Fair, adds nothing new.
- MONA MONIQUE — Soft pink. Large formal to rose form double to peony form.  
 Comment: Good.
- MR. WONDERFUL — Blush pink. Large, irregular semi-double to peony form.  
 Comment: Good, but not large enough for form and color.

—————(Continued on page 25)

## Shreveport Men's Club Honors

### W. F. (Hody) Wilson

The Men's Camellia Club of Shreveport, Louisiana has elected W. F. (Hody) Wilson of Hammond, Louisiana to its "Hall of Fame". Election to the "Hall of Fame" is granted to outstanding individuals for their work with and furtherance of the Camellia. In the judgment of the Club, Mr. Wilson has contributed more than anyone else in the South during the past year to camellia culture. He has traveled far and wide talking to clubs in a most interesting and informative way. He has introduced numerous new varieties recently and his experimentation and sharing of research is appreciated by all camellia enthusiasts.

Prior recipients of this Award have been Dave C. Strother of Fort Valley, Georgia; William E. Woodroof of Sherman Oaks, California; Carl Tourje, formerly of San Gabriel and now of Camarillo, California, and Alton B. Parker, formerly of Temple City and now of Sebastopol, California.

## Camellia Varieties That Keep

Mark Anthony, Superintendent of Descanso Gardens, sent the following statement to the Editor regarding the condition of some of the flowers which were removed from the Descanso Gardens show display tables six days after they were placed there for the Saturday-Sunday show.

In taking the camellia flowers from the tables I noticed that some flowers, as a variety, kept much better than others. Going along the tables ten to twenty kinds would be completely wilted, or dead, but all at once a group of eight to twenty-five flowers would be in fine shape. This was done Thursday A. M., March 4th, six days after they were put in the show.

The kinds that were in the best shape, in order of perfection, were:

1. GLEN 40 & GLEN 40 VAR
2. CARTER'S SUNBURST
3. BETTY SHEFFIELD  
SUPREME
4. KRAMER'S SUPREME
5. CLARK HUBBS
6. MARIE BRACEY )
6. C. M. HOVEY )
6. VILLE DE NANTES ) even
6. DIXIE KNIGHT )
6. DEBUTANTE )

## BILL WOODROOF REPORTS (Continued)

PARTY DRESS — Sweet pea type. Large, irregular semi-double.

Comment: Good.

PINK RADIANCE — Clear pink. Large, full peony form.

Comment: Good. Unusual form.

PINK SUPERLATIVE — Light pink. Large, formal double.

Comment: Good but adds nothing new.

REBEL YELL — White, striped, speckled and moired red. Very large, irregular semi-double.

Comment: Good. Good form but doubts will reach very large size.

SINGING WATERS — Clear pink. Large, loose peony form.

Comment: Good form and color.

SUNDAY MORNING — Light rose pink. Very large semi-double.

Comment: No value.

TOM HERRIN — White marked red. Large, semi-double to peony form. Sports red.

Comment: Woodroof has the red sport, which is good but adds nothing new.

TOMORROW PARK HILL — A soft pink "Tomorrow".

Comment: Good.

# EFFECTS OF CONCENTRATIONS OF GIBBERELIC ACID ON THE FLOWERING OF CAMELLIAS

Brian Takenaga\*  
Pomona, California

The first work reported on growth promoting substances now known to be the gibberellins in the United States was on the isolation of a substance from *Fusarium moniliforme*, Sheldon, the asexual stage of the ascomycetous fungus whose sexual stage is *Gibberella fujikuroi* (Saw) Wt.<sup>1</sup> It was not known at that time that the substance was a gibberellin. The symptoms produced by this substance were similar to the "Bakanae" disease of the rice plant previously worked on in Japan.<sup>2</sup> The symptoms produced included the characteristic internodal elongation of stems as well as elongation of roots. The gibberellins have since been isolated, purified and become commonly available particularly in the form of gibberellic acid.

This project was initiated to throw more light on the action of different concentrations of gibberellic acid on the camellia plant. As work progressed, however, the project was expanded to include preliminary work with the auxins, kinetins and growth retardants. Results of this latter part of the project will be reported during the next flowering season. This study involves gibberellic acid concentrations in the same range reported by C. P. North<sup>3</sup> and F. R. Reed<sup>4</sup>.

