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The BEGONIAN



The BEGONIAN

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INSIDE THIS ISSUE

The Cover: The central red dot on the leaf, the multiple bracts enveloping the emerging bud, and bright scarlet flowers (even if they do not appear orange red here because of the background) are all clues in the Peruvian Puzzle. Thelma O'Reilly is the photographer and tells her part in the newest installment in this ongoing Begonia Mystery in this issue. Next time there will be another part as Carrie Karegeannes discusses the history of these species, and we hope before long to bring you to the conclusion: the identity of *Begonia* U095.

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ABS NEWS

PRESIDENT'S MESSAGE

Thank you for your continued confidence in my ability to lead the American Begonia Society for another year.

While we did not accomplish all that we had hoped to, we did tie up some loose ends and clarify some issues. We will strive to do better in the coming year.

We had a very successful convention and show in September, and it was a pleasure for all to renew acquaintances with those we see so infrequently. We missed those who were unable to attend, but were pleased to see and meet those who were attending for the first time, or who had missed some of the more recent conventions. We do need to reaffirm our Aim to "Bring into friendly contact" all who love and grow Begonias.

The more we put into a project the more we get from it, so let us hear from you, and "give us a hand" in order that we may also "give a hand" to you.

Although it is early as I write this, it should be timely when you read it: Good Wishes for a Happy Holiday Season and Friendly Contact throughout the New Year.

Margaret Lee, ABS President

SOME CORRECTIONS

The front cover of the last issue was correctly dated September-October, but the date in the page footers was not updated and carries the wrong months. Fortunately,

the page numbers are correct. It will undoubtedly help you in the future if you note the correct dates on an early page in the previous issue.

Bookstore Manager Bob Bailey does really live at 4106 Madrona Road, Riverside, CA 92504. His address was updated in the July-August issue, but changed back to the old address in the last issue due to a phone call. Please send this sort of information in writing to prevent errors.

ABS ADOPTS UNIFORM TROPHY POLICY

At the convention, the members voted to adopt a policy of offering at all national conventions the opportunity to win all major awards and division trophies. The Showing is Sharing Trophy, which has been given at some of the recent conventions would be included.

BRANCH DIRECTORY REVISION

The directory of affiliated groups will be printed after the first of the year. Many branches change officers in January, with a large group having changed in early Fall. ABS Secretary Jeannette Gilbertson says that she has received very few notices recently. If your group has had new officers, please inform the Secretary so she may update her list.

Jeannette Gilbertson, ABS Secretary
410 JoAnn Circle, Vista, CA 92084.

BEGONIA COLLECTING IN PANAMA AND COSTA RICA IN 1986

W. Scott Hoover

The main purpose for a *Begonia* collecting expedition to Panama and Costa Rica was to fill a gap in my stomatal data. Having previously sampled *Begonia* from many areas of Mexico and Guatemala and all through the northern Andes, the one region where a gap existed was in Central America. This latest trip has now successfully accomplished that goal and resulted in the acquisition of some very interesting species, some of which are likely new to horticulture, if they can be propagated. A few may be species new to science. Table 1 summarizes the collection information from this trip, and Fig. 1 indicates collection locations.

Aside from the usual *Begonia* work which involves collecting pressed specimens, germplasm, and epidermal peels for stomatal work; photographing, making all ecological observations, and detailed recording of the geographical and regional locations of each species population, several other collecting activities were accomplished as well. One of these activities involved preserving leaf sections in FAA (chemical preservative) for later histological analysis. Dr. Fred Barkley and one of his graduate students discovered an important relationship between stomatal cluster size and number of epidermal cell layers among different species of *Begonia* (Boghdan and Barkley 1972). Their conclusions indicate that *Begonia* species with large stomatal clusters have many epidermal cell layers, while species with singly occurring stomata have single epidermal cell layers, and species with intermediate sized clusters have an intermediate number of cell layers. For my stomatal research, I needed field data to further substantiate their observations and determine variations between populations of a species occupying different ecological conditions.

Scott Hoover is co-chairman of the ABS Conservation Committee. Seeds from his trip are available through the Seed Fund. His address is 718 Henderson Road, Williamstown, MA 01267.

Such data will further enhance the ability to describe the evolutionary biology of stomatal clusters in *Begonia* and specifically assist in determining the functional significance of stomatal clusters.

Another operation involved collecting Araceae for Dr. Thomas Croat of the Missouri Botanical Garden in order to practice special techniques for collecting this diverse group. I am a Research Associate with the Missouri Botanical Garden. Dr. Croat is a very well-known tropical taxonomist, specializing in aroids, and is recognized to have one of the largest specimen collections in the world for one person. In order to conduct larger scale expeditions into remote areas, I have teamed up with Dr. Croat on two substantial grant applications. If the grants come through, the *Begonia* Society and individual members will benefit greatly by receiving germplasm from South America Andean species without having to contribute very much financially. Also, the ABS would be acknowledged along with the major funding agency in any resulting publications of mine.

The conservation objectives of this trip were fulfilled as usual, though a great deal more time should be spent collecting and documenting, as it should everywhere in the tropics. If the ABS could afford it, the ideal situation would be to have several permanent collectors on each continent who would just collect and document year round. Even without this situation, my efforts have made some dent in the problems because specimens are deposited in herbariums, germplasm is propagated and distributed, and a photographic record is made for all species and their habitats. Unless these professional methods are employed, the collecting of *Begonia* is not oriented toward a conservation objective.

