# The Camellia Bulletin

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MARGARET SHORT

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**The Camellia Bulletin,** in keeping with the fundamental concept of the amateur organizations it serves, is a non-profit enterprise published quarterly (Jan., Apr., July and Oct.) by the Northern California Camellia Society, Inc. Its principal objects and purposes are furtherance of the enjoyment and benefits derived from the culture of camellias and the dissemination of knowledge related thereto. By special arrangement with, and through the co-operation of, the Pacific Camellia Society, The Camellia Society of Sacramento and The Camellia Society of Santa Clara County, this Bulletin is also available in conjunction with membership, which is open to the general public upon application to the Secretary of any of the societies mentioned, at the respective addresses shown above. For full membership in the Northern California Camellia Society, Inc., and with respect to all persons resident in the counties of Alameda, Contra Costa, Marin, San Francisco and San Mateo, the annual dues are $5.00—outside that area, limited membership privileges, including the right to all Society publications, are $3.00 per year. MEETINGS are held on the first Monday of each month November through May, at 8 p.m. in the Claremont Junior High School Auditorium, Oakland, and include an informal flower display and refreshments. All matter regarding the content of the Bulletin should be addressed to the Editor. CHANGE OF ADDRESS should be reported promptly to your Secretary, as the Post Office will not forward periodicals. Remit dues to Treasurer.

As we enter the New Year, *The Camellia Bulletin* embarks upon an expanded policy. Effective with this issue, you will note that we have added to our staff of regular contributors one of the prominent women in camellia circles of the Deep South, Mrs. M. J. (Lilette) Witman, an intense lover and grower of camellias who, with her celebrated husband, Mike, constitute one of the outstanding man-and-wife teams in the country. These two universally known and loved camellia personalities travel widely in the pursuit of their hobby and both have long held positions of prominence in camellia affairs, particularly those of the American Camellia Society.

We are, indeed, fortunate to have Lilette Witman on our staff and her new column, "THE SOUTHERN SCENE," will serve to keep us intimately and accurately informed on the significant events of that important camellia area. We know you will enjoy her fresh, individualistic viewpoint. This welcome addition also brings to our staff the feminine touch heretofore lacking and, at the same time, gives recognition to the increasingly important part our constantly rising membership in the South plays. We are sure you will enjoy this new feature.

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Perhaps a fair measure of the success of any amateur society is its contribution to the world in which it operates. Certainly it is not a true measure of the achievements of an idealistic organization that it be financially successful — most are not — except to the degree necessary to produce the wherewithal with which to pursue commendable, unselfish objectives.

For the past thirteen years, the first eight of which were on the basis of a completely internal organ, the BULLETIN has been published by the Northern California Camellia Society regularly, at least every quarter. Conducted on a somewhat wider scope during the past five years, this publication has been enlarged and its circulation multiplied several times. Improvement in quality and steadily rising printing costs have, however, largely offset the increasing circulation with the result that today, as in the years when it was solely an internal organ on a more modest basis, N.C.C.S. still picks up the tab for an annual deficiency in income. This has now been going on for thirteen years and I think the members of N.C.C.S., both regular and subscriber, take considerable pride in the fact they have been, as individuals, instrumental in carrying out what must be an amateur activity in the truest sense.

Within the past year, several of the more prominent camellia societies have found it necessary to increase their dues owing to circumstances beyond their control. We have, however, so far never increased either our subscription nor regular members' fees.

The quality of any publication necessarily must depend upon its revenues and, as Editor, the writer will never be satisfied until we are completely self-supporting. We do not wish and do not intend to compromise on quality and we do not wish to have and will make every effort to avoid any increase in dues. Being the only major camellia publication in the United States that has no advertising, which we feel enables us to carry more information as well as being in the truest amateur tradition, we have one obvious course open to us — larger circulation. To that objective, we shall now devote increasing attention and, to the extent that any may feel justified, we would sincerely welcome your support. As detailed elsewhere herein, the writer has thought of a novel plan to personally express his appreciation to those who consider our objectives worthy of such interest. To some it will mean little, to others it will not only be our modest way of reciprocation but may actually prove quite rewarding.

**COVER FLOWER**

One of the best of the many fine seedlings produced by Harvey F. Short of Pasadena, this seedling of ELEGANS is now under propagation by Nuccio's Nurseries, Altadena, Calif.

**SEE OFFER ON BACK COVER**

## THE SOUTHERN SCENE

Mrs. M. J. (Lilette) Witman, Macon, Georgia

At the Fall meeting of the American Camellia Society's governing board in Columbia, S. C., several noteworthy decisions were taken. Mr. Joseph H. Pyron of Reynolds, Georgia, was appointed Secretary and Editor of the society, starting in January, succeeding Arthur Brown, who is retiring after many years of outstanding service. Joe, a member of the NCCS, is a great camellia fancier, perhaps one of the best informed southerners on new varieties. He is a former Professor of Botany at the University of Georgia and seems to be well equipped to fill his new post. We wish him well. The board also decided to increase the size of the quarterly publication and to change its name to "Camellias," The Journal of the ACS. I was told that a newly introduced variety in color will adorn the cover of each issue henceforth and that the lovely colored picture of "BETTY SHEFFIELD SUPREME," which graced the cover of our BULLETIN last October, has been selected for January.

There is very little talk down our way about outstanding new seedlings at the present time. I hear that Carl Wheeler has a magnificent new one labeled "WHEELER #459," but will not release it this season. This reminds me that, among the awards bestowed in 1959 by the British Royal Horticultural Society, the camellia japonica R. L. WHEELER received the Society's coveted Award of Merit.

The ACS fifteenth annual meeting on January 28-30 in Jacksonville, Florida, seems to be attracting visitors the world over. The writer received a letter from Mr. Roland R. Young, President of the Wanganui Branch of the newly formed New Zealand camellia society, saying that he intends to visit camellia gardens and nurseries in the South on his way to attend the ACS convention. I also hear that Mr. Peterson of Wellington, New Zealand, will attend, as well as Mr. T. J. Savige of Victoria, Australia.

The camellia season started gloriously in Georgia. We had an unusually rainy summer, which provided a good supply of underground water for our shrubs; then our Fall was delightfully mild 'way into November. This accounted for a profusion of fine early blooms. Our hopes were raised high, only to be shattered overnight by a severe freeze right after Thanksgiving, when the temperature suddenly dropped to about 20°. Naturally, all the flowers were killed.

Every Fall, in the middle of November, we feel an irresistible urge to visit Mobile, Alabama, and to feast our eyes on the magnificent early blooms they have in that section of the South. Generally by that time we have had our first killing frost in Georgia. This year, however, the reverse occurred — Mobile had the early freezes, and no flowers of consequence were to be seen anywhere. Our trip would have been a dismal failure had we not had the good fortune of finding Mr. K. Sawada at home, whom we met for a chat at his nursery in Crichton, Alabama. He received us, as usual, with the warm smile of an old friend who is happy indeed to see you. The few moments spent with him made us forget our disappointment in not finding any blooms around. Mr. K. has really retired and placed the nursery business entirely in the hands of two of his sons. However, he is still deeply interested in what is going on at "OVERLOOK NURSERY," and continues, merely as a hobby, his fascinating work in hybridizing and cross pollination which he started years ago. In fact I believe that Mr. K. was the first grower ever to attempt systematic breeding of camellias in this country. Having the infinite patience and thoroughness of his race (he was born in Japan), he has, over the years, made a careful study of the best seed bearers. As a parent species for hybridizing he seems to prefer *C. fraterna* which, he says, is a prolific seeder. He has a seedling of *Fraterna* crossed with *Akebono* which he likes very much and may release some day.