Two hundred plants of uniform

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size and age were selected from a total of four hundred available and used in the early experimental work. The plants involved included six cultivars and two species including *Camellia reticulata* cv. 'Buddha'; *Camellia japonica* cvs. 'Ace of Hearts', 'Berenice Boddy', 'Debutante', 'Finlandia', and 'Giulio Nuccio'. Most of the experimental work was completed with *C. japonica* cv. 'Debutante'. 'Debutante' was used because of the availability of plants with five to twelve buds and because it was felt the peony type of flowering would show greater variations than the simple single or double flowering types. Experimental work done on the other varieties will be reported later when more data can be accumulated.

Groups of eight plants were chosen at random for each concentration level and the control (non-treated plants). All treatments were made in the same manner so that the experimental error in this area was kept to a minimum. The concentrations used were .25%, .50%, 1.0%, 2.0% and 5.0%. (See Table I) All concentrations were made on a weight to volume percentage with all weighings accurate to 0.1 milligrams. The gibberellic acid being sparingly soluble in water was brought into solution using a weak ammonium hydroxide solution approximately 0.01 molar. This would

Table I. Concentrations of gibberellic acid used with concentration data for applications to individual buds.

Concentrations of gibberellic acid	Corresponding PPM	Approximate corresponding milligrams applied to each bud
.25%	2,500	0.125
.50%	5,000	0.25
1.0%	10,000	0.50
2.0%	20,000	1.00
5.0%	50,000	2.50

correspond to about four or five drops of ammonium hydroxide (household ammonia will do) in ten to fifteen milliliters of water. The gibberellic acid used was Eastman Organic Chemicals, Red Lable Grade, Catalogue number 7444.

The plants in the main experiment were treated on two primary dates: September 26, 1964 and October 24, 1964. The significance of these two treatment dates will be discussed later. The size of the buds on the 'Debutante' before treatment was approximately 2.0 centimeters on September 26, and approximately 2.2 centimeters on October 24.

The method of treatment was the standard horticultural practice and involved the application of one drop of the gibberellic acid solution to the cup remaining after the vegetative bud adjacent to the flower bud had been broken off. This method involves the application of one drop of the solution to the exposed terminal bud stem between the shortened bud scales after the removal of the terminal bud. This method was compared with others but at the present time insufficient data has been accumulated

to evaluate results between methods.

Table II is a statistical analysis of the experimental data obtained from the previously described gibberellic acid experiment involving the cv. 'Debutante'. The analysis was through the use of an IBM 1620 computer. The mean (average) and the standard deviation (a value which added and subtracted from the mean gives the range of 95% of all the values) was calculated for all of the factors measured. From the means and the standard deviations, a statistical test for significance was run between the control and the different levels of concentration. The statistical test for significance was calculated for the results of the flowering diameters, depth, petal length, petal width and flowering times. In each case, for a five percent level of significance there is a significant difference between the control and the gibberellic acid treated flowers. There was also in each case a significant difference between the .25% and 5.0% levels of concentration. There was not, however, a significant difference between two adjacent levels of concentration. These

*(Continued on next page)*

**Table II. Some effects of gibberellic acid on flower development of 'Debutante'.**

Conc. of Gibberellic Acid	.25%	.50%	1.0%	2.0%	5.0%	Control
No. of flowers	41	47	44	47	43	31
Diameter of flower mean size in mm.	83	83	83	84	85	79
Standard deviation	7.2	7.6	7.8	9.0	7.3	5.2
Depth of flower mean size in mm.	53	54	53	54	56	49
Standard deviation	5.0	5.8	5.3	5.4	4.5	5.9
Petal length mean	40	42	43	43	43	36
Standard deviation	3.8	5.0	4.1	3.7	4.0	2.7
Petal width mean	36	36	37	37	37	34
Standard deviation	3.5	3.9	3.5	3.3	3.1	2.4
Petal length/width ratio	1.13	1.15	1.16	1.18	1.16	1.06
Flowering time mean in days from treatment	78	61	65	55	56	108
Standard deviation	28.3	24.8	22.5	17.3	17.9	25.6

significance tests indicate that the effect of the gibberellic acid treatments has a tendency, within the concentrations levels of the experiment, to increase with the higher concentrations. Because no inhibition effect has been noted at the 5.0% level of concentration, it would appear that an even higher concentration might have still a greater effect on the 'Debutante' flower. To the home experimenter, these general trends would seem to indicate that if more effect was desired, a higher concentration could be used in treatment up to the 5.0% level. It must be remembered, however, that these concentration tests were run with 'Debuante' and that responses of other camellia cultivars could possibly differ.

