THE Camellia REVIEW

A Publication of the Southern California Camellia Society

'Bob Hope'
Courtesy Nuccio's Nursery

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Southern California Camellia Society Inc.

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

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

Application for membership may be made by letter to the Secretary. Annual dues: $7.50.

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THE COVER FLOWER

C. JAPONICA 'BOB HOPE'

Nuccio's Nurseries of Altadena, California has released several good red japonicas and 'Bob Hope' will surely join the group that has stood up. It is a luscious, brilliant dark red large to very large semi-double. The form may be an irregular semi-double as in the flower on the cover or it might be regular. The plant is also attractive with bushy upright growth and very dark, medium size green foliage. It blooms mid-season to late.

THOUGHTS *from the editor*

I am picking camellia blooms now—buds that I gibbed in September. Flowers bring thoughts of camellia shows, and thoughts of camellia shows bring to mind thoughts we have had in former years about little things we might do to improve the shows for the people who look at the flowers and for the exhibitors who take them to the shows. When the weather cooperates, our camellia shows are really very good and what I am writing here are probably my own gripes about what I have observed.

I think that every exhibitor should take a personal pledge to do his best to the end that the flowers will last through the show. This is a big order, particularly when the weather turns sour during the show. I believe that there is too much reliance in entering flowers on the rule that flowers are judged according to their condition at the time of judging. If I were a czar and knew how to do it, I would establish a rule that awards would be withdrawn from a flower that has deteriorated during the show to the point that it would not be considered even for a third place ribbon. Seriously, I think that the situation of poor blooms at the end of the show could be improved if exhibitors would set their sights in that direction as high as they have set their sights on winning awards.

I believe that more attention should be given to identifying seedlings on the entry card, when this is possible. For example, identify the parent or parents when the information is available. A person who is at all interested in seedlings wants to know more about the flower than is usually shown on the entry card, such as merely the word "Seedling."

Also about seedlings, show the name of the originator when some person other than the originator enters a seedling. Not to do this is not only unfair to the originator but it does not give the information to the viewer that he wants and should have. For example: "Seedlings originated by Jack Clark of New Zealand, entered by etc." More than one such seedling has been entered without this information, which of course leads to the conclusion that the seedling was originated by the exhibitor.

Enter only sports that have been established by grafting. I seem to see too many one time sports; that is, flowers that do not repeat themselves or which have not been grafted to establish themselves. All of us know that a sport does not always repeat itself and, if grafted, does not always come through.

We know pretty well how to organize and manage shows so that the viewers can look at the flowers to their best advantage. Improvements as I have suggested would seem to be in the hands of the exhibitors. It might help if they prepare their blooms for the show .

Harold E. Snyder

A CAMELLIA TOUR DOWN UNDER

Williard F. (Bill) Goertz
San Marino, California

Twenty-two hours after leaving home we arrived in Sydney, Australia on July 28th, to join in the festivities — expertly organized by Peter Duly and Eric Craig — of the International Camellia Congress of 1973. Participants from California included: Jessie Cromer (Altadena), Bernice Gunn (Whittier), Mr. and Mrs. Houghton Hall (San Anselmo), Capt. and Mrs. John Nichols (Menlo Park), Caryll Pitkin (San Marino), Mr. and Mrs. Richard Pozdol (Fresno) and Ruth and myself. Coming from other parts of the United States were: Dr. and Mrs. Arthur Maryott, Mr. and Mrs. Douglas Hall, Mary Hourihan, Edith Jarvis and Kay Lahr, (all from Maryland), Mr. and Mrs. Philip Ireland (Washington, D.C.), Mr. and Mrs. William Kemp (North Carolina) Mr. and Mrs. Jack Lynn (Arkansas), Gertrude Gavin ,Montana), and Brent Senay, Lena Knight and Beryl Brown (all from Georgia).

Professor E. G. Waterhouse, the "grand old man" of camellias in Australia.

Upon arrival we were taken to the Sebel Town House, and in each room were found several beautiful camellia blooms, an immediate warm feeling of welcome from the members of the local branch of the Camellia Society. Under the direct supervision and guidance of Eric Craig, we had a very full and eventful fifteen days in Australia — seeing the sights of Sydney, the world famous opera house (officially opened last month), the beautiful harbor, lovely gardens —both those publically and privately owned, an immaculate camellia nursery, a very unusual camellia show (unusual by U.S.A. standards) and a viewing of original camellia paintings by Paul Jones with the opportunity to meet the artist. Also a host of cocktail parties and dinners which allowed us to meet and visit with grand old Professor Waterhouse, all the other dignitaries involved in the Australian camellia circles, as well as the hobbyists with whom we all have a lot in common. Their hospitality and genuine friendship were second to none — very typical of the camaraderie that exists among all the camellia enthusiasts around the world.

We visited the E. G. Waterhouse Garden, where a planting ceremony was held—representatives of each of the nations represented at the Congress planted a camellia. The one they had for the U.S. to plant was 'Mona Monique,' in honor of the late Ralph Peer who originated the variety.

The Camellia Show at Farmers — a downtown department store—was beautiful. Not competitive, just a gorgeous display of camellias, both indi-

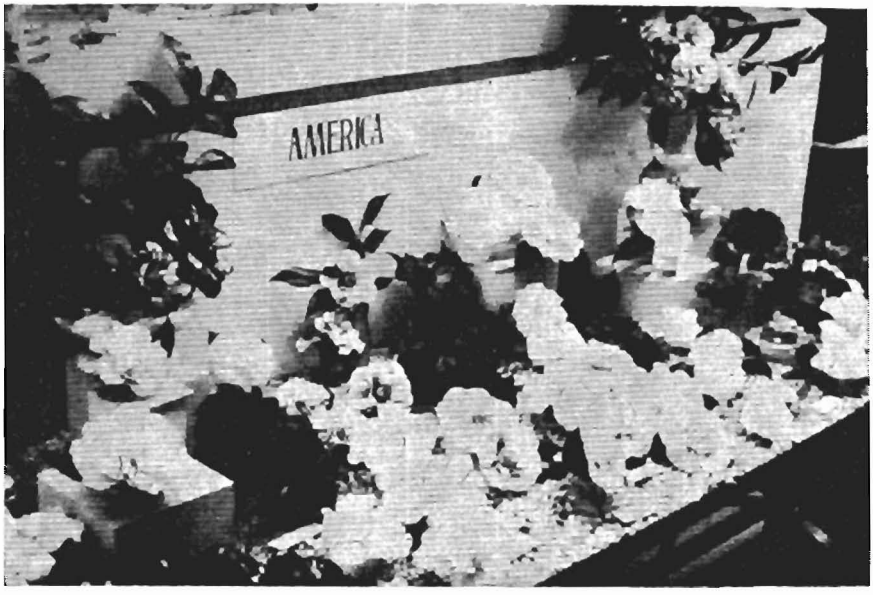
vidual blooms (one to five of a variety) on tables together with camellia arrangements, all very artistically placed. The blooms were segregated according to country of origin, one or more tables of each: Australia, New Zealand, Eastern Asia, Europe and the United States.

The camellia blooms were comparable to the best of those grown by California camellia fanciers, grown in the open, most of them completely unprotected (even by shade house) and, of course, not chemically treated. (With very few exceptions, they do not use gib in Australia or New Zealand).

The main things which impress a U.S.A. visitor when visiting gardens Down Under would be the size of the gardens (there are practically no container grown plants — they have plenty of room to put them in the ground). They do not need to artificially water their plants as much as we do, as there usually is ample rain. This, of course, varies in different locals — Melbourne, further south, is cooler and wetter than Sydney and the blooms are probably a bit larger. It is not necessary for them to pick up each spent bloom and petal as we must do, as they are not bothered with petal blight. The typical camellia hobbyist there does very little pruning or disbudding. They are most concerned with garden color and landscaping and not so much with the individual bloom. All camellia peoples' gardens have many plants other than camellias, and the folks are generally very knowledgeable about *all* types of plants and trees.