# CAMELLIAS IN THE GREAT VALLEY

Ralph G. Gladen, M.D., Modesto, California

When I began associating with camellias in San Bernardino in 1939 I had not the slightest forethought that one day I would have hundreds of them in the San Joaquin Valley. I am happy for the experience, though, because I believe that this valley provides, for the majority of camellias, more consistently than any other area I know of, the climatic conditions most suitable for them. All that is necessary is that you provide them with some shade, water, and a morsel of food, along with perhaps three sprayings a year and judicious pruning. Nature provides the rest.

Since the camellia is a winter blooming plant, the mean temperature of 50 degrees customary in the Modesto area from about late September on is ideal. (Mean temperature meaning the average for a twenty-four hour period.) This permits the buds to develop slowly, to attain their correct size and form, proper color, and petal substance. After a six-week period having a mean temperature of 50 degrees, only a very hot spell can cause a little blasting.

In the spring, again we are blessed in the Modesto area. This is the season for the setting of buds. A six-week period about June, during which a mean temperature of 80 degrees or higher is maintained, means excellent bud setting. This year we had several weeks of above 100 degree weather daily, and as high as 110 degrees, and the year's buds are the best and most numerous that I have ever seen. There is a horticultural secret about camellias — hot weather in June, cool weather in November, for best results.

All of my camellias are grown in the open. I prefer some shade because I have learned that, although many of them will grow readily in full sun, all of them do better with some shade. Full sun is too likely to result in scorched and stained petals, undersized and uninteresting blossoms, burned leaves, and stripped tips of the foliage. If one does not care especially to have perfection in the blooms, some camellias will prosper in the sun. I prefer to give the plant a chance to thrill me with its flowers.

With many camellias too much shade is almost as bad as too much sun. Although this certainly is not true of plants like Lotus, still it is a general rule that much bright sunlight, perhaps as much as a half day, is preferred by most camellias. The best locations therefore are East side and the north side of buildings; the west side and south side are least desirable. Light shade can be provided by high-growing trees or artificial shade.

I realize that the performance of certain varieties might be better if I provided a greenhouse, or at least a lathhouse. I intend some day to have both, but wanted to learn something about sun tolerance, cold tolerance, growth characteristics, disease resistance, and bloom characteristics — under varying conditions. I have grown some 1500 varieties of camellias. I now have about 800 varieties but I have dropped, grafted-over or otherwise replaced the ones I liked the least. In so doing I have learned the value of high planting, good drainage, and humus. I have found that LADY MARY CROMARTIE, a most satisfactory camellia, will prosper in full sun without a "squawk" of any kind, except that her blossoms are better in partial shade; that VICTORY WHITE, another most satisfactory camellia, objects to too much shade; that sewage sludge is an ideal supplement to cottonseed meal in my feeding program. I have learned that camellias can be moved almost recklessly, just so long as you do not disturb the roots too much, and that azaleas, if you select the low growing ones, make fine companions for camellias, and so do fuchsias, hydrangeas, and Japanese anemones, if you have the room, providing year-round color in the garden — and so on.

To take advantage of our fine climate for bud setting and blooming one must control (1) Planting, (2) Watering, (3) Feeding, (4) Pruning and Root Pruning, (5) Disbudding, (6) Spraying, and (7) Moving.

**Planting:** A rich loam with one third humus, such as peat, added, is usual. A richer mixture with some sand may be

desirable for potted plants, which can be grown in the same container for ten years or longer. The crown of the plant MUST be above the ground. Make the camellia roots reach for the ground, if necessary. Always, when settled down, the crown should be an inch or two above the ground level. In my garden I plant two to six inches above ground level. I have a great deal of mortality from plants sunk in the ground, especially those shipped from the East. Frequently I have had to raise such plants to keep them from being choked to death. I learned the hard way — by losing valued plants. I was on my own; there is no other camellia fancier in the area, though last year one moved into the Stockton area (and we've not met).

**Watering:** This is provided by either overhead "rainbird" type sprinklers, which are turned on three times a week in hot weather and less frequently in cooler weather, or by bubblers which flood the beds — same watering schedule. Where bubblers are used leaf sprinkling is encouraged at least occasionally during the hotter weather. Time of watering ranges from 15 minutes to a full hour, depending on heat and wind. Wind is as harmful a threat as is excessive heat, and must be compensated for. Similarly, I think that a good overhead watering of the camellias will help them withstand an otherwise damaging frost. If a killing frost is expected, I water in the evening preceding. I don't mean plant killing, I mean bud killing, frost. I think, however, that the prewatering would help protect against plant killing frost, also. So long as you maintain good drainage it is difficult to overwater, though it is to be avoided.

**Feeding:** I want to grow handsome flowers. I would just as soon have my plants stay as they are, size-wise, since I have too little space for them as it is, therefore I do not feed my plants to make them grow. I feed to keep my plants healthy, and to produce large, beautiful flowers. Therefore my feeding schedule calls for a handful of cottonseed meal and the same amount of processed sewage for a 3 to 4 foot plant on the first of December, and repeated on the first of January, each year. Sewage sludge (I use Gardenite, put out in 80 pound bags by the City of San Francisco) provides 2% nitrogen, 2.12% available phosphoric acid, and, to the camellia's delight, 3½% iron, 2.5% aluminum, and 1.3% magnesium, all expressed as elemental. As you probably know, a good cottonseed meal provides 6.5 to 7% nitrogen, about 3% phosphoric acid, and 2% potash, which though not immediately available as in commercial fertilizers, is more so than in manures. It also tends to keep the soil acid, in addition to supplying food. It is my belief that these two products are almost ideal for the camellia grower. Any residue is useful as humus. The only complaint I have is that for a week or two following the applications I get snide remarks from the kitchen area because of the somewhat hearty odor. This is a low price to pay for value received. These actually are less costly and less dangerous to use than most other fertilizers. If you wish to avoid the unpleasant odor, I suggest you use commercial fertilizers prepared for acid loving plants, in smaller quantities.

**Pruning:** This usually is taken care of when blooms are removed or at periodic inspections. I trim my plants back each year, to keep them growing within bounds. Extremely strong growing plants like DR. TINSLEY must be dealt with somewhat severely. Even so, it is always loaded with blossoms. No branches should be tolerated lower than a foot above the ground. Such branches invite scale. Each plant suggests it rightful shape and should be helped in its natural selection. The interior should be kept free of excess branches and dead wood, to allow for good air circulation.

**Root Pruning:** I always root prune my plants at least a month before transplanting. This is done by driving a square pointed spade straight into the ground all around the plant, somewhere near the drip line. This allows the plant to grow hair roots at the site of the cut, so that future moves will not shock the plant. If practiced routinely, it allows the plant to develop a dense, healthy root system somewhere near the main trunk, so that a

*(Continued on page 8)*

# THE PRINCIPLES OF GRAFTING

In this country, January and February are generally regarded as the best months in which to graft camellias, for the condition of dormancy so essential to success for the operation is present then, while the natural period of vegetative growth is just far enough distant to permit the proper union of scion and stock to take place prior thereto. It is timely, then, that we discuss the whys and wherefores of grafting, the actual technique of which is more easily learned through personal demonstration.

As succinctly defined by the R. H. S. *Dictionary of Gardening,* "Grafting is the operation of combining a shoot, the scion, of one plant with a rooted portion, the stock, of another so that the two may grow together and form one plant. It differs from budding in its general application only in that in budding the undeveloped shoot, a bud, is used as the scion, instead of a developed shoot."

