

Hybridizer's Notebook — 1: The Importance of Observation

One of the by-products of aging is retrospect. To the mature orchid hybridizer the consideration of past events is not only pleasurable but also valuable as one plans new directions in breeding. One of the keys to making quality hybrids is the knowledge gained from successful parent clones to breeding lines. The majority of orchid hybridizing today involves complex parentage, either in one parent or, most frequently, in both.

As many readers know, I began my orchid career at Stewart Orchids over 40 years ago under the guidance of Ernest Hetherington, who imbued in me the absolute necessity of observation. From the beginning I was taught that a grower or hybridizer never enters a growing area without consciously looking at specific flowers, or, as one passed through the growing area, observed the growth habits of plants. Time has convinced me that all plants talk to you, not audibly, but through sign language. Deaf mutes utilize hand motions or gestures to communicate or converse; plants indicate their good health by foliage or bulb vigor, color or healthy roots. They indicate ill health through shriveled leaves or bulbs, rotted roots, yellowed leaves, smaller, less vigorous bulbs and substandard blooms.

As in the case of the deaf mute, someone must teach the novice grower to read the signs the plants are expressing. That someone to you may be a person in your orchid society that you admire as a successful grower. Cultivate him or her. Most orchid

folk are yearning to share their successes in growing with a friend. As Roger Rankin writes in his collection of epigrams and aphorisms, "A good orchid friend is not a person to lean on but one who will make leaning unnecessary. The object in teaching a person how to grow orchids is to enable him to get along without you. It is one thing to show a man how poor his culture is, and another to give him the knowledge to correct it."

As I progressed in my career I was approached by the late Rod McLellan to join his orchid firm as the orchid department manager, a position that would become a terrific challenge, due not only to the size of the company but also the diversity of orchid genera. With some personnel changes I suddenly found myself with the responsibility of carrying on the *Paphiopedilum* hybridizing program. At the time McLellan's was producing tens of thousands of complex *Paphiopedilum* hybrids for the cut-flower and pot-plant markets of Europe. Fortunately, past records were available, and the former hybridizers shared personal hybridizing observations with me, but I knew that somehow I had to become involved in an in-depth crash course in *Paphiopedilum* hybridizing.

Following a lecture titled "*Paphiopedilum* Species and Their Influence in Hybridizing," presented by the renowned Dr. Gustav Mehlquist of the University of Connecticut, I asked him if I could spend some time with him discussing *Paphiopedilum* breeding. After several hours he concluded by saying, "You have just heard me lecture on the influences of *Paphiopedilum* species

¹Fordyce Orchids, 7259 Tina Place, Dublin, California 94568.



Above, *Slc. California Apricot* 'Orange Circle', HCC/AOS shows the broad petals that are passed along to its progeny. Below, *Slc. (Hazel Boyd x Lc. Drumbeat)* is a first-bloom seedling showing the influence of *Cattleya Horace*, one of the parents of *Lc. Drumbeat*.



in hybridizing. Now forget everything I said about that aspect." Dr. Mehlquist quickly went on to say, "What you heard was information utilizing the species in combination with other species and primary hybrids. What you are asking me to validate is a reliably proven formula to hybridize very complex hybrids involving many species throughout several generations of breeding. That is impossible." You can guess how I felt. My hopes of success vanished. If this highly trained geneticist could not give me the answer, who could? Dr. Mehlquist hastened to suggest that the most probable and reliable means of discovering the answer would be to set aside one hundred seedlings of each hybrid made, watch them grow and bloom, make copious notes over several years of observing the plants as they mature and compile those notes. Then certain patterns of genetic influence would become apparent.

The sage advice Dr. Mehlquist gave me that evening is part of some of the most valid and practical truths I have learned about hybridizing. I did follow his suggestion and observed not 100 but 25 seedlings of each cross, recorded my observations weekly over a period of two blooming seasons and began to scratch the surface of complex *Paphiopedilum* hybridizing. Certain parents consistently imparted strong growth, others imparted long floral stems, some dominated with brushed dorsal color tones, even when combined with heavily spotted types. The cupping of flowers is often a problem when the more complex red parents are used, but we found that using the *coloratum* form of *Paph. Maudiae* greatly influenced hybrids to produce blooms with a flat dorsal stance on strong, erect stems.

The point of the illustration outlined above is that no matter what the genus might be, the more complex the hybrid, the more difficult it becomes to predict its outcome. Personal observation is the key. To a hybridizer, it is equally important to see the poor flowers in a specific cross as it is to see the awardable ones. One seeks key influences that signal certain parental dominant or recessive traits. Because it is literally impossible today for a grower to raise large quantities of each hybrid to blooming size for the sake of observation, it becomes necessary to view as many as possible as they bloom in your own collection and to observe others on plant forum tables, as well as question other growers about their results. As time passes you will become aware that certain parent clones lend specific influences to the majority of all hybrids in which they are involved.

In thinking of cattleyas, it is well documented that when *C. bicolor* is used as a parent, the isthmus of the lip is a dominant factor. In the case of *C. dowiana*, the molten gold veins in the labellum are transferred even though the yellow of *C. dowiana* may disappear when combined with purples. In complex hybrids, *Slc. California Apricot* stamps its hybrids with broad petals, tending toward orange or yellow coloration. The massive, purple *C. Horace 'Maxima'* tends to pass along superb overlapping petals to many of its progeny.

Observation and remembrance is the key to the successful hybridizing of complex hybrids. When you look at a flower, what do you see? Does it simply please or repulse you? Perhaps that is all you require; but as a hybridizer, the flowers should speak to you — in sign language, of course. ♦



Hybridizer's Notebook — 2: The Importance of Research

One of the many services the *American Orchid Society Bulletin* provides its membership is the monthly listing of "New Orchid Hybrids" as supplied to them by the Royal Horticultural Society, the International Registration Authority for Orchid Hybrids. This valuable listing allows the orchidist to keep abreast

logical record of plant awards granted by the American Orchid Society with a cumulative yearly index published in the final issue each year. Each award listed has a complete technical description of each flower or plant, where and when the award was issued, the point score it received and the name of the exhibitor. A substantial per-



*If the hybridizer wants his or her plants awarded, it is important to research the best clones of species or hybrids and use them. *Sophrolaeliocattleya Hazel Boyd* 'Orinda', AM/AOS is one of the awarded clones from the remake of the cross between *Slc. California Apricot* 'Orange Circle', HCC/AOS and *Slc. Jewel Box* 'Beverly', AM/AOS. Photography by Frank Fordyce.*

of new hybrid combinations as well as newly established intergeneric names. Additionally, the *Awards Quarterly* provides a chrono-

centage of flowers and plants awarded are illustrated by black-and-white photographs, and a special color centerspread is devoted to a specific topic related to the judging of orchids.