On a portion of our Tour there were approximately 15 visitors from Japan. Twenty-eight were there from New Zealand and the same number from the U.S.A., and about 200 Australians partcipated in portions of the scheduled events and functions.

After five sunny days in Sydney, two buses took 56 of us to Canberra, the beautiful capitol city of Australia. Enroute we got an idea of what



The show tables at the Farmers show are artistically designed, not row after row of flowers by variety as we do.

the outback country looks like; we visited a sheep station, watched sheep dogs in action, learned (?) how to throw the boomerang and saw plenty of kangaroos.

Leaving Canberra, we turned further inland to Swan Hill, on the Murray River, for two days, visiting some of the oldest settlements of Australia. They have preserved much of their early history there in Pioneer Settlement — which we might compare with our Knott's Berry Farm — relics of the Old West. On our way to Melbourne we visited the city of Bendigo, a very old but extremely clean city with well preserved buildings, street cars and a historic gold mine.

The three and a half days in Melbourne were crammed with visits to several beautiful large private gardens, the Royal Botanic Gardens with huge camellia trees, and several camellia nurseries which differ from our own in that they are beautifully landscaped and give the potential plant purchasers an "appetite" for camellias. The blooms here are really outstanding and we saw many new interesting reticulata hybrid seedlings. It was a treat to visit a regular meeting of the Victoria Branch of the A.C.R.S. one evening and enjoy the warm hospitality of the Melbourne camelliaites. Their meeting is very similar to our S.C.C.S. meetings, about the same number of blooms on display, in competition but not segregated by classes as we do it. Their attendance of approximately 150 people, the program portion, the plant raffle and the refreshments were very much "like home."

The Farewell to Australia Dinner on our last evening came with a feeling of "what a grand finale to a perfect visit," and yet a distinct sadness (there were even a few tears shed) that our association with these

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The people of Australia can prune their camellia trees to the form of Christmas trees.

The parent plant of the reticulata hybrid 'Janet Clark.' Jack Clark, the originator, and Ruth Goertz indicate the size of the plant which is about ten years old.

PLANTING SEEDS THIS YEAR?

If you have not heretofore tried your hand at camellia seed culture, this might be the year to start. If you have tried it before, you know it is like any other habit. It is difficult to break and why should we want to break it! It is one of the most interesting phases of the camellia hobby. We do not know what we are going to get or even when we are going to get it. Nuccio's Nurseries in Altadena, Cailfornia plants about 10,000 seeds a year and out of this number they are pleased to come up with half a dozen or less per year that they think are worthy of being offered to the trade. On the other hand, the beautiful 'Tiffany' came from a handful of seeds that were placed in peat moss in the manner described in this article. And the seedling plants that do not produce flowers that are worthy of keeping are always good for rootstock for grafting. In fact, some camellia growers plant seeds (often sananqua) primarily to grow their own grafting stock, with worthwhile seedling flowers a secondary consideration. Whatever the purpose, growing seedlings is one of the pleasures of the camellia hobby.

Back in the 1940's, E. C. Tourje, Editor of the Southern California Camellia Society's book *Camellia Culture*, did some experimenting toward simplifying and improving camellia seed culture. The general practice then was to plant the seeds in a seed box containing the planter's favorite germinating mixture, approximately one inch under the surface. When the planter emptied out his seed box, he would find tap roots which reached the bottom of the box. Mr. Tourje asked himself, "why waste the strength and vigor in growing a valueless tap root?" So he conceived the idea of germinating the seeds in peat moss, then transplanting them after germinating to a mixture in which they could develop their root systems. Not until after the root system was fully developed would the new seedling plants be put into their permanent soil mixture. He experimented along this line and in 1950 stated his findings and recommendations in an article in the book *Camellia Research*[1] that was published by the Southern California Camellia Society. His findings of 1950 are still good and while people with greenhouses often follow the old method of using planting boxes, those without these facilities generally follow the Tourje method. It can be used for a handful of seeds or for larger quantities, with a minimum amount of space required during the germinating period. The following discussion is built around the Tourje article in *Camellia Research.*

Camellia seeds like all other seeds require the collective combination of certain factors for successful germination; namely, moisture, favorable temperature and oxygen. Moisture is perhaps the most important of these factors. It softens the hard shell of the seed coat and enables the embryo through moisture absorption to swell and burst this tough seed coat. Moreover, moisture aids in the transmission of oxygen to the living cells thus assisting essential respiration, digestion and assimilation during the germination process. Regarding temperature, Mr. Tourje concluded that on the basis of his experiments the optimum temperature would be on the order of 65 to 70 degrees Fahrenheit. The third essential is oxygen, and the seed which during dormancy requires very little oxygen, requires adequate quantities of the element during the germinating period in order that the process of respiration may take place.

Mr. Tourje concluded that the

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[1] This book is out of print.—Ed.

method of planting in boxes was not fully effective for several reasons. The cold weather of the winter and early spring was not conductive to prompt and complete germination. (This factor is eliminated, of course, in the controlled temperature of a greenhouse.) All too frequently the moisture in the containers was unregulated and was too little; or was too much, in which event the seeds would become waterlogged, and if the moisture was excessive it would act as a deterrent to oxygen access. He discovered that with a light and porous germinating medium, such as peat, thoroughly moistened but not soggy, and maintained at a temperature of between 65 and 70 degrees Fahrenheit, camellia seeds would germinate in days instead of months. He placed the seeds surrounded by damp peat moss in a glass jar and kept the jar in a warm, *light* location. He emptied the jar every few days after the seeds started to germinate. The tap roots of some of the germinated seeds showed up clearly through the jar. This enabled him to segregate the germinated seeds from those not germinated and second, it insured a constant and fresh supply of oxygen. The ungerminated seeds were returned to the peat. Water was added to the peat if there was insufficient moisture.

He experimented in pinching off the tap root, not with a pre-conceived idea that the tap root was useless but to see what would happen. He began the simple experiment of pinching off the radicle at different lengths and soon found that regardless of whether the remaining length was a quarter inch, a half inch or four inches, the point at which the root was pinched off callused in much the manner of a camellia cutting. If the pinched off root calluses like a cutting, he reasoned, why not treat it as one would a cutting? He placed the pinched off seedlings in flats of course sand to which had been added just enough finely sifted peat to insure moisture retention. He got best results by punching holes in the damp sand in rows, using a nail, and inserting the stub end of the radicle in each hole leaving the seed proper resting on top of the sand. He sprinkled enough loose sand over the seeds to hold them firmly in place. They received the best root development by placing the flat in strong light but not full sunlight.

The callused end of the radicle developed numerous lateral or secondary roots, much the same if not identical to that which develops at the end of a root cutting. These roots very quickly develop feeder roots and within sixty days from the time the radicle is pinched these seedlings have a very complete root system. The reason for this is quite simple. All the force and energy with which nature has endowed the food-rich cotyledons goes directly into the manufacture of these secondary and feeder roots insead of being wasted in the creation of great but useless tap roots.

There may be an urge to get the seedlings out of the flat and into a regular potting mix. They should not be potted until they have a good root system and best longtime results will be obtained in most cases by leaving them in the flat at least through the summer. By this time the root system will consist of perhaps a dozen lateral roots stemming from the point at which the tap root was pinched off. If there is doubt about the time for removing the seedlings from the flat, they may be taken out and examined. They do not resent being handled. Despite the seeming lack of nourishmnt in the rooting mixture of sand and peat, most of the seedlings in the flat at the end of six months will be found to have developed beyond those which have been potted earlier.

There is a reason for leaving the germinated seeds on the surface of

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IS IT TYPICAL?

Harold E. Dryden

Notes on talk at Sonoma County Camellia Society, March, 1973

Several years ago my wife went into the garden just before we left home for a Southern California Camellia Society meeting and picked a flower of C. sasanqua 'Ko-Gyoku' ('Little Gem') for the meeting competition. She was surprised that it was not on the winners' table at intermission time because it was really a beautiful little flower. She asked one of the judges why others had been picked over her flower and was told her flower was not typical. She was confused because her flower was identical to dozens we had bloomed on our plant over the years.