Conservation methods are particularly evident when one can observe encroaching forest destruction around a *Begonia* population; it is just a matter of time before the entire population—in many instances, endemic species—is wiped out. Unfortunately, this is

GEOGRAPHICAL LOCATIONS OF COLLECTION SITES AREAS IN PANAMA AND COSTA RICA

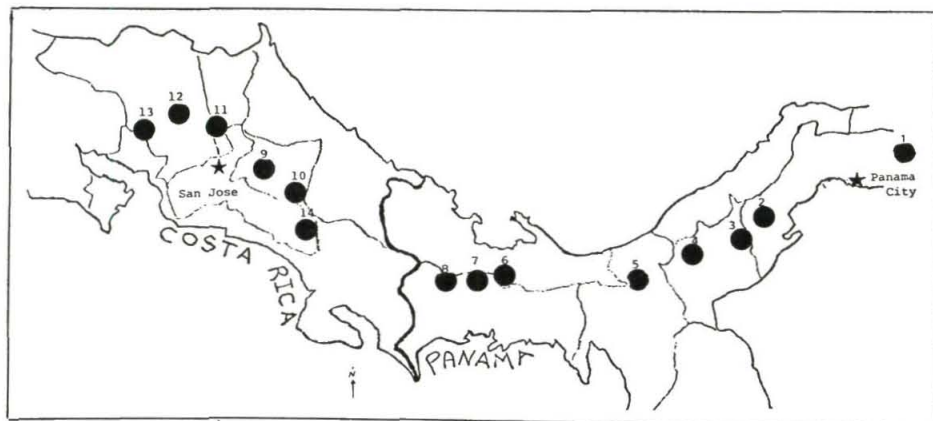


Figure 1

- | | |
|------------------|-----------------|
| 1. Carta | 8. Cerro Punta |
| 2. Cerro Campana | 9. Volcan Irazu |
| 3. El Valle | 10. Tapanti |
| 4. El Cope | 11. Volcan Poas |
| 5. Santa Fe | 12. Zarcero |
| 6. Fortuna | 13. Monteverde |
| 7. Boquete | 14. San Isidro |

A complete listing for each site of the collection numbers and numbers of specimens of epidermal peels and leaf sections is available upon request to the editor. Please send self-addressed, stamped envelope.

observed all too often. If I, or some other collector, is there to properly collect, at least we have a complete record of the species population. I can recall many instances where a species population is threatened and through conservation methods I have been able to preserve it. Let's continue our efforts and support more professional collecting trips; our efforts are making a difference; we are saving species from extinction.

I will report briefly on the species collected in Panama and Costa Rica, or at least as I have tentatively identified them. The species collected in Panama include the following: *B. alnifolia*, *conchifolia*, *croatii*, *estrellensis*, *glabra*, *guaduensis*, *involucrata*, *multinerva*, *quaternata*, *oaxacana*, *stigmata*, *tondouzii*, *urophylla*, *urtica*, several different *Gireoudia*, and several different *Rhizopavonia* species. The species from Costa Rica include the following: *B. alnifolia*, *cooperi*, *corredorana*, *estrellensis*, *fischeri*, *glabra*, *involucrata*, *multinerva*, *oaxacana*, *stigmata*, *udisilvestris*,

several *Gireoudia*, and *Rhizopavonia* species and one species whose section I do not know. Multiple collections were made from the majority of species. Most of the unidentified *Gireoudia* and *Rhizopavonia* species I only collected once and were species I could not identify at all. Hopefully, several will now be named (see Table 1).

A number of collections stand out as being most exciting either because the habitat was more interesting or because the species was one with which I was not familiar. It is difficult to select examples. As I review my notebook, I find all collections fascinating, so I must restrict myself to a few.

B. estrellensis, or what I tentatively have identified as this species, I first collected in the La Mesa area above Santa Fe in Coclé Province. This species was a small-leaved woody vine observed climbing nearly 25 feet up into a tree. It reminded me of the *B. microphylla* collections I had made in Venezuela.

A fantastic rainforest area is now accessible by road from the Fortuna Dam region of Chiriquí Province to the town of Chiriquí Grande, Bocas del Toro Province. The whole area is spectacular and several species were most interesting, one being a *Gireoudia* with thick, succulent leaves and petioles, a few-flowered inflorescence, and large (nearly two inches across) white flowers. The other interesting collection from Bocas del Toro was a species closely related to *B. alnifolia*, but with smaller leaves and flowers, and thinner

stem and petiole. This species had swarmed over a steep embankment, covering it with beautiful whitish pink flowers.

The Cerro Pate Macho area, Chiriqui, was reminiscent of the Choco area of north-western South America. I had to hike up a long trail starting at 4:00 p.m. The trail turned into a stream bed that flowed off the top of the mountain. The forest dripped with that perennial wetness that one only sees in the pluvial rainforests. Here *B. urtica* grew and another succulent type Gireoudia, possibly the same as the one from Bocas del Toro.

In Costa Rica, one of the great finds was *B. udisilvestris* on Cerro Muerte, San Jose State, at 2700 m, where it is perennially wet and quite cold. Several hours past Cerro Muerte, between the towns of San Isidro and Puerto Quepos, I collected a very succulent, epiphytic Gireoudia. It was a beautiful species growing on rotted logs and at the base of small trees; seedlings were observed growing on the ground, but not mature plants. Many other *Begonias* have special memories for me,

and I wish every *Begonia* lover could get to these remote, incredibly lovely places.