There are perhaps a hundred different ways of grafting but the grafting of camellias in this country is almost entirely by means of the cleft graft, although where small material is involved whip grafting is often resorted to. It is generally the rule that there must be fairly close compatibility between scion and stock, both in their botanical relationship as well as physical condition at the time of the operation. However, the successful grafting of such unlikely combinations as Kalmia on Rhododendron and Tomato on Potato have been reported. In the genus *Camellia,* it is believed that almost any species will graft on another, regardless of a sometimes wide difference in chromosomes, *C. sasanqua* being commonly used as the stock for *C. japonica* scions and vise versa, although the former has triple the chromosomes of the latter (90 vs. 30). The writer has successfully grafted the following species on japonica stock:

*C. reticulata*
*C. sasanqua*
*C. oleifera*
*C. roseaflora*
*C. taliensis*
*C. hongkongensis*
*C. cuspidata*
*C. maliflora*
*C. fraterna*
*C. drupifera*
*C. irrawadiensis*
*C. granthamiana*
*C. miyagii*
*C. rusticana*
*C. tsaii*
*C. hiemalis*

and perhaps others, as well as that more distant relative, *Tutcheria spectabilis.*

The *purpose* of grafting is, of course, to improve the quality of the camellia being grown by substituting a superior variety for one that is inferior, for enlarging the collection when one has several plants of the same variety, or for expediting the production of a sizable plant. Sometimes grafting is resorted to merely to replace a too large plant with one smaller, or to substitute one with a different growth habit because of space limitations. However, it is a very common occurrence that the variety cut down is actually superior to what the new one proves to be. Because it takes years to replace the original plant, in size and appearance, some caution is counseled where an old, well established camellia is involved. Do not destroy the plant you have, especially if important to your landscaping, unless you are sure the new variety you intend to substitute has *all* the qualities — not merely an attractive flower — that you want in a camellia!

The *technique* of grafting — especially cleft grafting — is fairly simple. It consists of:

(1) bringing stock and scion together preferably when both are in a dormant state — no sap running in the former and the wood firm in the latter.

(2) making contact of the cambium layer of both over as wide an area as possible (the cambium layer lies between the wood and the true bark and is distinguished by its rich green color). This is done through beveling of the scion both laterally and vertically, the lateral bevel resulting in the contact pressures being on the outside, where the cambium lies, while the vertical bevel, of course, forms the wedge which fills the aperture produced by forcing the two sides of the split stock apart.

In cleft grafting, especially when working with stock that has the sap rising, it is advisable to cut it on a slant and work

*(Continued on next page)*

## CAMELLIAS IN THE GREAT VALLEY (Cont. from page 6)

move at any time will find the plant prepared to submit to it.

Camellias, in their native state, develop long tap roots to seek a water table, and then they can live for centuries. We discourage this in cultivation, but the plant will try to send out a substitute tap root, one or two very large roots extending many feet away from the plant. It is best to discourage this, and encourage many smaller roots nearer the trunk if you are likely to move the plant. Cutting off these large roots is what shocks many field grown plants to death when they are dug for shipping. Proper root pruning prevents this risk.

**Disbudding:** I do not disbud if the plants makes a good show in the garden because of its heavy bloom. One must consider the effect one wants to obtain. Plants such as FAVORITE, PINK PERFECTION, FLORENCE DANIELL, and ALISON LEIGH WOODROOF, are probably better off left alone. For others, however, there are some advantages in disbudding. By permitting only one bloom to develop at the tip of a branch, the size of the individual blossom is increased. By leaving on various sized buds you can extend the blooming season of the plant. Disbudding conserves plant energy, wasting none. You can disbud so that the remaining flowers will face up or down, in or out. While inspecting the plant for disbudding you can do two other things. You can manually remove any aphids found, and you can remove any leaves or twigs that might interfere with the filling out of the blossoms, in case you want a show-quality bloom. Disbudding has to be repeated several times during a good year, but the elimination of aphids alone makes the project worthwhile.

**Spraying:** In case your periodic inspections and disbudding fail to get rid of the aphids you can use Malathion. I have a commercial sprayer cover the plants with a mixture of Malathion and an oil such as Volck once yearly, as a cleanup spray, in April or May. This takes care of scale. Also, during the first week of January and the third week of February, the ground is soaked with Terraclor to combat petal blight. This is a simple spray procedure when compared with most other plants.

**Moving:** If the plant is in a container it can be moved any time during the year and transplanted. If it is in the ground and has been root-pruned it can similarly be moved any time; however, it is best done during the winter, from November to April. The root-mass should be disturbed as little as possible. Quite easy to handle, these camellias. They will even naturalize for you, with seedlings springing up here and there without any special care. As for you, may an occasional mutant make life more interesting!

I have for years felt that camellias command affection bestowed on few other flowers. Roses may be more popular and rhododendrons sometimes more sensational, but the camellia is soft and beautiful, enticing, regal, thrilling. When I see a clumsy worker walking amongst them, I feel so sorry for the camellias, but they are strong and sturdy too. They tolerate a great deal of abuse. You cut them off, they grow and bloom next year anyway. If you care for them properly they will outlive you by hundreds of years. Your great, great, great grandchildren may get more pleasure out of your plants than you do. Don't you believe me? Try it and see.

## GRAFTING (Cont. from page 7)

the scion into the high side so that any bleeding will drain off and away from the point of contact. For the unskilled, or when working under conditions of poor light, it is good practice to slant the scion slightly when placing it in the stock. This insures that the cambiums must cross at some point and minimizes failures due to lack of contact, which is vital to the operation. The writer prefers to have a scion with at least three leaves, so that the lower leaf may be cut off at the node and the scion beveled up over this point, keeping the node on the outside. The reason for

*(Continued on Back Cover)*

# CHROMOSOMES AND CHROMOSOME NUMBERS

## Foreword

The comparatively recent availability of 20 or more new species of Camellia has instigated widespread effort to develop new types from cross-breeding of the different species (inter-specific hybridizing). In this effort heretofore, the lack of reliable information as to the prospects of success (and verification thereof), where species having different genetic structure are involved, has been somewhat of a handicap. Recorded experience has also been very meagre. Furthermore, although the scientific method of determining the basic genetic structure and thus compatibility of the different camellia species (by counting the chromosomes) had long been known, the results were available only in a very sketchy way.

That we now have a very comprehensive compilation of the chromosome determinations made over the past decade or so comes as a distinct aid to the would-be camellia breeder. This important work has been done by eminently qualified persons under the sponsorship of the Camellia Research Advisory Committee who have kindly made the results available for general publication and dissemination. To those responsible, particularly the authors and scientists, Messrs. Tourje and Longley, go great credit and the sincere appreciation of us all for this valuable addition to camellia knowledge.

## Introductory Remarks

Just what are chromosomes; what part do they play in plant life; how can we count them and just what does all this really mean? It shall be the purpose of these introductory remarks to attempt to explain in plain language this highly technical subject and its terms of reference.

To begin with, chromosomes are tiny bodies found in the cells of the higher forms of plant life, including camellias. They contain those minute units of inheritance — the genes — which determine the characters of everything that lives. In form, chromosomes resemble chains of beads which house the genes, the latter being so small as to be invisible to the most powerful miscroscope.

A single genus of plants, such as the Camellia, has a fixed *basic number* of chromosomes common to all of its species and varieties. This "basic number of chromosomes" is called a *set* and, in the Camellia, a set consists of 15, which is the "haploid" (single) number. These sets are contributed by both the male and female parents.