Recently a complete index of AOS awards issued from 1932-1988 was prepared by

American Orchid Society Bulletin

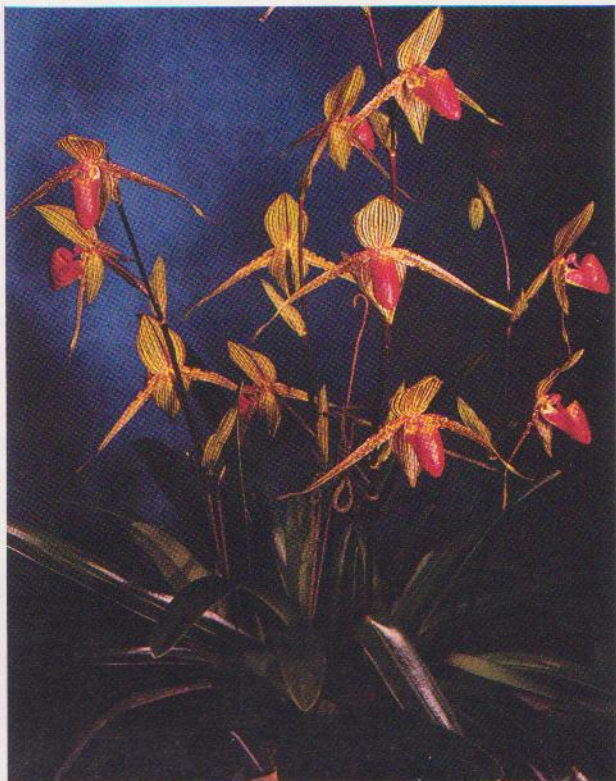
¹Fordyce Orchids, 7259 Tina Place, Dublin, California 94568.

James R. Fisher and David A. Bishop and is currently available through the AOS Book Department at a nominal charge. This combined index of all AOS awards is absolutely invaluable and should be in every serious hybridizer's reference library.

One does not merely glance at such records of awards as simple pronouncements; these records can be as dull as last year's newspaper, but as one learns to study and interpret them a tremendous wealth of information can be found.

Orchids, like many things in life, follow trends of popularity. A study of AOS awards to different genera will substantiate this statement. Take the *Cattleya* alliance, for example.

At one time the pristine, large white cattleyas were the most popular orchids in existence. In 1948 *Cattleya* Bow Bells (*Edithiae* x *Suzanne Hye*) was registered by Black and



Most of the awarded clones of *Paphiopedilum rothschildianum* in the 1970s and 1980s were crosses between two outstanding clones of the species: 'Charles Edwards' (above, also known as 'Charles E', grown by Harry Stage and Bert Logsdon and photographed by Ken Woolery) and 'Borneo' (below, grown by Val and Jack Tonkin and photographed by Beauford B. Fisher).



Flory of England, later to dominate all AOS awards during the 1950-1960 era with 49 individual honors. None has received an award since 1968. *Cattleya* Bob Betts (Bow Bells x *mossiae* 'Wageneri'), registered by McDade's Orchids in 1950, followed its famous parent with the first of 66 awards in 1952.

The trend was set. White cattleyas were riding the pinnacle of popularity with such hybrids as:

C. Pearl Harbor (Bow Bells x Celia): 24 awards, 1954-1966

C. General Patton (Bow Bells x Barbara Billingsley): 23 awards, 1956-1970

C. Princess Bells (Empress Bells x Bob Betts): 28 awards, 1959-1976

C. Esbetts (Bob Betts x Estelle Alba): 15 awards, 1960-1981

C. Empress Bells (Bow Bells x Edithiae): 22 awards, 1958-1974

C. Mary Lynn McKenzie (Bow Bells x Celia): 24 awards, 1958-1978

C. Mary Ann Barnett (Arctic Circle x Bob Betts): 20 awards, 1960-1981

To a hybridizer one inescapable fact leaps off the pages of awards listings; certainly the parents of *C. Bow Bells* (Edithiae x Suzanne Hye) are of utmost influence and must be considered in white *Cattleya* hybridizing. It is recorded that some clones of *C. Bow Bells* were diploid. However, many of the most highly awarded clones were counted as tetraploids, as were specific clones of *C. Celia* and *C. Estelle*.

For those who prefer the magnificent royal purples, names such as *Lc. Bonanza* (Cavalese x *C. Prospector*) captured 51 awards during the 1950-1960 era. During that same time *Blc. Norman's Bay* (*Bc. Hartland* x *Lc.*

Ishtar) received 19 awards, and *Blc. Mem. Crispin Rosales* (*Lc. Bonanza* x *Norman's Bay*) received 54 awards in the late 1960s and early 1970s. In researching the parentage of these truly great hybrids one cannot overlook the fact that *Lc. Lustre* 'Westonbirt' appears in all of their parentage, as well as in scores of the finest purples in history.

The above hybrids are examples of trends of breeding that vigilant hybridizers can find within the records of awards and utilize that information to breed the successful hybrids of tomorrow. Without any doubt, the commendable miniature cattleyas that are currently winning accolades will be bred with the tremendously popular, large-flowered classics of yesteryear to produce the mid-sized, compact-growing, full-formed hybrids of tomorrow. By reducing the plant size and increasing the ability to bloom every six months, we cut out overhead costs and increase production. Through innovative breeding we can also reduce the time it takes to grow a plant from seed to bloom, which is extremely important as the "pot-plant" market booms. Growers will be producing plants to bloom on a scheduled basis as mass-marketing demands. Good examples of miniatures crossed with classic standards are *Sc. Rose Pixie* 'Pinafore' (*C. Bob Betts* x *Soph. coccinea*) and *Slc. Bellicent* (*Lc. Bonanza* x *Soph. coccinea*). Both are compact plants with mid-sized, long-lasting blooms. They even flower twice per year.

As you search through the monthly "New Orchid Hybrids" in the *AOS Bulletin*, keep in mind that because a hybrid has been registered does not necessarily indicate that it is a cross recently "bloomed for the first time." There can be specific circumstances surrounding that registration. There are instances in which a cross has been blooming for many years without having been registered. When someone decides to use that unregistered cross to make a new hybrid, a problem arises.