Recalling these collections around Cerro de la Muerte, there may be some debate about what I have tentatively identified as *B. udisilvestris* C.D.C. (*B. oaxacana* var. *stenoptera* had been tentatively identified from this area.) This was the only species I observed at the upper elevations (2700-2900 m). My reasons for this identification include the following:

1. Having collected *B. oaxacana* A.D.C. nearly 10 times, in Mexico, Guatemala, Panama, and other areas in Costa Rica, the Cerro de la Muerte species was intuitively distinct from any *B. oaxacana* I have ever seen.

2. Morphologically, *B. udisilvestris* is glabrous, except for a ring of trichomes at the apex of the petiole (Smith and Schubert 1958). *B. oaxacana* exhibits pubescence on its leaves and stems.

3. The Cerro de la Muerte species had leaf margins that were rimmed with a dark reddish color, and had a strongly apiculate leaf tip, both characters which I have not seen in *B.*

Table 1
COLLECTION SUMMARY

Taxa	# of Pressed Specimens	# of Species	# of Populations Sampled
<i>PANAMA</i>			
<i>Begonia</i>	205	20	41
Araceae	66	50 cuttings	33
<i>COSTA RICA</i>			
<i>Begonia</i>	230	20	46
Araceae	25	25 cuttings	10
Taxa	# of Epi-dermal Peels	# of Cell Sections	# of Photographs
<i>PANAMA</i>			
<i>Begonia</i>	410	410	75
Araceae	---	---	31
<i>COSTA RICA</i>			
<i>Begonia</i>	460	370	40
Araceae	---	---	15
<i>TOTAL COLLECTIONS - 2589</i>			



Gireoudia sp. (SH605) collected at 1970 m, San Isidro.



Rhizomatous sp. (SH587) collected at 1730 m, Zarcero area.

oaxacana, which does have an apiculate leaf tip, though not as exaggerated. My collection numbers for this species are 602 and 603, specimens having been deposited with the Missouri Botanical Garden and the National Museum, Costa Rica.

It is appropriate to make some remarks about the effort it takes to do this *Begonia* collecting (see Table 1 and Fig. 1). The 87 populations of *Begonia* sampled in Panama and Costa Rica were made during a period of 26 days, of which nearly half were spent in plane or bus transportation, obtaining permits and supplies, and other logistical matters; only 15 days were spent making the actual 2,589 collections! This amounted to an average of 14 hours per day for my assistant and me. Some people may think I am mad to work this hard for no pay; as a matter of fact, this trip, like most, cost me several hundred dollars. The reason for my willingness to push so hard is that I am personally driven to explore. This type of *Begonia* work will never pay me or anyone else a salary. One does it because they



Gireoudia sp. (SH545) collected at 530 m in gorge along route to Chiriqui Grande, Bocas del Toro, Panama.



Gireoudia sp. (SH586) collected at 1800 m, Zarcero



Gireoudia sp. (SH557) collected at 2050 m, Cerro Punto Macho, Panama

love it, and recognize their contribution toward the conservation of earth's diversity of life.

An observation that may be of interest to some people is that Panama and Costa Rica are the most westernized Third World countries in which I have ever worked. These would be two areas, along with Mexico, where I would consider taking a small group of interested *Begonia* lovers. If anyone has an interest in my leading a *Begonia* tour, please let me know. It might also be possible to have several people accompany me on a research trip in the future.

At any rate, let's keep up the good work and continue to support *Begonia* collecting expeditions before we don't have the opportunity to collect any more. We are making progress.

Literature Cited:

- Boghdan, K. S. and F. A. Barkley. 1972. Stomatal Patterns in the genus *Begonia*. *Phytologia* 23 (4): 327-333.
- Goldsmith, L. 1986. Costa Rica: *Begonia* Treasure Trove. *Begonian* 53:4-7.
- Smith, L. B. and B. G. Schubert. 1958. Flora of Panama (Begoniaceae) *Ann. of Miss. Bot. Gard.* 45:44-67.

I would like to thank the following for their support of this field work: Howard and Barbara Berg, Ed and Phyllis Bates, Ralph and Mabel Corwin, Martin Johnson, Tim and Thelma O'Reilly, Ed and Millie Thompson, Rudolf and Margaret Ziesenhennel, Barbara Philip Hal and Joan Campbell. Also, the contribution of the American Begonia Society and the following branches is gratefully appreciated: Buxton Branch, Chicago Branch, Dallas Area Branch, and Palomar Branch.

BEGONIA STOMATA PUBLISHED IN BIOTROPICA

Early this year a scientific paper was published that Scott Hoover wrote about his research on stomata of Mexican species (completed in 1984), and the reference and abstract of that work are included here.

Stomata and Stomatal Clusters in *Begonia*: Ecological Response in Two Mexican Species. *Biotropica* 18(1): 16-21, 1986.

Abstract

Many species in the genus *Begonia* have stomata that occur in clusters; stomatal clusters are an unusual character and have an extremely limited distribution among the higher plants. Six populations of *Begonia heracleifolia* Cham. et Schlecht. and nine populations of *B. nelumbiifolia* Cham. et Schlecht. were sampled from tropical forests in Mexico to determine the ecological response of the stomata and stomatal clusters of these species. Several stomatal characters, including mean cluster size, number of stomata/cluster, stomatal length, and number of stomata/mm², were analyzed to determine variation within and between populations; the latter three characters are responsive to elevation in *B. nelumbiifolia*, but only mean cluster size and number of stomata/mm² are responsive to elevation in *B. heracleifolia*.