In the reproductive organs, which produce the pollen and ovules, the sets are of only one *sex,* but in the normal body cells of the plant (scientifically called "somatic tissues") the two sets, one contributed by the pollen parent and the other by the seed parent, are present. For example, in *C. japonica,* there are 30 chromosomes present in each of the body cells of the plant. In the formation of the pollen and egg cells, these are reduced back to the haploid number of 15. The chromosome number is restored to "diploid" (doubled) when these haploid sets are combined by union of the pollen nucleus (having 15 chromosomes) with the egg nucleus (also having 15 chromosomes). The resulting cell by numerous divisions forms the seed from which the plant germinates and grows.

Camellias have the capacity to form in a single flower (the primary purpose of which is reproduction) both the egg and pollen cells and to self-reproduce (self-pollinate) simply because there is combined in the flower in compatible form the essential tissues which, during the development of the flower, become the seed-bearing portion and pollen-bearing portion (anthers). The would-be hybridizer is thus confronted at the outset with the problem of making certain this does not happen before he attempts artificial pollination.* It is obvious, therefore, that

*There is always the further risk that the seed produced is of apogamous origin, as geneticists tell us that the camellia is actually capable of producing seed without going through the process of pollination. For discussion of this interesting subject the attention of the reader is directed to the article "Apomixis: Possible Cause of False Camellia Hybrids," American Camellia *Yearbook,* 1959, by E. C. Tourje and Albert E. Longley.

camellias having completely double flowers are sterile because they lack the parts necessary to reproduction (stamens and stigma). Even though the sexual parts may be present, as explained above some varieties (and many hybrids) are also sterile.

Where there are *more than two sets* of chromosomes present in the cells, the plant is described as being "polyploid" (containing multiple sets). Where there are multiple sets of chromosomes, the cells must be larger, usually resulting in larger leaves, flowers, fruits and plants. The exact number of sets of chromosomes in the cells of a polyploid plant is designated by the prefix in the term used to describe them, as shown below, the known multiples in a Camellia being not more than 6 times the basic number:

| | NUMBER OF CHROMOSOMES | |
|---|---|---|
| | *In Germ Cells* | *In Body Cells* |
| Haploid (basic single number) .. | $n=15$ | ..... |
| Diploid (basic pair) ..... | ..... | $2n=30$ (1 pair) |
| Triploid ..... | * | $2n=45$ (3 sets) * |
| Tetraploid ..... | $n=30$ | $2n=60$ (2 pairs) |
| Pentaploid ..... | * | $2n=75$ (5 sets) * |
| Hexaploid ..... | $n=45$ | $2n=90$ (3 pairs) |

*There being an odd number of chromosomes in the body cells, it follows that the chromosomes are unable to form pairs at the formation of the germ cells, this imbalance (incompatibility) resulting in a high degree of sterility in such plants.

The symbols used in the attached compilation are explained thusly: When a microscopic count has been made of the chromosomes in a *diploid* camellia's pollen (or ovule) cells, the result is expressed by the symbol $n=15$, or $2n=30$ if the chromosomes in the body cells were counted; if a *triploid* camellia's pollen (or egg cells) were counted for chromosomes, the symbol would be $n=45/2$, but $2n=45$ if the body cell chromosomes were counted; similarly, $2n=90$ would reflect the fact that the body cell chromosomes had been counted on a plant determined to be a *hexaploid,* while $n=45$ would denote that the determination had been made from the germ cells.

(With acknowledgment to Dr. Walter E. Lammerts and E. C. Tourje.)—*The Editor.*

## CHROMOSOME NUMBERS OF CERTAIN CAMELLIA SPECIES AND ALLIED GENERA

Compiled for CAMELLIA RESEARCH ADVISORY COMMITTEE

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Letter a, preceding various of the following chromosome reports, indicates prevously unpublished.

b, indicates that data were previously reported by Patterson, Earl B., Mary Olga Longley and Donald S. Robertson. Chromosome Numbers in Cultivated Camellias. *Camellia Research,* 1950. Southern California Camellia Society. Also *American Camellia Yearbook,* 1950.

c, indicates that data were previously reported by Janaki Ammal, E. K., Chromosome Relationships in Cultivated Species of Camellia. 1952. *American Camellia Yearbook.*

d, indicates that data were supplied by Satomi, Eikichi, Tokyo, to R. S. Peer, member of Camellia Research Advisory Committee.

e, indicates that data were previously reported by Darlington, C. D. and A. P. Wylie. Chromosome Atlas of Flowering Plants. 1953. Allen and Unwin. London. 1956. Macmillan. New York. (by permission).

f, indicates that data were previously reported by Tourje, E. C., *Camellia Culture.* 1958. (Southern California Camellia Society). Macmillan. New York.

(Where the symbol *n* is used it is indicated that numbers were obtained from gametic tissue studies. Where the symbol *2n* is used it is indicated that numbers were obtained as a result of somatic studies.)

| Species & Variety | Source Code | Author of Count | Date of Count or Publication | Source of Material | Count Number | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | Diploid | Triploid | Hexaploid | Other |
| *C. cuspidata* | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso[1] | n=15 | | | |
| *C. cuspidata* | c | Janaki Ammal, E. K. | 1952 | Kew Gardens | 2n=30 | | | |
| *C. cuspidata* | e | Janaki Ammal, E. K. | 1953–56 | | 2n=30 | | | |
| *C. drupifera* | a | Longley, Albert E. | 10/10/58 | Huntington Bot. Gdn. #15527 | | | n=45 | |
| *C. fraterna* | a | Longley, Albert E. | 10/10/58 | Huntington Bot. Gdn. #15476D | | | n=45 | |
| *C. granthamiana* | a | Longley, Albert E. | 11/ 5/58 | Hartman, A. M. | | | | n=30 |
| *C. hiemalis*[2] | d | Arizuma, K. | — | Kyushu University | | | 2n=90 | |
| v. Shishigashira | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | | | | n=30 |
| v. Shishigashira | a | Longley, Albert E. | 10/29/56 | Huntington Bot. Gdn. #13851B | | | n=45 | |
| v. Shishigashira | a | Longley, Albert E. | 10/21/58 | Tourje, E. C. | | | n=45 | |
| *C. hongkongensis* | c | Janaki Ammal, E. K. | 1952 | Kew Gardens (18-50) | 2n=30 | | | |
| *C. hongkongensis* | e | Janaki Ammal, E. K. | 1953–56 | | 2n=30 | | | |
| *C. japonica* | | | | | | | | |
| v. Akahsigata | d | Arizuma, K. | — | Kyushu University | | 2n=45 | | |
| v. Aki-no-yama | d | Arizuma, K. | — | Kyushu University | 2n=30 | | | |
| v. Berenice Boddy | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | n=15 | | | |
| v. Bokuhan | d | Arizuma, K. | — | Kyushu University | 2n=30 | | | |
| v. Daikagura | d | Arizuma, K. | — | Kyushu Unviersity | 2n=30 | | | |
| v. Daikagura | b | Patterson, Earl B. *et al.* | — | Kyushu University | 2n=30 | | | |
| v. Elegans | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | n=15 | | | |
| v. Eureka | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | 2n=30 | | | |
| v. F. G. 2 (Iwani) | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | 2n=30 | | | |
| v. Frank Gibson | c | Janaki Ammal, E. K. | 1950 | Rancho Descanso | n=15 | | | |
| v. Genji-karako | d | Arizuma, K. | 1952 | Peer, R. S. | | 2n=45 | | |
| v. Grandiflora | e | Janaki Ammal, E. K. | — | Kyushu University | 2n=30 | | | |
| v. Grandiflora | a | Longley, Albert E. | 1953–56 | | | 2n=45 | | |
| v. Hakugan | d | Arizuma, K. | 1948 | Rancho Descanso | | n=45/2 | | |
| v. Higurashi | d | Arizuma, K. | — | Kyushu University | 2n=30 | | | |
| v. Iwani-shibori | d | Arizuma, K. | — | Kyushu University | 2n=30 | | | |
| v. Jenny Jones | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | n=15 | | | |
| v. Kauha-shiratama | d | Arizuma, K. | — | Kyushu University | 2n=30 | | | |
| v. Komyo | d | Arizuma, K. | — | Kyushu University | | n=45/2 | | |
| v. Kifukurin-beni-karako | d | Arizuma, K. | — | Kyushu University | 2n=30 | | | |
| v. Kingyo-tsubaki | d | Arizuma, K. | — | Kyushu University | 2n=30 | | | |
| v. Konron-Kuro (Konron-Koku) | d | Arizuma, K. | — | Kyushu University | 2n=30 | | | |
| v. Kumasaka | d | Arizuma, K. | — | Kyushu University | 2n=30 | | | |
| v. Lady Clare | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | | n=45/2 | | |
| v. Lauren Bacall | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | n=15 | | | |
| v. Lotus | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | n=15 | | | |
| v. Mathotiana | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | | n=45/2 | | |