The word "typical" is used mostly in connection with the form of flowers, and judges are trained to exclude from consideration any flow-r that is not "typical" of the variety being judged. This principle is used sometimes to support a contention that, in the case of varieties that have more than one form, a particular form is the one that should be used as the norm in judging. The contention is not consistent with the principle that form is "that which is true or characteristic of a variety in all its customy variations.'' While judges manifest a broader attitude now toward what is typical than was the case not too many years ago, I believe that the subject warrants some discussion.

A really competent judge should have such broad familiarity with varieties that he knows the flowers that he judges. This position will be attained, probably, only in a camellia heaven. Actually, judges obtain their knowledge of flowers from the fo--lowing sources, probably in the order listed.

1. Their own gardens. This suffices for many varieties provided a judge's collection is large, particularly if he has a turnover which is characteristic of many large collections.

2. Camellia shows. This gives an exposure to varieties but not a broad enough exposure within varieties that a person can draw conclusions regarding what is typical.

3. Definitions in 'Camellia Nomenclature.' This is probably the least reliable of all because (a) it is supplied by the originator in most cases and therefore is based on his own flowers and probably on flowers on relatively small plants; (b) the large number of listings in "Camellia Nomenclature" precludes extensive description of the flowers.

4. Visits to other gardens. This is the best source of knowledge because it shows flowers growing under different conditions. It is particularly significant if gardens visited are outside the judge's own area.

The ideal situation, of course, is that a judge will undertake to use all available sources of knowledge regarding blooming habits of the different varieties. Few judges have the time to do this.

I believe that observance of the following three principles will improve the judging of camellias by judges and will add to one's own pleasure in judging the flowers in his own garden.

1. In many varieties there is no flower that can be considered to be "typical of the variety." Some of these varieties are well-known and can be spelled out. There are differences between areas. Different treatment, particularly in fertilization, will cause differences in color. There are differences on the same plant. In my own thinking on the subject, (largely in deciding whether a flower might

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THE CAMELLIA AND I
Part 2
Ernie Pieri

On our way after our visit with Dr. Eshelman, we were driving along Garvey Blvd., in Monterey Park and before we reached our turn-off street we saw a big sign along the boulevard advertising "Carter's Camellia Gardens". We slowed down as we passed the place to take a good look at what a camellia garden looked like. We didn't bother to stop or go back that day, but we sure talked about what colors we wanted to buy.

After a few days I drove over to visit the nursery, but Mr. Carter was not in at that time. I wandered around the gardens and met his propagator and grafting man. I inquired about the price of the various camellia varieties and asked what would be the best varieties to get for starting a small camellia collection. He said that as far as he was concerned, the 'Elegans' family in the pink and variegated colors and the 'Daikagura' family with its pink, white and variegated colors were some of the best. Of course these were only names to me so he showed me bushes that bore the names of 'Elegans' family and the same for the 'Daigakura' group. There were several flowers in bloom on the 'Daikagura' group. so of course I had to buy some of these plants in gallon containers. He also told me that 'Emperor Wilhelm' or 'Gigantea' as we call it today was another excellent plant for the Garvey area. So off I went home with five or six plants in the back of the car, to add to the one Dr. Eshelman had given me, to start our camellia collection. (I should have stopped there, but oh no, I wanted the best of all I could get.) I think that I paid 75 or 80 cents per plant.

The garden man took me over to the cutting area, where there were literally thousands of 4" pots with growing cuttings. Some of them were at least eight inches high. This vision really got to me. Here I had the choice of any variety that was in the area for ten cents a pot. Did I have a field day during the next four or five weeks, as I usually stopped at the nursery on my way home from school* and always managed to get a dozen or more small potted plants of different varieties. The back of my car looked like a nursery delivery wagon. Of course I didn't know what I was going to do with so many camellias, but at least I had a lot of them to play with. The fellow at the nursery told me that it was about time, October, to take the cutting plants out of the small containers and put them in number ten size cans. What a #10 size can was I didn't know, but he showed me some and said that they were the large sized cans in which fruits and vegetables were canned. From then on I was on the lookout for #10 size cans. Scrounging behind restaurants became an evening event. I even told some of the operators of the gasoline stations that I patronized, to and from school, to save me their large size oil cans. I also had the cooking teacher at school save all of the large sized cans that he had after emptying the contents. At the same time I was getting ready to venture into a repotting program.

The same nurseryman told me that the best potting mix for camellias, the same mix as they were using at the nursery, was one part sand, one part peat moss and one part loamy soil. To this mix, and depending upon the amount of soil you were mixing, you could add one cup of well dried steer manure. Well I got plenty of sand from the creek bed on

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South San Gabriel Blvd. at the Whittier Narrows Dam site. Our back yard, or at least the back part of our quarter acre, was a good source of loamy soil, and I had to buy a bale of German Peat moss from the nursery. I now felt that I was ready to set forth and mix my own potting soil and not use some commercial type of mix. Well I did but my results were not so good. Of the 120 cutting plants that I had repotted about 40 of them died. Back to the nursery I went, to find out what caused them to die and to get more small plants to replace the ones that I had lost. (Had I known that it took several years for these cutting plants to bloom, I certainly would have purchased older, larger and better established plants, with bud blooms showing. I would have purchased less plants, but would have bought better varieties.)

In no time at all, the section that I had allocated for these camellia plants was over-run with 4" pots and a few #10 can size plants. The enthusiasm that I had started out with still burned strong in my heart. But the question was, where was I going to put more pots? In answer to that question I quit buying more plants, except for an occasional plant that was budded and ready to bloom.

In 1949 the community of Garvey decided to put larger sewer pipes through most of the streets. As we lived on Newmark Avenue, we were one of the first streets to be dug up for pipes for run-off and sewers. Boy what a dirty mess. One evening, after arrving home from school, my wife said that she had had it, right up to her neck and she wasn't just about to clean up the fine dust that came into the house through every window and that we were going to move. My first reaction was, fine let us move, but what do we use for money. I had spent quite a bit of money remodeling and repairing parts of our home and as a consequence finances were at a low ebb. Well she said we should first sell our place and then during the escrow period we could look for and find another home. Very good, so to the real estate broker we went. But in the mean time I had to get rid of about 50 rabbits, two dozen hens, a couple of turkeys and several geese. Well it was a good thing that I had several friends at school who liked the meat from these animals, I got rid of them real quick like.

We were real lucky in selling our home. Several days after we had put the place up for sale, an elderly couple with their son who had recently been discharged from the Navy came to see the place, liked what they saw and wanted to buy it. We sold it for what it cost us. Later on, we drove by our former home and found that the people who had purchased the house and 1/4 acre had also purchased some of the homes that had been removed from the San Bernardino Freeway right-of-way and had moved in six houses making it into a sort of manor for people who wanted a home but not a big yard and could rent such a place.

Well, we did do some house hunting, but settled on the first house we saw in San Gabriel. Luckily for use the escrow for our former house was for sixty days, and we bought the new home in San Gabriel. Moving day came along and we had a moving company move the household goods, but I was going to move my camellia plants so that I could be sure that they would not be injured during the moving.

The interesting thing about the location of our new home was that it was across the street from a nursery which also sold camellias and azaleas, the nursery being run by a

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* Mr. Pieri was a school teacher then. He was a principal when he retired last year. —Ed.

ESPALIERING CAMELLIAS

Harold E. Dryden

There are few homes without at least one wall that needs to be covered with foliage. Camellias are not ordinarily thought of as meeting this need. We think first of the japonicas, whose tendency is to bush out with their rather inflexible branches, or of the reticulatas that should really be thought of as trees. I have used 'Berenice Boddy' effectively for espalier, and some of the new reticulata hybrids seem to be flexible enough, in their early years at least, that they might be trained on a wall with plenty of space for expansion. There is no question, however, about the use of sasanquas and some of the newer non-reticulata hybrids for this purpose. The accompanying pictures of such use are from the Dryden garden.