Take as an example a blooming plant of (*C. Horace* x *Lc. Dorothy Fried*) x *Blc. Ivan Hughes Stanfield*. Not only is it difficult to

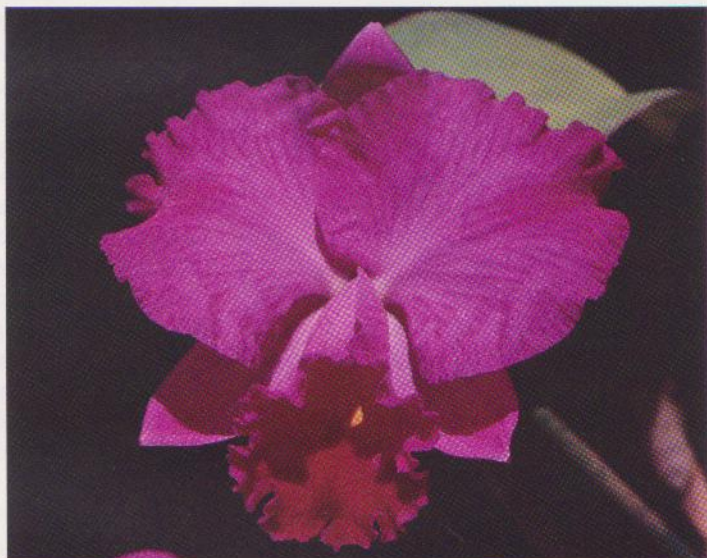
find a pot label large enough to contain all the printing, but in order for that specific cross to be registered the cross of *C. Horace* x *Lc.* Dorothy Fried must be registered first. Then that registered name in combination with *Blc.* Ivan Hughes Stanfield may be submitted for registration.

There are some hybrids that are never registered at all, primarily due to the low quality of the cross. Or perhaps the low yield of seed produced only a few plants of the cross. Most hybridizers register the very first seedling to bloom, as soon as possible, in order to assure exclusivity of its parentage. Unfortunately, there exists an occasional unscrupulous person who refuses to abide by the rules set by the International

one hundred plants, the majority of the cross will bloom in 3-4 years from flask. I know of a hobbyist who purchases flasks, grows under lights in an environmentally controlled basement and blooms a few miniature hybrids such as *Slc.* Hazel Boyd and *Slc.* California Apricot in as little as 12-18 months from flask.

Realistically, few hybrids become well publicized until they have grown to full maturity and bloom on strong plants. Look back at the famous purple, *Lc.* Bonanza, registered by B. O. Bracey in 1949. It received the first of 51 awards five years after registration in 1954. Bracey also registered *Blc.* Mem. Crispin Rosales in 1959; the first of these was awarded in 1961. The great *Slc.*

Sophrolaeliocattleya
Bellicent 'Fox Den',
AM/AOS (*Lc.* Bonanza x *Soph. coc-
cinea*) exemplifies the
trend of breeding the
miniatures with classic
standards to produce
compact plants with mid-
sized, long-lasting flowers
twice a year. Photography
by Frank Fordyce.



Authority for the Registration of Orchid Hybrids, the Royal Horticultural Society, and falsifies information in order to receive the credit for making a specific hybrid first. Fortunately this is the exception to the rule, and those who deviate from accepted practice are usually found out and their reputation and believability tarnished.

While it is not unusual to bloom one or two *Cattleya* seedlings in as little as 1 1/2 - 2 1/2 years from the flask within a group of

Hazel Boyd was registered in 1975 by the Rod McLellan Company and received its first award in 1977, though most awards were in the early 1980s.

The observation has been made that it is difficult to know how any seedlings of a given cross were grown to maturity, and that therefore it is almost impossible to evaluate the percentage of high-quality blooms within a specific cross. We do know that in the days of *C. Bow Bells* and *C. Bob*

With the rapid change of orchid plant production within the USA, the key to maintaining a successful orchid business will revolve around a carefully researched knowledge of the immediate future popularity of specific genera grown for resale.

Betts, thousands of seedlings were bloomed, but not all were of the original cross. Some were selfings while others were siblings bloomed by several growers. Today, far fewer plants of any specific hybrid are grown. The original *Slc.* Hazel Boyd records show that 600 were raised in the laboratory; by the time they reached saleable size they probably had been culled by growth vigor to 400 plants. I believe the remake, using identical parent clones, numbered 300-400 plants. Approximately 43 awards were made to 300 blooming plants of *Slc.* Hazel Boyd. But only 50-60 awards were granted among approximately 5,000 blooming plants of *C.* Bow Bells and *C.* Bob Betts.

Let's now look at awards to *Paphiopedilum* species. We know that a few of the clones of *Paph. rothschildianum* were jungle-collected, but one would have to possess inside knowledge to know that the majority of the clones awarded in the 1970-1980 era are hybrids between the clones 'Charles Edwards' and 'Borneo', two FCC/AOS clones. Since we are neighbors of Tonkin Orchids at the Orchid Ranch in Livermore, California, we enjoy the fantastic sight of 350-500 mature plants of this premier cross in bloom

every year. This assortment gives the Tonkins a fine selection from which to choose the 37 awards they have received in this terrific mating of two selected, vigorous clones. Another highly awarded *Paphiopedilum* species is *Paph. delenatii*, with 41 AOS awards. Possibly only a fraction of those awarded were natural clones; the balance were the result of several selfing and sibling crosses. The newly imported *Paph. armeniacum* appeared in the awards listing in 1983 and has captured the limelight with 30 awards through 1987: 5 HCCs, 18 AMs and 7 FCCs. Look forward to the introduction of their new hybrid combinations soon. We cannot overlook *Paph. bellatulum* that garnered 83 awards from the late 1960s to the 1980s. Here again I suspect that hybridizers, noting the popularity and awards received by collected plants, selfed and sibbed the fine clones in order to secure quantities of seedlings from which to select awardable clones. Looking at *Paphiopedilum* awards, it is evident that this species ranks very high among the most awarded orchids.

With the rapid change of orchid plant production within the USA, the key to maintaining a successful orchid business will revolve around a carefully researched knowledge of the immediate future popularity of specific genera grown for resale. Though this is obviously good business practice, the absolute necessity of planned production has never been more important. Research of general agri-business practices and plant merchandising will become a must if a profit margin is to be maintained in a hobby business or as a full-time orchid nursery. The era of selling orchid plants in bloom has arrived. The overproduction of poorly researched, unflowered seedlings and mericlones offered by every Tom, Dick and Harriett will noticeably begin to decline.