Ecological evidence from this study supports the hypothesis that stomatal clusters in *Begonia* assist in water conservation. A distributional analysis of sympatric populations of these species at a waterfall site in Chiapas indicates that the relative density of *B. nelumbiifolia* is greater near the pool formed by the falls, and that the relative density of *B. heracleifolia* is greater away from the pool. *B. nelumbiifolia* has a lower mean cluster size and a lower range of cluster sizes than *B. heracleifolia*. The hypothesis is further supported by differences in the range of cluster sizes between populations occupying different habitats and substrate types: populations growing on rocks near waterfalls have larger stomatal clusters than populations collected from soil substrates.

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BEGONIA SPECIES FROM MEXICO

Tamsin Boardman

The United States has no native *Begonia*, but our neighbor to the south, Mexico, has an abundance of them: more than 75 named species have been discovered in Mexico since the Spanish conquistadors arrived in the early 1500s, and more recent discoveries await classification. In addition, *Begonia* which were initially discovered in Central America are also found as natives in Mexico.

Imagine a cornucopia, line it with mountain ranges on the east (the Sierra Madre Oriental, with peaks from 7,000' to 10,000') and the west (the Sierra Madre Occidental, with peaks from 6,000' to 10,000'), and then bring the mountains together in the south to form the Sierra Madre del Sur, the range with the highest peaks and the most volcanic activity. All through the mountains are mini-environments formed by crevasses and valleys; between the northern ranges lies a high and mostly arid plateau; along the west snakes the long, skinny peninsula of Baja California, where rainfall is 10" or less per year; and at the end of the cornucopia, jutting out into the Gulf of Mexico on the southwest is a limestone ledge forming the peninsula of Yucatan.

The mountains are the dominant factor in the climate of the country. In Mexico temperature is determined by altitude, not latitude. Low coastal areas have temperatures of 75° and up; elevations of 3,000' to 6,000', 65-75°; 6,000' to 10,000', 55-65°; over 10,000', temperatures under 50°; and above 14,000', temperatures under 32°—and this in a country often supposed to be "tropical." In Mexico, four peaks with year-around snow overlook valleys of eternal spring.

Rainfall is as varied as altitude. Mexico has not four seasons, but two: rainy and dry. For most of the country, that means six months

ABS Third Vice President Tamsin Boardman, who was raised in Mexico, explains the general geography to give clues to desirable growing environments. This was the basis for a seminar at the last Southwestern Regional Get-Together. Her address is Box 249, Roanoke, TX 76762.

of daily rain, six months of little or no rain; but there are extremes, particularly along the west, where rainfall is sparse and the rainy season may last only a few weeks, and along the east coast, where some regions in the state of Tabasco are underwater for nine months of the year.

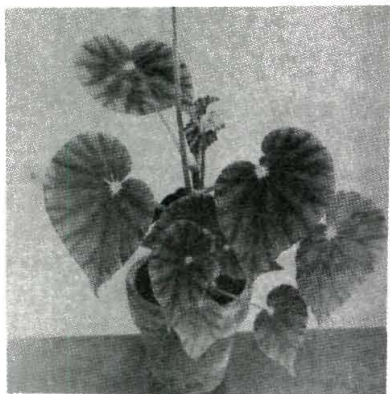
As might be expected with so many climates, Mexico has a great diversity of vegetation. Pines and cedars, grass savannas, desert shrubs, deciduous forest, and tropical rainforest are all found, often surprisingly close together, as the mountains hold the rain on one area and deny it to another.

Given the on-again, off-again nature of rainfall throughout the country, tuberous and rhizomatous *Begonia* would be what you would expect to find in Mexico: the tuberous types can go dormant, and the rhizomatous types store moisture, during the long dry season. Mexico has ten tuberous *Begonia* the best known being *B. gracilis* (also known as *B. martiana* and "the Hollyhock *Begonia*"). Others are *B. abaculoides*, *monophylla*, *palmeri*, *sandtii*, *biserrata*, *bulbillifera*, *boissieri*, *viscida*, and *B. cavum*. *B. cavum* is so named because it has been found growing in caves. *B. viscida* is also of interest in that it has pale green flowers.

The rhizomatous *Begonia* as *B. bowerae*, *carriea*, *heracleifolia*, *thiemei* (called *macdougalii* for years), *B. manicata*, *kenworthyae*, *imperialis*, and *B. pustulata* were all discovered in Mexico. Of interest also is *B. violifolia*, with "yellowish white flowers with red hairs," (1) an exception to the rule that *Begonia* with yellow flowers come from Africa.

It might be more of a surprise to learn that Mexico has shrublike varieties (twelve, including *B. metallica*); thick-stemmed varieties (six, of which *B. chivatoa* and *B. lindleyana* are perhaps best known); trailing-scandent varieties (eight, including *B. glabra* and four forms of *B. mazae*); and even a *Semperflorens* type, *B. franconis*. *B. franconis*, incidentally, is reputed to be one of the more tasty be-

(1) Mildred L. and Edward J. Thompson, *Begonias: The Complete Reference Guide*, New York Times Books, 1981. P. 330.