We have used sasanquas for years, as background foliage on brick walls

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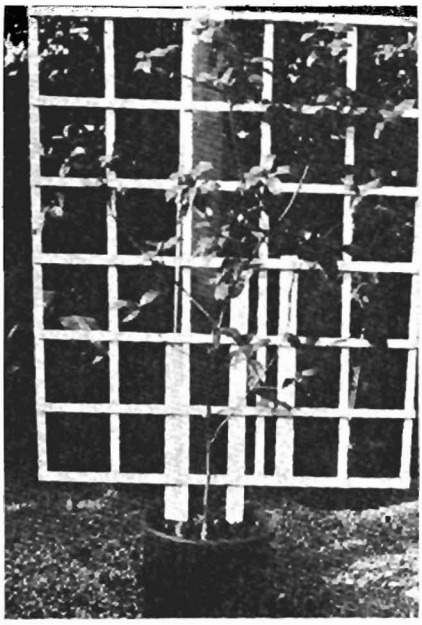
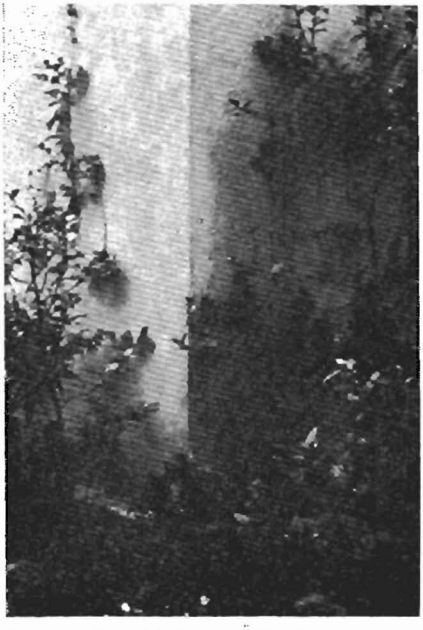


The non-reticulata hybrid 'South Seas' espaliered in a container.



Non-reticulata hybrids espaliered on side of house. "Elegant Beauty' on left, 'Water Lily' on right.

Japonicas planted with their bases about 1½ feet from brick wall.

and for covering of a lattice fence that separates us from our neighbor. The foliage is always green and we like the sasanqua flowers that start to bloom in September. The growth of sasanquas is reasonably rapid. For those who would like a solid color throughout, we find that 'Australian Hiryu' and 'Dazzler' are very good.

The north wall of our two-story house has always presented a problem. Two years ago we planted the area on the north side between the house and a brick wall to non-reticulata hybrids and azaleas, with two plants of 'Water Lily' espaliered in the corners of the chimney and 'Elegant Beauty' to grow up on the chimney. The two 'Water Lily' plants are now eight feet tall and the 'Elegant Beauty,' slow to start, is now going well. We have tied the branches of all three to screw eyes in lead anchors that we have placed in the wall. We look forward to a beautiful sight in a couple of years.

We have espaliered a plant of 'South Seas,' now growing in a four-gallon plastic countainer, so that we can move it about. The frame can be easily moved to a redwood tub when we find it necessary to move the plant to a larger container.

We have also planted japonicas close to a brick wall, in such a way as to have the effect of being espaliered. We have used varieties that spread as most japonicas do. We shall have to keep the back branches pruned but we see no problem in that.

Camellias really have more uses than just to plant them in the ground or in containers for picking show flowers. They can be made an integral part of the garden when a person so desires.

CAMELLIA TOUR (Contd.)

friendly, hospitable people — with whom we have so much in common —had come to an end.

But actually it was only the end of the Australian portion and most of the Americans still had New Zealand to look forward to. We did not all go as a group but went our various ways. As for the Goertzes, we had a most enjoyable twelve days being with old friends and meeting many new ones. It was winter down there, of course, and quite cold—every day it rained at least a portion of the day but the weatherman cooperated so that the showers came mostly between garden visits!

The New Zealand folks also surely know about gardens and hospitality. As in Australia, New Zealand camellias are excellent, especially the reticulatas. The latter are more vigorous and more heavily foliated than ours, and blooms considerably larger. Most all camellia gardens here are out in the open, with no protection from the weather. Rainfall adds up to almost 150 inches a year in some areas. If you want to grow nice camellias with the minimum of effort, there is where you should live. With no artificial watering, no pruning or disbudding, no shade houses, no picking up of spent blooms and petals, no spraying and very little fertilizing—all you need to do is plant in the ground and get out of the way! There are exceptions to this generalization, of course, and those gardens which do have some protection produce even more spectacular blooms. This shows up particularly with japonicas.

Be that as it may, even with the beautiful countryside, the gorgeous gardens and camellias — the most outstanding quality these two countries have is the people who live there. It is certain that every one of the Americans on this tour will never forget the warmth and the friendliness of the "Aussies" and the "Kiwis."

SEEDS (Contd.)

the flat with the pinched off radicle inserted in the sand. It is briefly this: As soon as the secondary roots begin to form at the callused end of the radicle the plumule with minute foliage leaves develops at the point where the radicle of rudimentary root breaks from the seed shell and quickly forms a green stem with foliage. This plumule rises to reach the light and as it does so the process of photosynthesis begins the manufacture of food, thus assisting the cotyledons in further developing the root system.

Outline of Camellia Seed Culture

1. Place seeds in damp (*not wet*) peat, preferably in wide mouth jar.
2. Container should be covered but not air tight.
3. Put in moderate light.
4. If possible, maintain temperature of 65 to 70 degrees Fahrenheit. Top of hot water heater is a good place if the water heater is in a location with good light.
5. Remove contents when tap roots show through the jar, returning the ungerminated seeds and those just starting. Repeat this operation about each week. Be sure that the peat moss is kept moist.
6. Pinch off the tap roots of germinated seeds at about one inch.
7. Put the germinated seeds, root end down, in flat of sand mixed with a small quantity of peat. Leave the seeds resting on the surface. Sprinkle sand to half cover the seeds and hold them firm. Keep the flat moist. A screen will protect from rodents and birds.
8. Place the flat in a strong light, preferably filtered or somewhat shaded sunlight. The seedlings will grow faster, of course, if the flat is kept in a greenhouse with a temperature maintained at about 70 degrees. They will grow satisfactorily, however, in the open but at a slower rate.
9. As previously stated, better results will be obtained if the seedlings are left in the flat through the summer, when they should be potted in regular camellia soil mix. Four-inch pots are preferable to the one-gallon size, from which they should be moved to larger pots when the roots fill the pot.
10. The seedling plants should be watched carefully for watering. As the little plants grow, there is less room for soil and they dry out quickly.

Take a visitor to the meeting of your Camellia Society. Every Camellia Society needs new members. You can help to build membership by exposing your society to people who are interested in camellias.

TYPICAL (Contd.)

be a mutation), typical form is "that which is true or characteristic of a variety *in all its customary variations.*" Assuming that the plant is healthy, and the foliage will establish this, typical color is that which is blooming and I shall let my own likes influence me in what I think is best.

2. If this position is sound, stop judging flowers against a pre-conceived standard (form or color) but judge it on its own merits.

3. Unless one has positive knowledge that causes him to decide that a flower has been mis-classified, assume that if an exhibitor has entered a flower in a show, it is of the variety under which it has been entered. The only justifiable reason for disqualification under my thinking is that the flower should be treated as a mutant. In one of last season's shows, a flower of 'Julia Hamiter' was awarded Best Hybrid. I have a large plant of 'Julia Hamiter' and I have never had a flower of the form or beauty of that one. Looking backwards, I am pleased that I had the courage of my convictions and voted for the winner. I have advanced over the day a few years ago when I objected to sending to the Head Table a flower of 'Alta Gavin' because it was new to our team of judges. After the judging had been completed, we agreed that it was th best medium japonica in the show.

