THE Camellia Review

Rare SPECIES and HYBRIDS

Camellia *(reticulata* x *saluenensis)* 'Inamorata'
Courtesy Royal Horticultural Society

A Publication of the Southern California Camellia Society

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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.

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'GUILIO NUCCIO' WINS AWARD

The Hertrich Awards Committee announces that the seedling 'Guilio Nuccio' which was developed by Nuccio's Nurseries is this year's winner of the Margarete Hertrich Award.

This seedling is described as a large, irregular semi-double, 5 to 6 inches in diameter with 3 to 6 rabbit ears. The height of the blossoms is 4 to 4½ inches. It is similar in form to the reticulata blossoms. Color is coral rose, which lightens toward the edge of the petals.

C. japonica **'Guilio Nuccio'**

The blooming season is from early to mid-season; first blossoms appear in November.

Plant growth is vigorous and upright with large foliage. The leaves are occasionally fishtail shaped.

One parent of the seedling is *C. japonica* 'Kingyo-Tsubaki' (Fishtail) and the other is not known.

Camellias of the Future

By RALPH PEER

Bringing together two forms of life—people and Camellias—has brought forth our garden varieties now constituting the Camellia world. It is interesting to note that most of these varieies are from *C. japonica* and this, it seems to me, must have resulted from the well-established fact that this species has, since the dawn of history, been growing in a wild state both in Eastern China and in Japan. In China especially (Province of Fukien) there has been for more than two thousand years a well developed form of civilization giving attention to various arts and particularly to horticulture. There is evidence to indicate that many of the garden varieties of *japonica* developed in Fukien made their way to Japan as a part of the baggage of Buddhist Monks.

For many hundreds of years, Japan also has been a horticultural paradise and hundreds of garden varieties of *japonica* have been developed during the centuries of civilization.

In the Asiatic countries which have been backward in a cultural sense, horticulture has not progressed and, consequently, we do not find evidence of the development of garden varieties of camellia species as was the case in Eastern China and in Japan. The "rare" species are designated in this manner because they grow wild in far distant, undeveloped sections of the world where horticulture is largely not known. My personal theory is that nearly all of the rare species will, if given a chance in our gardens, eventually produce the mutations which lead to an endless number of varieties.

When, in 1954, I was able to visit the mountains of Western Japan to inspect *C. rusticana* blossoming in the snow, I also inspected many farm gardens in that area and was amazed to find 14 or 15 garden varieties of *rusticana* growing in this one valley. Presumably, these mutations had been noted amongst the wild camellias and had been moved into the gardens, but I could obtain no positive evidence as to the actual method of transition. Almost certainly, however, if large quantities of seeds were gathered from these garden varieties, the resultant plants would themselves contain other variations—new garden varieties would occur just as is the case with *japonica* and *sasanqua.*

The purpose of this article is to call attention to the vast possibilities along this line. The flowers of practically all camellia plants are attractive. A large field filled with flowering plants of *saluenensis, pitardii* or other species would be quite beautiful aside from its experimental values. Obtaining a supply of seeds for such special investigations will be a long and arduous task.

About 30 years ago, an Englishman, Mr. J. C. Williams, discovered that *C. saluenensis* crosses readily with other species. At this time, he did not have much to work with, but nevertheless created the class of camellia hybrids known as *'williamsii,' japonica* x *saluenensis.* He also developed 'Cornish Snow,' a combination of *C. cuspidata* with *C. saluenensis.*

We have available now *C. pitardii,* a species which probably can be crossed successfully with *reticulata* and *oleifera.* Seemingly, there are unlimited possibilities for the camellia world.

We are indeed much more fortunate than our friends who are interested in other kinds of flowering shrubs. The 3,000 and more varieties of camellias which are at our disposal at the present time are only a very small part of the possible number of mutations and hybrids which we will develop in future years.

THE CULTIVATION OF TEA (CAMELLIA SINENSIS) IN EAST AFRICA

By N. A. GOODCHILD

The cultivation of the tea plant is a comparatively new industry in the East African territories and it may be of interest to follow its development in the various regions before considering the cultural procedures associated with them.

The first trials to see if the crop could be grown satisfactorily date from the beginning of this century, although it was not grown on a commercial scale until much later. In the year 1900 a consignment of tea plants was grown at the Botanic Gardens, Entebbe, Uganda, and growth was found to be very satisfactory. At about the same time, tea was introduced into Tanganyika by the Amani Research Station in the Usambara Mountains. In Kenya the early experiments date from 1903 when Mr. G. W. L. Caine and his brother at Limuru imported some seed of the Manipur hybrid jat through the Botanic Gardens, Calcutta. These plantings were successful, although a number of plants died due to lack of knowledge at that time of the correct planting months for eat. These original plants are still in existence.

According to J. K. Matheson (1) the first tea plant to be raised at Kericho (now the largest tea district in East Africa) was grown by Mr. H. B. Partington, the District Commissioner at the time. This plant was grown in the Prison Gardens and is now a large tree. It was probably planted in 1907.

Further small importations of seed into Kenya took place between these early trials and 1925. It was not, however, until the latter year that tea was noted officially in the Agricultural Census with an acreage of 382. Most of this was at Kericho and Limuru. By this time, three companies had acquired land in the Kericho district and 1925 may be considered as the beginning of large scale expansion of the industry. The annual increase in the area under tea was comparatively large up to 1933, by which year the Kenya acreage was nearly 12,500. In Tanganyika the tea acreage was reported to be 2,739. In Uganda the area under tea was 186 acres in 1926 and 1,691 in 1934.

Expansion was limited between 1933 and 1947 by the terms of the International Tea Restriction Agreement of which the three East African Governments were signatories, together with the main tea-producing countries of Asia. The object of the Agreement was to control world production and, by doing so, to partially reduce the slump in prices that occurred in the 'thirties. After the last world war, the three East African Governments decided to withdraw from the Restriction Agreement and to allow unrestricted expansion of the industry. This has resulted in increased development in the established tea regions, and has also resulted in the planting of tea in regions where previously there had been little or none.

The latest statistics available show that at the end of 1954 the acreages for Uganda and Tanganyika were 9,278 and 10,860 respectively, and the area in Kenya at the end of 1955 was just over 25,000 acres.

The tea areas of East Africa are widely separated and scattered over the whole region from Tukuyu at the northern tip of Lake Nyasa in Southern Tanganyika (9.15°S) to Fort Portal near to the Ruwenzori range in western Uganda (0.40°N). The elevation at which tea is grown varies

from 3,000 to 8,000 feet above sea level. As might be expected, taking into account the large area and differences in altitude, a considerable diversity of soil conditions and climate is encountered. Fortunately tea is tolerant of a wide range of climates and, to some degree, of different soil types provided that the soil is acid. This tolerance, particularly of climatic conditions, is largely due to the number of so-called jats (varieties and hybrids) of which the tea population consists. Thus, the small dark-leaved China hybrid type is nearly always associated with the areas at very high altitudes which are comparatively cool, whereas the large light-green leafed Assam type does best in lower districts with warmer climates. The term jat is a broad one and is used generally to describe a type rather than a variety. Varieties, as such, are practically non-existent in cultivated tea, nearly all of which consist of hybrids, although it is generally recognized that originally there were at least three distinct types, that is the China, the Assam, and the Cambodia or Indochina. There is tea in East Africa that is predominantly one or other of the two extreme types mentioned above, the China and the Assam, but the majority consists of the intermediate jats with darkish, medium sized leaves. Tea is almost entirely cross-pollinated and, for this reason, the degree of variation is considerable.

Tea, for economic production, is generally considered to require an annual rainfall of at least 60-70 inches, and the paucity of rainfall over much of East Africa has confined tea growing to comparatively well defined areas where the rainfall is reasonably abundant. These regions are nearly all either near to an escarpment or to a large lake (Victoria Nyanza, and Lake Nayasa) where the precipitation is considerably higher than that of the surrounding country. Even so, there are a number of districts where tea is grown with a rainfall of 45-55 inches which, compared to that of the tea areas of Asia, is distinctly marginal. Mist during the dry seasons is one of the main factors in a number of these low rainfall belts that enable the tea to produce reasonable crops of a somewhat higher order than would be expected from a study of the annual rainfall alone. In other regions, high crops are produced on comparatively low rainfall (55-60 inches) due to its even distribution. As is to be expected, crops vary considerably from place to place, from 200 to 1500 lbs. of manufactured tea per acre.

Tea soils are, in general, red lateritic loams derived from various parent rocks. These have been developed in regions of 40 inch rainfall and over. The pH values vary from about 4.5 to 6.2, the upper limit for tea being about 6.0, but this largely depends on the availability of aluminium in the soil. In Southern Tanganyika tea is grown on rather different types of soil overlying pumice. All the soils are well drained and most of them are very fertile compared with those in India and Ceylon, and responses to fertilizers are, in general, less than in other countries. The soils erode comparatively easily but slopes in most districts are not steep and measures to prevent soil erosion are not difficult.

Propagation is, at the present time, nearly always by seed, although experimental areas have been planted with selected clonal stock propagated by cuttings. Owing to restrictions placed on the import of seed from Asia because of the presence of Blister Blight disease (*Exobasidium vexans*) East Africa has to be practically self-supporting and new extensions depend largely on the seed supplies of the three territories. Most of this seed comes from Tanganyika,

and small quantities are imported from Nyasaland and the Belgian Congo.

The seed is first put in water and the floaters kept separately from the sinkers, as the light seed gives a lower percentage germination. The seed is invariably germinated in damp sand or under damp sacking and the germinated seed planted in the shaded nursery as soon as the radicle appears; this ensures an even stand. Seedlings remain in the nursery for 2-3 years before being stumped (stem cut to 4-6 inches) and planted, bare root, in the field. The shortage of seed and the need for increased crops is arousing interest in the propagation of superior clones by means of leaf cuttings consisting of a leaf, bud, and internodal stem. Once rooted, they can be treated in much the same way as seedlings. During the first 4 to 5 years they are in the field, tea plants have to be pruned 2 or 3 times to induce a bushy frame and discourage the natural tendency towards apical growth. The first prune is low, usually at about 8 inches from ground level, and the others progressively higher up to about 16 to 18 inches. At the end of this bush forming process the tea is cropped lightly for about 3-4 years, depending largely on the climate. After the ensuing prune, at 18-20 inches, the tea is treated as mature tea and the leaf is then plucked at more or less regular intervals for the periods of 2-5 years between prunes. The length of the pruning cycle, as it is called, depends mainly on the climate and partly on the type of plucking system followed.

Camellia sinensis, in the wild state, is a low tree growing under high forest, but it grows perfectly satisfactorily in many parts of Africa in full sunlight once past the seedling stage. The only noticeable difference between shaded and unshaded tea is that the foliage of the unshaded plants tends to be rather yellowish. This has, however, no apparent effect on the vigour of the plants or their rate of growth. Mature tea is sometimes grown under a tree shade but not always, although in districts where hot, drying winds occur frequently in the dry season, tree wind belts are essential. The shade tree species depend largely, like so much else, upon the climate and elevation. At the higher altitudes *Grevillea robusta* is the most common, while below 4,500 ft. *Albizzia stipulata* is largely grown.

The tea planters in these territories are fortunate in having very few pests and diseases to contend with. The only major fungus disease is the root disease caused by *Armillaria mellea*, which attacks the tea from old forest tree roots left after clearing. This is combated by ring-barking forest trees prior to felling. Termites are pests in some areas where they ring-bark mature tea. The remarkable freedom from pests and diseases is undoubtedly due to the fact that Africa is isolated from the main tea growing areas, and also that there are no indigenous Camellia species to harbour pests and parasitic fungi.

This short description of the tea industry in this part of the African continent would not be complete without some mention of its latest adjunct, namely the Tea Research Institute of East Africa. Prior to the war, the acreage of tea was obviously quite insufficient to support its own research establishment. Since the territories contracted out of the Restriction Agreement, with the resultant expansion, the situation changed and in 1951 the Tea Research Institute of East Africa was duly incorporated, with its headquarters. and laboratories in Kericho, Kenya. Work in the laboratories actually commenced at the beginning of 1950 with a scientific staff, at that time, of three, including the first Director, Dr. T.

