Northern California Camellia Society, Inc.

A Non-Profit Organization

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CAMELLIA ×WILLIAMSII • DONATION

Courtesy Camellias in America
Revised Edition, by H. Harold Hume

The Northern California Camellia Society, Inc. is a non-profit organization of camellia fanciers interested in the culture, propagation, and development of camellias. Meetings are held on the first Monday in each month from November to May inclusive, at 8 p.m., at the Claremont Junior High School Auditorium, Oakland. Membership is open to all those with a serious interest in the subject. Annual Dues $5.00 except to those residing outside the counties of Alameda, Contra Costa, Marin, Solano and San Mateo, to whom Bulletin subscription available at $3.00 per year. Membership application blanks may be obtained from David B. Grigsby, 2218 Jefferson Street, Berkeley, Calif. Address all matter regarding the Bulletin to the Editor. **Report change of address to the Secretary.**

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COVER ILLUSTRATION

It is singularly appropriate that we should inaugurate a new milestone in the progress of the BULLETIN—the adoption of a color cover and expansion to 20 pages—with a reproduction of the hybrid camellia DONATION, which also represents a step forward for it marks the beginning of a new era in camellias. Our use of a cover in color has been made possible by special arrangement with the American Camellia Society. That we have such a magnificent new camellia as DONATION is due to the far-sightedness and persistence of the late J. C. Williams, of Caerhays Castle, at Gorran, Cornwall, England, who created this excellent hybrid, among others, a few years ago as a result of crossing the species **C. Saluenensis** and **C. Japonica** DONCKELARI.

The complete story of the Williams hybrids is not available to us at the moment, but it is both a reasonable and natural assumption that his objective was to create a camellia that would be more hardy and thus particularly suitable to the severe climate peculiar to certain parts of the British Isles. From the few years' experience the writer has had with DONATION, it would appear that it will stand considerable cold as well as shade, in which exposure it also seems able to put on dense growth, which apparently is characteristic of Saluenensis x Japonica hybrids. DONATION makes a beautiful miniature tree—its branches are both numerous and symmetrically arranged—and even with a minimum of sun it blooms profusely, the distinctively colored and veined blooms attaining a size of slightly over 5 inches. Based on the writer's observation, the shade of pink is actually somewhat lighter than the illustration, with a distinctive lavender tone and prominent veining.

The results obtained by Williams definitely establish that the species **Saluenensis,** while not particularly outstanding in itself except for its delicacy, is nevertheless of great value because it crosses readily with **C. japonica** and evidently contributes certain valuable characteristics to the hybrid. It will be of great interest to follow the further developments in this new strain, particularly the second generation seedlings, many of which will have been re-crossed with japonica. Prof. E. G. Waterhouse, of Gordon, N.S.W., Australia, has already obtained a number of excellent new hybrids from **Saluenensis** seedlings, one of which, LADY GOWRIE, is described in detail in his latest beautiful book, "CAMELLIA TRAIL." Since that time, he has obtained at least two others of merit—a light, semi-double pink named for his daughter, MARGARET WATERHOUSE, which variety the writer has seen, and a full double, amaranth rose hybrid, which he thought well enough of to give it his own name. All three of these new hybrids are now in this country and will eventually be available. It is further known that Mr. Vernon James, of Campbell, California, has a number of interspecific hybrids involving the species **Saluenensis,** some of which look very promising. The writer also has a number growing, including several second-generation seedlings from the original Williamsii hybrids and no doubt many others are similarly engaged.

We believe, therefore, that it is safe to say that within the next five to ten years there will be many excellent, new and distinctly different camellias in general propagation arising from this original cross and similar experiments. Judging from the evidence already available, one may forecast that these new hybrids will prove a boon to persons having a small garden and those who practice container culture, for there is every indication the plants will be rather miniature in size, quite orderly and compact in growth habit but with large, showy blooms. What more could one ask of a new addition to the family?

THE MARCH MEETING

Every few years, when we feel the need of a change of pace and azalea time approaches, it is our good fortune to be able to present an outstanding authority on the subject of their culture in the person of one of our local acid-plant enthusiasts. Thus it was that on the evening of March 7th last, Mr. Charles O. Phillips, of Oakland, was our featured speaker, his subject being "Camellias and Their Companion Plants." Almost everyone horticulturally minded locally knows Charley Phillips by reputation as a long-time grower, hybridizer and exhibitor of azaleas in all their forms, and his outstanding displays at our Oakland Spring Garden Show are something which once seen are long remembered. The following is a report on Mr. Phillips' talk prepared from the excellent notes of Irene (Mrs. Haig) Ashuckian, Recorder for the BULLETIN.

Thinking about gardens in general, it has been said "Never plant a garden bigger than your wife can take care of"; also, "Gardening is simply a matter of your enthusiasm holding up until your back can get used to it." (Perhaps it is a matter of your back holding out until you become an expert, as in Mr. Phillips' case.)

The history of gardens is as old as mankind. Gardening is symbolic of the earth: it began when the cave man had nothing to do but hunt, in the course of which he ran across certain bulbs and plants. With his limited intelligence he thought "Why can't I take these home and have my wife take care of them?" Inevitably, the deer came and ate them, forcing him (or his wife) to build a fence around their garden. That is not so different from the situation today.

However, there are a few fundamental things every good gardener must know. Know your soil. Is it good and fertile, clay, loam, rocky or sandy? Is it alkaline, acid or neutral? Know the important plant families such as the tea family, to which camellias belong; the rose family, the heather family. Know whether plants are fibrous rooted or whether they are primary plants. Know something about their natural surroundings; whether they like sun or shade, wet or dry situations, heavy or light, rich or poor, sour (acid) or sweet (alkaline) soils. All such knowledge makes gardening more interesting and successful.

Know how to fertilize and how to control pests and diseases, for they are all a part of the game. Know how to plant a good lawn or ground cover, for these are like a carpet leading to your garden. Know how to plan your blooming sequences and color combinations.

Know soils, for they are fundamental to success. Adobe soil and yellow clay are worthless for gardens unless corrected. Know about leaf molds and compost. My favorite is pine needle mold as it breaks down very slowly and has a distinctly acid reaction. On tests of various molds, eucalytpus leaf mold headed the list, with bay (laurel) mold next in line. It is very acid (4.5 pH) and therefore excellent for azaleas and camellias. The least desirable mold, but still good if you are careful what you put into it, is plain garden compost. However, sycamore and maple leaves will give your compost a lime (alkaline) reaction.