Getting away from judging flowers in camellia shows, this lack of uniformity in the flowers is a big factor in making camellia growing so delightful a hobby. I look at the flowers of 'Adolphe Audusson,' 'Disneyland,' 'Grand Slam,' 'Elegans' and its family, and the others that spurn uniformity, and marvel at what God has created on a single plant. I believe that the approach to judging in camellia shows need not depart from our own thinking as camellia growers.

TWO PRE-SEASON SHOWS IN SO. CALIFORNIA

There will be two camellia shows in Southern California prior to the time that we usually think of as the start of the camellia season, that is, the San Diego show. Both of these shows will be built around gibbed flowers.

The first show will be at the Los Angeles County Arboretum in Arcadia on the week-end of December 8-9. This will be the show that has been called the Early Show that has moved between the Arboretum and Descanso Gardens according to the availability of the Hospitality House at Descanso. The schedule and format of the show will be as in past shows, with Sections for both non-gibbed and gibbed flowers and Divisions for the different size groups as is usual in camellia shows.

The second pre-season show will be the second edition of the show at the Huntington Botanical Gardens in San Marino that was inaugurated last year by the Southern California Camellia Society and was produced in cooperation with the staff of the Huntington Gardens. This will be an "open" show, which is a term used to designate that both gibbed and non-gibbed flowers will be entered in the same Divisions and will therefore compete against each other. Last year's show was the first in Southern California with open competition and there was some concern about the outcome. The show was very successful from the point of view of both exhibitors and viewers. The date of this show will be the week-end of January 12 and 13, 1974.

Schedules for both shows can be obtained from Ernie Pieri, 601 Elm, San Gabriel, 91775.

CALIFORNIA CAMELLIA SHOW SCHEDULE—1973-74

Date	Sponsor	Location
Dec. 8-9	Southern California Camellia Council	L. A. County Arboretum Lecture Hall, Arcadia
Jan. 12-13	Southern California Camellia Society	Huntington Library San Marino
Feb. 2-3	San Diego Camellia Society	Conference Bldg. Balboa Park, San Diego
Feb. 9-10	Peninsula Camellia Society	Veterans Memorial Bldg. 1455 Mission Ave., Redwood City
Feb. 9-10	Temple City Camellia Society	L.A. County Arboretum Lecture Hall, Arcadia
Feb. 16-17	Santa Clara County Camellia Society	Student Union Bldg., San Jose City College, San Jose
Feb. 16-17	Pomona Valley Camellia Society	Pomona First Federal Savings & Loan Assn. 399 N. Garey Ave., Pomona
Feb. 23-24	Delta Camellia Society	Pittsburg High School Pittsburg
Feb. 23-24	Southern California Camellia Council	Descanso Gardens La Canada
March 2-3*	Camellia Society of Sacramento	Memorial Auditorium 15th & J Sts., Sacramento
March 9-10	Camellia Society of Kern County	Mall of Valley Plaza Shopping Center Ming and Wible Road, Bakersfield
March 9-10	Northern California Camellia Society	Sun Valley Shopping Center Concord
March 10	Central California Camellia Society	Fresno City College 1100 E. Weldon, Fresno
March 16-17	Camellia Society of Modesto	Palm Court of E. & J. Gallo Administration Bldg., Modesto
March 23-24	Sonoma County Camellia Society	Doyle Student Center Santa Rosa Junior College Santa Rosa

* This show will be held in conjunction with the Annual Meeting in Sacramento of The American Camellia Society. Details of the meeting will be included in the January 1974 issue of CAMELLIA REVIEW.

CAMELLIA NOMENCLATURE

New Edition in December

SCCS members must have paid 1974 dues to obtain copy.

BEST IN SHOW SEASON 1972 - 1973

The American Camellia Society's *The Camellia Journal* lists the Best Flowers of the 1972-1973 shows for which results were given to the American Society. With a "Thank you" to Joe Pyron, Editor of the *Journal*, we are listing the winning varieties for the information of readers of *Camellia Review* who are not members of the American Camellia Society, most of whom are in California, Australia and New Zealand.

LARGE JAPONICAS

Tomorrows	
Tomorrow Park Hill	12
Tomorrow's Dawn	7
Tomorrow and Var	4
Tomorrow's Tropic Dawn	1
Tomorrow's Dream	1
Elegans Supreme	8
Carter's Sunburst	7
Clark Hubbs	7
Sawada's Dream	7
Betty Sheffields (including 5 Betty Sheffield Supremes)	12
Guilio Nuccio	6
Mathotiana Supreme	6
Helen Bower	5
Tiffany	5
Ville de Nantes	4
Lady Kay	4

Some new varieties placing Best in Show for the firts time are: Elegans Splendor, Easter Parade, Gunsmoke, Joe Pyron and Premier. Some older varieties which placed Best in Show after an absence of several years: Flame, Florence Stratton, Imperator (France), Purity, Reg Ragland and Victory White.

MINIATURES

Fircone	4
Man Size	3
Pink Smoke	3
Sugar Babe	2
Tinsie	2

Also ran: Ellie (new), Lil Tift (new), Little Red Riding Hood, Little Slam, Mini Pink.

HYBRIDS WITHOUT RETICULATA PARENTAGE

Elsie Jury	14
El Dorado	10
Charlean	6
Anticipation	4
Julia Hamiter	4
Angel Wings	2
Massie Lane	1

RETICULATAS and HYBRIDS with RETICULATA PARENTAGE

Lila Naff	13
Francie L	12
Howard Asper	12
Mandalay Queen	10
Valentine Day	8
Valley Knudsen	8
Mouchang	7
Aztec	5

CAMELLIA AND I (Contd.)

Mr. Keller and his son. While I was unloading my camellia plants from the trailer, Mr. Keller came over and asked if I was in the nursery business. When I told him that I was not, that it was a hobby of mine, his face lighted up and said "I am glad of that, I was sure you were going to start a back yard nursery, and wanted you to know that you would have to have a license to do so.

It was through Mr. and Mrs. Keller that I became a member of the Temple City Camellia Society in the winter of 1950. We met, at that time, in the cafeteria of the Longden Avenue Elementary School in Temple City. From this start in the Temple City Camellia Society my education regarding camellias really grew.

NEW 1974 CAMELLIA NOMENCLATURE READY IN DECEMBER

Bill Woodroof, Editor of CAMELLIA NOMENCLATURE, says that copy for the 1974 edition, the 14th revision of this book is at the printers. The books will be delivered to the Southern California Camellia Society right after December 1st. Bernice Gunn, S.C.C.S. Secretary, states the new books will be mailed promptly after she receives them to organizations and individuals who have ordered them and to the members of the Southern California Society who have paid their dues for 1974.

Woodroof says that excepting for the few new varieties that are not reported to him, the new book will be up-to-date with respect to American varieties. Unfortunately, some of the new Australian varieties that were listed in the CAMELLIA NEWS of the Australian Camellia Society, the source of new Australian varieties, did not contain descriptions of the varieties. This was not detected in time to obtain the descriptive information.

Efforts have been made in recent editions of the CAMELIA NOMENCLATURE to improve its usefulness in camellia shows with regard to size. As is commonly understood, the indicated size for most varieties is that which has been stated by the originator of the variety, which means of course that it is based on blooming conditions in the area of origian which may not be typical of growing conditions in other areas. Variation in size occurs mostly with varieties in the Medium and Large groups of japonica, although variations also occur in the Miniature and Small groups. A step to call varieties of such variable size to the attention of users of the book was made a few editions ago by showing "medium to large" for the varieties in which flowers might be of either Medium or Large size. This has not served the purpose of defining varieties for specific camellia shows. 'Betty Sheffield Supreme,' for example, blooms in both Medium and Large sizes in California. It is described in CAMELLIA NOMENCLATURE as medium to large.