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THE SNOW CAMELLIA OF JAPAN

PART I

On the Trail of Camellia rusticana

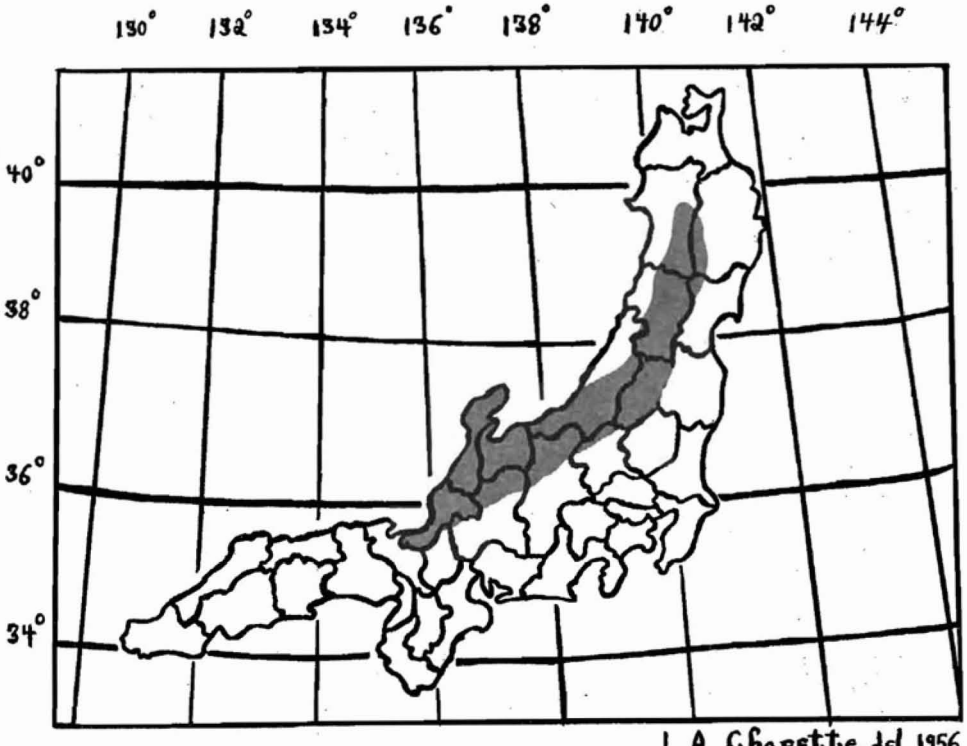
By L. A. CHARETTE

In August, 1953, a list of plants desired for propagation at the Missouri Botanical Garden was included in a letter received from Dr. F. G. Meyer. Of the species enumerated in the list *Camellia rusticana* was one for which I could find no description in my manuals. At my request Dr. Meyer sent the literature he had available.

During a visit with friends at the Botanical Institute of Hiroshima University in September I endeavored to get more information. They related their observations and studies made on field trips in which the Snow Camellia was encountered and apprized me of the Japanese literature on the species. The nearest locality where it grew was a full day's journey to the northwest of Hiroshima. Plans were formulated to botanize there, if possible, in late April of 1954. It was during the course of our conversation that I learned of the Snow Camellia's distribution.

Efforts Made to Find Plants

Much to my chagrin I realized that in August, 1953, while collecting with the botanists of the University of Hiroshima in the foothills of Mt. Zao, we had actually been at one of the most northerly known stations for the species, Lake Tazawa. Although my attention was being called to other interesting species of the



Distribution of Snow Camellia in Japan

region, this camellia was not observed, no doubt, because the plants are inconspicuous in the summer.

During this visit with the Hiroshima botanists I met Prof. Minoru Yoneyama, a new member of the faculty. I was delighted to learn that his home was in a district where the Snow Camellia is abundant. He related much of interest about the plant and also volunteered to assist me in any way possible in procuring the desired cuttings, seeds and herbarium specimens. He soon put me in touch by correspondence with Mr. Syuho Kirino, a teacher of biology in the Middle School of his native village of Yatsuo.

Search for Seeds

At my request Mr. Kirino searched diligently in the latter part of 1953 for seeds but could provide no more than 6 viable capsules due to the lateness of the season. Most of the capsules or seeds had either been damaged by insects or had otherwise suffered from the recent typhoon which had inflicted great destruction upon the vegetation in that area. These seeds, together with a small bundle of cuttings were all that I could send Dr. Meyer in 1953. The shipment arrived safely and within one month the cutting had begun to root! Dr. Meyer had good success with these and in January, 1955, he wrote:

> "There is a bud on one and it is beginning to swell now, and ought to be in flower when you come to St. Louis in March."

Additional material was desired, this time from plants growing in the more northerly known stations, on the theory that such stock might more readily survive or adapt itself to the climate of part of the U.S.

Specimens Obtained for Missouri Bot. Garden

Unable to obtain leave from my military duties at the opportune time for such collecting, I requested Mr. Kirino to undertake the project for us. With financial assistance provided by the Missouri Botanical Garden, he journeyed to Akita Prefecture on 1 March, 1954, where during the next three days he procured a large number of cuttings and some herbarium specimens in flower. These were shipped to me in Iwakuni City, for transhipment by air to the U.S. Due to the great distance involved, the time lapse between collecting and shipment they reached Dr. Meyer in a poor condtion. Although almost beyond salvage, I eventually received a letter from him stating:

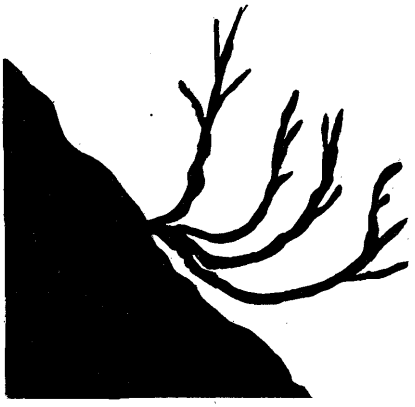
> "Believe it or not, all, or at least most of the *Camellia rusticana* were inserted into rooting material and have now rooted, despite their poor condition upon receipt here. I think that is rather amazing."

As my tour of duty in Japan would come to an end in October, 1954, I was most anxious to study and collect the Snow Camellia in the Spring of that year. Prof. Yoneyama had kindly offered to guide me to Yatsuo village in April so that we could be there during the brief period that the plant would be in flower. Plans had been made long in advance, but when the time arrived my military duties prevented me from accompanying him. It was not until late August that I could obtain necessary leave, thus preventing my seeing the species in flower in its native habitat.

In the fall of 1954 Mr. Kirino renewed his efforts to provide ample fruiting material. In this he was most successful. With the assistance of his students he sent a large shipment of seeds. These more than made up for the paucity of seeds available in 1953.

Thrill of a Discovery

There is a thrilling experience awaiting those who will see, for the first time, a Camellia in full bloom in their own garden. I imagine their pleasure will equal the joy which I



Habit sketch of the Snow Camellia. Note the steep bank and decumbent habit of the plant caused by extremely heavy snow accumulation.

experienced upon viewing my first Camellia in full bloom in Japan. It was on a memorable Sunday afternoon in February, 1953, while I was out in the "field" in search of evergreen ferns. Not being familiar with the progression of the seasons in this strange land, I never expected to find anything in flower or of great interest at such an early season of the year. I had just left the main road to follow an obscure path leading to a wooded rise. As I approached the base of the hillside a reddish hue on the ground beneath an unfamiliar tree attracted my attention, As I approached ever closer I could discern the mass of flowers on the tree. It was such a spectacular and exotic scene that I could hardly believe my eyes. I was immediately captivated by the beauty displayed. It was difficult to associate such a tree with the drab appearance of this somnolent winter landscape. Reflecting upon the scene I realized that here was a tree whose blossoms brought forth a vividness of color to an otherwise unappealing countryside; blossoming at a time when other splendors of the plant world can hurl no challenge to its mark of regal distinction. The color balance and contrast was so perfect, as only nature can so effortlessly produce for our enjoyment, that it seemingly was designed and created to complement just such a landscape.

So lasting are first impressions, so genuine was my delight to see a Camellia in flower for the first time, that whenever I was to encounter another specimen in my Japanese travels, there would surge forth a renewed thrill and inspiration of the first experience. Of such good things is life made!

From a retrospective point of view, a large measure of whatever success may have attended my botanical collecting in Japan, can be directly attributed to the trails which I followed in search of *Camellia rusticana*, trails which guided my footsteps in a strange land to out-of-the-way places seldom visited by tourists. I was to see some of the most beautiful mountainous areas of Japan, which for their grandeur and ruggedness, justify comparison with the Swiss Alps. Indeed, in the language of travel posters these mountainous areas of northeastern Japan are referred to as the Japan Alps.

Also, during my search for the Snow Camellia, I was able to study and collect many interesting species of plants which I might have never known otherwise.

Of greater value to me is the memory of my Japanese friends possessing kindred interests with whom I became acquainted. They displayed an eagerness to share their knowledge, a willingness to help a foreigner better understand and appreciate the customs, manners and the charm of their delightful country. By displaying their warm, genuine friendliness I consider it a privilege to have been their companion along the trails which brought me to the Snow Camellia.

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THE SNOW CAMELLIA OF JAPAN

PART II

History and Literature

By L. A. CHARETTE

The Snow Camellia was described in June, 1947, but it is doubtful if its existence was a matter of common knowledge to the English speaking world until early 1950. There is evidence that seeds and cuttings had been sent to this country by Prof. Nakai. Possibly there were other introductions but at least this Camellia never became widely known outside of Japan.

At the height of the Tokyo air raids, in June, 1945, Prof. M. Honda of Tokyo joined the "hordes of people evacuating the city." He journeyed to the deep mountainous regions of northeastern Japan to investigate reports of a "strange Camellia" growing on "Saru-Iwa" mountain.

Rusticana Literature

His investigation formed the basis of a paper, written in Japanese, entitled "A New Species of Camellia" published in the June, 1947, issue of the periodical Biosphaera. Here he proposed the name *Camellia rusticana* for what appeared to him a peculiarly unique species. The article contained a formal Latin description and a full page line drawing (lacking sharpness, however, due to the poor grade of paper used), but it had no English summary.

Biosphaera was an ephemeral Japanese periodical which had a very local and limited circulation in Japan. No complete set could be located in this country, although there are scattered issues in two American libraries. Through the generosity of Dr. Jisaburo Ohwi I received a complete set which is deposited in the library of the Missouri Botanical Garden.

C. rusticana **single**

In the spring of 1947 Prof. Takasi Tuyama studied the occurence of *Camellia rusticana* in Niigata Prefecture. Additional morphological characters were noted and the original description was subsequently emended in a paper entitled: "On *Camellia rusticana* Honda" in the December, 1949, issue of the Journal of Japanese Botany, a periodical of world wide circulation. This had three fine figures and an English summary. These figures, and the one accompanying Honda's original description, comprise the only published illustrations depicting this plant which have come to my notice.

A Very Old Species

Although only recently known scientifically, this species was known at least eleven centuries ago to Japanese horticulturists and others as shown by a reference to it in two ancient songs concerning Camellias, according to Tuyama.

The first song is preserved in its original handwritten form in one of the 20 volumes of Manyoshu, a National Treasurer of Japan. The author is not definitely known, but the song is generally ascribed to a Japanese Lord named Yakamochi Otomi (718 (?)-785 A.D.). During his travels through Etchu District, (ancient name for the area now included in Toyama Prefecture) it was his custom to record the songs as sung by his people.

The second song is included in a study of folk songs of the earliest period of the Heian age of Japanese history (about 794-1192 A.D.) in the book Yagumomisha. This song refers to a Camellia known as "Yatsuo-no-tsubaki" (The Camellia of Yatsuo). My own collection as well as those in the herbarium of the Missouri Botanical Garden all came from the same village in Toyama Prefectture.