| Species & Variety | Source Code | Author of Count | Date of Count or Publication | Source of Material | Count Number: Diploid | Triploid | Hexaploid | Other |
|---|---|---|---|---|---|---|---|---|
| *C. japonica* | | | | | | | | |
| v. Mermaid | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | n=15 | | | |
| v. Mrs. Howard Asper | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | n=15 | | | |
| v. Mrs. John Laing | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | n=15 | | | |
| v. Nagasaki | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | | n=45/2 | | |
| v. O-Shiratama | d | Arizuma, K. | — | Kyushu University | 2n=30 | | | |
| v. Otome | d | Arizuma, K. | — | Kyushu University | 2n=30 | | | |
| v. Pink Perfection | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | 2n=30 | | | |
| v. Prof. Charles Sargent | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | 2n=30 | | | |
| v. Rainy Sun | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | 2n=30 | | | |
| v. Seedling #45091/3 | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | 2n=30 | | | |
| v. Shiratama | d | Arizuma, K. | — | Kyushu University | 2n=30 | | | |
| v. Tafuku-benten | d | Arizuma, K. | — | Kyushu University | 2n=30 | | | |
| v. Ville de Nantes | b | Patterson, Earl B. *et al.* | 1950 | Descanso Gardens | n=15 | | | |
| v. Yabu-tsubaki (wild Japonica) | d | Arizuma, K. | — | Kyushu University | 2n=30 | | | |
| v. Yukimi-guruma | d | Arizuma, K. | — | Kyushu University | 2n=30 | | | |
| *C. kissi* | c | Janaki Ammal, E. K. | 1952 | (Nepal) | 2n=30 | | | |
| *C. kissi* | e | Janaki Ammal, E. K. | 1953–56 | | 2n=30 | | | |
| *C. lanceolata* | e | Janaki Ammal, E. K. | 1952 | Caerhays | 2n=30 | | | |
| *C. lanceolata* | e | Janaki Ammal, E. K. | 1953–56 | | 2n=30 | | | |
| *C. maliflora* | c | Janaki Ammal, E. K. | 1952 | Kew; Wisley | 2n=30 | | | |
| *C. maliflora* | e | Janaki Ammal, E. K. | 1953–56 | | 2n=30 | | | |
| *C. maliflora* | | | | | | | | |
| v. Betty McCaskill | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | n=15 | | | |
| *C. oleifera* (*C. oleosa*) | a | Longley, Albert E. | 10/ 3/58 | Huntington Bot. Gdn. #13367 | | | n=45 | |
| *C. oleifera* | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | | | n=45 | |
| (McIlhenny strain) | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | | | | n=30 |
| *C. oleifera* | c | Janaki Ammal, E. K. | 1952 | Chung 64e, Kew | | | 2n=90 | |
| *C. oleifera*, tea-oil plant | e | Janaki Ammal, E. K. | 1953–56 | | | | 2n=90 | |
| *C. pitardii* | c | Janaki Ammal, E. K. | 1952 | Peer, R. S. | 2n=30 | | | |
| v. *pitardii* | e | Janaki Ammal, E. K. | 1953–56 | | 2n=30 | | | |
| v. *yunnanica* | e | Janaki Ammal, E. K. | 1953–56 | | | | 2n=90 | |
| v. *yunnanica* | c | Janaki Ammal, E. K. | 1952 | 590/37 Kew | | | 2n=90 | |
| v. *pitardii* | a | Longley, Albert E. | 1/ 2/59 | Huntington Bot. Gardens | n=15 | | | |
| v. *yunnanica* | f | Longley, Albert E. | 10/29/56 | Huntington Bot. Gdn. #15474C | | | n=45 | |
| *C. reticulata* | | | | | | | | |
| v. Butterfly Wings | f | Longley, Albert E. | 10/20/56 | Huntington Bot. Gdn. #15464 | | | n=45 | |
| v. Butterfly Wings Reticulate | f | Longley, Albert E. | 11/29/56 | Huntington Bot. Gdn. #15460 | | | n=45 | |

| Species & Variety | Source Code | Author of Count | Date of Count or Publication | Source of Material | Count Number: Diploid | Triploid | Hexaploid | Other |
|---|---|---|---|---|---|---|---|---|
| v. Captain Rawes | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | | n=45/2 | | |
| v. Chang's Temple | f | Longley, Albert E. | 11/29/56 | Huntington Bot. Gdn. #15468 | | | n=45 | |
| v. Chrysanthemum Petal | f | Longley, Albert E. | 12/26/56 | Huntington Bot. Gdn. #15465 | | | n=45 | |
| v. Cornelian | f | Longley, Albert E. | 11/29/56 | Huntington Bot. Gdn. #15466 | | | n=45 | |
| v. Crimson Robe | f | Longley, Albert E. | 2/23/57 | Asper, J. H. | | | n=45 | |
| v. Lionhead | f | Longley, Albert E. | 12/11/56 | Huntington Bot. Gdn. #12156B | | | n=45 | |
| v. Moutancha | f | Longley, Albert E. | 1/29/57 | Tourje, E. C. | | | n=45 | |
| v. Noble Pearl | f | Longley, Albert E. | 11/29/56 | Huntington Bot. Gdn. #15469 | | | n=45 | |
| v. Osmanthus Leaf | f | Longley, Albert E. | 12/26/56 | Huntington Bot. Gdn. #15467 | | | n=45 | |
| v. Pagoda | f | Longley, Albert E. | 12/11/56 | Huntington Bot. Gdn. #15469A | | | n=45 | |
| v. Professor Tsai | f | Longley, Albert E. | 11/29/56 | Huntington Bot. Gdn. #15459 | | | n=45 | |
| v. Purple Gown | f | Longley, Albert E. | 12/26/56 | Huntington Bot. Gdn. #15463 | | | n=45 | |
| v. Shot Silk | f | Longley, Albert E. | 11/29/56 | Huntington Bot. Gdn. #15462 | | | n=45 | |
| v. Shot Silk Reticulate | f | Longley, Albert E. | 12/11/56 | Huntington Bot. Gdn. #15458 | | | n=45 | |
| v. Willow Wand | f | Longley, Albert E. | 11/29/56 | Huntington Bot. Gdn. #12156C | | | n=45 | |
| v. Willow Wand | a | Longley, Albert E. | 2/20/57 | Nuccio's Nurseries | | | n=45 | |
| *C. Reticulata* | | | | | | | | |
| wild form | a | Longley, Albert E. | 11/29/49 | Armstrong Nurseries | | | n=45 | |
| wild form | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | | | n=45 | |
| *C. reticulata*[3] | c | Janaki Ammal, E. K. | 1952 | Kew | | | 2n=90 | |
| *C. reticulata*[3] | c | Janaki Ammal, E. K. | 1952 | Trewithen; Wisley | | | 2n=90 | |
| *C. reticulata* | e | Janaki Ammal, E. K. | 1953–56 | | | | 2n=90 | |
| *C. rusticana*[4] | c | Janaki Ammal, E. K. | 1952 | Peer, R. S. | 2n=30 | | | |
| *C. salicifolia* | c | Janaki Ammal, E. K. | 1952 | Kew | 2n=30 | | | |
| *C. salicifolia* | e | Janaki Ammal, E. K. | 1953–56 | | 2n=30 | | | |
| *C. salicifolia* | a | Longley, Albert E. | 10/10/58 | Huntington Bot. Gdn. #15476E | 2n=30 | | | |
| *C. saluenensis* | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | n=15 | | | |
| *C. saluenensis* | c | Janaki Ammal, E. K. | 1952 | Type 574/48 Kew; Exbury form, Wisley | 2n=30 | | | |
| *C. saluenensis* | e | Janaki Ammal, E. K. | 1953–56 | | 2n=30 | | | |
| v. Macrophylla | e | Janaki Ammal, E. K. | 1953–56 | | | | | 2n=60 |
| *C. sasanqua* (tea-oil plant)[9] | e | Janaki Ammal, E. K. | 1953–56 | | | | 2n=90 | |
| *C. sasanqua* | | | | | | | | |
| v. Azuma-Nishiki | c | Janaki Ammal, E. K. | 1952 | Kew | | | 2n=90 | |
| v. Bodnant | c | Janaki Ammal, E. K. | 1952 | Bodnant | | | 2n=90 | |
| v. Crinkley Flowers | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | | | n=45 | |
| v. Fuki-no-mine | c | Janaki Ammal, E. K. | 1952 | Kew | | | 2n=90 | |
| v. Mine-no-yuki | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | | | 2n=90 | |
| v. small white | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | | | n=45 | |
| v. White Doves | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | | | n=45 | |
| v. Wisley | c | Janaki Ammal, E. K. | 1952 | Wisley | | | 2n=90 | |