The length-width ratios were separated from the rest of the data because the statistical analysis differs in the case of ratios. However, a general trend can be observed to indicate the petal length increasing over the width in the gibberellic acid treated flowers.

It was found in analyzing the data separately for the September 24 and October 26 treatment dates that flowering occurred at approximately the same calendar dates for each level of concentration. The number of days from treatment to flowering would then be greater by approximately 30 days for the earlier September treatments. This would tend to indicate that as the treatment date became nearer to the normal flowering date, the gibberellic acid treatment would tend to have more of an immediate effect on flowering expansion and opening. Statistical test calculated between the two groups of flowers indicate that the flower diameter, depth, petal length, and petal width do not differ significantly. Thus, it would appear that the gibberellic acid would have approximately the same effect at the later treatment date on flower diameter, depth, petal length and width, while having more of an im-

mediate effect on flowering expansion and opening.

The colors of the 'Debutante' flowers were compared to the British Horticulture Colour Chart.<sup>5</sup> "Carmine Rose" was the color chart used in this comparison. Colors in the chart are numbered according to their shade. In the case of "Carmine Rose," 621/3 was the lightest shade and 621 was the darkest shade on the chart. The "normal" 'Debutante' color was 621/3 with tendencies to be slightly lighter in shade than the 621/3. The gibberellic acid treated flowers varied between 621/2 and 621/1 with tendencies toward the darker shade 621/1. This darker shade of the gibberellic acid treated flowers became less pronounced toward the end of the flowering season. The colors of the gibberellic acid treated flowers varied in the later part of the season between 621/2 and 621/3 with tendencies more toward the lighter shade 621/3. It is suggested that any test of color is only a subjective test at best unless pigment extracts are made and analyzed. The color tendencies, however, are strong enough to indicate possible changes brought about by gibberellic acid treatments.

### Summary of Results

1. There is a tendency as the concentration of gibberellic acid increases, within the levels of the experiment, for a greater effect of the acid on the flower.
2. Petal length-width ratios show a general tendency to be longer than wide in the gibberellic acid treated flowers than in the control flowers.
3. Treatment dates nearer to the normal flowering dates seem to have a faster action on flowering expansion and opening.
4. Color variation tendencies tend to be less in the later part of the season.

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## **Curtis Monograph On Genus Camellia Is Published**

Charles W. Traylen, antiquarian bookseller of Guildford, England has republished Samuel Curtis' "Monograph on the Genus Camellia" which was first published in 1819. According to the publisher, the original edition of this work is extremely rare and if a copy were offered for sale the price would be something over £1,000 (\$2,800). The price of the new edition is \$12.60 postage prepaid.

The new edition has a large folio—18 X 22 inches. It has a facsimile of the original title page, a descriptive text printed on both sides of a single sheet, and five color plates reproduced in full size from the original drawings by Clara Maria Pope and printed in eight-color offset lithography. The new edition is not only beautifully done but it also provides in the descriptive text and the illustrations a sketch of camellias as they were known at the beginning of the 19th Century.

Orders and inquiries should be directed to Charles W. Traylen, Castle House, 49-50 Quarry St., Guildford, England.

### **WHAT'S BEHIND (Continued)**

peat moss, 1 part sandy loam, and 1/2 coarse sand. Increase the sand to 1 part if it is a reticulata. Give the reticks more sun, less fertilizer and keep them pruned fairly close to the center of the plant.

I heard of a study on plants to determine if the love of the plants by the gardener had any effect on the growth and blooming qualities. It was determined there was a marked correlation. If this is true it is sure easy to spot at show time the growers who love their plants.

California will have a December

show this year, so those of you who haven't tried gibberellic acid should try it this year. There will be some sessions to demonstrate its use, and the approximate time to gib to bloom for the December Show. Join the jabbers and get a couple of additional months' enjoyment out of your blooms.

This is my last article on culture, as your Editor likes a different person to write it each year to get a different point of view. Camellia culture is like raising children, each one of us has a little different approach to the subject.

P.S. Al is getting out from behind "THE GREEN THUMB," and I am also getting out from "BEHIND THE GREY TYPEWRITER." GOODY!