Comparison with japonica

In 1936 two varieties of *japonica* were described, which according to Prof. Honda are referable to his *rusticana* because both are decumbent and from the same general district. These were J. Sugimoto's *C. japonica* var. *decumbens*, described in his "Key to the Trees and shrubs of Japan" published on 10 March, 1936, and Y. Yanagita's *C. japonica* var. *Hajime Tanaki*, published in the Journal of Forestry Society of Japan for August, 1936. Both are now considered to be synonyms of *Camellia rusticana.*

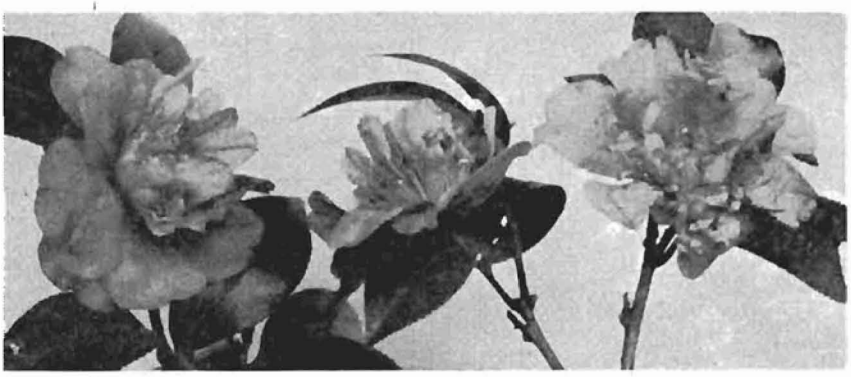
Neither of the authors designated a type specimen for their varieties. Honda, admitting the possibility that these varieties and his new species might be identical, stated that if this could be proved, then the earliest binomial, proposed by Sugimoto, should be the name for what he proposed as *Camellia rusticana.*

In Honda's own words "A lack of detailed data in regards to the flower parts" in the description of the two varieties, as compared with the distinctive floral characters observed in his own specimens was one of the motivating factors prompting him to describe it as a new species.

Prior to Honda's description of *Camellia rusticana*, its distinctness from *japonica* was recognized by the inhabitants of the deep mountain valleys where it grows. To the forest rangers and woodsmen it was known variously under the colloquial names of Yuki-tsubaki, Hai- tsubaki and Oku-tsubaki: (Snow Camellia, Creeping Camellia, and Oku Camellia. Oku being the name of a district of Japan, now more commonly Ohwu, meaning "frontier or hinterland").

There is little doubt that *rusticana* is very closely related to *C. japonica.* The only question is the degree of relationship. In 1950 Kitamura relegated it to a subspecies of *C. japonica.* This opinion is accepted by J. R. Sealy of the Royal Botanic Garden, Kew, London. In a recent paper, Mr. Sealy discussed the matter to some extent, based on the study of a large series of specimens collected in Yatsuo village preserved in my herbarium and in the Missouri Botanical Garden.

Mr. Sealy discusses the range of floral variations encountered in other



C. rusticana **double blossom**

Our Cover Flower

Portrayed on our cover this month is the *C. 'Inamorata,'* a copy of a painting by A. J. Wise, artist for the Royal Horticultural Society. The flowers are single from 3 to 4 inches in diameter and a rich rose in color, with a circle of golden tipped stamens protruding from the center.

According to Francis Hanger, a *C. saluenensis* and both wild and garden form of *reticulata* were planted on a sheltered north wall at Exbury where they flowered regularly. One fertile capsule containing two seeds resulted from some flowers of the *C. saluenensis* being crossed with pollen from the wild form *reticulata.*

The seeds were pushed into the ground and one germinated. Eventually this seedling was planted in the Temperate House at Wisley where it grew rapidly and bloomed freely. It is hoped that sufficient stock may result from cuttings of this 'Inamorata' so that it may become a part of the collection on Battleston Hill.

species of Camellia and states that: "There is no reason why a comparable range of variation should not be attributed to *Camellia japonica.*" In the collections of *Camellia rusticana* received from Mr. Kirino in late 1955 there are some with floral characteristics which render them difficult, or impossible, to distinguish from typical *Camellia japonica.*

Double Flowers Are Noted

Two variations of *rusticana* have been described in recent literature. Unfortunately these papers are not presently available. The first is var. *plena* which is described in Honda's supplementary paper entitled: "Further Notes on *Camellia rusticana.*" This is the "double" flowered form mentioned by Tuyama:

"I was greatly surprised to find that in the mountainous parts of Niigata Prefecture, *Camellia rusticana* 'Honda' was being cultivated. I even observed horticultural specimens with double flowers, which are supposed to have been derived from *Camellia rusticana* 'Honda'."

The second is var. *Kagamontana,* described by Gankei Masamune in a paper published in the Hokuriku Journal of Botany, sometime during 1954.

Finally, there is a most interesting observation made by Mr. Sealy:

". . . It may be noted, however, that the plant figured in Siebold and Zuccarini, Flora of Japan 1: 155. pl. 82 as the wild form of *C. japonica* would seem to be *C. rusticana.*"

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OBSERVATIONS ON THE SPECIES FRATERNA

By ANDREW SEARS

The specimens of *C. fraterna* which I have came from seed obtained from the Lushan Botanical Gardens, Kuling, China; the species is closely allied to *C. cuspidata* and more closely resembles this species than any other. The plant is a dwarf spreading or hanging but rather compact in type. The blooms are about the same size as those of *cuspidata* but are more regular in formation being about the size of a quarter or slightly larger, occasionally about the size of a half-dollar. The three outside petals are round, about the size of a penny, and usually have a faint blush of pink on the outside. The inside three petals are long and narrow and of pointed shape — very much like those of a trillium. They are about one-half inch wide and one inch long and of snowy, waxy white. The petals are recurved almost from the time the flower first opens.

C. fraterna

The plants are very prolific bloomers, blooming over a four to five month period, starting early in October and often having some blooms left into March and occasionally in April. The blooms usually drop when they start to fade and the ground is covered with them but they do not discolor much even after dropping. The blooms have a compact circle of stamens joined to the petals extending about three-fourths of an inch, with the pistil about three-eighths of an inch longer. This makes the bloom resemble a fuchsia from a distance.

This species is quite fertile bearing a number of seed pods on even young plants and the seeds are viable. The seed pods are small, three-eighths to one-half inch in diameter and usually each pod has three seeds that are nearly round.

I have not had much experience propagating this species and no luck at all with cuttings. I had only 2 grafts from 30 attempts. Most of the other reports I have had from this species are similar, that is, in the difficulty of propagation, but I have received two reports from persons who obtained scions from one of my successful grafts that it roots like weeds and grafts easily.

I have not had a chance to test this species for hardiness. The one plant I placed outside was killed this last fall in the early freeze which also killed many old established plants. The plant was a two-year graft and was planted out about the middle of September and was still tender when the freeze hit in early November. From my observation of the plants growing in a *cool, cool* greenhouse, however, it is my guess that *fraterna* plants will not prove to be as hardy as most *japonicas* but probably a little more hardy than the *reticulatas*. The plant seems to do better in a protected location where it does not get too much sun.

RARE CAMELLIA SPECIES AND HYBRIDS AT BODNANT GARDENS

By C. E. PUDDLE

Camellias have always been one of the favorite shrubs at Bodnant and in recent years the collection has been greatly increased until they now take their rightful place with rhododendrons and magnolias to form the "big three." The large numbers of japonicas, sasanquas, and reticulatas are outside the scope of this article but before describing the other species and hybrids which are grown, it might be helpful to mention the position and climate of the gardens. We are in North Wales about eight miles from the sea, on a westward slope facing the Snowdonian Mountains, our average rainfall is 38 inches, and during the winter we expect about 25 degrees of frost and about every third year the temperature drops to zero. Naturally the more tender species are not possible but perhaps a better idea can be obtained by saying that *reticulata* 'Captain Rawes' succeeds when planted against walls and each year the fifty year old plants are covered with blossoms.

Camellia saluenensis is the most popular of the rarer species at Bodnant. The typical plant raised from the original seeds sent by Forrest from Yunnan has pale pink single flowers and rather small narrow leaves. There is little difference in the original specimens in the gardens but seedlings raised from isolated plants have shown the great variation in flower and foliage which appears to be common to most camellia species. The named seedlings are all good but unfortunately many have become listed as hybrids, for instance 'Bow Bells' and 'First Flush' which are merely variations within the species *saluenensis*. I prefer the seedlings with the more open flowers but all are useful woodland plants providing the bluish pinks are placed on their own. One or two of the seedlings have occasionally been browned by frost but the majority appear perfectly hardy. We are fortunate in possessing a plant of the rare pure white form of *saluenensis* mentioned by George Forrest in his original notes.

The hybrids of *saluenensis* and *japonica* now grouped under the name *williamsii* have been widely planted and we have more large specimens of 'J. C. Williams' than any other camellia. This fine hybrid was considered by the late Lord Aberconway to be one of the outstanding shrubs of the century and it has certainly greatly contributed to the recent revival of interest in camellias in Britain. Like most of the *williamsii* group it flowers from the end of January until May, the freely produced single pink flowers open in rapid succession with the dying flowers dropping of their own accord. For those who prefer a deeper shade, 'Mary Christian' and 'St. Ewe' are equally good and form a trio of excellent garden plants which originated at Caerhays Castle in Cornwall, the home of the late J. C. Williams.

'Donation' is the best of the *williamsii* group to date and the sight of a large plant covered with the huge semi-double deep pink flowers is breath-taking. It is the most admired of all camellias in the garden and I cannot speak too highly of this cultivar from the late Col. Stephenson Clark's garden at Borde Hill in Sussex. Another hybrid from the same garden, 'Salutation,' is also a favorite of mine. Originally the parentage was stated to be *saluenensis* x *reticulata* but later became regarded as a companion seedling to 'Donation' which is *Donckelarii* x *saluenensis*.

I still see reticulata blood in this hybrid with its characteristic loose growth and silvery pink flowers so closely resembling those of 'Captain Rawes.'

'Barbara Hillier' is one of the newer additions to this section. The large tubular rose madder flowers are freely produced but it has not been with us long enough to judge its garden value. 'Elizabeth Rothchild' and 'Bartley Pink' are both good deep shades whilst 'Hiraethlyn,' one of the few named hybrids raised at Bodnant has very pale pink tubular flowers and narrow leaves. I would include under this group the Exbury Hybrid 'Inspiration'— a very fine new camellia but the bluish pink tinge may not appeal to everyone. 'Francis Hanger' (*alba simplex* x *saluenensis*) promises to be one of very best single white camellias and I cannot leave the *williamsii* Hybrids without mention of an un-named form tentatively called 'Semi-double.' The flowers are similar to those of 'Salutation' but the habit is much more upright and the leaves completely different. All these cultivars have become immensely popular in Britain and I think it is only a matter of time before those of you who admire the smaller blooms will realize what useful garden plants they are.

Returning to the species, one of the rarest is a fine plant of *pitardii* var. *yunnanica*. The flowers are similar to the wild forms of *reticulata* but the long pointed leaves are quite distinct. I am investigating the possibilities of using this species as a parent for new hybrids, but the fact that it is on the borderline of complete hardiness perhaps restricts its value. The very few true plants in cultivation all have deep pink flowers but I expect other shades will be introduced.

Camellia hongkongensis has grown for many years against a wall but in severe winters it is badly damaged and must really be regarded as too tender for outside cultivation. The same must be said of *taliensis*, a delightful species with creamy white flowers and the true *oleifera* (not the *sasanqua* variety). *Tsaii*, however, seems hardier although its young growths get cut, but it is more of botanical interest than garden value. *Camellia maliflora* flowers freely but never looks happy with us. *Salicifolia* and *drupifera are* greenhouse plants.

Camellia cuspidata is of course quite hardy and is used at the rear of plantations with great effect. For garden value, however, it is far surpassed by its three named hybrids with *saluenensis* known as 'Cornish Snow,' 'Michael' and 'Winton.' They differ very little but I think 'Michael' is the best. The small flowered members of the *wabisuke* section whilst not being very attractive are most hardy and with their deep green foliage are useful for hedges and wind-breaks.

I have mentioned some of the camellias we admire and enjoy most but there are other new varieties and species which we have not yet had long enough to give a considered opinion. I should be delighted to see any members of the society who may visit Britain and to spend a happy hour showing them our camellias.

THEA SINENSIS *from page 6*

Eden. The Tea Research Institute is financed entirely by the tea industry of Kenya, Uganda and Tanganyika through a cess paid to the statutory Tea Board of each territory. The research programme includes investigation of the problems associated with manuring, soils and vegetative propagation, as well as advisory visits to estates in the three territories.

(1) *East African Agriculture* Edited by J. K. Matheson and E. W. Bovill; published by Oxford University Press, 1950.