Orchid growing as a hobby is great fun, but whenever plants are offered for sale, the responsibility of improving the genus should go along with them. The growing and sharing of orchids is not commonplace; it is truly an art form of classic beauty. ♦

Hybridizer's Notebook — 3: Adventures with Sophronitis

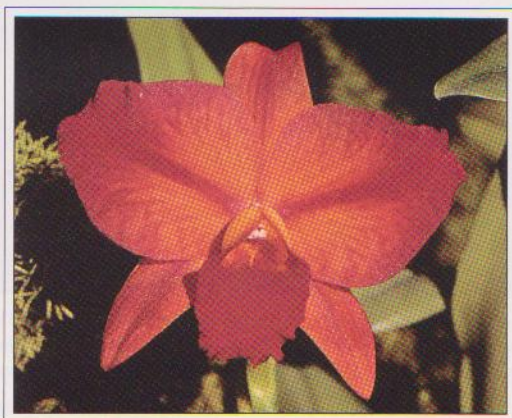
During a recent illness when I found myself confined to bed I took the opportunity to study the *American Orchid Society Awards 1932-1987* in depth. It is truly a fascinating record of all American Orchid Society awards issued up to 1988. As I have noted previously, to some it is merely a record that a specific plant has been judged sufficiently outstanding to receive a permanent award denoting its obvious qualities. Yet, to serious hybridizers, such records contain a wealth of information, such as breeding trends, beyond the obvious issuance of the award. My interest in the miniature *Cattleya* alliance

stimulated me to review the smaller-growing species of any genus that might breed with *Cattleya* types and trace their involvement in subsequent hybrids. The following are thoughts brought to mind as I reviewed species and hybrids that have received the

most awards within their type.

In any perusal through the list of AOS awards, certain species and hybrids literally jump off their page in their exuberance as if to say, "Look at all the awards we won!" I found that *Sophronitis coccinea* (= *grandiflora*) received 35 awards spread rather

evenly over the 55 years. The breakdown of awards is 7 HCCs, 5 AMs, 2 FCCs, 7 CCMs, 1 CHM, 1 CC, 1 CCC and 1 CBR. Because the majority of the red coloring and smaller growth habits found in today's popular miniature cattleyas are inherited from *Soph. coccinea*, one might be led to believe it is the major parent utilized directly in miniatures today. A study of *Sander's*



Sophrolaeliocattleya California Delight 'Dublin Apricot', HCC/AOS (California Apricot 'Orange Circle' x *Lc. Orange Gem 'Delight'*) shows why *Slc. California Apricot 'Orange Circle'* has been so influential in hybridizing miniature cattleyas. Aside from miniaturizing crosses, it adds a splashing effect to the petals. Grown by Fordyce Orchids.

List of Orchid Hybrids 1981-1985 shows only 41 crosses registered. This low figure may be explained by the fact that not everyone grows this cool-growing species well and has available pollen or a plant in bloom to hybridize. Additionally, if the species is bred onto a complex hybrid of larger size, fertilization may not occur. Remember, we are combining species and hybrids that grow under widely diverse conditions: some cool

¹Fordyce Orchids, 7259 Tina Place, Dublin, California 94568.

and moist, some very dry and bright; some with eight pollinia and others with only four.

Most *Sophronitis* are collected wild clones and often experience the hazards of acclimatizing to a totally new environment. When two such plants are bred to each other the resultant sibling plants are notably more

exposed to the air. They require fairly bright light but are very flexible about temperature. While we find most *Sophronitis* produce one or two blooms per raceme, *Soph. cernua* has many, and that trait tends to be passed along to its progeny provided the other parent has multiple flowers.

Curious to know why *Soph. cernua* had



Sophralaeliocattleya Kevin Hipkins 'Umina', HCC/AOS (California Apricot x Soph. cernua) is another Slc. California Apricot 'Orange Circle' hybrid illustrating the next generation of crosses from this benchmark clone. Grown by Gold Country Orchids and photographed by Richard E. Fleig.

easily grown and flowered.

Sophronitis cernua is a delightful species, much easier to grow and bloom under warmer, more varied conditions than *Soph. coccinea*. Personally, I believe it is a much overlooked species that warrants more serious hybridizing efforts. While individual flowers measure 2.2-2.7 cm in size, they are borne in clusters of 5-7 blooms per raceme. I would classify *Soph. cernua* as a micro-miniature growing only 2-3" (5-8 cm) in height. To my knowledge it has only been successful in hybridizing as a pollen parent except for selfing or sibling. They prefer to be grown on tree bark where their roots are

limited use in breeding, I asked many hybridizers how they were using it. I found few hybrids of interest except *Sl. Cherio* (*L. rupestris* x *Soph. cernua*), *Sl. Sparklett* (*Sl. Jinn* x *Soph. cernua*) and *Slc. Preschool* (*Precious Stones* x *Soph. cernua*). The specific hybrid that called this species to my attention is the cross between *Slc. Sassy Sofia* (*Soph. coccinea* x *Lc. Little Sunbeam*) and *Soph. cernua*, a cross made by the late Rudolph Pabst and registered recently by Fordyce as *Slc. Hot Drops*. I was indeed surprised and pleased with the superbly rounded petal form of this cross and in particular the clone 'Orange Button' that

had excellent upright inflorescences well above the foliage.

With the emphasis on miniatures turning hybridizers' thoughts toward smaller, more compact plants, *Sander's List* of 1981-1985 shows 10 new *Soph. cernua* hybrids.

Recently the combination of [*Slc.* California Apricot 'Orange Circle' x *Soph. cernua*] flowered, and we registered the cross as *Slc.* Kevin Hipkins in honor of a rather stalwart agent in Australia who operates Royale Orchids. I made the cross twice using different *Soph. cernua* clones; both crosses bloomed, the flowers appearing on plants in 3" and 3 1/2" pots. Blooms are of exceptionally full form — in red, orange and a very few canary yellows. They resemble the *Slc.* California Apricot parent, but many are surprisingly of even better form. I predict plants will mature at approximately 8-10" tall with 4-6 blooms per raceme. They seem to bloom any time a new growth matures, a distinctly new hybrid type in our future. To date the AOS awards list shows 16 awards issued to *Soph. cernua* — 3 HCCs, 4 AMs, 2 JCs and 8 CCMs — mostly in the 1970-1980 era.