B. mazae, a rhizomatous Mexican species

gonias, and it is interesting to speculate as to whether the Aztecs or Mayas used it as food.

Ever since Joseph von Warscewicz crossed *B. hydrocotylifolia* with *B. manicata* in 1845 to produce *B. 'Erythrophylla'*, hybridizers have been fascinated with the Mexican species. A partial listing shows Mexican parentage for many of our favorite hybrids. (See Table 1.)

The most amazing Mexican *Begonia* for the hybridizer, however, has been *B. bowerae*. In 1981, Rudolf Ziesenhenné reported on 583 of its hybrids in the December *Begonian*.

Where can the tourist see some of the beautiful Mexican species in their native habitat? Two of the easiest places are at Fortín de las Flores, a lovely mountain town on the road from Mexico City to Veracruz, and at the Maya ruins of Palenque, where rhizomatous *Begonia* grow in such riotous profusion that machete-armed groundskeepers hack them back so that the pyramids are not swallowed. Should you want to bring back their cuttings, the U.S. Dept. of Agriculture allows plant materials with no soil attached to enter—check with your state agricultural department before leaving to make sure their regulations are in accord.

Despite the fact that Mexico boasted advanced civilizations before the Conquest, despite the fact that Europeans arrived several centuries ago, despite scientific interest in Mexico's flora, there are still areas where plants have not been cataloged. Maybe there are still marvelous Mexican *Begonias* to come.

Table 1.
Some Hybrids from Mexican Species

The parent species is listed with its cultivars beneath:

- B. manicata*
 - 'Freddie'
 - 'Verde Grande'
 - 'Bob Hamm'
 - 'Crestabruchii'
 - B. metallica*
 - 'Thurstonii'
 - 'Alleryi'
 - 'Margaritae'
 - B. carolineifolia*
 - 'Carol Mac'
 - 'Carol Star'
 - 'Dusky Shadows'
 - 'Palmgarten'
 - B. mazae*
 - 'Oceanside'
 - 'Ricky Minter'
 - 'Tamo'
 - B. incarnata*
 - 'Florence Carrell'
 - 'Tingley Mallet'
 - 'Sylvia's Sweetheart'
 - B. carrieae*
 - 'Lospe'
 - 'Misty Meadows'
 - 'Munchkin'
 - 'Oliver Twist'
 - 'Troll'
 - B. hydrocotylifolia*
 - 'Posy Wahl'
 - 'Question Mark'
 - 'Rip Van Winkle'
 - B. nigro-venia*
 - 'Delia Marleau'
 - 'Helen Krauss'
- and the Skeezer grex

For other contributions, see "Imperialis Hybrids Infinitum," by Carlos Jardínero, in the *Begonian*, April, 1953, and "The Distinctive-Foliage Pustulated *Begonias*," by Elda Haring, Sept. 1981.

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THE BIG TUBERHYBRIDA

George McCormick

Within a period of a little more than 100 years an international group of breeders developed the small insignificant flowers of the wild Andean tuberous species to produce the strikingly large flowers and rich colors available today.

The first of these species was introduced into commerce in 1848 by Henderson of London, namely, *B. cinnabarina* Hook. and also *B. clarkei* Hook. Seven species were imported around 1854 to which all Tuberhybrida varieties are related in some way. It is accepted that Veitch of London were the first to produce hybrids from these species. From 1840 to 1882 Veitch introduced 18 tuberous begonia hybrids, all raised by their head gardener John Seden. The first of these, named after him as *B. 'Sedenii'*, was introduced into commerce in 1840. Veitch abandoned tuberous begonia breeding in 1882, his catalog of 1884 mentions no tuberous begonias. Only in 1895 did his catalog offer tuberous begonias and then only in mixed colors. Meanwhile they concentrated their efforts towards the winter-flowering begonias. By this time the breeding of these hybrids was widespread, and improvements were becoming available through careful selection.

As far as the large-flowered hybrid is concerned, Blackmore and Langdon, who joined forces in 1901, must be given the credit for the rapid improvement which is now available to the present growing public. The flowers of today are a marvelous example of the time and patience exercised in the production of these hybrids as we know them. Begonia production is now taken up in a large way with the Belgian growers leading the way in producing between 40 and 80 million tubers every year. Six to eight million are produced in nurseries in the U.S.A. We also have our own well-known



Sheila McCormick with her flower *B. 'Sheila Mae'*, a yellow picotee.