An ideal planting mixture for azaleas is any acid leaf mold—pine, redwood, eucalyptus, bay, oak, etc.—and about an equal amount of good garden loam mixed with some manure—sheep manure in preference to cow manure—that has lost its heat. Peat moss may be used in place of leaf mold, if necessary. Some add a small amount of sand, also.

In fertilizing azaleas, I like to use Atlas Fish Emulsion, April through August. Ortho Dry Mix is also good,

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VARIEGATION IN CAMELLIAS CAUSED BY VIRUS

The cause and effect of variegation occurring in the foliage and flowers of camellias, particularly with respect to grafted plants, has for some time been a matter of concern to camellia growers throughout the country. Studies of this phenomenon were made a number of years ago by Dr. A. G. Plakidas(1), Professor of Plant Pathology, Louisiana State University, which established beyond a reasonable doubt that variegation of a certain type occurring in camellias was, in fact, virus-induced and transmissible. Because of the interest which this discovery aroused generally, our Society was desirous of obtaining information on the matter first-hand. It was our unexpectedly good fortune to have an expert on plant viruses available in the person of Dr. P. D. Caldis, Director of Agricultural Research for the California Packing Corporation, who was good enough to address us on this subject at the January, 1955, meeting. Through a happy circumstance, Dr. Caldis had been in frequent and close contact with Dr. Plakidas, a personal friend, who had recently conducted a seminar at the University of California, Berkeley, on the subject of variegation occurring in camellias. Through this source, prints and colored slides were obtained by Dr. Caldis and projected at our meeting in illustration of his excellent talk, the essence of which was as follows:

In 1946, Drs. Milbrath and McWhorter (2) successfully transmitted leaf variegation to solid-green varieties and seedlings by grafting, thus demonstrating such condition to be infectious and presumably virus-induced. Following this discovery, in 1948 Dr. Plakidas had advanced the theory(3) that color-breaking of flowers in camellias was due to virus infection rather than to bud sports or mutation as was generally believed and suggested that this be utilized in a practical way in order to produce new, variegated types of self-colored camellias by grafting. Two years later, E. C. Tourje reported(4) successful transmission of variegation from the variety ELEGANS to the variety C. M. HOVEY, although it was not entirely clear whether this referred to the foliage, the flower, or both. In that same year (1950), Dr. Plakidas began a series of experiments designed to determine whether variegation was, in fact, transmissible to flower as well as leaf by grafting. His experiments continued for several years and have amply demonstrated, in a number of instances, that certain types of flower variegation can be brought about in the same manner as leaf variegation, both in **C. japonica** and **C. sasanqua** and in grafting from one to the other. While this would tend to disprove the general belief that variegation is due to mutation, this is not claimed nor is it contended that all variegation in camellias is virus-induced. In fact, it is believed that in certain varieties such as HERME, BELLA ROMANA, TRICOLOR, ELIZABETH and many others that the variegation is of genetic character. It is also noted that the pattern of the variegation in these naturally-variegated flowers is in the form of bars or stripes (striation), whereas on all known virus-induced variegated flowers the marking appears in irregular white blotches, or spots. Furthermore, where the same varieties were grown on their own roots, the foliage showed no trace of mottling, there being no opportunity for contamination as in grafting.

It was brought out in Dr. Caldis' illustrated talk that the virus was transmissible by scion as well as root stock. A number of projected pictures illustrated how it had been possible to transmit the virus from an infected (variegated) scion to one not infected simply by grafting both on a forked understock known to be virus-free, which resulted in variegated

flowers appearing on both scions eventually. However, it was pointed out that not all colors nor varieties are believed to be subject to virus-caused variegation. For example, there is no known instance of the variety FRAU MINNA SEIDEL (Pink Perfection) having shown variegation. Dr. Caldis stated there is no known cure for camellia virus at the present time. It is believed that aphids and leaf hoppers may possibly transmit the infection from one leaf or plant to another. This would seem entirely likely in view of the fact that Dr. Plakidas' experiments demonstrated the virus became transmitted to sasanquas even in cases where the graft had failed to unite.

The writer would like to add a few observations of his own on the general subject of variegation in camellia blooms, which we know to be quite in inconstant matter, possibly due at least in part to environmental differences:

(1) As many of us have experienced, some variegated camellias which have been purchased at a distant nursery will often seem to "lose" much of the white marking after a year or two in one's own garden. If memory serves, this usually happens when the plant has been moved from a warm to a cooler climate. On the other hand, I personally know of several instances where different varieties of camellia, which had little or no variegation whatsoever in the cool San Francisco Bay vicinity, have become quite variegated in their present warm interior valley location. Among these, I can name offhand DONCKELARI, GIGANTEA, MARCHIONESS OF SALISBURY and I am sure there are other varieties of which this is true. The difference was not due to one strain compared with another, as it is recognized there is often considerable divergence in the markings of the same variegated camellia variety—these were the same, the identical plants. The foregoing would indicate that heat may be a factor in the extent of variegation. In this regard, last fall I placed a plant of GIGANTEA, which had never shown appreciable variegation, in my greenhouse. After several months under abnormal warmth—heat, in fact—it was moved into the lath-house where it bloomed exceptionally early, most of the flowers being heavily variegated. My conclusions are that this was due either to the unusual warmth to which it had been subjected or because of its very early blooming—there were no other discernable causative factors. It has further been observed that very often the first few blooms on some of the variegated camellias seem to have the greatest amount of white — late blooms will often have very little variegation. I believe this to be true of those camellias having the spotted or blotch type of marking —not of the striated or striped (presumably naturally-variegated) types.

(2) In most cases, the "special" strains of these blotched-type variegated camellias having an exceptional amount of white marking, seem to be notably weaker growers, which would presumably be expected of virus-infected plants.

(3) If the virus is transmissible by sap-sucking insects, or simply by contact of scion and understock without union, would it not be spread readily through pruning the plants of a collection, unless one takes the precaution of sterilizing the shears after each operation? The same principle would apply to cutting flowers, especially if wood is taken.