Sophrocattleya Beaufort (*Soph. coccinea* x *C. luteola*) cannot be overlooked as one of the most delightful of the smaller-growing miniatures. Registered in 1963 by Casa Luna, the hybrid has received 3 HCCs, 7 AMs, 2 CCMs and 1 JC. Dominated by such superior, AM/AOS clones as 'Elizabeth', 'South River' and 'Elmwood', the easily grown plants have captured the eye of most every cattleya buff. A specific clone of 'Elmwood', reputed to be a tetraploid, is far superior to the rest of the mericlones of the regular 'Elmwood'. This new polyploid should give us even finer miniatures when hybridized.

Sophrolaeliocattleya Tangerine Imp (Tangerine Jewel x *C. luteola*), registered by Richella in 1982, has been awarded 7 HCCs and 3 AMs through the 1987 listings. Recently more have received awards. The *Slc.* Tangerine Jewel 'Vi' parent clone is becoming a topnotch breeding plant, often substituting for *Soph. coccinea* when used

in Hawaii, for it grows and blooms well under their warm conditions. We have bloomed [*Slc.* California Apricot 'Orange Circle' x *Slc.* Tangerine Jewel 'Vi'] on small plants in compots; the form is excellent, and the color is primarily intense red to tangerine.

Sophrolaeliocattleya Jewel Box (*C. aurantiaca* x Anzac) has proven itself to be not only a fine parent but one of the leading compact hybrids to grow into specimen display plants. Of the 16 CCMs beginning in 1969, 11 were issued to the clone 'Scheherazade'. Altogether there are 9 HCCs and 7 AMs to the cross. *Sophrolaeliocattleya* Jewel Box is the parent of *Slc.* Madge Fordyce as well as *Slc.* Hazel Boyd and *Slc.* Rajah's Ruby. Most breeding done with *Slc.* Jewel Box has been with *Soph. coccinea* hybrids for intense color. Also, because of the *C. aurantiaca* background, the progeny usually have strong flower stems with clusters of mid-sized blooms. When bred to standard-sized yellows such as *Blc.* Gift to make *Pot.* Flameout, the flowers are intermediate between both parents. Up to four, glowing orange to red flowers appear on each raceme.

Sophrolaeliocattleya California Apricot 'Orange Circle', HCC/AOS (*Lc.* Pacific Sun 'Lemon' x *Soph. coccinea*) is the specific clonal parent that influenced so many awards and was highly instrumental in launching the popularity of the miniature cattleyas. With the registration of *Slc.* Hazel Boyd (*Slc.* California Apricot 'Orange Circle', HCC/AOS x *Slc.* Jewel Box 'Beverly', AM/AOS), miniature cattleyas began to come into their own realm of acceptance.

When a hybridizer enjoys the success of a specific cross that merits much attention and acceptance, he instinctively searches its genealogy in an effort to determine what species and hybrids were dominant or recessive in its breeding. The hybrid *Slc.* California Apricot, registered in 1964 by the Rod McLellan Company, had produced only two registered crosses before *Slc.* Hazel Boyd was registered in 1975. They were *Pot.*



Sophrocattleya Beaufort 'Elizabeth', AM/AOS (*Soph. grandiflora* x *C. luteola*) is a cross now almost 30 years old and popular almost as long for ease of culture. Grown by Curtis Ewing and photographed by Lewis Tabor.

Kiska Volcano (*Slc. California Apricot* x *Pot. Tapestry Peak*) and *Slc. California Delight* (*Slc. California Apricot* x *Lc. Orange Gem*). *Sophrolaeliocattleya California Apricot* received 10 awards, almost one each year from 1966 to 1973, spread among nine HCCs and one AM. The cultivar 'Orange Circle' that was so successful as a parent received an HCC/AOS in 1973. The only AM/AOS was issued to the cultivar 'Hughes'.

The pod parent of *Slc. California Apricot*,

Lc. Pacific Sun 'Lemon', is a complex yellow hybrid involving a total of 14 separate species of *Laelia*, *Sophrontis* and *Cattleya*. They are: *Soph. coccinea* (used once); *C. schroderae* (used once); *L. cinnabarina* (used twice); *L. harpophylla* (used twice); *C. trianae* (used twice); *L. flava* (used once); *C. dowiana* (used six times); *L. tenebrosa* (used once); *C. bicolor* (used once); *C. gigas* (used four times); *C. lueddemanniana* (used twice); *C. mossiae* (used once); *C. mendelii* (used once); and *L. purpurata* (used twice). That's a lot of species to be found in one hybrid! Since most *Slc. California Apricot* clones are generally less than 12" high, one might wonder how just one inser-

tion of *Soph. coccinea* in each parent of *Slc. Hazel Boyd* could miniaturize the cross. The other parent of *Slc. Hazel Boyd*, *Slc. Jewel Box*, contains *Soph. coccinea* (used once); *C. aurantiaca* (used once); *C. dowiana* (used twice); *C. mossiae* (used once); *L. cinnabarina* (used once); and *L. purpurata* (used once).

Of considerable interest to me is the involvement of the famous large purple parent, *Lc. Lustre*, within the *Slc. California Apri-*



In its own right **Slc. Jewel Box** is a classic red that forms specimen plants quickly. Eleven Certificates of Cultural Merit have been awarded to the clone 'Scheherazade' since 1969, including the one above grown by Mrs. V. D. Taylor. But when crossed to *Slc. California Apricot*, the result was even more spectacular: the great *Slc. Hazel Boyd*.

cot lineage. I assume it is the renowned *Lc.* Lustre 'Westonbirt' clone, made famous by H. G. Alexander of England, one of the finest orchid hybridizers. *Laeliocattleya* Lustre appears in the lineage of the most successful large purple hybrids of all time. Its appearance in *Slc.* California Apricot may partially explain the subtle splashing effect noted on the petals of that hybrid, as well as *Slc.* Hazel Boyd and its progeny. Historically, *Lc.* Sargon, *Lc.* Cavalese, *Lc.* Soulange, *Lc.* Lustrous, *Lc.* Braceyana as well as other noted hybrids from *Lc.* Lustre were enhanced by colorful cerise-purple splashing of color on their petal tips, which incidentally is not the same type of splashing as one finds in *C. intermedia* var. *aquinii* splashed-petal hybrids.