REMARKABLE NEW CAMELLIA SPECIES AND HYBRIDS NOW AVAILABLE

By W. E. LAMMERTS

One of the most interesting hybrids obtained as a result of crossing various species together is one displayed at Descanso Gardens in the special collection as Hybrid L. This was from a cross pollination in 1947 of *C. japonica seedling* 102, as seed parent, with *C. cuspidata.* It is growing right along side several plants of the species. Direct comparisons are thus easily possible. The leaves, though shaped like *C. cuspidata,* are several times larger and a very deep green. The general habit of the plant is such that it would be ideal for espalier treatment. The flowers, about two inches in diameter, are a delightful apple blossom pink and occur in great profusion beginning about the middle of February. A plant given to Mr. David L. Feathers of Lafayette is performing exquisitely. He is most enthusiastic about this inter-specific-hybrid. It is far enough off the general line of *C. japonica* varieties to be intriguing indeed as a shrub. So far no tests have been made as to its winter hardiness but, because of its obvious hybrid vigor, possibly it may prove to be more hardy than *C. japonica* varieties.

From the scientific point of view it is unusual because it is a cross between two rather unrelated sections of the genus Camellia, namely, Theopsis and Camellia. The only other *C. cuspidata* hybrid seems to be 'Cornish Snow.' a cross of *C. saluenensis* x *C. cuspidata.* The flowers of 'Cornish Snow' are, as would be expected from the parentage, very fleeting. As far as I could determine, when last at Descanso Gardens, Hybrid L is, as would be expected, highly sterile. Enthusiastic hobbyists would be greatly rewarded for their efforts if, by colchicine treatment, they could make such a hybrid fertile. This variety is now being propagated by Descanso Distributors, Chino, California, and will be available for general distribution in several years.

The *C. reticulata* varieties which I successfully imported for Manchester Boddy in the spring of 1948, also, of course, offer challenging possibilities for hybridization. Several possible hybrids between *C. japonica* and several varieties of the Kunming reticulatas will soon be in flower. It will be interesting to see if they are really hybrids or the result of either self pollination, in spite of all precautions, or diploid merogeny. Remarkable hybrids which could result by successfully combining the fall flower qualities of *C. sasanqua* with the amazing flower size and transformation of the reticulatas, the fine plant habit of *C. japonica* and cold resistance of *C. rusticana,* have been discussed by me in considerable detail in the 1954 American Camellia Society Annual and also in the special April, 1956, issue of the Northern California Camellia Society. Anyone interested in hybridizing would profit by thorough study of these articles. With the availability of such a large number of species and hybrids as we now have, exciting new varieties of camellias, adapted to various areas where camellias cannot now be grown at all, are possible.

A REPORT ON CAMELLIA TALIENSIS

By JOHN L. THRELKELD

One of the outstanding Camellias in the Species Collection at Los Angeles County's Descanso Gardens in La Canada is the *C. taliensis*. It is a very vigorous, upright grower with small, single white flowers possessing a slight fragrance. On certain flowers a slight tint of creamy yellow is detectable in the veins of the petals. Anthers are a bright yellow. Flowers are borne singly, or in twos or threes. The over-all appearance of the plant in bloom is a beautiful sight to behold, being almost completely covered with small, delicate flowers.

In early March it reaches peak bloom, but it begins with its first flowers around Christmas time and slowly increases in beauty over nearly a three-month period, climaxing in a glorious burst of white engulfing the entire plant.

As a garden shrub, I cannot think of any plant that would excel the beauty of *taliensis*. The great branches arching under the weight of flowers are especially adaptable to flower arranging and cutting use. The individual leaves, measuring up to five inches in length, are artistic, having wavy margins with deep serrations. The new growth is very bright and shiny, losing some of its glossiness as the leaves mature. Foliage color is generally lighter than other species of Camellias.

Mark J. Anthony, Asst. Superintendent in Descanso Gardens, La Canada, is shown here inspecting one of the large plants of *Camellia taliensis* in the Descanso Camellia Species Garden. Note the thick mosaic pattern of the leaves. The ground cover is California native wild strawberry.

The large, broad leaf effect and the over-all structure of the plant is such as to make it an especially beautiful plant at any time of the year, whether in flower or not. The general habit is bushy, with the large leaves abundantly spaced all along the branches right up to the main stem—spaced in a most attractive mosaic pattern affording each leaf the best advantage to light.

Although real hardiness tests have never been made on *taliensis* in Descanso Gardens, we are sure that it will take conditions equal to any

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A NEW SPECIES OF CAMELLIA FROM HONG KONG NEW TERRITORY

By J. Robert Sealy

Since the year 1841, when Richard Brinsley Hinds made the first important collection of plants on the island of Hong Kong, the flora of that island, and its New Territory on the adjacent mainland has been thoroughly examined by a long succession of botanists and collectors, while the adjacent Chinese province of Kwangtung has also been widely explored, especially during the years from 1916 to 1940, when large collections were made under the auspices of the Lingman and Sun Yatsen Universities. It was, therefore, something of a shock to find that a specimen collected in the New Territory some three and a half miles northwest of the port of Kowloon in October, 1955, by a Chinese forester, Mr. C. P. Lau, represented a new and very distinct species of *Camellia* — especially as it is a striking plant with white flowers 5½ inches across and handsome, shining bullate leaves. How such a plant can have remained undiscovered until now is a mystery, but no previous record of it has been found.

The specimen collected by Mr. Lau was sent to Kew for naming towards the end of November, 1955, by Mr. H. C. Tang of the Hong Kong Gardens Division, but since it was not possible to dissect the flower on that specimen, a request was made for further material. Mr. Tang at once very kindly made a special trip to the plant, and though at that time, December 10, 1955, flowering was just coming to an end, a single fresh flower was found and carefully dried so that its structure could be examined. Particulars of the occurrence of the plant are given in the following extract from a letter from Mr. R. E. Dean, Superintendent of the Gardens Division, Hong Kong:

"You will be interested to know that only one plant, a small tree about 10 ft. high, has so far been found. It is growing in partial shade, on the edge of a wooded ravine, in company with *Ilex rotunda* (20 ft. tall), *Caesalpinia* spp. (climbing) *Adina* spp. (5-6 ft. tall), and grass about 5 ft. tall. It is a multi-branched tree, with a base diameter of a little over 12 inches. There is strong reason to believe that it was cut to within a foot or so of the ground a long time ago.

"Its age is difficult to determine, but it is probably between fifty and seventy years. No other similar plants have been found growing within a radius of a hundred yards of this particular specimen, but I am planning a fairly extensive field trip there in the near future, and hope to spend several days making a thorough survey over a much wider adjoining area.

"The area concerned is very remote, and is served only by a narrow track; it is a good one and a half hours' hike from the road. In the ordinary course of events it is certain that the spot is hardly ever visited, except by an occasional forester or villager; the forester who told us about it had no particular business in the area and came upon it quite by chance. It is quite likely that it has hitherto been passed off as a *gordonia*."

The new *Camellia* is not closely related to any other species, and is outstanding in the genus by the combination of the following characters: Flowers sessile with perules (bracteoles and sepals) forming a large cupular persistent involucre 3-4 cm. long and 4.5-5 cm. wide, white corollas 12-14 cm. in diameter united to the androecium for only 6 mm. at the base, stamens free to the union with the corolla, gynoecium of five carpels densely

tomentose except for the five glabrous stigmatic arms, and 5-locular capsules invested by the persistent perules even when dehisced.

It is a pleasure to comply with a suggestion made by Mr. Dean, and to propose for the new species the name *Camellia granthamiana* in honour of Sir Alexander Grantham, G.C.M.G., Governor of Hong Kong since 1947, who, so Mr. Dean tells me, has taken a great interest in the discovery of this camellia, as, indeed, he does in all things botanical.

CAMELLIA GRANTHAMIANA Sealy Sp. Nov. inter congeneros floribus solitariis terminalibus sessilibus, perulis (bracteolis sepalisque unam seriem formantibus) persistentibus cinereo-albo- tomentosis in involucro circiter 3-4 cm. alto et 4.5-5 cm. diametro dispositis, corolla alba permagna (12-14 cm. diametro) petalis basi per 6 mm. ad androecium adnatis, staminibus numerosissimis, filamentis basi circiter 6 mm, coalitis ceterum liberis, gynoecio ramulis stigmatiferis quinque exceptis albo-tomentoso, capsula in valvas quinque patentes dehiscente perulis persistentibus vestita insignis.

A *tree* about 3 metres high; young branches brown, pubescent at first; older branches ash-grey. *Leaves* shortly stalked; *blades* oblong-elliptic to broadly oblong-elliptic, bluntly acuminate, rounded or obtuse at the base, mostly 8-10 cm. long and 2.7-4 cm. wide, but here and there shorter (6.5-7.5 cm.) and/or narrower (2-2.2 cm.), very shallowly and bluntly serrulate with the teeth about 2mm. apart, leathery, upper surface shining deep green with the venation deeply impressed and glabrous, lower surface light green with midrib and nerves raised spreading-villose on the midrib at first and with small brown cork-warts widely scattered over the surface; *petioles* stout, 6-7-(8) mm. long, pubescent. *Flowers* solitary and collateral with a vegetative bud at the end of young shoots and branches, perulate. *Perules* 12 or more, persistent until after the capsule has dehisced, at anthesis forming a cupular involucre 3-4 cm. high and 4.5-5 cm. in diameter, varying from semi-orbicular about 8 mm. high and 14 mm. wide (outermost) to orbicular-obovate 3.6-3.8 cm. long and 4-4.6 cm. wide, strongly concave, leathery-crustaceous, dark brown, yellow at the base inside markedly so on the inner perules where the yellow blotch is up to 1.6 cm. long and wide, outer surface grey-tomentose or lower perules pubescent to subglabrous, inner surface pubescent to tomentose. *Corolla* 12-14 cm. in diameter, white, yellowish when dried, of 8 wide-spreading petals united with the androecium for up to 6 mm. from the base; *free part of petals* from obovate or broadly obovate 4.5-7 cm. long and 3.8-5 cm. wide (outer) to oblong 5-5.9 cm. long and 3.5-4.3 cm. wide or 4 cm. long and 2.5 cm. wide (innermost), more or less deeply notched. *Androecium* of numerous stamens united for up to 6 mm. at the base and forming a dense cluster in the centre of the flower; free part of filaments filiform and about 1.5-2 cm. long; anthers bright yellow, about 2 mm. long when dehisced; pollen golden-yellow. *Gynoecium* about 3 cm. long, densely white-tomentose up to the stigmatic arms; *ovary* globose-ovoid, about 4 mm. high and 5 mm. in diameter; style stout, tapering upwards, 2 cm. long and then dividing in 5 glabrous recurved 7 mm. long stigmatic arms; stigmas 1-1.5 mm. across. Scar of attachment of corolla and stamens apparently bright orange in colour. *Capsule* (seen only in the dehisced condition) embraced by the persistent perules, 5-valved; *valves* spreading horizontally but remaining firmly attached at the base to the stout 1.2-1.5 cm. high columella, 2.7-3.5 cm. long and 1.5-2 cm. wide, 7-8 mm. thick and woody in the dried state. *Seeds* subglobose

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HYBRIDS FROM THE FEMININE ANGLE

By CHARLOTTE HOAK

The possibility of superior new hybrids extends the horizons of the camellia connoisseur now that the material is at hand and the way has been opened by those who have the far vision clearly in mind and have already commenced the initial work.

Women by Mother Nature are endowed with that subtle genius for creation. Keen eyes and clever fingers and a working knowledge of genetics will lead the ambitious into broader fields.

This midsummer number of the Camellia Review is devoted to camellia species and hybrids! not *C. japonica* upon *japonica* but the hybridization of species hitherto little touched. Therefore let us pass in review some of the recent ones.

Perhaps we are most familiar with 'J. C. Williams.' We were completely won over by its performance record during the last September hot spell when the mercury soared to 117° and higher. Where it was exposed to the full sun this treasure took the withering blast on an eastern exposure where a sturdy old 'Purity' had its leaves badly scorched and shed hundreds of buds. 'J.C.' did not have a single leaf burned; kept every bud, and blossomed triumphantly when the blossoming period came on normally. The delicate soft rose pink blossoms shed clean and delighted me for several months.