Bernice (Gunn)

### **IS CAMELLIA HETEROPHYLLA? (Continued)**

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## New S. C. C. S. Officers And Board of Directors

New Officers and Directors took charge of the affairs of the Southern California Camellia Society as of the close of the meeting of April 13th. It has been customary for a President to hold office for two consecutive one-year terms. Press of personal duties precluded Robert F. Dickson from continuing as President for a second term and Alvin L. Gunn, of Lynwood, Vice President and Program Chairman for the prior year, was elected President. Fred D. Byers of San Marino was elected Vice President and will serve as Program Chairman for next season's meetings.

At a business meeting held in connection with the February 9th Society meeting the following new Directors were elected. For one-year term: Fred Byers, Erni Pieri and Mark Anthony. For two-year term: R. F. Dickson, Wilber Foss, Alvin L. Gunn and Douglass Thompson. The following Directors, having been elected to two-year terms in 1964, continue on the Board: Walter T. Scott, Fred I. Sinclair, Robert W. Smiley and Mrs. Deloris Taylor. Harold E. Dryden was elected by the new Board to serve as Secretary - Treasurer and Editor of CAMELLIA REVIEW for another year.

### EFFECTS OF CONCENTRATION (Continued)

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5. *Horticultural Colour Chart*.  
Issued by The British Colour Council in Collaboration with The Royal Horticultural Society.

#### Acknowledgments

Mr. R. W. Ragland for making funds available for the initiation of this project.  
Tomlinson's Nurseries of Whittier, Calif. for the donation of a number of plants.  
Dr. C. R. Parks of the Los Angeles County Arboretum staff for help and guidance.  
Dr. J. E. Dimitman, head of the Biology Dept. of California State Polytechnic College, for assistance.

#### I'm a New Member

I see you at the meetings, but you  
never say "Hello."  
You're busy all the time you're there  
With those you already know.  
I sit amongst the members, And yet  
I'm a lonesome guy.  
Why can't you nod or say hello,  
Or stop and shake my hand,  
Then go and sit among your friends.  
Now that I understand,  
I'll be at your next meeting;  
Perhaps a nicer one to spend;  
Do you think you could introduce  
yourself,  
I'd like to be your friend.

—Anonymous



This is Bill Goertz's 'Kramer's Supreme'  
after pruning.



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## Directory of Affiliated Societies

- Camellia Society of Kern County.....Bakersfield  
 President: Melvin G. Canfield; Secretary: Mrs. Charlotte Johnson, 1902 Niles St., Bakersfield.  
 Meetings held 2nd Monday of the month, October through April, in Police Building, 1620 Truxton Ave., Bakersfield.
- Camellia Society of Orange County.....Santa Ana  
 President: Warren Woody; Secretary: Mrs. George T. Butler, 1121 Orange, Santa Ana.  
 Meetings held first Thursday of month, October through April, in Orange County Farm Bureau Building, 1916 W. Chapman, Orange.
- Central California Camellia Society.....Fresno  
 President: Mert Weymouth; Secretary: Mrs. Glen S. Wise, 5493 E. Liberty, Fresno.  
 Meetings held at Heaton School, Del Mar Ave., Fresno on Nov. 18, Dec. 16, Jan. 27, Feb. 24, Mar. 24.
- Huntington Camellia Garden.....San Marino  
 Henry E. Huntington Library and Art Gallery, Oxford Road, San Marino.
- Pomona Valley Camellia Society.....Pomona  
 President: I. John Movich, 932 N. Park Ave., Pomona; Secretary: Alvin E. Anderson, 743 Calspar St., Claremont  
 Meetings held 2nd Thursday of each month, November through April, in the Pomona First Federal Savings & Loan Assn. Bldg., Garey Ave. & Center St., Pomona (1 block South of Holt).
- San Diego Camellia Society.....San Diego  
 President: Mrs. Althea T. Hebert; Secretary: Mrs. Carol Bradford, 5707 Jackson Dr., La Mesa.  
 Meetings held 2nd Friday of the month, November through May, in Floral Association Building, Balboa Park, San Diego.
- Southern California Camellia Society.....San Marino  
 President: Robert F. Dickson; Secretary: Harold E. Dryden, 820 Winston Ave., San Marino.  
 Meetings held Second Tuesday of every month, November to April, inclusive at the San Marino Women's Club House, 1800 Huntington Drive, San Marino.
- Temple City Camellia Society.....Temple City  
 President: Harry S. Putnam; Secretary: Mrs. Violet Shuey, 5813 N. Golden West Ave., Temple City.  
 Meetings held on 3rd Friday of November and December and 4th Thursday January through March in Lecture Hall of Los Angeles County Arboretum.
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