Because the majority of *Slc.* California Apricot 'Orange Circle' hybrids are just beginning to bloom for the first time, plants generally are not of sufficient size to submit for awards. Some of the hybrids already proving noteworthy are *Slc.* Kevin Hipkins (California Apricot 'Orange Circle' x *Soph. cernua*), *Slc.* Octoberfest (California Apricot 'O.C.' x *C. luteola* 'South River'), *Slc.* California Ruby (California Apricot 'O.C.' x California Delight) and [*Slc.* California Apricot 'O.C.' x *Sc.* Doris 'Pamela'].

Sophrolaeliocattleya Hazel Boyd (California Apricot 'Orange Circle', HCC/AOS x Jewel Box 'Beverly', AM/AOS) is a cross that I made while orchid manager at the Rod McLellan Company and registered in 1975. Total awards up to 1987 were 21 HCCs, 22 AMs and a group of 12 plants receiving the coveted breeders award, the Award of Quality in 1985. Thus, *Slc.* Hazel Boyd becomes the most highly awarded recent introduction with 43 awards in only 10 years. Dominant colors within the cross are red and orange with a few clear lemon yellows of superior form. Have you noted, given the popularity of *Slc.* Hazel Boyd, that relatively few crosses have been offered for sale using it as a parent? Like many complex hybrids con-

taining *Sophronitis*, few or no seeds germinate. The problem may lie in the complexity of the hybrid or in the fact that *Sophronitis* chromosomes are so unlike *Laelia* and *Cattleya* chromosomes that they fail to pair at reduction division, with the result that fertilization is reduced.

Speaking of chromosomes, one of the most important developments at this time is the use of the chemical colchicine to create specific tetraploids for use in hybridization. Those who attended the 12th World Orchid Conference in Japan saw a magnificent example of this work as presented by Plantech Co. Ltd., associated with Miura Mericlone Ltd., both venture companies in plant technology. Plantech displayed a large quantity of *Soph. coccinea* polyploids created by the use of colchicine, a chemical that has the capability of doubling the number of chromosomes by upsetting the normal process of cell division. There are no guarantees that all cells will be changed to tetraploids; verification by cell counts must be made. Please note this experimentation is not for everyone. Colchicine is poisonous both to plants and human beings, so caution must be used.

Once tetraploids have been identified, select two sibling tetraploids and breed them together. The resultant progeny would be marketable tetraploids of considerable value in hybridizing. For example, one could remake some of the already outstanding diploid or triploid crosses using the newly acquired tetraploid to impart even better quality in the remade hybrid.

Should you wish additional, easy-to-understand information, I recommend the chapters on genetics and hybridization in Rebecca Northen's fine book, *Home Orchid Growing*, now in its fourth edition. For additional technical reports read about the colchicine research by Donald Wimber and Ann Van Cott in the *Proceedings of the Fifth World Orchid Conference* and in the July 1968 issue of the *AOS Bulletin*. ♦

Hybridizer's Notebook — 4: Breeding Tips and Predictions

Have you experienced the frustration of trying to make a specific hybrid many times, only to see that the seed capsule never sets or (adding to the disappointment) that the capsule goes to term without producing viable seed? If so, welcome to the ranks of the professional orchid hybridizer. Perhaps it is as suggested in Rebecca Northen's book, *Home Orchid Growing*, that the chromosomes from *Sophronitis* are so unlike those of *Cattleya* and *Laelia* that they fail to pair at reduction division and that many reproductive cells are therefore non-functional. Is this the reason that other species and hybrids fail to set seed no matter what pollen is used on them? At some magical moment in their life cycle viable seeds are produced, even with the same parent plant tried many times previously. One good example is *Slc. Madge Fordyce*; another is *Phalaenopsis Golden Sands 'Canary'*.

The complexity of combining dissimilar genera has both drawbacks and terrific rewards if we are willing to be persistent and be satisfied with only a few plants growing well to maturity. When knowingly making such complex hybrid combinations, we should always cull the weak plants from flask through flowering. The temptation is to keep everything regardless of its vigor, but I assure you that frustration is the final result, for too frequently the hybrids are of such poor vigor they will not grow well

enough to bloom within 5-7 years. Few can afford the space for that length of time. It's a difficult lesson to learn.

A new terminology has entered the orchid world, so we might as well become familiar with it: "pot plant" marketing. It refers generally to the mass marketing of orchid plants in bloom to the non-orchid-growing general public. There is a specific difference between plants purchased by members of the American Orchid Society versus those valued by the general public. The majority of *AOS Bulletin* readers are dedicated hobbyists who enjoy not only the beauty of the flowers themselves but also the intrigue surrounding hybridizing, flasking, growing seedlings into blooming plants, sharing information, winning awards and simply the fellowship of others pursuing that same unique interest. The person who passes an orchid plant in the supermarket, nursery or florist and is curious enough to pause, admire its beauty, check its attractive price and purchase it on the whim of the moment exemplifies the general public. Perhaps such people will become hobbyists in time, but the vast majority will purchase, neglect or overwater and eventually discard their first orchid plants.

It becomes our task as hobbyists and members of the AOS to educate this market and encourage those who mass-market orchid plants to provide adequate cultural information and possibly include reference to the AOS for additional information. Thus we provide a fundamental educational service and add to our membership.

¹Fordyce Orchids, 7259 Tina Place, Dublin, California 94568.



Slc. Sondra Fordyce 'Pink Fashion' was the result of crossing *C. harrisoniana* with Slc. Madge Fordyce 'Red Glow'.

When crossed with *Brassocattleya Buttercup*, the *Cattleya intermedia aquinii* influence is clearly seen in ***Brassolaeliocattleya Horizon Flight 'Happy Landing'***, grown and photographed by Stewart Orchids.



Cattleya schilleriana 'Yardley's', AM/AOS (originally known as *Sanderiana*), crossed with Slc. Madge Fordyce 'Red Orb', AM/AOS, produced **Slc. Crimson Radiance**.
Photographer :
Frank Fordyce





Cattleya loddigesii var. *harrisoniana* 'Streeter's Choice', FCC/AOS, clearly shows why this species is enjoying a resurgence of popularity. This clone received its FCC in July 1988 and was grown and photographed by R.J. Streeter.