| Species & Variety | Source Code | Author of Count | Date of Count or Publication | Source of Material | Count Number: Diploid | Triploid | Hexaploid | Other |
|---|---|---|---|---|---|---|---|---|
| *C. sinensis,* Chinese tea | e | Janaki Ammal, E. K. | 1953–56 | | 2n=30 | | | |
| v. *assamica,* Assam tea | e | Janaki Ammal, E. K. | 1953–56 | | 2n=30 | | | |
| v. *assamica* | c | Janaki Ammal, E. K. | 1952 | F. 26180, Kew | 2n=30 | | | |
| v. *macrophylla* | c | Janaki Ammal, E. K. | 1952 | Kew | | 2n=45 | | |
| v. *macrophylla* | c | Janaki Ammal, E. K. | 1952 | Simura | | | | 2n=60 |
| v. *macrophylla* | c | Simura (1935) | 1953–56 | | | | | 2n=45⅚0 |
| *C. taliensis* | c | Janaki Ammal, E. K. | 1952 | Bot. Mag.; Kew | 2n=30 | | | |
| *C. taliensis* | e | Janaki Ammal, E. K. | 1953–56 | | 2n=30 | | | |
| *C. taliensis* | a | Longley, Albert E. | 10/ 4/58 | Huntington Bot. Gdn. #12098A.. | n=15 | | | |
| *C. tenuifolia* | a | Longley, Albert E. | 10/10/58 | Huntington Bot. Gdn. #15475A.. | | | | n=30 |
| *C. uraku* | | | | | | | | |
| v. Sukiya | d | Arizuma, K. | — | Kyushu University | 2n=30 | | | |
| *C. vernalis* | | | | | | | | |
| v. Dawn | e | Longley, Albert E. | — | | | n=45/2 | | |
| v. Hiryu (Australia) | f | Longley, Albert E. | 10/29/56 | Huntington Bot. Gdn. #13817.... | | | n=45 | |
| *C. wabisuki* | c | Janaki Ammal, E. K. | 1952 | Peer, R. S. | 2n=30 | | | |

## HYBRIDS AND UNCLASSIFIED

| Species & Variety | Source Code | Author of Count | Date of Count or Publication | Source of Material | Count Number: Diploid | Triploid | Hexaploid | Other |
|---|---|---|---|---|---|---|---|---|
| *C. hiemalis* (Shishigashira) × C. ———[7] | | | | | | | | n=30 |
| v. Winsome | a | Longley, Albert E. | 12/15/58 | McCaskill Gardens | | | | or 30+ |
| *C. japonica* × *C. cuspidata* | | | | | | | | |
| v. Unnamed | b | Patterson, Earl B. *et al* | 1950 | Rancho Descanso | 2n=30 | | | |
| *C. japonica* (Elegans) × C. ———[5] | | | | | | | | |
| v. Creation (form. 203) | a | Longley, Albert E. | 3/21/58 | McCaskill Gardens | n=15 | | | |
| *C. reticulata* (Early Peach Bloom) × *C. pitardii* v. *yunnanica* | | | | | | | | |
| v. Buddha[6] | a | Longley, Albert E. | 12/11/56 | Huntington Bot. Gdn. #15461.... | | | n=45 | |
| v. Confucius[6] | a | Longley, Albert E. | 12/11/56 | Huntington Bot. Gdn. #15457.... | | | n=45 | |
| *C. saluenensis* × *C. cuspidata* | | | | | | | | |
| v. Cornish Snow | a | Janaki Ammal, E. K. | 1952 | | 2n=30 | | | |
| v. Unnamed | b | Patterson, Earl B. *et al* | 1950 | | 2n=30 | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| *C. saluenensis* (Apple Blossom) × *C. japonica* (Berenice Boddy) | | | | | | | | | |
| v. Unnamed | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | 2n=30 | | | | |
| *C. saluenensis* × C. ———[7] | | | | | | | | | |
| v. Apple Blossom | b | Patterson, Earl B. *et al.* | 1950 | Rancho Descanso | n=15 | | | | |
| *C. saluenensis* × *C. japonica* | | | | | | | | | |
| v. Donation | c | Janaki Ammal, E. K. | 1952 | | 2n=30 | | | | |
| v. J. C. Williams | c | Janaki Ammal, E. K. | 1952 | | 2n=30 | | | | |
| v. Donation | a | Longley, Albert E. | 10/10/58 | Peer, R. S. | n=15 | | | | |
| *C. saluenensis* × *C. reticulata* | | | | | | | | | |
| v. Inamorata | c | Janaki Ammal, E. K. | 1952 | | | | | | 2n=75 |
| v. Salutation | c | Janaki Ammal, E. K. | 1952 | | | | | | 2n=60 |
| v. Salutation | a | Longley, Albert E. | 2/14/59 | Borde Hill, Sussex England | | | | | n=53/2±2 |
| C.——— × C.——— | | | | | | | | | |
| v. Williams Lavender | a | Longley, Albert E. | 9/28/56 | Huntington Bot. Gdn. #13630B.. | n=15 | | | | |
| C.——— × C.——— | | | | | | | | | |
| v. Narumigata | a | Longley, Albert E. | 10/28/57 | Tourje, E. C. | | | | | n=75/2 |