In conclusion, perhaps it should be emphasized that, so far as we now know, virus-induced variegation in camellias is usually not a serious matter insofar as plant health is concerned. There may be occasional extreme cases where the foliage becomes variegated to such an extent as to practically constitute a condition of chlorosis. Of course, anything that brings about a lessening of the

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THE HISTORY OF THE HUNTINGTON GARDEN and MORE ABOUT THE RETICULATAS

Based on a Talk given by Mr. Howard Asper,
Superintendent, Huntington Botanical Garden, San Marino, California*

The Huntington Botanical Garden, consisting of 207 acres of which 70 acres are now open to the general public free of charge and without the necessity of advance reservation, is located in San Marino, California, just south of the city of Pasadena. Visitors' hours are from 1:00 to 4:30 p.m. every day except Monday. These gardens are justly famous for their valuable collections of plant material, that of the succulent family being perhaps the most extensive in the world. Of recent years, the Huntington camellia collection has expanded tremendously, the garden area devoted to it enlarged and improved and it is in general assuming its rightful place as the finest thing of its kind in the western part of the United States. A brief history of its founding and growth is both interesting and appropriate.

The acreage on which Huntington Gardens now stand was purchased by Mr. Henry Huntington in 1900 when it was operated as a large ranch. It was first designed to be a citrus orchard but, after a few sad frosts had done extensive damage, that project was abandoned. In 1905, Mr. William Hertrich, a trained horticulturist, was engaged as ranch manager, and to him the development of these famous gardens is in great measure due, as Mr. Hertrich devoted the greater part of his very active life to this project, which must forever stand as a living memorial to his art, intelligence and capable management. Mr. Hertrich, now Curator Emeritus, is presently engaged in preparation and publishing of a series of excellent books on the Huntington camellias, the first of which has appeared, but continues to take an active interest in its affairs nevertheless. The gardens are maintained by an endowment fund left by Henry Huntington at the time of his death in 1928, which fund is presently administered by a group of five distinguished citizens of California, including from this area former President Herbert Hoover and Mr. Wallace Sterling, President of Stanford University.

Accompanying Mr. Asper's very interesting talk on the Huntington Gardens were excellent slides in color of the camellia garden and the flora in general, and the many personal anecdotes which he recounted made the story that much more intimate and entertaining. The second part of Mr. Asper's talk, relating to the story of the Yunnan reticulatas, has been the subject of a recent special issue of this publication and we will therefore deal only with that phase of it relating to the securing of the varieties now known as "BUDDHA" and "CONFUCIUS," which we do not believe has previously been published in full, as well as other subsequent developments.

As background, up until 1945 it had been generally believed that the only worthwhile garden form of reticulata was that brought in by Capt. Rawes in 1820, which was universally known by the specific name **"Reticulata"** rather than a varietal name. Through scions obtained from the large plant in the Universiy of California Arboretum at Berkeley about 1938 or 1939, propagation of this reticulata grew rapidly and it reached the height of its public distribution about 1942 or 1943. Research begun in 1945 by Dr. Walter Lammerts, working with Mr. Asper at Rancho del Descanso in Southern California on plant development and importation, by 1948 had culminated in the successful introduction of 18 new vari-

eties of reticulata from China. Sometime later, their agent in Kunming, a Prof. Tsai, wrote that additional varieties were obtainable, which he had secured by crossing the **Reticulata** LION HEAD with **C. pitardii.** These seedlings were described as very beautiful and obtainable at a price of $400.00 each. Following the making of the necessary financial arrangements, one plant of each was shipped from Kunming by China National Airlines but, on transfer to the transpacific plane it was mistakenly placed aboard one destined for Vancouver. This was noted at Honolulu and the plants put off there. At this point, the shipment ran into difficulties. An alert customs inspector noted that the 46" plants exceeded the height limitation of 30" prescribed in the import regulations which, of course, led to considerable delay and the necessity of contacting Washington, D. C. officials before the shipment was allowed to proceed, and this only after these priceless plants had been trimmed to the prescribed 30" height limitation.

By the time the shipment reached Los Angeles, the unexpected delay and exposure had resulted in immeasurable damage. They were immediately soaked in a solution containing vitamin B-1 and then put in a resuscitating chamber comparable to an oxygen tent. Eventually one started to grow slowly but the other looked extremely doubtful. Finally, it developed a very weak shoot but the plant itself gave indication it would not survive. There followed a very important conference for the purpose of making a grave decision—would it be better to take a chance at grafting this softwood, weak scion or should they gamble on the plant pulling through? Mr. Asper's decision was to graft it, which he immediately set about to do. Apparently this was the right decision, for we now have two more fine varieties, BUDDHA and CONFUCIUS (so named by Descanso Distributors, Inc.) to add to the original eighteen from Yunnan.

Subsequent correspondence with Prof. Tsai developed the fact that he would undertake to deliver a plant of the hitherto unknown species **C. heterophila,** known to be obtainable some 500 miles distant, upon payment of the sum of $800.00. His plan was to send a runner over the mountains with a potted camellia, on which a scion of this rare species would be grafted, who would remain there six months or until the graft became adequately established. There followed agreement on these terms and a letter of authorization to proceed, but, before anything could be done, apparently the "bamboo curtain" came down, for no further word has been received in this regard. Eventually, however, it is expected that this and other beautiful plants will become available to us, for the Chinese are too deeply devoted to art, beauty, and rightfulness to remain forever oblivious to the desirability of interchange of such attributes of culture.

*Prepared from notes taken at the meeting by Recorder Irene Ashuckian.

VARIEGATION BY VIRUS (Cont.)

leaf-green (chlorophyll) must result in some impairment of plant health by reason of diminution of the plant starches. This can usually be corrected by the application of iron in the form of ferrous sulphate—4 oz. to the square yard — somewhat slower by applying iron oxide.

(1) Plakidas, A. G. See "Transmission of Leaf and Flower Variegation in Camellias by Grafting." Amer. Cam. Soc. YEARBOOK, 1953.

(2) Milbrath, J. A. and F. P. McWhorter. "Yellow Mottle Leaf, a Virus Disease of Camellias." Amer. Cam. Soc. YEARBOOK, 1946.

(3) Plakidas, A. G. "Possibility of Using Virus Infection as a Means of Producing New Varieties of Camellias." A.C.S. YEARBOOK, 1948.

(4) Tourje, E. C. "Virus Transmission through Grafting." Southern California Camellia Society "CAMELLIA RESEARCH BULLETIN," 1950.

ONE MAN'S GREENHOUSE

David L. Feathers, Lafayette, California

In the Fall of 1953, I decided that past methods of growing seedlings were too slow and that, if I were to accomplish some of the things I hoped to do with camellias, it would be necessary to cut materially the time element involved between planting the seed and viewing the flower. Being familiar with the results achieved by Lammerts and others through the use of continuous light, high minimum temperature, maximum nutrient levels and controlled humidity available under greenhouse conditions, I decided to undertake construction of one with automatic facilities insofar as possible.