Woodroof has attempted to cover this situation in a statement in the new book that will be included under the sub-title "SIZE" in the section headed "Classification and Description of Varieties." He suggests that for such varieties, the Show Committee should decide how placement of entries and judging of flowers should be handled. This section will be on page 9 of the new edition, and he suggests that Show Committees might like to read the section carefully.

LATE FERTILIZING

Fertilizing is an activity in camellia culture that is usually thought of for the spring and early summer months. Some people believe in and practice late fertilizing, using a low nitrogen and high phosphoric acid and potash fertilizer. This can best be explained by quoting from Larry and Vi Shuey's article "Camellia Culture As We Practice It" in the October 1971 issue of CAMELLIA REVIEW.

"Another very important function at this time of year is the application of additional fertilizer to camellias. As the first new buds appear, we discontinue the use of high nitrogen fertilizers (which promote rapid new plant growth) and begin feeding our plants with low nitrogen fertilizers. We are currently using "High Bloom," a liquid fertilizer, whose principal chemical ingredients are as follows: 2% nitrogen, 10% phosphoric acid and 10% potash. This plant food has proven highly satisfactory in the obtainment of quality blooms and is applied every 30 or 40 days until the commencement of the blooming period. We also augment this fertilizer with iron chelate which is applied at least twice between October and December. In addition to strengthening and rejuvenating the soil, iron corrects chlorosis (yellowing of foliage) caused by iron deficiencies and restores the deep, green healthy color to foliage. Furthermore, the use of iron is extremely important in darkening the color of red in camellias. We use a product sold under the trade name of "Iron Plus," and because in addition to iron, it contains zinc, manganese, copper and sulphur, all of which are beneficial to build up the soil."

Some growers go further in using nitrogen-free fertilizer in using one with the ingredients of 0% nitrogen, 10% phosphorous and 10% potash. Products with these ingredients can be located by reading the descriptions of brands that are carried by different garden supply stores.

AUSTRALIAN AND NEW ZEALAND DUES

The S.C.C.S. Secretary advises that dues are now payable for membership in the Australian Camellia Research Society and the New Zealand Camellia Society. The Southern California Society acts as American Representative for these societies and the payments should be sent to the address of the Secretary shown on the inside front cover of CAMELLIA REVIEW. The amounts are U.S. $4.00 for the Australian Society and U.S. $3.00 for the New Zealand Society. Checks should be made out to Southern California Camellia Society.

THINGS TO WATCH

1. California growers particularly should not be mislead by cool nights to believe that plants do not need to be watered. This is the time of year when flowers are forming, and flowers need water. Feel the soil and water when there is an indication that it is drying out.

2. Don't forget disbudding. You are not through just because you disbudded thoroughly up to October. New buds develop on the later varieties and buds that you thought were small when you last disbudded will have grown to sizes that can well be removed. Disbudding is a continuous operation even while you are picking flowers.

3. You can start your spring pruning while you are picking flowers, by removing small shoots that interfere with enlargement of flowers.

4. You might want to give the plants a late shot of iron, particularly if they do not look as green as you would like.

BUD SPORTS OF CAMELLIAS
THE WATERHOUSE LECTURE 1973

Tom J. Saviage
Wirlinga, N. S. W. Australia
(Reprinted from the Australia Camellia Society's CAMELLIA NEWS)

EDITOR'S NOTE: Tom Saviage is a former President of the Australian Camellia Research Society and for several years was Editor of the Society's Publication CAMELLIA NEWS. He is a student of the camellia and writes with authority. As the title suggests, the following article was presented as the Waterhouse Lecture, a lecture that was established by the Australian Society in tribute to Professor E. G. Waterhouse, "the Grand Old Man of camellias" in Australia. Because of its length, it will be presented to the readers of CAMELLIA REVIEW in installments.

In certain families of plants the appearance of a part of the plant with different physical characteristics from the rest is not uncommon. Where the colour of the blooms is affected this becomes particularly obvious. Such changes are known as "sports." They are more apparent in cultivated species, probably because, under natural conditions, many would be eliminated due to a low survival factor, whereas in cultivation, they are maintained by various methods of vegetative propagation due to their beauty or unusual form. The twisted filbert and variegated Agonis flexuosa are examples of this.

Amongst camellia species, Camellia japonica and its hybrids are particularly noted for their sporting propensity and many hundreds of horticultural varieties have been obtained by propagating these variations. Oddly enough, the other species of camellias rarely show evidence of sporting; only a few examples being reported for C. sasanqua and none at all for C. reticulata.

The reasons for sporting or mutating lie deep within the living organism and are part of its evolutionary and inheritance mechanism. To obtain an understanding of this process requires a study of the inheritance factors common to all living matter.

Different cells of the same body and different individuals of the same species generally have identical numbers of chromosomes, within which the genes are arranged in linear series. The genes are the basic heredity factors controlling both the growth of the individual and the identity of the offspring. Until recently they were considered as hypothetical units of function and were inferred from the reproductive and growth behaviour of living organisms.

Broadly it can be said that the species is an organised unit, at its particular point in evolution, based on an integrated framework of cooperating genes always tending to produce the optimal phenotype, resistant to major change. This results in genetic relativity in which no gene has a fixed value on its own, but only in relation to the overall genetic background.

It also means that new species evolve most frequently near the margins of their range where, under the influence of new selective forces and the absence of a continued flow from the species' central gene pool, forms develop which have escaped the old integration and undergo some genetic modifications enabling the formation of new integrated genotypic patterns.

One of the most important recent advances in the field of genetics has been the discovery of the desoxyribonucleic acids (D.N.A.). Their chemical structure, or a linked, double spiral in elongated, linear sequences and reversed polarity, permits them to be self-duplicating and enables them to store an enormous amount of genetical information. These linear constructions of

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D.N.A. are the primary structure of the chromosomes. They are composed of twin threads of linked units of four types of nucleotides capable of cross linkage. Thus, one type of nucleotide will link with another type by hydrogen bonds, binding the spirals together so that the nucleotide pattern on one thread is complementary to that on the other. It is this property that enables each to specify its counterpart on division. Up to date, this is the only compound molecule with such a structure that has been discovered, and it exits in nature only as chromosomal and viral material.

The scientists, Watson and Clark, envisaged that each new D.N.A. molecule developed with an old nucleotide chain acting as a template, the replication process involving the detachment of the linking hydrogen bonds between the original twin chains, the subsequent uncoiling and separation of the two chains occurring progressively from one end of the molecule (likened to the opening of a zip fastener), the attachment of the new nucleotide bases following progressively along the molecule until there were two complete, twin helix D.N.A. molecules where previously there had been one.

They further suggest that mutation might be due to the displacement of a random hydrogen atom between other multivalent atoms in a molecule so that at replication the wrong base is inserted in the complementary nucleotide chain.

Following this proposition, other scientists were able to cause mutations by substituting other base analogues in place of the specific bases in D.N.A. chains. Different mutagens of this type appear to affect specific mutational sites. It was found that the D.N.A. chain had certain points ("hot spots") with an extremely high incidence of spontaneous mutations.

While in some of the simpler organisms the chromosomal D.N.A. consist of one giant molecule, in the more advanced types the chromosomes consist of a considerable amount of D.N.A. which appears to be divided into a number of replicating sections which are called replicons. These are often joined head to tail, sometimes assuming a circular pattern, or forming a loop in an otherwise linear chain.

The sequence of nucleotides in the chromosome of each clone is unique, and forms the genetic code, but the D.N.A. of all living organisms, plant and animal, follows the same plan. D.N.A. operates by specifying enzymes that can form chains of amino acids which build up into a protein molecule. Each type of protein molecule has a distinctive shape to fit a biological purpose such as cambium, bark, etc.

If the sequence of nucleotides required for the formation of a particular enzyme is considered as a basic gene, and each enzyme is constituted of about 100 amino acids, it will be seen that the section of D.N.A. composing each gene is quite long. It can take up to 1000 genes to specify the various enzymes for one cell, and a great many more to cover all the types of cells that make up a camellia.