The little known *C. saluenensis* discovered in the province of Yunnan by George Forrest grows on cliffs and on rocky grassy slopes, in thickets and among the scrub at elevations of 6,000 to 9,000 feet sometimes in the shade. In this native habitat the plants grow from 4 to 15 feet high and bear white, pink and crimson flowers. The compact specimens with numerous branches are covered by abundant foliage. The leaves are dark, glossy green above, lighter on the undersides. Between each pair of side or lateral veins the upper surfaces of the leaves are elevated, or puffed up, i.e. bullate, and the veins appear as sunken or depressed. This gives the leaves a dainty effect different from the smooth surfaced leaves of *C. sasanqua* and *C. japonica.* (See the natural size drawing from specimens grown in Cornwall, p. 32 in "Camellias" by Dr. Harold Hume.) If you are interested in reading further in the history of this interesting and promising species, turn to pages 121 to 126 in the same volume.

To go back to 'J. C. Williams,' it is *C. japonica x C. saluenensis.* Last year's erratic season proved its worth and I for one am going to give it the most favorable spot in my garden up front where it can be seen by every camellia lover who passes by. I am using a special soil mixture for acid loving plants recommended and used exclusively by John Drucker for his fine rhododendrons in his nursery at Fort Bragg, Mendocino County. It is one of nature's naturals which he gathers up in the dry fall season and composts by hundreds of feet, making the piles not more than four feet high. It is better than any artificial, purely organic made largely of redwood, oak, pine, fern and some tan oak residue.

The next adidtion to my camellia group is going to be 'Donation.' The parentage of this handsome hybrid is said to be *C. saluenensis x. 'Doncklarii.'* The semi-double flowers when fully expanded are four to five inches across. The petals are rounded or slightly notched at the tips and are of that pleasing soft rose color which is so enchanting. It is said to show

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MY ADVENTURES WITH CAMELLIA SPECIES AND HYBRIDS

By Dr. P. L. Hilsman

First, may I state that I am a M.D. and that I have had no formal training in botany. I am, therefore, "pseudo-botanist." In order to obtain scions of some of the rare species and hybrids, I have had to resort at times to being one of Mr. Sam Harn's "mail order scion scroungers." If my plants grow successfully I have hopes of some day becoming one of Mr. Frank Griffin's "pseudo-hybridizers."

My interest in Camellias dates back some twelve years, at which time the nomenclature problems and lack of information about the *Camellia japonica* and *Camellia sasanqua* was almost as bad as the confusion that exists today concerning the various Camellia species and hybrids.

I soon found out that my limited space and pocketbook, as well as my limited mind, were unable to keep up with the numerous new *C. japonica* cultivars being introduced constantly. So, having many of the same varieties under different names, I began to seek refuge in the rarer Camellia species and hybrids. I bought 'Appleblossom' as a *C. saluenensis*, 'Capt. Rawes' as a form of the *C. reticulata* species, and McIhenny's *oleifera* 'Narumi- Gata' as a plant of the *oleifera* species, among others. Finally realizing my mistakes, I next began writing inquiries to a number of the nurseries. With the exception of *C. cuspidata*, I found out that only a very few nurseries had any species other than *C. japonica* and *C. sasanqua*. The few nurseries which had the wild forms of *C. saluenensis*, *C. reticulata*, or others kept them "under lock and key," for experimental purposes only.

Spurred on by Mr. Ralph Peer's adventurous articles about rare species and hybrids from the four corners of the earth, I next imported a number of dead and dying plants, along with non-germinating seed from distant lands.

In desperation, I next turned to individual species and hybrid collectors and curators of gardens where species and hybrids were known to exist, At last my search began to bear fruit. I found all these men to be very interesting, helpful and generous both in their advice and information as well as in supplying plant material, whenever possible. I feel especially indebted to Mr. Andrew F. Sears of Portland, Oregon, Mr. Ralph Peer of Los Angeles, California; Mr. Austin Griffiths, Jr. formerly of the University of Florida Agricultural Experimental Stations; the late Mr. Dan McCarthy of Florence, South Carolina; Mr. A. H. Dekker of Glendale, California; Mr. Charles Puddle of Bodnant Gardens in North Wales; Mr. Francis Hanger Curator of the Royal Horticultural Society Gardens, and Mr. W. M. Campbell, Curator of the Royal Botanic Gardens, among others.

My collection of species and hybrids is still not large, due partially to the ineptness of my propagation methods, for I have unsuccessfully grafted many choice and rare species and hybrid scions. Most of the plants I do have are either seedling or small grafts and have not bloomed as yet, but observation of their growing habits and differences has afforded me much pleasure. Later I'm afraid it's going to be a matter of the survival of the fittest. Least cold resistant species such as *C. hongkongensis* may fail to survive, while others such as the Yunnan *reticulatas* will probably survive but rarely bloom, judg-

(Continued on Page 33)

Rare Camellia Species Presen

C. cuspidata

C. honkongensis

C. irrawadiensis

C. tsaii

Interesting Growth Differences

C. rosaeflora

C. pitardii

C. transnokoensis

C. granthamiana

CAMELLIA POLLINATION AND HYBRIDIZATION

By W. E. LAMMERTS[1]

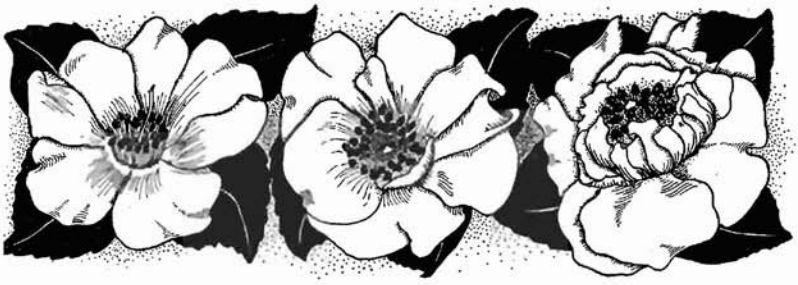

FIGURE 1
Single and Semi-Single Varieties

Introduction

The breeding of camellias for the production of new varieties is of general interest and open to every camellia grower. The camellia breeding program of the Descanso Gardens has been earlier described by the author in [2] and [3]. It is the purpose of this article to give details as to the technique of successful cross pollination, and a preliminary report on the inheritance of various genetic factors of primary importance in the successful breeding of new camellia varieties.

Pollination Technique

The most important factor in successful camellia hybridization is the selection of proper seed bearing or female parents. A great deal of time and labor can be wasted if this is not understood. Plants in too lush or vegetative state of growth are not likely to set seed. On the other hand, plants not receiving sufficient nitrogen, as observable by yellow green leaves, or other basic nutrient elements are likewise poor subjects for experimentation. A good rule is to use only plants which have in previous seasons been observed to set seed under natural pollination conditions. Avoid, however, plants which in the past season set an unusually large number of seed capsules, because the camellia is somewhat alternate in its seed bearing habits. Thus an Amabalis plant which sets a great number of capsules in the 1949-50 season would be unlikely to set very many in the 1950-51 season. Young plants just recently set out are also as a rule poor seed bearers, as usually they are in the process of making much new root growth, and generally are too much in the vegetative phase of growth to be very reproductive.

Fortunately from the genetic point of view, as will be shown later, it is unnecessary to use double, peony or even anemone flowered varieties as female parents, in order to get formal fully double, peony, or anemone

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[1]Descanso Gardens, La Canada, California.

[2]Lammerts, W. E. 1948. Progress Report on Camellia Breeding. *American Camellia Yearbook* 1948 pp. 83-88.

[3]Lammerts, W. E. 1949. The Effect of Continuous Light, High Nutrient Level and Temperature on Flowering of Camellia Hybrids. *American Camellia Yearbook* 1949 pp. 43-56.

flowered varieties. This happy state of affairs is not exactly a coincidence but rather due to the factorial nature of the inheritance of these characters. It is indeed propitious from the practical breeder's point of view because even such anemone flowered varieties as Chandleri Elegans only infrequently set seed. Old well established Daikagura plants only rarely set seed, and Gigantea has never been observed to do so.

Single and semi-single varieties (Figure 1) make very fine seed parents as a rule, provided of course that they are well established and in a balanced state of growth as mentioned above. Amabalis has proven to be an excellent female parent both from the genetic and seed setting point of view. Other varieties very successfully used as female parents are Berenice Boddy, Pride of Descanso, Lady Vansittart, Fishtail, Ville De Nantes, Donckelari, and many large single and semi-single red and white unnamed seedlings. In general, of course, the largest flowered single and semi-single varieties you can locate should be selected, as large size is always a highly desirable commercial objective. Environment plays a large part in the successful use of varieties as seed parents. Thus Mr. Harvey Short at Ramona, California, has been most successful in getting open pollinated seed to set on Lotus, naturally a very desirable female parent, because of its large size, whereas at Descanso Gardens it has never set seed.

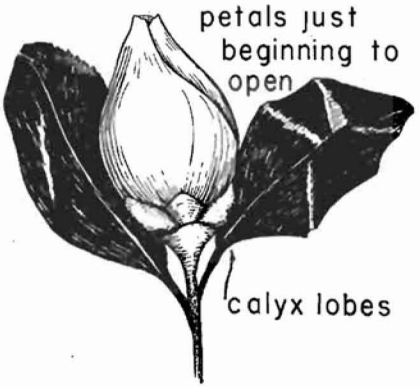

FIGURE 2
Proper stage for emasculation and pollination

Having thus selected a series of seed parents the next problem is the proper stage of the flower development for emasculation and pollination. Fortunately as in the rose, camellia flowers may be emasculated and pollinated at the same time if the flower is selected just before the petals open to disclose the anthers, as shown in Figure 2. This is because the anthers of the camellia flowers do not usually split open or dehisce until the petals are at least partially opening out. Yet the stigmatic surface is receptive at least so soon after this stage of flower development, that pollen placed upon it effects fertilization. The various parts of the camellia flower are clearly shown in the cross section of the flowers shown in Figure 3. When emasculating, i.e., removing anthers, injury to the petals should be avoided as much as possible. There is some evidence that complete removal of petals may be a factor in early abortion of the young ovary. Gathering and storage of pollen is quite important to the success of the hybridizing program. The anthers may be gathered just as they are

splitting open or dehiscing, placed in small bottles and the pollen then applied to stigmatic surface with forceps or brush.

A much more efficient and rapid method of pollination depends on use of capsules kept in pollen storage jars made up as follows: Place in bottom of 1-ounce massage jars about ¼ inch of dry commercial chloride of lime. On top of the chloride of lime place a layer of about ¼ inch of cotton. The massage jars thus will hold upright about 6-8 gelatin capsules size 00. These are filled with anthers taken from the camellia flower just as it begins to open but before the anthers start splitting. The jar is tightly closed with a tight fitting black bakelite lid and in twenty-four hours the dry chloride of lime has extracted almost all the moisture from the anthers giving a fluffy mass of golden yellow pollen free from the completely dehisced anthers. Each capsule of pollen is labeled, of course, giving the pollen parents code numbers in order to save time in writing labels for pollinating or identification tags. In order to effect pollination, the stigmatic surface of the pistil, following emasculation (Figure 4 and 5) is simply moved about in the capsules and the pollen grains stick in great abundance to the stigmatic surface. Fortunately the style of most camellia flowers is long enough to reach deeply into the capsule when the flower is inclined or bent slightly. Following pollination each flower pollinated is identified as to the pollen parent used by writing the code number on a Dennison Marking Tag. The date is also written on each tag. Though there is little evidence that a flower once pollinated could be contaminated by pollen from another variety due to insects, as a precaution all pollinated flowers are

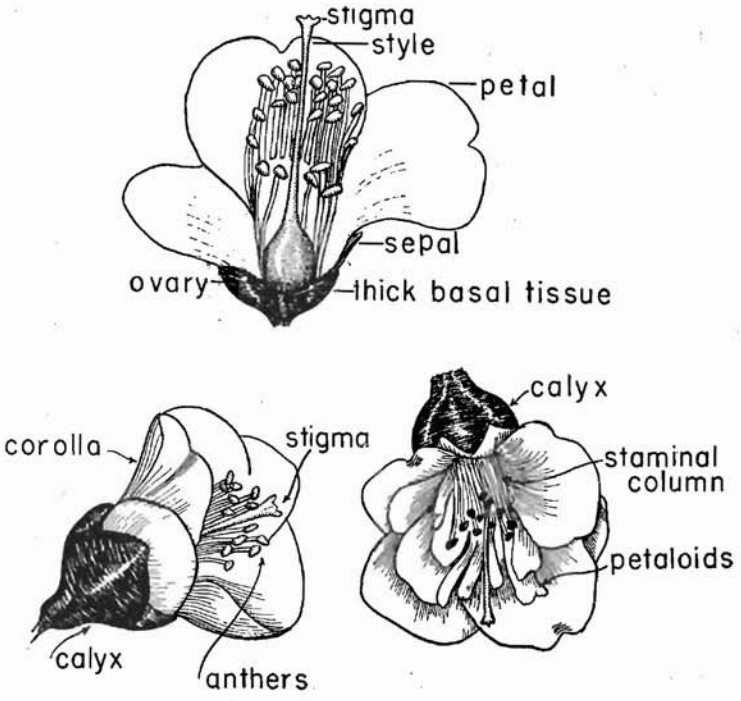

FIGURE 3
Various parts of camellia flowers

covered with a No. 2 light weight manila bag cut in half. Clips are used to secure the bag to the branch on which the flower is located.