While we have no accurate way to count the total number of hobbyist orchid growers in the United States, I would estimate that there are less than 100,000. Obviously there are hundreds of thousands of others who enjoy growing other plants besides orchids; they are the "pot plant" market of the future. While the United States is just beginning this new phase of marketing, Dutch and Japanese growers have been doing it for years. So, hobbyists, get ready to see plants of several orchid genera in the marketplace, but don't assume that your needs for awardable quality are being neglected. There are far more hybridizers generating new and exciting crosses than ever before.

Once you have determined to pursue a particular line of hybridizing, your appetite for information for species involved in that line should never wane. Every reference available should be reviewed, from early paintings, drawings and literature on the subject to *Sander's List of Orchid Hybrids*, awards lists, discussions with other hybridizers and plant forums at orchid societies.

Soak it all up; practical experience cannot be found in a single location.

My own line of hybridizing has involved miniature cattleyas. Over the years I have amassed personal observations about the species in this line, thoughts which I would like to share below.

Broughtonia sanguinea was first awarded by the AOS in 1957, and a few were awarded in the next decade. Selfings and siblings probably won the bulk of AOS awards in the 1980s: 6 HCCs, 8 AMs, 3 CCMs and 1 JC. Warmer growing, its hybrids were first introduced in Hawaii and Florida. Hybrids grow very rapidly and easily in warmth and bloom on young plants. They make good, tall-stemmed specimen plants but are ironically losing popularity. While the quality of its progeny is usually above average, most of its hybrids are too similar in appearance. Most hobbyists want distinctive differences. White forms, which result from the combination of two specific white clones, are now

popular. Until recently, the breeding of two whites together resulted in a variety of pastel pinks to creams. There is a new white *Broughtonia* hybrid utilizing *Bro. sanguinea* var. *alba* 'Dream City' that, when crossed with mid-sized white cattleyas such as a selfed, white *C. walkeriana*, will produce excellent white miniatures with good flower stems that are so desirable.

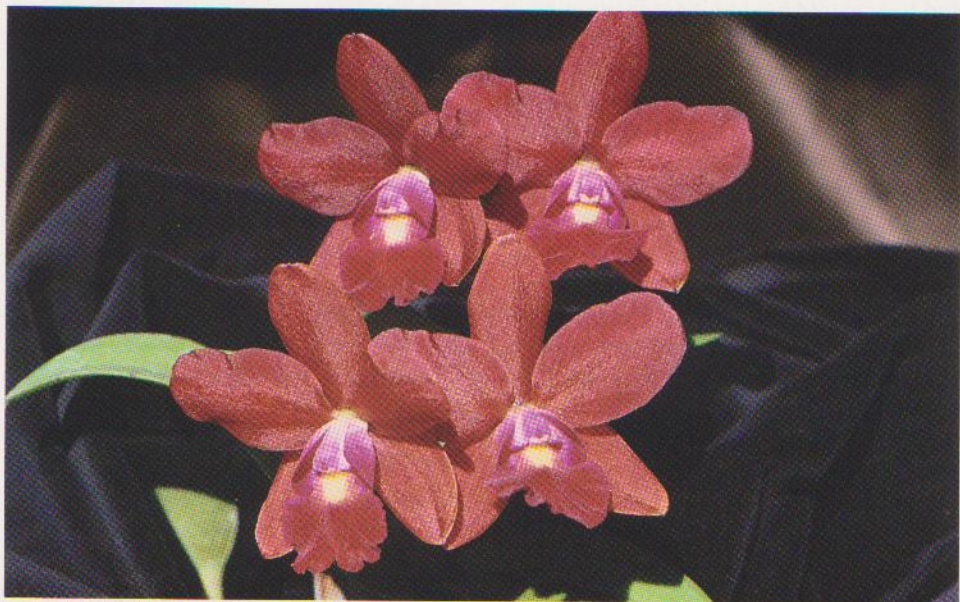
The yellow forms of *Bro. sanguinea* have been disappointing in breeding for additional yellows, but when used with *Ctna*. Keith Roth in remaking *Ctna*. Jamaica Red, some of the finest red forms have appeared. *Cattleytonia* Jamaica Red is possibly the most successful *Broughtonia* hybrid to date, winning 19 AOS awards including the very special Award of Quality, issued to 12 flowering plants of the same hybrid shown at the same time. Quality must be exceptional, and several plants within the group must have received individual awards, thus indicating the quality of the entire cross. Truly it is a hybridizer's award. When you see an

Award of Quality to a group of plants you can be sure that the whole hybrid population is exceptional.

Laelia sincorana was first awarded in 1978 (2 HCCs, 7 AMs, 1 CCM). Without doubt the FCC/AOS issued in August 1987 to *Sl*. Isabelle Stone 'Red Lulu' (*L. sincorana* x *S. coccinea*), owned by Jerry Rehfield, will focus attention on *L. sincorana* as a potential breeder. However, like *L. pumila*, it generally produces only 1 or 2 flowers per inflorescence. This FCC was awarded on one flower with one bud on one inflorescence; the natural spread was 9.5 cm with petals 4.2 cm wide, having inherited the *S. coccinea* form. If we can find a way to increase the floriferousness of *L. sincorana*, we will have an excellent parent with long-lasting flowers.

Laelia jongheana has numerous awards beginning in 1978 (2 HCCs, 7 AMs, 1 CCM). This is a charming but endangered species not in wide distribution. Most hybrids seen to date are not as attractive as the

Slc. Precious Stones 'True Beauty', AM/AOS is an example of the shiny, leather-like spot-free hybrid resulting from a cross of *Cattleya aclandiae* x *Sl. Psyche*.



species itself. Look for white and semi-alba forms of this species to appear soon.

Encyclia citrina surprisingly has 18 awards as an *Encyclia* and seven when it was known as a *Cattleya*. Most *Encyclia* awards were issued in the 1980s with 2 HCCs, 11 AMs, 2 FCCs and 3 CCMs. As a *Cattleya* the awards to it were 1 HCC, 1 AM, 3 FCCs and 2 CCMs. Although highly regarded as a species, it is difficult to grow and to date has been a poor parent.

Encyclia mariae was also reclassified by taxonomists, for it once was known as *Epidendrum* and received 1 HCC, 2 AMs and 2 CCMs during the 1960s. Possibly the finest cross is *Epilaeliocattleya* Mae Bly (*Lc.* Ann Follis x *Epi. mariae*) bearing lush green flowers, often five per inflorescence and as large as 6" in natural spread. This cross won 3 HCCs and 4 AMs in the late 1970s and 1980s.