As early as 1959 Pontecorvo demonstrated that genes are functional units of physiological action, structurally consisting of series of units of crossing over or re-combination and what he called "mutational sites" and compounded of nucleotide pairs whose sequence controls the specific character of the genes. Quite a simple organism can have a total number of mutational sites running into many million. The genes thus appear to be linear structures containing units of mutation and re-combination. The D.N.A. molecules also contain groups that control sequence and there are genes which switch on a reaction and repress it once the reaction has gone far enough. Broadly these contain

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organic development to the pattern prescribed by the genetic code.

In specialised cells, for example, most of the genetic material is inhibited by these switching genes; only the section required for the development of the particular cell remaining active.

Early methods of causing mutations were relatively crude, and involved damaging the D.N.A. chains by ray bombardment or chemical mutagens. Many changes obtained this way were undesirable and regressive, involving some loss of hereditary material. However, new methods of causing mutations by introducing sections of foreign D.N.A. or base homologues into the cell are producing interesting results.

Amongst the chemical mutagens an alkaloid derivative of the autumn crocus known as colchicine has been successful in a number of cases by inducing the chromosomal abberation of polyploidy. This it does by inhibiting the formation of the mitotic spindle during cell division with the result that the chromosome number doubles at mitosis. The tetra snapdragons and the new teraploid daylilies are examples.

In the 1973 A.C.S. Year Book there is an interesting article, Chromosomal Chimeras of Camellia 'Frangrant Pink' Produced by Colchicine Treatment by Ackerman and Dermen, which demonstrates that colchicine Treatment polyploidy in Camellias. In this case, the experiment was undertaken to overcome the sterility barrier in infertile hybrids of C. lutchuensis, by doubling their chromosomes so that further steps could be taken in breeding camellias with fragrance.

Ultra-violet and X-rays as well as radio-active bombardment have all been shown to be causes of mutations.

It is thought that the present garden forms of C. japonica, because they are the product of endless intercrossing and outcrossing, over the centuries during which they have been cultivated, have accumulated a very high genetic variance. Much of this remains potential unless released by the effect of environment on selection. Unfortunately, there is also a considerable genetic load of disadvantageous variations which may be released by re-combinations.

The growth of a plant involves continuing cell reproduction. The reproduction of a cell by division involves chromosome division. Whenever a chromosome divides there are produced two daughter chromosomes with similar genes. Genes arise only from genes, and hereditary is due to accurate gene reproduction, that is true replication of the D.N.A. genetic code. However, when a gene copy varies from the original, a gene mutation has occurred. Likewise the chromosomes may be changed by the loss or rearrangement of component genes. This is known as a chromosomal mutation.

Gene mutations on their own generally cause less change than the chromosomal mutations; in fact, many are so small they go unnoticed.

When mutations occur in the seed a mutant individual is produced. When they occur in the growing part of a plant, they are referred to as a somatic mutation or bud "sport" and it is by vegetatively propagating from this "bud sport" that new horticultural varieties are produced.

In camellias there have appeared cases of seed mutation due to the chromosomal abberations of Haploidy and Polyploidy. Haploidy is where each chromosome is represented singly and is exemplified by C. reticulata var. 'Captain Raws.' Polyploidy is where each chromosome is represented by more than two homologues, and can be induced on both seed and somatic tissue by some chemical mutagens. Some of the various triploids amonsgt the Camellia

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japonica varieties could be examples of this form of mutation.

However, it is with the "bud sports" in camellias that we are basically concerned. The most common form is in colour change in the flowers. This is followed by change of flower form, change of petal edge, change of leaf edge, leaf variegation and change of leaf form. Some of these appear to be linked.

In considering colour change, variegation due to virus is not included; only the changes considered to be due to modification of the heredity factors.

The most common colour changes occur to the white-flowered varieties with some colour, which may vary from the faintest pink spot on one petal, to being variegated, striped or spotted with colour. Generally, a sport with a wholly pink colour will appear first, and then one with a deep pink or red colour. The groups of sports based on the original varieties of 'Paolina Maggi,' 'Mathotiana alba' and 'Contessa Lavinia Maggi,' are well-known examples. It will usually be found that the terminal sport, that with the deepest colour, is the most stable, rarely reverting or modifying, while the intermediate sport will often produce reversions to the parent form.

Subsidiary colour forms that sometimes appear, include striped forms and forms with paler coloured petal edges, and on the more versatile sporting camellias, there have been forms having coloured petal edges and white centres, the "picotee" coloured, and a wide range of colour variations. Certain camellias have proved very unstable as far as colour forms are concerned. Examples are those based on the parent cultivars 'Aspasia,' 'Elegans,' 'Betty Sheffield' and 'Hikaru-Genji.'

Fimbriation of petal edge has been one of the most admired mutations, exemplified by the ancient Chinese variety 'Fimbriata,' the fimbriated sport of 'Alba Plena." We find fimbriations on 'Hawaii' from the 'Elegans' group; 'Fred Sanders' from the 'Tricolour' group; 'Ville de Nantes Red' from the 'Donckelari' group, and many others.

Change of form has also occurred with fimbration; 'Hawaii' taking a peony form when mutating from 'C. M. Wilson.' 'Lady Kay' is a peony form sport of 'Ville de Nantes' and retaining the fimbration. Mutation of form is generally away from the regular to the irregular, such as 'Mrs. Hooper Connell,' a peony sport of formal 'Alba Plena.' The examples of 'Hawaii' and 'Lady Kay' have been mentioned. In many of these "form" sports the foliage is affected. Both 'Hawaii' and 'Kona' in the 'Elegans' complex have leaves that are of less substance and average smaller in size than the parent, while 'Elegans Supreme' has deeper leaf serrations and heavier texture.

The fimbriations of sports such as "Hugh Kennedy' (sport of 'The Czar') and 'Guilio Nuccio Fimbriated' are of a different type in as much as the flower is smaller and the petal texture thicker and coarser. At the same time the leaves are more leathery, thickened and rugose with obscure serrations. Some of the effects of this form of leaf mutation are evident on one type of leaf variegation. 'Benten' is a good example, the periphery of the leaf being distorted and pulled in wherever the variegation nears the edge.

In as much as petals are basically modified leaves, certain genetic groups exercise an overall control on form, so that when mutations occur within these groups, both petal and leaf are affected.

Thus there are apparently three types of mutations that include fimbriations:

1. Straight fimbriation without other change.
2. Fimbriation linked with an accompanying change of flower form.

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3. Fimbriation linked with an accompanying change of leaf form.

The mutation of leaf variation comes in two forms.

1. The blurred irregular type of variegation, as on 'Benten,' often with white and pewter streaking.
2. The clearer, more defined, and regular variegations, as on 'Francois Wiot,' and 'Benten Kagura,' the colour of the variegation tending more to gold with more definite margins.

In Japan, there are a considerable number of camellia varieties with variegated leaves, but it is not possible, with the information available, to indicate those due to "bud sports." In general however, most varieties of plants with variegated foliage, other than virus induced, are often of somatic origin stemming from such 'bud sports.' Examples are common amongst the maples and conifers and, from observation, this seems true of camellias.

In Tourje's Camellia Culture, Dr. A. G. Plakidas has pointed out that most, if not all, non-infectious variegations are chimeras. A chimera is a mixture of tissues having cells with varying genetic structure. Two kinds of chimera are common in plants, sectorial and periclinal. The sectorial chimera has the different tissues in adjacent sectors, while in the periclinal chimera they are in layers. Striped varieties are generally sectorial chimeras. The growing point of a camellia is composed of three tissue layers; the outer forming the epidermis of stems, leaves and fruit; the middle layer forms the body of the leaves and the petals, and the inner the growth of the stems.

Colour mutation occurs in one or more of the three layers of cells at the growing point. The stage of development of the flower bud effects the pattern by varying the proportion of mutated to non-mutated cells. Mutations at an early stage affect larger areas. Multiple mutations also are possible as well as mutations involving colour intensity.