## ALLIED GENERA

| Species & Variety | Source Code | Author of Count | Date of Count or Publication | Source of Material | Count Number — Diploid | Triploid | Hexaploid | Other |
|---|---|---|---|---|---|---|---|---|
| *Eurya japonica* | e | Nakajima (1942) | 1953–56 | | | | | 2n=42 |
| *Gordonia anomala* | a | Longley, Albert E. | 10/ 3/56 | Huntington Bot. Gdn. #15474A.. | | | n=45 | |
| *Ternstroemia japonica* | e | Morinaga & Fukushima (1931) | 1953–56 | | | | | 2n=50 |
| *Tutcheria spectabilis* | a | Longley, Albert E. | 6/ 4/59 | Los Angeles State and County Arboretum 57P-216 | 2n=30 | | | |
| *Tutcheria virgata*[8] | a | Longley, Albert E. | 5/28/59 | Descanso Gardens | 2n=30 | | | |

[1] Now Descanso Gardens.
[2] A letter states this to be variety Shishigashira.
[3] Doubtless wild form.
[4] Now generally considered to be a sub-species of *C. japonica*.
[5] Open pollination. Pollen parent believed to be *C. saluenensis* (Apple Blossom).
[6] Generally classified with Reticulata group.
[7] Open pollination.
[8] So labeled. Neither genus nor species fully determined.
[9] Probably *C. oleifera*, as *C. sasanqua* is not a source of tea-oil and the two species were long confused.—Ed.

# Camellia Testing at the U. S. National Arboretum, Washington, D. C.

John G. Worman, Baltimore, Maryland

Most visitors to the Nation's Capitol are aware of the Japanese cherry trees around the Tidal Basin. Many have seen the plantings of the nearby historic shrine, Mount Vernon. Some have been aware of a wealth of fine plant material in the grounds of the Capitol and adjacent Government buildings. Conversely, few out-of-towners have seen or perhaps even realized the existence of a National Arboretum within the District of Columbia. It may be explained by the fact that the Arboretum is emerging from a developmental stage and has not opened on a full time basis to the general public. Admittance, for the present, is by appointment except for short periods in the spring during azalea and camellia time and in the fall for sasanqua blooms.

The strategic location of the Arboretum enables it to serve as a national institution in a very real sense. It is in an intermediate climatic zone that is favorable to the cultivation of plants from a wide range of habitats. The soil is composed of the rather typical acid clays and gravels of the Coastal Plains region.

## Plantings in General

The plantings are arranged in varied patterns throughout the Arboretum. Present studies take into consideration all possibilities of plant arrangement; i.e., by botanical, geographical, functional or purely display systems in order to make for an attractive landscape scene and at the same time contribute to the educational value of the Arboretum as an outdoor museum.

In direct view of the M Street entrance is the 30-acre "synoptic plantings," which when completed will represent a digest of all the plant groups of the Arboretum, arranged scenically and also by families (Map location 1, Fig. 1 below).

Plant groups of unusual interest include the azalea plantings, which are among the most extensive in the nation, the dogwood planting of the Women's National Farm and Garden Association and the collection of Oriental plantings in the Cryptomeria valley of the Garden Club of America (Camellias, Map location 2). These plantings of camellias, cryptomerias and other chiefly Oriental plants, when

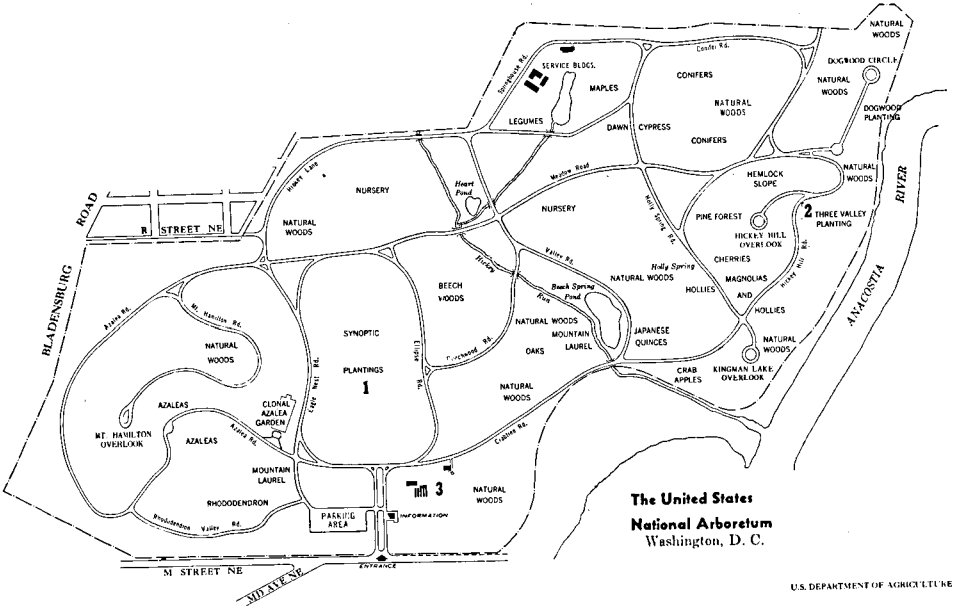


Fig. 1

**Fig. 2. Sasanqua Planting**

complete, will serve as an educational demonstration of the plant contribution of China and the rest of the Orient to the gardens of America.

Other plantings could be mentioned but the above quick tour reveals something of the objectives of the Arboretum in its programs of plant testing in which an abundance of worthwhile information on problems of plant relationships, taxonomy and performance is currently being secured. The results of various programs in plant breeding are already to be seen. The Glenn Dale Azaleas, for example, are well known.

**Camellia Plantings**

The National Arboretum's camellia program is presently concerned with maintaining a well-labeled collection on display for the public and with evaluating existing varieties for hardiness and flower quality. Through trials and a camellia breeding program to be initiated in the near future, Dr. Francis de Vos[1] hopes to add to the already impressive list of varieties suitable for culture north of the presently recognized camellia belt.

The first camellias planted at the National Arboretum came as a gift from Mr. Kosaku Sawada of Overlook Nurseries, Mobile, Alabama, in 1949. Bordering the camellia trail (Fig. 2 and Map location 2) these original Sasanqua plants now tower 8 to 10 feet overhead. Most Sasanqua varieties can be successfully grown and flowered in the climate of Washington, D.C. In 1954 the *C. japonica* collection was started through the generous gift of Tom Dodd Nurseries, Semmes, Alabama. The camellia collections are situated on slopes approximately 100 feet above the Anacostia River. The japonica collection is located on an easterly slope under tulip trees and oaks and the *C. Sasanqua* group on a southeasterly slope among individual large but scattered oaks, beech and tulip trees. The Sasanqua site, as intended, is definitely more sunny.

**Extending the Range of Camellia Landscaping Usefulness**

In this country, the southeastern states and the coastal areas of California, Oregon and Washington have traditionally been the homes of the camellia planted

[1]Assistant Director, United States National Arboretum.

outdoors for over 200 years. Since World War II, there has been a recurring interest in growing camellias in the coastal area bordering the Chesapeake Bay, in scattered places on Long Island and at points as far north as Cape Cod. In spite of periodic cold damage, successes have been numerous enough in the Washington-Baltimore area for gardeners to feel that the help of horticulturists and plant breeders will result in finding and developing camellias better adapted to fringe area environment. This, it would seem, applies as well to northern places on the West Coast. As for *C. sasanqua,* the blooming season for the fall of 1959 ended on November 17 with temperatures of 15 to 18° F. It was considered to have been a good season. The principal barrier to successful culture of Sasanquas from Washington, D. C. northward in areas where they would be bush hardy is the retarded development of flower buds.