One final observation may be worth recording. In general pollinations made on female varieties approaching the end of their flowering season are unsuccessful. The flowers are usually lacking in substance and firmness. Accordingly most pollinations in our climate are made in December, January, February and a few on real late flowering varieties in early March. The only risk run with early pollinations is that of freezing, camellia flowers being killed at 25-26° F.

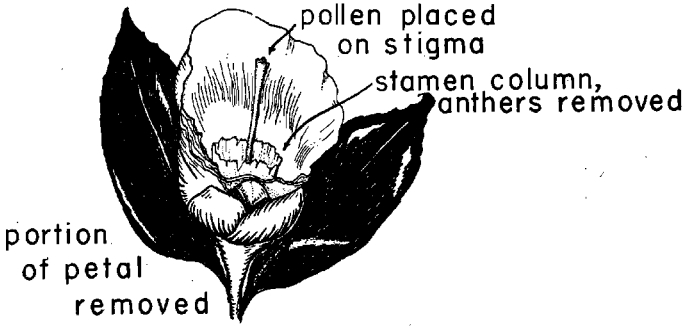

FIGURE 4
Flower after emasculation

The camellia is by no means the easiest of flowers to hybridize. By observing the above precautions, however, and taking advantage of any local environment quirks one may hope to set seed on from 25 to 50% of the flowers pollinated.

Data on the Inheritance of Important Commercial Characteristics

Fortunately from the point of view of breeding commercially worthwhile varieties of camellias the various forms of double flowers appear to be dominant to single flowers. Thus the relatively few hybrids of single 5-6 petal varieties x single or semi-single (8-10 petals) so far obtained were all single and semi-singles. Since the work at Descanso Gardens is primarily commercial, no truly analytical crosses have been made testing the above thesis that singleness is recessive — i.e., is not visibly expressed to any very noticeable degree in the first generation but reappears again in the second or F2 generation in a ratio of three doubles to one single. On this hypothesis, of course, one would expect single varieties when intercrossed or selfed to give only singles or semi-singles. Semi-double varieties would then be heterozygous, i.e., carry the factor for single flowering. Crossing them with singles should then give approximately half singles and half doubles. As shown in Table I the various singles and semi-single varieties crossed with anemone, peony and imbricate double varieties used as pollen parents give just such a segregation into an approximately 1:1 ratio. By way of explanation the hybrids classified as peony flowered differ from those classified as anemone flowered, mainly in that the petaloids of peony flowered hybrids are much longer and more petal-like giving the full rounded effect characteristic of Daikagura. Thus an anemone flowered seedling may actually have more petaloids than a peony flowered one, but they are shorter and narrower.

Though certain individual progenies depart quite widely from this ratio, as for example Amabalis ♀ x variegated Daikagura ♂, only about one-third

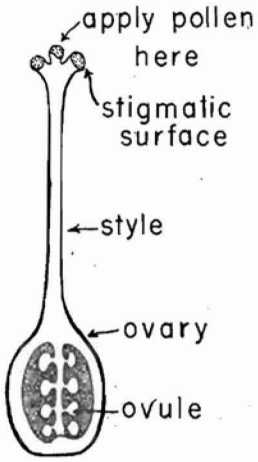

FIGURE 5
Enlarged view showing stigmatic surface, style and ovary

of the population has so far been classified, and I believe that when all the hybrids have flowered the individual progeny ratios will more nearly approach 1:1. Even now the overall ratio of total number of singles to total number of doubles of all classes is 1:1. Of particular interest from the practical point of view is the fact that practically all types of doubles may be obtained from crossing singles with any particular type of double. Thus as may be seen from progeny obtained by crossing Amabalis ♀ x Double Flowering Fishtail ♂, even fully formal imbricate types similar to Alba Plena are obtained. These have flowers without any anthers, all having been converted to petals. Since all double flowering varieties so far used have been heterozygous for the singleness factor it is at least a plausible assumption that the doubleness factor when homozygous is lethal.

White flower color is definitely recessive to pink or red flower color. Analysis of statistically adequate F2 or second generation and backcross progenies have so far not been made. However the evidence submitted in Table II makes this conclusion most probable. Furthermore the lovely light pink shades characteristic of such varieties as Berenice Boddy are also recessive to the dark pink and red color Daikagura.

Size of flower appears to be quantitatively inherited. Large flowered varieties crossed with intermediate flowered ones fortunately give a worthwhile number of resonably large flowered seedlings. The graduation from the smallest to the largest flower in the various hybrid population is quite gradual.

No data is as yet available as to the inheritance of earliness of flowering. Due to the method of forcing the camellia seedlings under continuous light, the flowering season of these hybrids is not typical of their behavior under normal seasonal conditions. It is of interest, however, to note that approximately 1/6 of the seedlings growing under continuous light form flower buds in about 18 months, about half of them in 2-2½ years, and about ¼ delay bud formation until almost three years. (See article in the 1949 American Camellia Yearbook on the growing of camellias under continuous light.)[3]

Non-fragrant varieties crossed with fragrant or slightly fragrant ones give

TABLE I

Hybrids Obtained by Crossing Single Flowered Varieties with Double Varieties According to Petal Number and Flower Type

Parent Varieties Used		Classification of Various Hybrid Seedlings Resulting From Crosses						
				Double Flowering Hybrids				
Single Flowered Varieties	Double Flowered Varieties	Single & Semi-Single Flowered Hybrids	Anemone Flowered Hybrids	Peony Flowered Hybrids	Imbricate Formal Type Flower	Formal Semi-Double	Total Doubles
Amabalis ♀ X	Variegated Daikagura ♂	13	1 34 petals	2 { 1-16 petals & 100 petaloids; 1-16 petals & 71 petaloids		1-28 petals	4
Amabalis ♀ X	Double flowering Fishtail ♂	6	1 29 petals		2 { 1-16 petals; 1-30 petals	4 { 1-12 petals; 1-25 petals; 1-13 petals; 1-17 petals	7
Amabalis ♀ X	Herme ♂	6	6 { 1-21 petals & 49 petaloids; 1-24 petals; 1-20 petals & 67 petaloids; 1-21 petals & 82 petaloids; 1-18 petals & 67 petaloids; 1-21 petals & 32 petaloids	9 { 1-35 petals; 1-44 petals & 45 petaloids; 1-50 petals; 1-24 petals & 82 petaloids; 1-33 petals & 51 petaloids; 1-9 petals & 110 petaloids; 1-17 petals & 75 petaloids; 1-15 petals & 56 petaloids; 1-28 petals & 40 petaloids		2 { 1-29 petals; 1-26 petals	17

TABLE 1 (Continued)

Hybrids Obtained by Crossing Single Flowered Varieties with Double Varieties According to Petal Number and Flower Type

Parent Varieties Used		Classification of Various Hybrid Seedlings Resulting From Crosses					
				Double Flowering Hybrids			
Single Flowered Varieties	Double Flowered Varieties	Single & Semi-Single Flowered Hybrids	Anemone Flowered Hybrids	Peony Flowered Hybrids	Imbricate Formal Type Flower	Formal Semi-Double	Total Doubles
Amabalis ♀	X S-218 (Semi-double imbricate) ♂	4			1-20 petals		1
Single White ♀	X Light Variegated Daikagura ♂	8	1-34 petals & 30 petaloids	2 { 1-24 petals & 52 petaloids; 1-18 petals & 80 petaloids }	2 { 1-17 petals; 1-35 petals }		5
Single White ♀	X Herme ♂	2	1-39 petals & 5 petaloids	1-19 petals & 56 petaloids	1-27 petals		3
Large Single Variegated ♀	X Light Variegated Daikagura ♂	7	4 { 1-17 petals & 48 petaloids; 1-47 petals; 1-14 petals & many small petaloids; 1-17 petals & 34 petaloids }		1-42 petals		5
	Totals	46	14	14	7	7	42

TABLE II

Classification of Hybrids Obtained by Crossing White Flowered Varieties With Colored Varieties

White Variety		Colored Variety	Hybrid Seedlings Classified According to Color Segregation				
			White	Pink	Red	Variegated	Total
1. Amabalis ♀	X	Variegated Daikagura ♂	13	1	5	—	19
2. Amabalis ♀	X	Double Flowering Fishtail ♂	5	4	4	—	13
3. Amabalis ♀	X	Herme ♂	8	3	12	—	23
4. Single White Seedling No. 1 ♀	X	Variegated Daikagura ♂	4	—	5	—	9
Total above segregating populations			30	8	26		64
Expectation 1:1 ratio			32 white	to	32 colored		
5. Amabalis ♀	X	Berenice Boddy ♂ (Light Pink)	—	3	—	—	3
6. Amabalis ♀	X	S-218 (Red) ♂	—	—	4 (2 with	— darker stripe)	4
7. Amabalis ♀	X	Helen Hunt ♂	—	2	3	—	5
Populations 5-7 indicate pollen parents involved do not carry factor for white							
8. Single White ♀	X	S-25 (White semi-double) ♂	3	—	—	—	3
9. Large Single Red and White Variegated ♀	X	Variegated Daikagura ♂	3	—	5	4	12
Population 9 shows segregation for recessive white in 3:1 ratio i.e., 3 white to 9 colored.							

an appreciable number of distinctly fragrant hybrids. Until fragrant varieties are crossed with each other and lines breeding true for non-fragrance are established, little can be guessed as to the inheritance of fragrance.

The most seriously limiting factor so far found in the breeding of good commercial varieties is petal texture. The great majority of hybrids unfortunately have petals which are relatively thin. However, in each population a few hybrids with firm thick petals of excellent texture do occur.

Finally a brief statement as to vigor is necessary. From the gardener's viewpoint, although slow growing, relatively weak types such as Chandleri Elegans are highly prized because of the lovely flower, in general strong growing varieties are preferred. The seedlings of the 1947 crosses so far classified may be grouped into four classes as regards vigor. It is very fortunate that most of the hybrids are in the very vigorous and vigorous classes with only about 10 to 15% of them classifiable as weak growers.

It may readily be understood from the above consideration of commercially important characteristics that the chances of combining in one plant a good degree of doubleness, interesting color, large size, earliness of flowering, fragrance, good petal texture, and vigor are not, statistically speaking, very large. Particularly is this true when only very heterozygous varieties of unknown genetic constitution are available. However, many hybrids of known parentage resulting from crosses made in 1946 and 1947 set seed this spring. Appropriate intercrosses and self pollinations of these will greatly increase the chances of getting the exact combination of commercial qualities we desire.

Meanwhile among the 1946 and 1947 crosses some very fine double flowering varieties of unusual form, fine size and texture have appeared. A few of these are also fairly fragrant. These have been grafted and are being tested for season of flowering and garden behavior.

Reprinted from "Camellia Research," a publication of the S.C.C.S.

FEMININE ANGLE *from Page 20*

considerable trend toward doubling. It is one of the beautiful hybrids produced by the late J. C. Williams of Carehays Castle, Gorran, Cornwall, England, where the compact shrubs have already reached the height of fifteen feet or more.