With the invaluable assistance of a good friend possessed of an incredible amount and variety of tools and the knowledge of how to use them, we started grading the site and boring the post-holes in September — one of our hottest months of the year. All of our ground is sloping, in varing degree, and the geological structure is extremely interesting, particularly to one in the mining business. The digging of the post-holes with an auger went smoothly until we passed through our typical soft sandstone into a sort of peanut-brittle type of conglomerate that proved to be virtually impervious to every conceivable sort of hand-tool. Finally, however, the ground wore out first and we were able to set our steel posts and begin construction. I had purchased the materials for a Lord & Burnham sectional, 18' x 35' glasshouse, with 8' eaves, having a gable height of 12' and divided into an 8'7" concrete-floored warm room, and a 25'9" gravel-floored temperate room, separated by a glass partition. The posts, supports and braces were all of steel and galvanized pipe, the glass-bearing sash, sill, etc. of redwood cut only to approximate lengths. All the hundreds of pieces of redwood had to be painted two coats and cut to precise fit. It took us over three months of spare time work to complete the job, which included building the forms for the 6" x 36" reinforced concrete base, which is integral with both the post-hole piers and the 4" concrete floor slab, making a very solid, substantial foundation.

The entire house is heated by radiant heat, the copper coils going first through the floor slab, then out through the concrete partition under the 3 ft. bench on one side, across the room level to the door, thence overhead running the full length of the large room back to the partition, then across overhead, returning to the far side, finally down under the other bench and thus back to the heater, which is a 50,000 BTU gas-fired hot-water type unit that is both economical and efficient. An interesting feature is the stringing of 4"-square aluminum radiation fins along the entire length of the ½" copper tubing, about ¼" apart, thus giving maximum heating surface. The radiant heat in the work-room floor serves to keep the operator's tootsies warm in the cold, winter days, as well as a means of propagating with bottom-heat simply by placing the 6" deep seedling flats on the floor area. Very fast action is thus obtained in germinating the seed. The front door into the large room is oversize — 4 ft. — with 3 ft. doors between the rooms and at the rear. Lighting in the main room is supplied by two fluorescent reflectors, each containing two 4 ft. 40-watt tubes, but only one bank (80 watts) is kept on all night.

The glasshouse is served by an L-363-V Electric Powervent, which is set to open at 72° and therefore remains closed at any lower temperature. The heating unit thermostat is usually maintained at 55-60° minimum in winter and 60-65° minimum in summer, manually raised to 70°

during daytime, or just enough below the ventilator setting to prevent wasting heat. There is usually a difference of between 5 and 10 degrees in the **minimum** temperature between the two sections, the large "camellia" room being the cooler. (The heater temperatures relate to the warm room, which has a manually-operated ventilator.) Humidity is supplied manually, by sprinkling overhead gently every other day in summer. About once a week it is necessary to water each plant individually, using a Waterwand. There are presently about 1,200 camellias in the two sections of the greenhouse, mostly in 1-gal cans.

It should be emphasized that the primary purpose of this glasshouse is to speed the development of seedling plants into bloom — all else is secondary. It is also a very excellent facility for accelerating grafts. In fact, it is extremely beneficial to growth of any kind, as that is its function. Because plants kept under these conditions grow and develop much more rapidly, it follows that one may expedite their blooming, if so desired. For example, my LION HEAD reticulata kept continuously in the greenhouse was completely through blooming during the month of December last year. It is a well known fact that forcing camellias into bloom is unsatisfactory; the best way to advance their blooming season is by developing an earlier growth cycle. Continuous light and high night temperatures are not, however, conducive to best quality blooms. For one thing, they mature too speedily and, by reason of being kept under "soft" conditions, usually lack substance. It might be well to mention here that the finest quality blooms I have ever had outdoors occurred after a very cold winter, both substance and color being above normal. I have always felt that, for the fullest development, camellia flowers should mature as slowly as possible, which gives them the greatest opportunity to develop size and form to the ultimate. However, I believe the greenhouse technique can give superior flower development in many cases, provided sufficiently cool night temperatures are maintained, because one has absolute control over all the elements affecting florescence.

As is implied by the foregoing, my glasshouse is used year-round. Shade from the otherwise excessive summer heat is provided by (1) a large live-oak, which gives filtered sunlight till noon for part of the house, and (2) calcimine coating, applied externally, either sprayed or daubed. In our ravine situation, the high westerly hills cut off the summer sun at about 5 p.m. Temperatures will rise to about 100° maximum, even with all doors and vents open, on the hotter days.

Occasionally, for various reasons I will place large potted plants in the greenhouse for a few months, returning them to the lathhouse after flowering or making first growth. Some seem to bloom excellently indoors even under the abnormal conditions provided. AUDUSSON has bloomed early and with unusual variegation, although having somewhat smaller flowers; DR. JOHN D. BELL was magnificent the one season I kept it under glass; DR. H. G. MEALING has never shown blooms outdoors nearly so large as in the greenhouse. On the other hand, ELEANOR HAGOOD (a 6' plant) bloomed all at once last year, with almost no bud centers and undersized. (However, it had been moved in just prior to blooming.) Other varieties have also proved to be inferior under my glasshouse conditions. Possibly, the conclusion to be drawn is that those varieties preferring quite warm conditions do as well as or better than outdoors, while those inclining toward the cool side do not perform so well. I am speaking, of course, of my own situation with warm night temperatures and

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THE CONTROL OF CAMELLIA FLOWER BLIGHT

C. A. Hanson*

Camellia flower blight or flower spot is a serious problem in many of the camellia growing areas of the United States. It is widespread in distribution, having been reported in Oregon, Louisiana, Texas, and is the cause of much concern to growers in California.

The disease is caused by a fungus **Sclerotinia camelliae** and is specific on camellia flowers. Diseased flowers become spotted, blotched, generally discolored and shatter or fall off prematurely. Blossom life is materially shortened and cut blooms may become spotted and discolored within a few hours after cutting, if kept in a warm environment.

Because of its specificity, the fungus is dependent on camellia flowers for its survival. Therefore environmental conditions favorable for camellia flowering are also very favorable to the sporulation of the fungus. All varieties of **C. japonica** are susceptible and some late flowering varieties of **C. sasanqua** have been found diseased.