Cattleya aelandiae, boldly barred and spotted, has to be among the most intriguing *Cattleya* species of all. Awards began in 1966, but most were in the 1970s and 1980s — 7 HCCs and 5 AMs. Wild-collected plants are often difficult to grow; the sibling crosses are proving much better in this respect. One would think that the bold spots and bars would be dominant features in its progeny. Not necessarily. If you want to guarantee spotting in progeny, breed it with other spotted types such as *C. guttata*, *C. schilleriana* or even *C. loddigesii* (yes, there are random spots on flowers of some plants of this species). If you desire long-lasting, shiny, leather-like, almost spot-free hybrids, cross *C. aelandiae* with solid-colored flowers. If *Slc.* Dixie Jewels (Madge Fordyce x *C. aelandiae*), with bright, clear red flowers is crossed with clear-colored species such as *L. esalqueana* (to make *Lc.* Jungle Elf), *C. luteola* (*C.* Small World) and *C. aurantiaca* (*C.* Robin Colleen), there will still be a fair percentage of random spotting.

Cattleya schilleriana, a uniquely colored and marked species, closely resembles *C. aelandiae* but has mahogany coloring, and its sizeable blooms boast wavy, waxy

petals and a purple lip that has unique vertical striping. It received its AQ/AOS in 1957, but most awards were in the 1980s (3 HCCs, 6 AMs, 2 CCMs, 1 JC) during the influence of compact-growing cattleyas. It is a vigorously growing species, the best-known clone of which is 'Yardleys', AM/AOS.

Cattleya walkeriana began its awards with the variety *nobilior* in 1961. A few were awarded in 1970, but as the popularity of miniatures grew, many more awards were issued in the 1980s. In this species are lavender, white, semi-alba and blush-tinted blue color forms. Of the 18 awards, five were to white clones. The semi-albas and blues are still rare. Awards issued were 3 HCCs, 10 AMs, 1 FCC and 4 CCMs.

Laelia pumila began its 21 awards with two in 1963 and the majority in the late 1960s and 1980s. Awards were 10 HCCs, 9 AMs and 2 CCMs (four of these awards were to the rare alba form). I believe that awards to *L. pumila* and its hybrids will decrease for reasons that some may find difficult to understand. Obviously, this species and its hybrids are among the popular, round-petaled, full-form types that are so widely sought. On close study it becomes apparent that this species produces only one or two blooms per inflorescence; however, it does produce multiple front leads, so that there are several blooms on a plant at maturity. The flowers are not always long-lasting and will possibly fall short of the criteria that will guide future breeding for the rapidly developing "pot plant" market.

Cattleya aurantiaca would be considered at the upper limits of any list of miniatures, but without doubt it has contributed immensely to that group. It began receiving AOS awards in 1955, with the majority in the 1970s. The 32 awards are 10 HCCs, 11 AMs, 1 FCC, 1 CBM, 7 CMBs and 2 JCs. The majority of all clones are vivid orange, but recent awards include the rarer yellow and the FCC, white form. I've recently learned that a red form also exists, the result of a sibling cross. It may be possible to

begin a new line of breeding to secure a true red, pure *Cattleya*. This species will undoubtedly play a substantial role in producing hybrids for the "pot plant" market because of its ability to pass along bright color and multiple flowers per strong flower stem. Remember, use its pollen on other plants; do not use *C. aurantiaca* as the pod-bearing parent because self-fertilization occurs in many clones. Its best-known hybrids are *Slc. Jewel Box* (*C. aurantiaca* x *Anzac*) and *C. Chocolate Drop* (*guttata* x *aurantiaca*).

Cattleya skinneri — The AOS awards were first issued in 1954 with 2 HCCs, 10 AMs, 2 FCCs, 5 JCs and 24 CCMs given since. Anyone who has grown this species is aware that it is a terrific specimen plant, growing in many directions and sending up large clusters of lavender or white blooms in great abundance. That is undoubtedly the reason for the many Certificates of Cultural Merit. Note also that 14 of the 43 awards were to white clones. The question arises, "Why isn't this spring-blooming species used more in hybridizing today?" Could it be because the blooms do not last long enough by today's standards? If so, perhaps tetraploid conversion through the use of colchicine might be seriously considered.

Cattleya percivaliana is a winter-blooming species that is returning to popularity as a parent and can influence compact-growing and mid-sized flowers. Within the species are purple, semi-alba and alba color forms. The AOS awards list shows only 1 HCC and 2 AMs.

Cattleya loddigesii var. *harrisoniana* is also enjoying a resurgence of popularity. While the species received only 4 HCCs, 5 AMs and 7 CCMs in the late 1970s and 1980s, I predict that the recently awarded *C. loddigesii* var. *harrisoniana* 'Streeter's Choice' that received the FCC/AOS in July 1988 will call attention to the real beauty of

this species. This is by far the most fantastic *C. loddigesii* anyone has seen to date. Blooming with four flowers on one inflorescence, the magnificent petals were very full and the texture was so firm the blooms lasted over a month in July. The second inflorescence blooming a month later carried seven flowers. Exhibited by Robert Streeter of California, it is the finest species this writer has ever seen. Yes, it has been selfed and sibbed, and I guarantee you'll hear more about this unusual clone.

Cattleya intermedia. It is interesting to find the AOS has issued only six awards to this very popular species, 1 AM, 4 CCMs and 1 JC, and four of the awards to the alba form. There is no indication that the *aquinii* form was ever awarded. Since the *aquinii* form is in great demand and lovely in itself, one would assume that more would be submitted for award consideration. Perhaps we've all been too busy pollinating the flowers to submit them for recognition.

There appears to be confusion in regards to the true identity of several clones used for hybridizing, among them 'Ross' and 'Spencer'. These two plants have considerably larger growth habits. I personally believe them to be either *C. Okami* (*Suavior* x *warszewiczii*) or one of its hybrids. *Cattleya Suavior* is a primary cross between *C. intermedia* and *C. mendelii*; its splashed-petal forms resemble *C. intermedia* 'Aquinii'. Both 'Ross' and 'Spencer' clones occasionally have floral deformities and larger flowers than the regular *C. intermedia* 'Aquinii'.

Orchid friends have chastised me for failing to pass along observations about species and hybrids gained during the past 44 years of orchid growing. What you have read in this series is an attempt to formalize a portion of my observations so that others may benefit and possibly utilize them in their own growing and hybridizing efforts. ♦