And now our fondest hopes are centered in the thought that in the near future we may possess a deep rose or crimson hybrid which takes back to its wild ancestors in the distant province of Yunnan which was the treasure land of flowers for many a daring plant explorer, notably E. H. Wilson and George Forrest.

These promising *saluenensis* hybrids have already received five awards of the Royal Horticultural Society. What promise for the hybridizers the world over!

SNOW CAMELLIA *from page 9*

I hope that in the not too distant future there will be available a race of Camellias which will make it possible for a representative of the genus to be grown in the northern sections of our country. This would spread northward the popularization and appreciation for those aristocrats of the evergreens — Camellias.

Northerners, who would be so inclined, could become members of that select group of personages familiarily known as "Camellia-philes." Outside of botanical gardens, except to those rare individuals growing them under glass, Camellias are relatively unknown in the North.

CAMELLIA SPECIES *from Page 21*

ing by ten years experience with the *reticulate*, 'Capt. Rawes.'

I have made out a chart* of some of the salient features of those Camellia species and hybrids, which, with few exceptions, I have at least seen combining descriptions from Camellia literature and personal observations. Due to the size of my plants and the failure of many of these to produce blooms yet, together with the absence of adequate descriptions of some of these in the literature available to me, I realize that the chart is both incomplete and in parts probably incorrect. I have tried to either place question marks after doubtful statements or leave the spaces blank where the data was unknown to me. Probably some of the experts will be able to correct these mistakes and add other pertinent information.

The Yunnan reticulatas and a number of the *williamsii* Hybrids are now available at the West Coast Nurseries. Mr. Donald Stryker of Langlois, Oregon, now has many different clones of Wild Reticulata and *C. saluenensis*. He also has a collection of many of the Camellia relatives, such as *gordonia, stewartia,* etc.

There are species gardens at the Huntington Gardens, and the Descanso Gardens in California, and at The American Camellia Society Gardens at Gainesville, Florida. Mr. Ralph Peer has probably the largest private collection of different species and hybrids. Mr. Andrew F. Sears of Portland, Oregon; Mr. L. Burr Belden of San Bernardino, California, and your S.C.C.S. president, Mr. Edwards Metcalf of San Marino, California, also have sizable collections.

Besides the species mentioned in this article I know of at least five additional species now growing in this country, although I have not seen any of these. They are *C. assimilis, C. caudata, C. drupifera, C. crapnelliana* and *C. hozanensis*. All of these bear small white flowers and the first four are natives of Hong Kong. *C. oleosa,* which is present on the West Coast also, is probably a form of *C. oleifera.* Some of the so-called Higo-Camellias have recently been imported from Japan.

Other species, mentioned in the literature, but not to my knowledge as yet growing in this country, include besides the yellow and purple flowering species from the Tonkin Province of Indo-China, *C. lanceolata* from the East Indies and the Philippines, *C. kissi* from the Nepal Province of India, *C. haematodes* from China, *C. yunnanensis, C. heterophylla, C. dutisepala, C. liuii,* and *C. obscurinervis* from the Yunnan Province of China, *C. biflora, C. brevistyla, C. gnaphalocarpa, C. gracilis, C. nakii, C. parvifolia, C. lutchuensis,* and *C. miyagii* from Formosa, *C. hortensis* from Japan, *C. wardii, C. stenophylla, C. costei,* and *C. fluviatalis* from Laos. Recently a new species with 5½ inch white flowers and interesting foliage was discovered in Hong Kong. No doubt there are many other species, as yet unknown to us, growing in China and Indo-China, particularly.

Most of the Camellia species and many of the hybrids have small flowers and are probably destined to be of interest only to collectors. Others, however, have desirable traits such as interesting foliage, large flowers, new or different colors or shades, fragrance, cold-hardiness, early flowering qualities, etc., which will be assets when inbred into *C. japonica* and some of the other desirable species. With such men as Dr. Walter E. Lammerts and others working on this problem, I predict a great and interesting future for the Camellia Hybrids.

*See inside back cover.

CAMELLIA RUSTICANA — THE SNOW-CAMELLIA

By Eikichi Satomi, Tokyo, and Ralph Peer, Los Angeles

It is probable that the first known painting of a camellia made in Japan actually represents the 'snow-camellia,' which until a few years ago had received no botanical recognition.

Recent research has disclosed that this camellia was known in ancient times under various names — for example:

YUKI-TSUBAKI
OKU-TSUBAKI (Late Blooming camellia)
HAI-TSUBAKI (Creeping camellia)
SARUIWA-TSUBAKI (Monkey Rock camellia).

*Botanical Notes:**

Mr. Junichi Sugimoto gave the plant the varietal name 'decumbens' due to the plant's habit of growing on a slant from a hillside. Mr. Yoschizo Yanagida uses the name 'Hajime-Tanakai.' Professor Honda of Tokyo University decided that this was a separate species which he named *C. rusticana.* This name was in part, at least, derived from the Opera 'Cavalieri Rusticana.' Professor Shiro Kitamura of Kyoto University formed the conclusion that *C. rusticana* could only rank as a 'sub-species' of *C. japonica.*

In 1940 an article appeared in the magazine "Natural Science and Museum" giving a description of the conditions under which this camellia grew in Western Japan while in 1950 Mr. Toyohachi Inada printed at his own expense a small leaflet which did a great deal to focus public attention on the snow camellia.

Despite the findings of the botanists, many learned people believe that *C. rusticana* is a separate species. As is well known now, these plants are covered by snow in December and continue growing under the snow until early in April. Usually the amount of snow falling in the area where these camellias grow wild amounts to more than six feet in depth. As soon as the snow begins to melt in April and the tips of the camellias appear, the branch immediately bursts into blossom.

The Species Argument

Those who argue that this is a separate species and not a sub-species depend principally on the fact that the home of *C. rusticana* is at a fairly high altitude (usually above 1500 feet) and that these plants do not grow near the ocean. They accept as their home high mountain valleys which are always full with deep snow between December and April of each year. *C. japonica,* on the other hand, normally grows wild only along the seashore or on islands just off the coast. *C. japonica* does not grow wild in the interior valleys.

The yellow stamens found in the snow-camellia are quite different from the stamens of *japonica.* They are much shorter in length and the base of the stamens is not cylindrical. This base is divided in such a manner as to indicate that the whole structure of the stamens is in a process of degeneration.

It is probable that this camellia presents more variation, both in the form of the leaves and the distribution of petals, than any other camellia. It is difficult to describe what will actually be a standardized snow-camellia. Practically all of the blossoms are, however, a rosy pink, not greatly different from wild *japonica.* About 5% of the blossoms, however, are white.

The seeds are quite distinctive. They are a lighter color than *japonica.*

Usually the pericarps, when the fruit is ripe, crack into four parts, whereas *japonica* will divide into three parts.

In the extereme northern part of the principal island of Japan (Honshu), wild camellias grow near the seashore. These camellias, however, are typical *japonicas*. *C. rusticana* does not grow wild near the ocean in spite of the fact that in this particular area it is so cold that the *japonicas* do not blossom until May.

Growth Habits

C. rusticana grows very slowly and must be described as dwarf in habit. The tallest trees which have been found do not exceed 12 feet in height and four inches in diameter.

It must be pointed out that because *C. rusticana* will grow under the snow through the winter, this does not necessarily mean that it is any more cold resistant than *C. japonica*. When the camellias are under the snow, they are actually protected by the snow blanket. Probably the temperature never descends below 30° F. The indications are that either a *japonica* or *rusticana* will survive a much lower temperature than this, perhaps down to 20° without injury to the tree itself.

In the valleys where *C. rusticana* grows wild, the seeds which fall on the ground are usually carried away by the woodmouse to be used as food. There are, therefore, very few new seedlings. On the other hand, many new plants appear from the tips of the roots.

Many Forms Noted

In Niigata Prefecture in Western Japan, about 50 different garden forms have been counted up to date. Most of them have not been officially named and they are not grown by nurseries. These garden varieties have been preserved for exactly the same reason that we have many varieties of *C. japonica*. There are semi-double, double, anemone-form and magnolia-form blossoms. The colors are usually pink, some a deep color and others a delicate light pink.

There is a form of *rusticana* which has naturally variegated and irregularly shaped leaves. There are white garden forms also.

Because it grows well under the snow, we hope that evenually this species —or sub-species—can be used to extend the area in which camellias grow.

*See bibliography page 12.

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Creating New Camellias, Ralph Peer, Camellian, September 1955

"Camellias in America," by Dr. H. Harold Hume.

Species Mail Bag

Dr. John L. Creech, Horticulturist in charge of the U.S. Plant Introduction Garden of the Agricultural Research Service of the U.S.D.A. at Glenn Dale, Maryland sent the following informative note: quote—

Our work in camellias consists mainly of locating and introducing into the U.S., species that may be suited for breeding purposes. For example, we introduced *Camellia fraterna* into cultivation for the first time and distributed it to a number of locations for test. At the same time authentic material of *C. oleifera* and several related genera was distributed for testing.

More recently, resulting from my Japan-Okinawa trip, we secured several additional species namely *C. miyagii, C. hozanensis, C. lutchuensis,* several clones of *C. rusticana,* both wild and cultivated, and in addition, I went to the remote, northern limit of distribution of *C. japonica* and collected both plants and seed. This latter location has rarely been visited and actually is further north than where *C. rusticana* grows. It should give us an unusually fine opportunity in the breeding of hardier varieties.

REPORT FROM THE MISSOURI BOTANICAL GARDEN ON C. RUSTICANA

By F. G. MEYER

I heard about the Snow Camellia (*Camellia rusticana*) from Mr. Leopold A. Charette while he was on Air Force duty in Japan in 1953. It sounded intriguing to hear of a Camellia that grew in the snow. I inquired whether it would be possible to obtain living material, or seeds of this Camellia for the Missouri Botanical Garden. Possibly, I thought, here might be a hardy Camellia for eastern United States. Through Mr. Charette's ferreting nature, it wasn't too long before we received an airmail parcel with a few seedlings of the Snow Camellia that had been collected in Toyama Prefecture in western Japan. Then in May 1953, we received at the Missouri Botanical Garden, a rather large bundle of cuttings of the Snow Camellia from Toyama Perfecture.

C. rusticana

It was very disappointing to open this package and discover most of the leaves had dropped in the course of the six weeks sea voyage from Japan. But we did our best to save them. We treated some of the cuttings with a 2% solution of Indol-butyric over night and some of them with 3# Hormodin powder. The treated cuttings were placed under a continuous mist in a mixture of one half peat moss and one-half styrofoam in the greenhouse about the middle of May. Then we waited to see what would happen. To our utmost surprise, in about two weeks roots had started to appear on the cuttings treated with 2% Idol-butyric acid. Within a month the ones treated with 3# Hormodin had also started to root. At the end of this little experiment well over 75% of the cuttings inserted had rooted.

Since that time, we have had excellent success growing the rooted cuttings, and one plant developed a single flower. Our flower was a clear waxy pink which opened perfectly flat in contrast to the ordinary wild form of *Camellia japonica* which has a semi-tubular flower with the petals turned upward. We are reluctant to plant our plants outside for fear of losing them from cold. We shall try a few plants after they have grown somewhat larger. Border-line plants often can stand considerably more cold when they become full size. At the same time, we shall grow some in our Camellia house and make the plants available to Camellia growers and breeders.

This is about all there is to tell concerning the Snow Camellia at the Garden here. As we now know, certain Camellia authorities, notably Mr. Robert Sealy at Kew Gardenas in England believes the Snow Camellia to be only a high altitude phase of *Camellia japonica.* I am quite prepared to go along with this viewpoint. This Camellia is certainly not suffi-

(Continued on Page 43)

C. TALIENSIS *from page 17*

other widely grown species or variety. The great heat of September 1955 had no adverse effect upon the plant.

Taliensis produces seed abundantly. The individual seeds are round, similar to *Thea sinensis*, and are borne in much the same way as *Thea sinensis* having smooth husks which droop from a rather long stem.

One should always be cautious in predicting the future of any plant—and particularly a Camellia. However, I feel secure in predicting that *taliensis* will become an important plant to both amateur and professional growers in the not too distant future.

The value of this plant may be in hybridizing or in understock production. However, I feel that it would be a serious mistake to overlook the values of this plant as a basic garden shrub. One has a tendency to overlook its real value because of its small, single flowers, but to sidetrack this plant because of that would be like not seeing a beautiful forest because there was a tree in the way.