The disease appears first as one or more small, tan or brownish spots, usually on a petal. The spot enlarges rather rapidly until the entire petal becomes discolored. The blighted area may have "veins" or filaments of a darker tone running through it. Usually the entire base of the flower becomes infected and often the whole flower. The blossom does not rot or wilt but remains somewhat firm in appearance. A completely blighted bloom may retain its shape perfectly, yet be over-all light brown in color. The petals often shatter easily and when the blight reaches the receptacle or base of the flower, the slightest shock may drop the bloom. The base of such blooms is brownish and discolored, as contrasted with a normal blight-free blossom. Flowers injured by weather usually have the injury confined to the outer edges of the petals and the injured area is a straw-yellow or much lighter in color than a blighted flower.

The fallen petals or flowers gradually shrivel and dry. During this period the fungus forms a hard, black, seedlike body in the thicker, fleshier portions of the petal or flower. This is the carryover or resting stage, **sclerotium,** of the fungus and serves to carry the disease over to a succeeding camellia blooming season. The **sclerotia** are very resistant to environmental conditions and vary considerably in size and shape. The presence of sclerotia in a dried flower can be determined by squeezing the base of the bloom. The hard sclerotia are easily located in this manner.

During some succeeding blooming season, when the weather is favorable, after a rain perhaps, with a temperature of 60-70° F., the **sclerotium** puts up one or more inverted mushroom-like **apothecia.** These are the sporulating structures of the fungus and as many as 33 have been observed coming from one large sclerotium. When the apothecium is mature it puffs out a cloud of spores, any one of which can start the disease cycle again.

The disease can be controlled by interrupting this cycle at one or more points. By picking off and destroying all infected flowers the formation of sclerotia can be prevented. This would have to be continued for at least 3 years since sclerotia have been found to remain viable for that long. In many camellia plantings, especially large nurseries, this is not always possible, particularly during the busy season. One blighted bloom falling unnoticed between containers can start the infection in a coming season. The picking of diseased blossoms combined with the application of a three-inch-thick sawdust mulch

to prevent apothecial development has also been recommended. While effective, this is not practicable or possible for many growers. Chemical control affords another means of interrupting the cycle. Both sulfur and ferbam have been recommended for the control of the disease but have not been generally accepted by the growers.

During the past several years the California Spray-Chemical Corporation has been developing a new and versatile fungicide, ORTHOCIDE, containing captan. This material has proven effective against fungi closely related to **Sclerotinia camelliae** and Calspray set up a research project to determine the effectiveness of ORTHOCIDE in controlling camellia petal blight.

Experimental work with ORTHOCIDE Garden Fungicide has been carried on at a number of nurseries in Southern California during this past season. Several hundred thousand camellias of all ages, including five species, principally **C. japonica** and many varieties, have been treated with from one to six applications of ORTHOCIDE Garden Fungicide.

There has been no injury to any of the plants from spray material.

ORTHOCIDE Garden Fungicide is applied at 2 lbs. per 100 gallons of water as a complete coverage spray to the plants and also as a drenching spray to the soil and containers. The spray residue on the plant helps to prevent infection by the spores of the blight fungus while the soil drench aids in suppressing apothecial development and sporulation.

The spray should be applied at about 14-day intervals starting at the beginning of the blight period and for best results 2 to 3 days after every rain.

In the experimental nurseries applications of ORTHOCIDE Garden Fungicide have reduced the disease to the point where only 10-12% of the blooms were blighted, as compared with 50-60% in the untreated areas. In nurseries where the blight problem has been present, but normally rather minor, ORTHOCIDE Garden Fungicide has reduced the disease incidence to less than .20%.

ORTHOCIDE Garden Fungicide is a 50% wettable powder that leaves only a very light colored residue on the plants. It has little or no odor and a low degree of toxicity to humans and warm blooded animals.

Experimental work has demonstrated that properly timed applications of ORTHOCIDE Garden Fungicide will reduce the incidence of camellia flower blight to a very low level. Camellia growers with a serious blight problem should continue the spray program for at least several years in order to reduce the number of surviving sclerotia to an absolute minimum. This spray program should be augmented by picking and destroying blighted flowers as much as practicable.

Such a program should eliminate or reduce the disease to a very low level and enable camellia lovers to again enjoy beautiful, long lived, blight-free flowers.

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*Research Entomologist—California Spray-Chemical Corporation.

Editor's Note: The foregoing article was submitted for publication at the request of the BULLETIN, and represents the opinions and conclusions of the manufacturer, who, in response to our inquiry, advises that it has been ascertained this fungicide has no effect upon the soil. Through the courtesy and cooperation of Dr. G. S. Hensill of the California Spray-Chemical Corp., independent tests are now being made in this area of captan-containing ORTHOCIDE in the treatment of camellia petal blight fungus. While it is too early to draw any conclusions as to the results of such tests, some fairly serious flower wilt was noted where open blooms had been sprayed with this fungicide. A further report will be given by the Society following the next blooming season.

NOTES ON RECENT MEETINGS

On April 4th, member John Paul Edwards who, with Mrs. Edwards had just returned from a two months' picture-taking trip to the Hawaiian Islands, treated us to a most enjoyable and relaxing evening in which we were entertained in his usual droll style as commentator and reporter par excellence during the showing of what must have been more than a hundred magnificent colored slides of the Edwards' extensive tour. The entrancing scenic beauty of the Islands and the thorough and informative coverage of its flora by one so well versed in such matters was brought out artistically as well as interestingly. This was a meeting which left the members with a kaleidoscopic impression — going home, that marvelous range of color and form which typifies the Islands' plant life passed before us in review, in mental image. Our chromatic appetite had been completely satisfied. Perhaps it is just as well that camellias do not have such a tremendous range of colors — there would never be enough of them to supply the demand!

One of those nice things which happens every so often and makes us proud of our Society occurred at the **May** meeting, at which handmade prizes were donated by an amateur member once again. This time it was retiring Director Thurston Skei, who contributed **four** large, stained redwood containers, two each of which were won by lucky members Skipper Kent and Dr. John F. Muzio.

The plant awards were beautiful specimens of ANN MILLER, won as an Exhibitor's Prize by founder-member Louis J. Macchia, and the new sasanqua OCEAN SPRINGS, won by member C. F. Jensen as a door prize. Both of these fine plants were contributed by our good friend George Budgen, proprietor of BERKELEY HORTICULTURAL NURSERY, 1310 McGee St., Berkeley, long an active supporter of this Society.