The apical meristem of a shoot, which is the point of growth development, generally has 1 to 3 apical initial cells in each of the three layers, daughter divisions of which, in turn, become initials. Should a mutation occur in a specific initial, the result will be a mericlinal chimera such as that from a mutant plastogene which affects chlorophyll synthesis, causing the common white and greenish white streaking.

However, once a chimeral condition exists in a plant, other variabilities become possible, due to the re-arrangement of this existing chimeral material. This can occur through the displacement of cells between periclinal layers during cell division, or from an adventitous bud arising from an under layer and lacking the outer layer cell formation. A plant propagated from such a bud, being based on existing genetic material, cannot be termed a mutation.

In other words, the term "sport," which includes mutant varieties as well as those arising from such re-arrangements of chimeral material, should be used in all cases where the true cause of the somatic variability is not established.

Although the changes affecting the colour appear in the growing vegetative tissue, it is generally considered that the genetic constitution of the plant exercises control. Even the suddenly occurring bud sports are due to the inheritance factor; the varieties most prone to mutation such as "Betty Sheffield,' 'Aspasia,' etc., inheriting a genetic constitution more prone to mutate. Probably, all or some of the genes in the group controlling colour, have sites with a high rate of spontaneous mutation. Colour inheritance in

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camellias would seem to be due to the joint action of several genes, each of which has some effect on the result. Geneticists have given such groups the name of Polygenes, and they are known as multiple inheritance factors. An unstable protoplasmic make up (particularly referring to the cytoplasm), has also been suggested as a cause of mutation, probably by gene absorption in which one or more genes, or sections thereof, are lost.

A point on which little is yet known, is what is the actual trigger that causes spontaneous mutation? While the actual mutation may be random, from an evolutionary point of view, mutational frequency seems to increase with environmental pressure. As far as camellia bud sports are concerned, there are a number of cases arising from adjacent tissue damage. It is usually found that heavy pruning of varieties arising from a somatic variation causes the re-appearance of the parent variety. In this case, the cell structure at the growth points has re-established its earlier genetic construction.

In the article 'Those Sporting Camellias' in the N.Z. Camellia Bulletin, November 1972, there is an interesting report from Mr. O. Blumhardt who states that on growing sprouted root ends from a wrenched 'Lady Loch' they all flowered 'Otahuhu Beauty.' He ascribed this to the assumption that 'Lady Loch' was a periclinal chimera with an inner cell layer, carrying 'Otahuhu Beauty' genes and an outer layer of 'Aspasia,' the blending of the two giving 'Lady Loch.' It is believed that the outer layer of cells in some plants does not extend to the roots, hence the root suckers turned out 'Otahuhu Beauty,' due to the absence of the colour inhibiting 'Aspasia' layer. This, of course, is not due to a mutation but the re-arrangement of chimeral material.

Here is a chance for experimentalists to try and force the terminal sport of a variety by inducing root suckers by physical damage on an intermediate sport. Obviously it would be necessary to use plants on their own roots.

Bud sports occur with varying degrees of stability, those to the terminal red colour, such as 'Otahuhu Beauty' being the most stable of all. On the other extreme the writer has twice apparently successfully grafted a formal double form which occurred on his 'Debutante.' Each time the resultant plant produced 'Debutante' blooms only. Such transient modifications are probably due to the distribution and concentrations of growth control hormones and auxins and cannot be considered mutations.

(To Be Continued Next Month)

Directory of California Camellia Societies

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

*CAMELLIA SOCIETY OF KERN COUNTY
President: John Fortenberry; Secretary: Mrs. Marcia Krause, 1160 Weyard Way, Shafter 93263
Meetings: 2nd Monday Oct. through Apr. at Franklin School, Truxton and A St., Bakersfield

*CAMELLIA SOCIETY OF ORANGE COUNTY
President: Paul Nielsen; Secretary: Mrs. George T. Butler, 1813 Windsor Lane, Santa Ana 92705
Meetings: 3rd Thursday Nov. through April at Great Western S/L cor. 15th St. and N. Main, Santa Ana

CAMELLIA SOCIETY OF SACRAMENTO
President: Herbert Martin; Secretary: Mrs. Frank P. Mack, 2222 G. St., Sacramento 95816
Meetings: 4th Wednesday, Oct. through April in Garden & Art Center, McKinley Park, Sacramento

*CENTRAL CALIFORNIA CAMELLIA SOCIETY
President: Arthur Gonos; Secretary: Mrs. Wilbur V. Ray, Fresno 93727
Meetings: Nov. 14, Dec. 19, Jan. 16, Feb. 20 at Mayfair School, Mar. 20 at Fresno State College

DELTA CAMELLIA SOCIETY
President: Donald R. Bergamini; Secretary: Mary A. Bergamini, 451 Dale Rd., Martinez 94553
Meetings: 2nd Wednesday, Nov. through March at Sumitomo Bank, 620 Contra Costa Blvd., Pleasant Hill

JOAQUIN CAMELLIA SOCIETY
President: Charles Boynton; Secretary: Mrs. Ethel S. Willits, 502 N. Pleasant Ave., Lodi 95240
Meetings: 1st Tuesday October through April in Micke Grove Memorial Bldg., Lodi

LOS ANGELES CAMELLIA SOCIETY
President: Thomas Hughes; Secretary, Mrs. Haidee Steward, 130 S. Citrus, L.A. 90036
Meetings: 1st Tues., Dec. through April, Hollywood Women's Club, 1749 N. La Brea, Hollywood

MODESTO CAMELLIA SOCIETY
President: Harlan Smith; Secretary: Helen Caputi, 1605 Victoria Dr., Modesto 95351
Meetings: 2nd Monday October through May in "Ag" Bldg. of Modesto Junior College

NORTHERN CALIFORNIA CAMELLIA SOCIETY
President: Edward A. Hays; Secretary: Wm. Lockwood, 3226 Primrose Ln., Walnut Creek 94598
Meetings: 1st Mon. Nov. through May in Claremont Jr. High School, 5750 College Ave., Oakland

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

PENINSULA CAMELLIA SOCIETY
President: Mrs. Charles F. O'Malley; Secretary: Mrs. Rex W. Peterson, 27 Walnut Ave., Atherton 94025
Meetings: 4th Tuesday September through April in First Federal Savings & Loan Bldg., 700 El Camino Real, Redwood City, Calif. 94061

*POMONA VALLEY CAMELLIA SOCIETY
President: Frank Burris; Secretary: Walter Harmsen, 3016 N. Mountain Ave., Claremont 91711
Meetings: 2nd Thursday November through April in First Federal Savings & Loan Bldg., 399 N. Garey Ave., Pomona

*SAN DIEGO CAMELLIA SOCIETY
President: Harry Humphrey; Secretary: Mrs. Mabel Higgins, 2152 Clematis St., San Diego 92105
Meetings: 3rd Wednesday November through April Rm. 101, Casa Del Prado Bldg., Balboa Park, 7:30 P.M.

SANTA CLARA COUNTY CAMELLIA SOCIETY
President :John M. Augis; Secretary: Mrs. Helen Augis, 2254 Fairvalley Court, San Jose 95215
Meetings: 2nd Thursday Sept. through April.

SONOMA COUNTY CAMELLIA SOCIETY
President: Mrs. Nadine Greene; Secretary: Mrs. Marylin Batt, 10047 Old Redwood Hwy., Windsor 95492
Meetings: 4th Thurs. Nov. through April, except Nov. and Dec. in Multipurpose room, Steel Lane School, Santa Rosa

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

*TEMPLE CITY CAMELLIA SOCIETY
President: Sergio Bracci; Secretary: Mrs. Elsie Bracci, 5567 N. Burton, San Gabriel 91776
Meetings: Nov. 16 (Fri.), Dec. 21 (Fri.), Jan. 25 (Thurs.), Feb. 22 (Fri.), Mar. 28 (Thurs.), Apr. 25 (Thurs.)

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