No one individual or institution has tested all of the available varieties of camellias for general landscape usefulness in a relatively hostile climate. The camellia collection at the National Arboretum is perhaps the most extensive of what might be referred to as cold-climate collections. At this date is comprises approximately 150 varieties of *C. japonica,* 100 varieties of *C. sasanqua* and a dozen interesting species and hybrids, about 800 to 1,000 plants in all. More are being added as knowledge of the camellia study program becomes widespread.

The problem of developing a race of fall-blooming camellias having the flower quality of *C. japonica* is a challenging one. On the other hand the possibilities for developing late-flowering hardy types for the northern garden are encouraging. One of the parents in intraspecific crosses might be the late-blooming Kominato strain of *C. japonica* which was recently distributed by the Plant Introduction Station at Glenn Dale, Maryland. It is conceivable that a breeding project can be carried out toward obtaining varieties with improved flower size, color, substance, form, hardiness and even fragrance. Toward this end, greenhouses (Map location 3) may become available for these breeding objectives as a part of the Arboretum's expansion planning.

*A discussion of relative hardiness of camellia species by the Arboretum's Dr. de Vos will be published in a future issue. —Ed.*

## RIGHT RESOLUTIONS BRIGHTEN CAMELLIA WORLD

Helen Dobson Brown, Sacramento, California

I hereby resolve to:

1. Remember that any gardening is more fun when it is lifted out of the rut of duty and into the realm of privilege.

2. Find out the essential needs of camellias in general and the specific needs of certain varieties in particular.

3. Make a special effort not to become a camellia worrier; remembering the camellia adage, "camellias take a lot of leaving alone."

4. Endeavor not to kill camellias with too much kindness — or fertilizer.

5. Discover why so many people have fun hybridizing, grafting and propagating camellias in addition to growing them.

6. Look up and acquire one or more of the beautiful newer varieties being introduced on the camellia market. Avoid merely buying new names without seeing the blossoms.

7. Be more selective in my choice of plants and locations. When choosing a planting site, consider it from a standpoint of beauty as well as exposure.

8. Remember that a lath house need not be merely a place to house fragile plants. Planned with imagination it can improve and add interest to a garden.

9. Remember the wonderful potential of camellias as landscape shrubs and use them when possible as hanging baskets, on trellises, espaliered and for ground cover, as well as for specimen plants.

10. As a collector, not let the search for every new introduction detract from the beauty of those already owned.

Reprinted from *Sacramento Bee,* Jan. 3, 1960.


This year's blooming season in Southern California has been about two weeks earlier than last year, and last year was, for most camellias, a month or more earlier than normal. This Thanksgiving saw about as many varieties in bloom as we usually have in mid-January, and at Christmas camellia blooms were everywhere, making it, from a camellia point of view, the most remarkable Christmas season we have ever had. It would be hard to find any more appropriate Christmas colors than those furnished by camellias.

That we are living in a changing world is attested by our changing tastes in camellia flowers. A dozen years ago the formal was at, or near, the top in popularity; the single was firmly placed at the bottom. Today, the formal, while still much appreciated, ranks below the big semi-double in popularity, and the singles have gained a wide acceptance.

The Oregon Camellia Society *Bulletin* for December contains the statement that sasanquas are less hardy than japonicas in the Northwest. Several years ago sasanquas were much sought after in the South for understock because they were thought to be *more* hardy than japonicas. The article mentioned above also states that English Hybrids are "unusually hardy" in Oregon.

At its December meeting the Pacific Camellia Society had the pleasure of viewing a hundred colored slides furnished by the American Camellia Society. These contained a good many varieties with which the average camellia enthusiast was not familiar, and demonstrated the educational value of seeing slides from another section. Also, since these slides had been donated to the A.C.S. by many individual collectors all over the country, they demonstrated the wide range of "know-how" among camellia photographers.

One of the most glaring deficiencies among these photographers was their failure to keep the camera at a known, or fixed, distance from the flower. For example, when the camera is kept approximately 13 inches from the flower, all flowers up to six inches in diameter can be photographed and their relative size judged by the viewer. A 35-millimeter slide will, at that distance, just barely accommodate, in its top to bottom dimension, a six-inch flower. But if a 3-inch flower is photographed with its edges reaching from top to bottom of the slide, the viewer has no way of judging its actual size.

At the annual show of the Australian Camellia Research Society held in Adelaide, September 5, thirty-three paintings (presumably of camellias) were exhibited. Another feature of the show: a large number of unidentified blooms were brought in for Professor Waterhouse to identify.

As we go to press, the very sad news of the death of Dr. E. Clark Hubbs, of Glendale, California, reaches us by letter. Clark's passing is a loss to all who knew him — a better and warmer friend, a cheerier soul, a more accommodating and enthusiastic camellia grower, a better neighbor, no one ever had. We are deeply grieved, for if ever any man was loved by all, that man was Clark Hubbs.—*Ed.*

## FREE — CHOICE CAMELLIA SEED

While it lasts, a supply of some 3,000 open pollinated, assorted *C. japonica* seed freshly gathered from the garden of the Editor in October, 1959, will be *mailed postpaid,* at the rate of *50* seeds for each new regular membership or subscriber-membership. Seed will be sent to those who request it and comply with the instructions below. The only limitation is the quantity available — first come first served. Source includes hundreds of varieties and new seedlings, from a garden containing numerous species and hybrids. Someone is certain to be lucky! We will not sell it but this will be our way of saying THANK YOU! (Mail to the Editor — Address on Page 2.)

### SUBSCRIPTION FORM

Name and Address to which seed to be sent: .....

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## OUR NORTHERN CALIFORNIA SHOW DATES — 1960

**FEBRUARY 28th: Camellia Society of Santa Clara County — 18th Annual Show**
Civic Auditorium, San Jose — Sunday only — 10 a.m. to 6 p.m. (non-competitive)

**MARCH 5th & 6th: Camellia Society of Sacramento — 36th Annual Show**
Memorial Auditorium — Sacramento — Saturday and Sunday (competitive)

**MARCH 19th & 20th: Northern California Camellia Society — 15th Annual Show**
Armory Building — Recreational Center, Walnut Creek (competitive)
Saturday: 2:30 p.m. to 10 p.m. Sunday: 10 a.m. to 6 p.m.
Theme: Taj Mahal (India) — Also featuring Flower Arrangements

### GRAFTING (Cont. from page 8)

so doing is that there is a circle of cambium (actually a miniature knot) at every juncture of leaf and stem which, if cut and placed properly, makes contact absolutely certain, as it is impossible to avoid crossing the cambium layers if a circle is placed astride a straight line. There is the further reason that the wood is harder to cut at the leaf node juncture, which makes it likely that the scion will be thickest at this point and thus be the first area of contact.

Binding the stock over the split area is essential unless the pressure is strong enough to insure close contact and that the scion will not become dislodged. Rubber grafting bands, string, strips of cloth, raffia and even plastic plant tie material are used successfully for this purpose but the writer prefers ½″ plastic electricians' tape (such as MMM), which is not only elastic but quite sticky and easily applied.

It may not be absolutely necessary but we like to put at least ½″ of clean sand around the base of the stock before placing the jar over the graft. This not only helps prevent infection but tends to absorb any bleeding and insures a solid, tight footing for the jar which, unless otherwise protected, should be firmly fixed in place with light stakes, as a precaution against accidents.

If glass jars are used, they should first be thoroughly washed or else dusted or sprayed with a fungicide such as Captan or Fermate to guard against fungus, a common cause of failure.

The after-care of grafts is extremely important. It is perhaps best to leave the jar undisturbed until definite signs of growth appear, removing it only at night a time or two before leaving it off altogether, thus to reduce the shock caused by greater exposure and less humidity.

When to graft? The consensus is that January and February are the best months.