This meeting having concluded our season, it seems a good time to again call attention of the membership to the desirability of showing their appreciation of the support faithfully accorded the Society year in and year out by its nurserymen members, through patronizing them whenever possible, as the best way of expressing our approval and appreciation.

NEW OFFICERS AND DIRECTORS

With the May meeting, our 1954-55 Season ended. The new Board of Directors, elected by the members, is as follows:

John H. Beers, Walnut Creek
Wallace H. Brown, Berkeley
Albert E. Evers, Lafayette
David B. Grigsby, Berkeley
Mrs. G. Myron Grismore, Oakland
Walter N. Powell, Oakland
Clement A. Roberts, Alameda

At the organization meeting of the new Board, the following Officers were elected:

President: Clement A. Roberts
Vice-President: Wallace H. Brown
Treasurer: Walter N. Powell
Secretary: David B. Grigsby

The retiring Directors and Officers were: Judson K. Kirby (Secretary), Clifton W. Lattin and Thurston Skei. To them the members of this Society express their most sincere thanks and appreciation for a job well done; to their successors we pledge our whole-hearted support.

THE MARCH MEETING (Cont.)

especially in the fall. The liquid, acid-type fertilizers are easiest to apply, especially if a syphon proportioner is used so that you can fertilize while watering the plants.

(Although it was a little early in the season for a complete display, Mr. Phillips brought blooms of a number of varieties, including several of his own new hybrids soon to be on the market, and the following are among the named varieties he showed, together with his comments.)

VITTATA FORTUNEI (white with lavender stripes) and VITTATA PURPUREA (solid lavender-purple). Tree-type, beautiful early bloomer that takes sun well.

ROSEA MAGNIFICA. A sport of Alba Magnifica, having a colored throat, that makes a very shapely plant. It blooms both in fall and spring, and is quite fragrant—up to 20 ft. distant. Large flowers, but both buds and foliage are sticky.

TEMPERANCE (originally named Princess Astrid in Holland). This is a large-flowered hybrid, of a very beauful lavender-purple shade, that makes rather tall growth.

FRED SANDER (large, double rose-red blooms—long season). One of the very best.

Among the Kurume (hardy, small-flowered type) azaleas, CORAL BELLS is one of the best, a strong grower that can be pruned and clipped like boxwood; HEXE is fine for a bright color and good bloomer, with extra-good foliage; WARD'S RUBY, the brightest, deepest red, takes full sun and never fades, foliage turns a beautiful mahogany in fall, but a somewhat straggly grower that needs pruning; L. J. BOBBINK is one of the most magnificent, a terrific grower and bloomer of the apple-blossom type that makes a solid mass of soft pink. Does best in shade. VIVID makes fine cascades, therefore good for hanging baskets, very graceful and covers itself with color when in bloom.

Azaleas are excellent when used in conjunction with camellias, either in the foreground or planted between them. As the culture is practically identical with that of camellias, they are both compatible and harmonious; furthermore, they usually will come into flower about the time camellias are going out, thus carrying on the display of color. By all means, grow some azaleas; they are certainly companion plants to camellias and no garden is complete without them.

BACK NUMBERS

Due to a number of inquiries recently for a complete set of all issues of the BULLETIN, the Society is interested in acquiring any copies available of the following numbers which are now out of print:

Vol. 1, No. 1; Vol. 1, No. 3; Vol. 2, No. 1; Vol. 2, No. 3; Vol. 2, No. 5.

We will be glad to pay 50 cents each for single copies in good condition of the issues enumerated above.

Back numbers of which an adequate supply is on hand may be had from the Editor at 25 cents per copy. A set of 30 issues, including the Reticulata special number, is available for $7.50, charges prepaid.

AU REVOIR!

Dr. Gordon W. Richmond (Past President), who just returned from Maryland after serving 2 years as a Major in the Army, leaves shortly for Iran, where his family will join him for a stay of 2 years or more.

Retiring Director Thurston Skei and family leave this month for St. Louis on a new assignment, to be gone a minimum of 2 years.

While we shall miss these stalwarts in the Society, we appreciate this implies recognition of their talents and all join in wishing them well and a speedy return! They will continue to be kept in touch through the medium of the BULLETIN.

CULTURAL NOTES (No. 2)

ON SOILS

It is quite elemental to say that soil is perhaps the most important single factor in plant health and growth, for there is really nothing more basic than the earth. The fundamental purpose it serves is, of course, to support plant life not only from the standpoint of nutrition but in the sense of holding it upright, as well. In addition to these basic characteristics, there are others of almost equal importance, which are actually so critical as to determine the kind of plant life which will survive. Chief among these is the drainage factor and the chemical content and nature of the soil aside from the minerals it contains which feed and fortify the plant. Fortunately, Nature has given us many different types of soils and, in its grand design, has also, by reason of basic differences in structure or as a result of adaptation or evolution, provided us with plants that will grow under radically different "soil" conditions. Consequently, many plants will not prosper or will fail absolutely unless that particular type of soil environment for which it is specifically equipped is provided. Therefore, mere food and drink are not enough, indispensable as they are. One never ceases to marvel at the ability of the rugged pine to thrive, clinging to almost sheer granite in the most exposed situation, but it will shrivel up and die in the richest meadow unless there is good drainage. Thus it is with camellias—they also are particular about the kind of soil, both as to texture and chemical reaction.

Let us consider first the texture factor, upon which depends essential drainage and aeration. While camellias will grow in almost any "kind" of soil that drains well and is not alkaline, they will absolutely fail if either of these requirements is not met. Soggy, mucky soil about its roots, or a lime condition eventually will mean sure death to a camellia; furthermore, if exposed to such conditions for any great length of time the plant will suffer such injury to its root system and such overall debilitation as to require years of nursing to restore it—in fact, it is generally better to discard such a plant entirely. What, then, should we strive for in order to provide the proper soil for camellias? Perhaps the best counsel that can be given is to seek to reproduce the soil conditions under which the camellia grows wild, for if it will grow in its natural environment without any care whatsoever, it will certainly prosper where such a situation is simulated under controlled garden conditions.