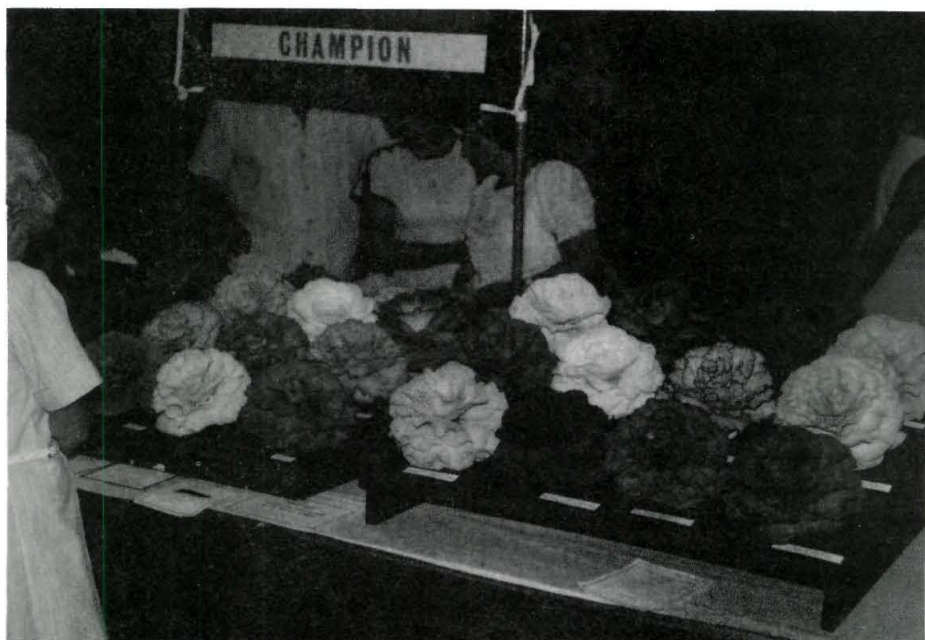
nurseries of Blackmore and Langdon and T. White and Son at Inchinnan growing to a lesser degree.

This is just a short version as to how these magnificent flowers originated, and the personal appreciation we owe to these early and present day hybridizers.

The amateur grower has been taking a keen interest in a small way in the growing of seedlings, either by producing their own seed or by purchasing it from the professional growers. The most successful of our own Scottish hybridists was the late Alan King, and some of his varieties are still gracing our greenhouses and show benches with distinction.

It is my firm belief if you hope to be successful in the production of show quality flowers, then you must produce your own seed. This is quite a simple matter providing you can acquire pollen or fertile male flowers, this being the difficult part. In my experience I have found that cuttings taken from selected parents in midseason, from mid-July to late August, give you the best chance of securing pollen-bearing flowers.

George McCormick is the grower of record-breaking tuberous begonias. See "Begonias in Scotland", Begonian, Nov-Dec 1985, for related information. His address is Rosedale Cottage, Kirkconnel, Dumfriesshire, DG4 6NJ, Scotland.



George McCormick's board in 1984 show earned title of
"British Begonia Champion."

Once rooted, pot the cuttings into 2 1/2-inch pots, and let the plant flower on the first bud. These male flowers can be either single or semidouble. In the meantime you should let your earlier cuttings of potential parent plants flower at will, taking out the male flowers and leaving the females. This will ensure you have a good choice of females, if and when, you secure pollen flowers. I never use other than selected proven parents, never first year seedlings.

The fertilizing of the females is a very simple process. Take a small camel hair brush and gently brush it across your pollen flower, transferring it to your female. This is best done from midday until early afternoon, as you will find the female flowers more receptive during this period.

If your cross is successful your female flower will fling its petals from roughly a week onwards. If your female doesn't fling its petals, don't assume your pod isn't fertile. The majority of my female flowers retain their petals for upwards of a month in some instances, and have still proved fertile. Leave

your pods on the plant until ripe and just before the pod starts to split, take it off and put in a paper bag. Leave in a warm place for a day or two, and it will be ready to discard its seed. Put seed into a small envelope with parents' names. I use a number and note the number and parentage in a diary. If you wish to be successful, it's important that you record everything. Don't leave it to memory. This is not a haphazard exercise.

Now you have the seed, which you have stored in a cool, though frost free, environment until you require it and intend to grow it. The usual practice here is to grow seedlings in the garden. If so, then you can't start the seeds too soon to ensure you have really good plants at planting time. The earlier you start the better the plants you will have to plant out. On the other hand, if, like me, you wish to grow them in pots, then the beginning of February is ample time. In the first instance you move the plants on as necessary until you are ready for planting. If you intend growing them in pots, then keep moving them on in the usual manner. *(Turn to page 162)*

A PERUVIAN PUZZLE

Thelma O'Reilly

"It's blooming! It's lovely; do you have time to come see it?" The phone call was from Mabel Corwin informing me that *B. U095*, an interesting plant grown from Peruvian collected seed, was blooming.

The following afternoon I was on my way to Vista, seeking additional clues to one of the most baffling begonia mysteries I have encountered. This involves three well-known names in *Begonia* literature, *Begonia lynchiana*, *B. roezlii*, and *B. bracteosa*. In 1984 another name entered the scene, *B. cyathophora*.

Until recently, the closest I came to any one of these species was through three sources: first, a thick file of research material, including letters, illustrations, and descriptions; second, a slide of *Curtis Botanical Magazine* Plate 6758 of *B. lynchiana* Hooker f. (*B. roezlii* Lynch. non Regel); and third, growing and studying *B. 'Rosea-Gigantea'* (*B. semperflorens* × *B. roezlii*), a 1883 hybrid by Lemoine.

This hybrid was recommended by Connie Bower when I attended my first Alfred D. Robinson Branch meeting 22 years ago. She said, "This is one of the finest winter-flowering begonias, with blazing red coloration. I grew it thirty years ago. It is difficult to obtain and grow but worth all your efforts."

After a three year search, I found it in Logee's catalog. It is a riot of scarlet red flowers that bloom from late fall through early spring, rarely branching, and usually dying if a cutting is taken. I hope Joy Martin will share Logee's cultural secrets. It is still listed in their catalog.

For 15 years I have studied the strong similarities between the slide and descriptions of *B. lynchiana* and *B. 'Rosea-Gigantea'*. They share bright green, glabrous leaves with a bright red spot at the leaf-petiole junction, scarlet red flowers, and a nonbranching growth habit.