To elaborate on the use of *taliensis* as understock, may I suggest that its great vigor and freeness of seed production should be considered. We in Descanso Gardens are planning a series of tests to determine: Compatibility of *taliensis* to other species and varieties of Camellias in grafting —resistance to disease, particularly oak root fungus — resistance to drought—tolerance to moisture, and reaction to heat and cold.

In hybridizing with *taliensis*, I do not see too much to be gained except for the possibility of foliage improvement in certain crosses. I do not believe there is any plant that has a more beautiful foliage and form than *taliensis*.

Of course this species is still new to us. Further experimentation may prove or disprove its merits. But even if we know no more about it in the future than we do now, it still is a very worthy garden subject and is worth any time and effort involved in growing it for what it has to offer in garden beauty.

FOR SALE

The Secretary of the Society has the following books for sale:

Our own book, "The Camellia, Its Culture and Nomenclature," a 1956 revision. $1.50 or $.90 each in lots of not less than 12.

"Camellias in the Huntington Gardens," by William Hertrich. Vol. I and II, $10.00 each.

"The Yunnan Reticulatas," 50¢.

"Old Camellia Varieties," a list with brief descriptions compiled at the request of the Council of the Royal Horticultural Society of the R.H.S. and the British Museum, by A. I. Ellis. A 374 page, 9x11 book. reprinted by permission by Mr. Ralph Peer. $5.00.

"Flower Arrangements of the Ohara School" the 1952 edition. Printed in English in Japan in folder form this book has six pages of descriptive matter and twenty-four colored prints in the Japanese manner. $4.60, from $10.00 to $12.00 in bookstores.

"Camellias in America, 1955," by H. Harold Hume. $25.50.

"The Camellia, What to Do," published by the Oregon Camellia Society. 35¢ postpaid.

Sasanqua issue of the Camellia Review, 75c postpaid. 57c in orders of 25 or more.

"Camellia Varieties in Japan," edited by Eikichi Satomi, 40¢.

All prices mail and tax prepaid when payment is received with order, otherwise these charges will be added.

CAMELLIAPHILE AT HOME

By DONALD W. STRYKER

I go plant hunting with a typewriter! Like most collectors, I had investigated some other Camellias besides varieties of *Camellia japonica* and *sasanqua.* Then, on day, while visiting the propagating house of Doty and Doerner in Portland, Oregon, I saw a box of scions from *C. reticulata* 'Captain Rawes.' Over the top of the branches the shipper had placed several flowers. That did it: now I was off on a mad search for *all* possible species! Letters were sent to all corners of the world for information, which not only led to many interesting friends and correspondents, but a fairly comprehensive collection of Camellias, plus what is, in all honesty, one of the most amazing assortments of other genera outside a botanic garden that I know of. Not only do I have nearly all species of Camellia in cultivation, but I have also nearly all of the family *theaceae* which are hardy in this climate, besides, many I must keep in the greenhouse—*stewartia, gordonia, schima, franklinia, tutcheria,* to name a few. There are flowers on at least one of these every day of the year.

So far the species have not disappointed me. The flowers on one may be small, but there is always something else the plant provides to make up for them in interest. The slender, beautiful appearance of *C. cuspidata,* and the purplish hue of the new leaves quite make up for the tiny size of the delicate white flowers. It is extremely hardy, too. *C. fraterna's* graceful arching branches are loaded with small white flowers, each with three petals recurved and three laid out flat, framing a bunch of orange-tipped stamens. Not being too certain of its hardiness, I grow them in pots so they can be carried into the greenhouse in cold weather. This should make an excellent subject for Bonsai.

C. hongkongensis: pure crimson cups, filled with bright golden pollen-covered anthers. The petals, which are two to two-and-a-half inches long, are prevented from spreading by the large bud scales. Plants in the wild are reported to be freely branched trees, thirty or forty feet in height. Young foliage is most unusual and striking. Unfolding from pink bracts, the new leaf is an olive-lead color above and deep mauve below. Mature leaves are a blackish-green, and on plants growing here they have attained a length of nine inches, with a three-inch width.

C. salicifolia: also from Hong Kong. This has not flowered for me, but has a most interesting foliage. The young leaves are bright red on the upper surface, and all young twigs are covered with a growth of white hairs. In shade the leaves attain a length up to four inches, and the plant will be some six feet in height. In full sun the plant becomes a low, dense shrub, two to three feet high. The flowers are small and white. This and *C. hongkongensis* are probably not too hardy, though plants are grown outside in protected areas of southern England.

C. sinensis: is the plant whose leaves are used for tea, and was classified as *Thea sinensis.* Of its many forms I grow only *bohea* and *rosea.* It is perfectly hardy in Southern California. It's chief interest lies in the fact that it is "ea," although when in flower the plant is quite attractive with one to one-and-a-half inch white or pink, fragrant flowers against a background of dark green leaves.

C. taliensis: will take several degrees of frost, but I keep mine in the greenhouse through the winter, just in case! The foliage is a bright, almost lime-

colored, green, and the flowers appear in groups of three together at the tips of the shoots. These are some two-and-a-half inches across, opening quite flat, and filled with spreading, gold-tipped stamens. It blooms for me as early as September.

C. oleifera: is not very interesting and is only grown here to fill out the collection.

C. assimilis, C. drupifera, and *C. pitardii:* I have not had long enough to say much about.

C. rusticana: is a sub-species of *C. japonica.*

C. wabisuke: according to a letter received from Mr. J. Robert Sealy of the Royal Botanic Gardens at Kew, seems to be a hybrid rather than a species, one of the parents being *C. japonica.*

C. Kuro-Tsubaki: also according to Mr. Sealy, " . . . is a highly sophisticated cultigen of *C. japonica.*"

C. reticulata (the wild form), and *C. saluenensis,* are my two great loves. To me, the large, simple flowers of the wild *C. reticulata are* far more interesting and beautiful than the hybrids. I have only seven flowering clones here but each is sufficiently different in color, size, and shape of flower to make me impatient of the slowness of the hundreds of seedlings that are growing here. Color ranges from pale "appleblossom" pink, through deep rose-pink, to almost red. One plant has uniformly four-inch flowers, though the size of bloom on others ranges from six to eight inches in spread. They have taken 16° of frost here, but did loose all the flower buds.

C. saluenensis: has an exceptionally long flowering period, from November to April. The blooms range from pale, creamy white with pink tipped petals, to a glowing deep pink, and from open, flat flowers to quite bowl-shaped ones.

SHOW DATES SCHEDULED FOR 1957

February 2nd and 3rd	Men's Camellia Society of Birmingham, Ala.
February 27th	Temple City Society
March 2nd and 3rd	Combination SCCS, Temple City, Los Angeles Society and Pacific Society
March 2nd and 3rd	Florence Camellia Society of Florence, S.C.
March 9th and 10th	Men's Camellia Club of Charlotte, N.C.
April 7th and 8th	Camellia Society of the Potomac Valley

PRESENTING OUR CAMELLIAUTHORS

Vermont

While stationed with the air force in Japan, **Leopold Charette** became interested in the *C. rusticana* and amassed a wealth of material on the subject some of which we are privileged to print. Mr. Charette makes his home in Burlington, Vermont.

Maryland

Horticulturist in charge of the U. S. Plant Introduction Garden of the Research Service of the U. S. Department of Agriculture at Glenn Dale, Maryland, **Dr. John Creech** evinces a deep interest in camellias, looking forward to new and finer species.

East Africa

A little insight into the vast propagation of the species *sinensis* is given graphically by **N. A. Goodchild,** Agriculturist for the Tea Research Institute of East Africa from Kericho, Kenya Colony.

Georgia

Along with his busy life as a physician, **Dr. P. L. Hilsman** has yet had time to become an avid camelliaphile and build up a private collection of species plants. His most interesting chart may well serve as guide for other private collectors. Dr. Hilsman is a resident of Albany, Georgia.

California

Journalist, Editor of "Golden Gardens" and famous octogenarian horticulturist of Pasadena, California, **Charlotte Hoak** looks at species from the feminine angle.

Dr. Walter Lammerts of Livermore, California, is head of research for Descanso Distributors and writes from personal experiences in breeding and hybridizing in which he has been engaged for many years.

Missouri

Dendrologist at the Missouri Botanical Garden in St. Louis, Missouri, **Dr. F. G. Meyer** is an arden camelliaphile from the scientific approach.

California

World known for his interest in and active advancement of camellias as well as for his own extensive collection at his home in Hollywood, California, **Ralph Peer** finds time to serve as Vice President of the S.C.C.S. and contribute generously to this magazine.

North Wales

Mr. C. E. Puddle in charge of the Bodnant Gardens at Tal-y-cafn, Denbigshire, North Wales takes a special interest in camellias and some time ago stated that the renewed interest in camellias there was chiefly due to the popularity of the *saluenensis* and wild *reticulata* varieties and the hybrids grouped under *C. williamsii.* The beautiful Bodnant Gardens were a gift from the late Lord-Aberconway to the British National Trust.

Japan

Eikichi Satomi, horticulturist and author, has long had an absorbing

(Continued on Page 42)

WHITE SALUENENSIS

By RALPH PEER

The original notes made by George Forrest, famous British plant explorer, during his expeditions to Yunnan in Southern China during the 1920's contain references to a camellia species which is now identified as *C. saluenensis*, white form.

Mr. Forrest sent seeds to his friend, Lord Aberconway, who successfully germinated them at Bodnant Gardens in North Wales. The original plant is still growing there and gives an excellent crop of blossoms annually. This variety differs from the ordinary *saluenensis*, not only in the fact that the flowers are pure white without any trace of pink, but also because this plant does not bear seeds. Ordinarily, plants of *C. saluenensis* in England are seed-bearing.

CAMELLIAUTHORS *from page 41*

interest in camellia research. This year his name is prominent as editor of the first camellia nomenclature book published in Japan.

Oregon

A most active camellia collector, worker and editor of the Bulletin of the Oregon Camellia Society, **Andrew Sears** of Portland, Oregon brings informative personal experiences with his own plants of *fraterna.*

England

Robert Sealy is a prominent horticulturist of England and writes often for the Journal of the Royal Horticultural Society.

Oregon

One of the most extensive collections of Camellia species in America is credited to **Donald Stryker** of Langlois, Oregon where he propagates them on a commercial scale. For years a lover of camellias in general, he has become deeply interested and extremely enthusiastic over the future possibilities of different species; one reason being that they provide him with camellia blooms every month of the year.

California

Superintendent of the beautiful Descanso Gardens of La Canada, California, scene of the mammoth joint camellia show of Southern California Camellia societies last spring, **John Threlkeld** is vitally interested in the extensive camellia gardens and of the future of his species garden there.

REPORT *from page 37*

ciently distinct, at least morphologically, to stand as a species on its own merit.

Perhaps growers in California would like to have some material of this Camellia. We would certainly like to get plants of *Camellia reticulata* and the more recent Yunnan forms of it. I did manage to root three or four cuttings of these that were sent to us a year ago from Huntington Botanic Garden, but it took a year to do it.

YOU CAN BE SURE
OF THE BEST
IN CAMELLIAS
FROM
OUR ADVERTISERS

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BOARD OF DIRECTORS, SOUTHERN CALIFORNIA CAMELLIA SOCIETY,
c/o Secretary, 40 N. San Rafael Ave., Pasadena 2, California

I hereby make application for membership in your society and enclose $5.00 for the current year's dues.

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City..... Zone..... State.....

Business .....

Sponsor ..... (signature)

APPLICATION MAY BE MADE BY LETTER IF PREFERRED

NEW SPECIES *from page 19*

somewhat compressed on two sides 1 cm. long and 1/3 cm. wide, or rounded-cuneate about 1.3 cm. in diameter, dark brown.

Hong Kong New Territory: Shing-Mun 22° 23′ N., 119 ′ E.), 600 metres altitude, October 25, 1955, *C. P. Lau 177;* ibid, December 10, 1955, *H. C. Tang 2422* (type, in the Kew Herbarium).

Cuttings have recently been received at the Royal Botanic Gardens, Kew, and it is hoped to establish the species in cultivation. It will, of course, need to be grown in a warm house.

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