In its natural state, the camellia grows as a plant of the forest, under the protection of surrounding trees and other vegetation. Many of us have never been to the Orient but we have been in the woods and observed how the ground is well carpeted with decaying leaves and branches, how our feet sink into the loose mulch and how we can walk in it immediately after a heavy rain without getting muddy. Any of you who have dug up woods plants, such as ferns, will have noted that the texture of the undersoil is loose, generally containing small pebbles or rock particles, partly-decayed twigs, etc. Woods conditions are much the same the world over, therefore this would be the type of soil environment in which the camellia grows wild: a top-dressing of fallen leaves and twigs, the soil beneath rather coarse and loose, a complete absence of clay or mud. All this adds up to perfect drainage, aeration and without trace of lime or other alkalinity.

The old master, Robert J. Halliday, in his treatise on the propagation and culture of Camellia japonica, "Practical Camellia Culture,"* printed in Baltimore in 1880, had this to say about camellia soils (in part):

"I use a good, fibrous loam, which is broken up thoroughly with the spade, and not sieved, which would take all the fiber from the soil . . . I find that (camellias) are not particular as regards the soil. My heap is made up in July or August, or at any time during the spring, summer or fall, whenever I can get good green sod from the hills, fence corners, or from old pasture land that has not been disturbed for years. Keep away from low bottom and clayey soil. Cut sods not over two inches thick, place on a pile with grass-side down, and in six weeks this will be ready for use. The loam alone is what I use and is all that is necessary for the growth of this plant . . ."

Evidently Halliday did not have access to woods soils, but my principal reason for quoting the above is to emphasize the importance of (1) fibrous matter and (2) coarseness of the soil texture. Unquestionably, one might grow camellias quite successfully in Halliday's type of soil, but we like to feel that modern techniques constitute an improvement in this, as in so many other things. At any rate, taking a leaf out of his book, I should like to caution against one very common mistake these days in the preparation of camellia planting soil. We should particularly avoid fine screening of the planting soil components. A finely textured soil will neither drain well nor permit of proper aeration; in fact, the principle is the same as with clay-type soils, which are impervious simply because the particles are so fine they adhere and thus pack. In preparing potting and planting soil, I make it a rule never to screen the materials through mesh finer than ½ inch, even for small seedlings. For planting in the ground, the mixture need not be screened at all. The result is that the soil mix is quite loose and friable—it will not make a tight ball when compressed, even when wet, no matter how hard it is squeezed. The larger the particles, the greater the air spaces between them. Soft or absorbent stone is excellent in this regard, for it tends to stay lumpy while retaining moisture to some extent. We are extremely fortunate to have on our place an inexhaustible supply of sandstone, which is a very valuable material in plant culture. I read some years ago that the old Scottish gardeners used large lumps of sandstone for holding the moisture and preventing the drying out of the ground around azaleas and rhododendrons, imbedding them in the ground near the plant roots. As sandstone of varying size and softness is readily available here, we have adopted this technique, and find it highly successful on a steeply sloping hillside.

In preparing our soil mix, both hard and soft sandstone is used extensively, screened through ½ inch mesh for potting soil, but large pieces up to 3 inches in diameter are allowed to go into the ground-planting mixture. The peat is also added without screening, although becoming broken to some extent in mixing. When these materials are blended with compost or manure, or both, the result must closely resemble in texture the natural soil of the woods where camellias grow wild, although unquestionably higher in nutritional value. While we adhere to no rigid formula, the following will closely approximate our soil mix for camellias and azaleas:

- 3 wheelbarrows light, sandy loam or topsoil
- 1 wheelbarrow Peat Moss
- 1 wheelbarrow homemade Compost, or Cow Manure
- ½ wheelbarrow sandstone particles screened (equivalent to fine gravel)
- 1 shovelful dry-mix Acid Fertilizer (4%-8%-8%)
- 1 shovelful agricultural Sulphur
- 1 shovelful Gypsum

The latter two components are to make the mix acid and to assist in releasing or "making available" plant nutrients.

Here in California, where we grow so many camellias in containers, the premium upon exceptional care with the soil medium is very high, because in such culture the plant is grown under unnatural conditions with a very limited amount of soil in a dry climate. Furthermore, the water supply is generally alkaline. Consequently, it is highly important to have a mix that will retain moisture well but still drain properly and that will counteract the alkalizing tendency of what amounts to a regular leaching with water that will show a pH reading of as high as 9.5. Therefore, for potted plants, in addition to the usual basal drain rock of an inch or two, we leave room for about a 2-inch mulch of milled pine-needles at the top. In between is the soil mix given above. If pine needles are not available, those of fir or redwood are about equally good though not as acid, while oak leaves may be used although they will not have the desirable acidity. This technique comes about as close as possible to the natural environment, in container culture. Mulching is almost indispensable, as it is Nature's own insulation against heat and cold.

I should now like to mention a few personal experiences and observations directly related to the subject of soils for camellias. Of course, if you are fortunate enough to possess good, loose loam, especially if it contains sod or turf, nothing much need be done to it. However, the addition of peat moss, which is mildly acid, will improve almost any soil, as it tends to act as a binder to light soils and to lighten heavy soils. Let me repeat, however, that a top dressing of humus—peat, leaf-mold, pine needles or any other organic material that will not permit a mud film to form when watered, is highly desirable for all soils. On sloping ground, such as we have, it is absolutely essential that such mulching be practiced as extensively as possible to prevent sealing off the surface through the formation of mud from overhead watering, which causes the water to rapidly run off. If this film forms, water will not penetrate properly even with light, overhead sprinkling, unless the soil surface has been broken by cultivating. And this brings me to another point about growing camellias in **heavy** soil.

Contrary to what "the book says," I have found that the only way we can successfully grow camellias in the area where we have a heavy, clay-type soil, is to annually cultivate the soil about the plants—to within a 2-ft. radius of the trunk. We have a planting of about 150 camellias on a sharply sloping hillside beneath live oaks. These camellias were planted in the usual manner—ample-sized holes were dug, coarse material placed in the bottom, the ball surrounded with a planting mix such as hereinabove described, and compacted. Nevertheless, after the first year or two it was found that they did not prosper as they should under the almost ideal conditions present. The whole area is under a sprinkler system and, after losing one or two, it was found that our difficulty was inadequate drainage and aeration—notwithstanding the considerable slope and normal precautions. The plants lost were, however, exceptional cases, and were in the lower portion of the planting area. It was found that moles present in the bed had made tunnels which diverted much of the water from above into a central point below, converting it into a soggy basin which would not drain although the area above might be overly-dry. We finally corrected this situation by placing two sets of drain tile at the lower edges of the beds, which permitted the excess water to drain off. To eliminate the cause of the trouble,

having been unsuccessful in eradicating the moles, we spaded the soil about 8 inches deep, which broke up their runways and, at the same time, let the air into the soil to sweeten it. This also sheared off competing feeder roots of the oak trees. In spading, the soil was not turned over—it was simply turned on edge to make the surface as rough and the ground as open as possible. On steeply sloping ground, in addition to aerating the soil, this also tended to make the water penetrate better. Finally, a top-dressing of about 1 inch of peat moss was added, which acts as a moisture-conserving mulch as well as helping to break up the heavy ground as it works down into the crevices. We are now adding some wood ashes from the fireplaces and incinerator, which are also excellent for breaking up heavy soils, if used moderately. The result of this cultivation was almost immediately apparent. In not more than a month, all the plants in the area began to improve and even to make unseasonal growth. This heavy soil is extremely rich and all camellias in the area are now exceptionally vigorous, with no nutrients added other than a light top-dressing of compost in the past year.