Thelma O'Reilly, 10942 Sunray Place, La Mesa, CA 92041, is the director of the unidentified species project, a part of the ABS Nomenclature Committee.



Curtis's Botanical Magazine pl. 6758 of *Rhizopavonia B. roezlii (lynchiana)*.

Let us trace *B. U095* to its origin. In September 1982, Stephen Morgan, curator of the Botanic Gardens at University of California, Riverside, and Dr. Sherman Carlquist of Pomona College and Claremont Graduate School in California took a two month collecting trip to Peru and Chile. Although not a begonia grower, Morgan arranged to collect available begonia seeds for two friends.

On Friday, September 10 Morgan collected seed of a *Begonia* described as follows: cane-like, to 1 m tall, bright red pink flowers, showy; leaves nondescript, reddish on backs. Collecting site was east of Villa Rica, Peru, in tropical forest with cool nights. His records show that this begonia was growing with tree ferns, aspleniums, pityrogrammas, and other begonia. Seed from this species, along with two different *Begonia* collections were sent to Patrick Worley directly from Peru.

The next clue shows that Worley requested three U-numbers for the seed, and they were assigned, with U095 given to the one described above.

During a visit to Mabel Corwin in 1984, I observed a begonia with huge stipules and



Michael Ludwig's plant (left to right): leaf and open inflorescence, floral bracts and emerging inflorescence, stipule scars and red appendages which do not develop. See page 166.

leaves remarkably like *B. 'Rosea-Gigantea'*, although of smaller size. Mabel said it was a species from Peru, raised from seed supplied by Worley. I was excited and told Mabel it might be *B. bracteosa*. Checking with Worley later, he reported that he lost all his seedlings from *B. U095* and the other seeds did not germinate.

During the next year I kept a close watch over Mabel's plant. After taking cuttings her specimen plant died. She shared rooted cuttings with Michael Ludwig and me. I watched mine die back, node by node, several months later.

Then in October 1985, I received Mabel's message that *B. U095* was blooming. It was late afternoon when I arrived in Vista, and I was dazzled by two large, scarlet red inflorescences on the plant. Mabel and I noted that one inflorescence held all female flowers, the males having bloomed and dropped; the other held all male flowers, with a few tiny female buds forming. The slides I took were of poor quality. Without question, a strong resemblance exists between *B. U095* and the Curtis plate of *B. lynchiana* Hooker f. and *B. 'Rosea-Gigantea'*. Mabel self-pollinated *B. U095*, and many young plants were available at Pua Nani Begonias in San Diego.

In February 1986, Michael Ludwig called with more exciting news. His *Begonia U095*

was in bud, and a broken stem was rooted and forming an inflorescence, which he offered to me to study. He generously brought both plants to a committee meeting so I could take slides. This time the slides were spectacular. After the photography session, we carefully removed the two huge, red-tinged bracts that were wrapped completely around one of the bud clusters (overlapping) and found two more reddish bracts that were slightly smaller than the outer two. It appeared to us that there were three sets of bracts on each bloom cluster, the last set quickly drying and falling when the peduncle reaches its full height and buds start to swell. Another important, unusual trait is that each bract is deeply divided.

Irish Luck deserted me when two days later the wind knocked my plant over and the lone emerging inflorescence broke off. The plant is now about 2 1/2 feet high and should bloom at the end of this year. I'll make a complete description of all floral parts.

In 1984 Lyman B. Smith and Dieter Wasshausen published in *Phytologia* 54:469 that *B. lynchiana* Hooker f. = *B. cyathophora* P. & E. As soon as I can obtain complete herbarium material of the flowers, we'll see if Smith & Wasshausen identify *B. U095* as *B. cyathophora*.

My appreciation to Stephen Morgan for clarifying the records of *B. U095* and sharing his field notes for this article.

GROWING FROM SEEDS

Jan Doorenbos

When asked about an article on producing seeds, former Seed Fund Director Joy Porter said there was none better than that Dr. Doorenbos had already written. It is reprinted here from the July 1975 issue with our heartfelt thanks for all his efforts on behalf of begonia growers.

As everybody knows, begonias can be propagated by cuttings. Most species root very easily, only a few (e.g. *B. platanifolia*) are really difficult. Several species are also capable of regenerating buds. Such species can be grown from leaf cuttings, a very rapid way of propagation for such diverse species as *B. prismatocarpa*, *B. sudjanae*, *B. bogneri* and of course *B. rex* and its hybrids.

Begonias can also be reproduced from seed, but many amateur growers seem to find this difficult; they cannot get their plants to produce seed, and once they have it they don't know how to sow it or how to nurse the young seedlings. This is a pity, because propagation by seed has several advantages over propagation by cuttings. It may sound unbelievable, but it is often easier and quicker to grow a begonia plant from a minute, almost invisible seed than from a sizable cutting. In the second place, seedlings are generally troublefree, while cuttings always take all the troubles of the parent plant (virus, bacteria, nematodes, mites, mildew, as the case may be) with them. A third advantage is that a plant usually produces many more seeds than cuttings, so that the rate of multiplication is much higher. Moreover, seed is easier to ship.