I might also mention that it has been found, quite accidentally, that our camellias actually seem to do better in this heavy soil if planted extremely shallow. In many places, vigorous plants have roots exposed on the lower side, where erosion has washed away the lower part of the soil pocket prepared when they were planted, so that the contour has reverted to about the natural slope. This observation, plus the fact that in two instances overlooked camellias were found to have had their wooden containers rotted away and taken root into the ground without any covering other than the soil which adhered to the roots, nevertheless prospering and blooming well, leads me to believe that, in heavy soils, it may be advisable to plant camellias quite shallow, perhaps building up the planting soil slightly rather than preparing the usual deep hole planting.

One more observation about camellia soil media. When we moved our 1,500 or so plants out here about six years ago, a considerable number of them were in temporary wooden containers, many of which had begun to rot because war conditions had delayed our building. When transplanting these, it was found that in many cases the root system had become imbedded into the wood, to the extent that some of the roots could not be separated from the container. Reflecting upon the fact that in its natural habitat decaying leaves, twigs and branches of larger trees are the camellia's chief source of food, I tried an experiment. One of my DAIKAGURAS was planted in a tub containing nothing but rotted oak limbs to which had been added peat moss as a binder and a small amount of cow manure. The camellia did exceptionally well in this planting medium and I therefore feel that any similar kind of woody or fibrous material would be beneficial in camellia planting soil. Peat moss, of course, serves much the same purpose although low in nutritional values; however, I have found it, as well as leaf-mold or compost, to be one of the absolute essentials to good camellia culture in this area.

*Reproduced from the original by lithography, in August, 1945, by "LONGVIEW," Robert O. Rubel, Jr., Publisher, Crichton, Ala., in Memoriam of Halliday's son, the late Robert Halliday.

ONE MAN'S GREENHOUSE (Cont.)

abnormal, if not absolutely continuous, light conditions.

Some established plants were brought indoors primarily for the purpose of inducing seed formation, where hand-pollination had been practiced. The ability to control the temperature and humidity and simultaneously exclude Nature's pollenizers is a great aid in this regard. Seed seemed to set very readily as a rule, and many hybrids were possible. I have an unusual white japonica seedling that developed a full-grown seed pod by March this year.

Perhaps the most notable function and result has been achieved with C. japonica seedlings and japonica x saluenensis hybrids. Japonica seed planted in January, 1954, potted in 1-gal. cans in July, 1954, and grown about one year under more or less continuous light conditions has shown tremendous growth, while there have been some blooms from 2-year-old seedlings which were moved in after the first year. The following are some specific growth examples:

LADY VANSITTART seedling: Age, 18 months; height, 24½ inches; No. of branches, 9; total length of all growth: 59 inches.

Saluenensis x Japonica hybrid No. 1: Age, 8 months; height, 8 inches; total length all growth, 19½ inches; number of branches, 5.

Saluenensis x Japonica hybrid No. 2: Age, 9½ months; height 6½ inches; number of branches, 9; total length all growth, 25½ inches.

MARY CHRISTIAN (J. C. Williams' Saluenesis x Japonica hybrid) **seedling,** 31 months old; height, 23 inches; total length all growth, 39 inches; number of branches, 5.

It should be borne in mind in this connection that the primary objective with seedlings has not been growth but florescence, consequently the fertilizing technique has not placed special emphasis upon nitrogen—rather a well-balanced formula has been used. It must also be remembered that "continuous" light has not been used uninterruptedly, nor for over one year in any instance.

OUR NEIGHBOR SOCIETIES' NEW OFFICERS - DIRECTORS

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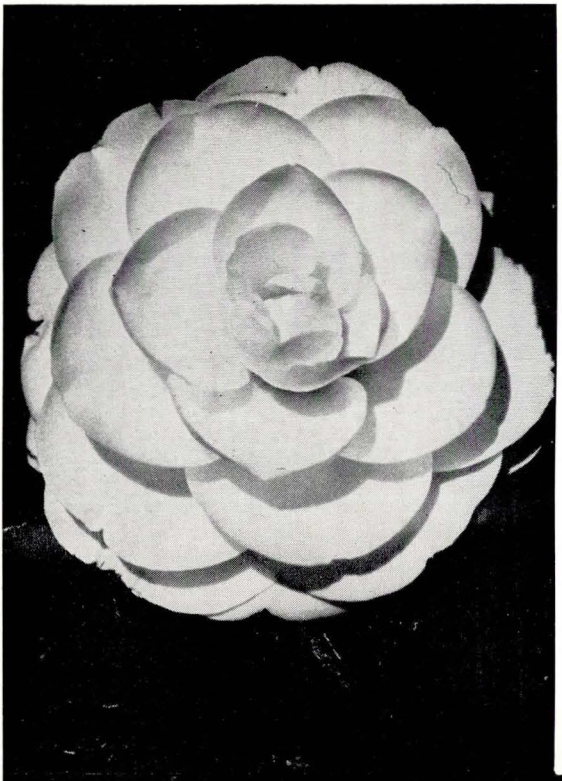

THE HARVEY F. SHORT "LOTUS" WHITE SEEDLINGS

Masterpiece

A large, cupped, rose-form double, usually formal, with much substance. Noted for its vigorous growth and massive foliage.

Bride's Bouquet

A very large, semi-double to loose-peonyform bloom of chalky white, having fluted and notched petals.

Fairest Day

An exquisite, medium-large flat single, with immense hemisphere of stamens — resembles Amabilis but larger and finer.

(Photos courtesy Harvey F. Short, 889 N. Foothill, E. Pasadena, Calif.)