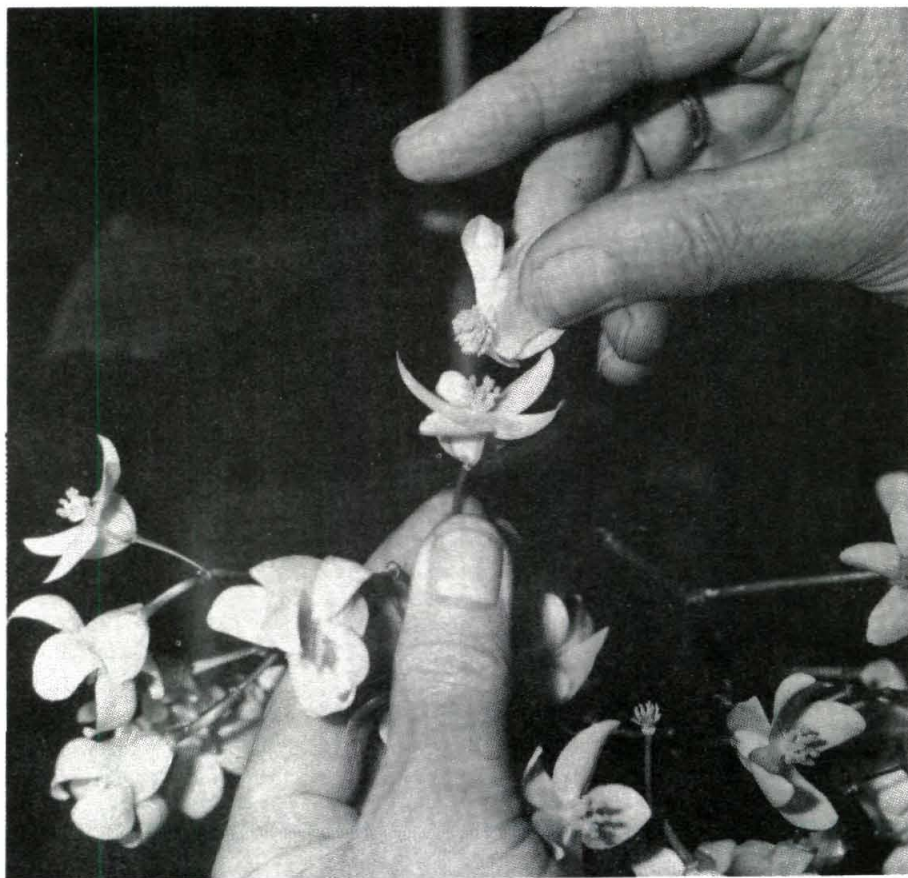
In order to get seed, one must have both anthers and pistils. In *Begonia* these never (except as an abnormality) occur in the same flower. In other words, *Begonia* flowers are unisexual: they are either male (with anthers) or female (with pistils).

Dr. Jan Doorenbos of the Dept. of Horticulture, Agricultural University. P.O. Box 30, Wageningen, The Netherlands, is well known for his work with Begonia species. He has supplied seeds, articles, and photographs as well as advice to ABS members.

As a rule, *Begonia* are monoecious; the male and female flowers are found on the same plant. A few species, however, are dioecious: a given plant forms either male or female flowers, but never both. Examples are *B. viscida* and certain forms of *B. micranthera*. It is sometimes very hard to tell if a certain species is monoecious or dioecious. Some plants may form only female flowers for months or even years on end, and then suddenly male flowers will appear. I have observed this in several African species, for instance *B. mauricei*, *B. molleri* and certain forms of *B. mannii*. The opposite, male flowers and only occasionally female flowers, is found in *B. squamulosa*. Apparently this not only occurs under greenhouse conditions but also in the wild. Several species have been described as dioecious which are in reality monoecious, for instance, *B. squamulosa*. Factors like plant age, temperature, light intensity, and daylength may play a role here, although this has not been clarified yet. It would also be interesting to see if the formation of male flowers is stimulated by the application of gibberellin and the formation of female flowers by auxin or by an ethylene-releasing compound like etephon.

In some *Begonia* (e.g. *B. herbacea* and *B. squamulosa*) the male and female flowers are borne separately, but in the majority of species they are to be found in the same inflorescence. Invariably, the male flowers are the first to bloom. Often there are still male flowers on the inflorescence when the female flowers open, but there are also many species (*B. acida*, *B. vitifolia*, *B. fuchsoides*) in which all male flowers have been shed before the female ones appear. In these cases one may have a profusely flowering plant and yet be unable to produce seed, unless one has the foresight to store pollen, which will be discussed later on.

Considering the unisexual flowers and the way they are grouped in the inflorescence one would expect *Begonia* to be typically outbreeding plants. However, there are some species, e.g. *B. hirtella* and *B. franconis*, which have developed mechanisms for self-pollination (see the *Begonian*, November



How to pollinate a begonia: a male flower is held above a female flower and gently tapped with forefinger to liberate the pollen.

1970). Also species with dense inflorescences in which male and female flowers are open at the same time (e.g. *B. dregei*) may set seed without any outside help. Most species, however, need some agent, other than gravity, to transport the pollen to the stigmas.

It is still unknown how female begonia flowers are pollinated in nature. In view of the showy petals and the strong smell of several species it seems reasonable to suppose that insects play an essential role. In our green houses, however, the only insect that visits the flowers is the honey bee which collects pollen from the male flowers but does not bring about pollination as it never visits a female flower. (How it tells them apart is a mystery, but it must of course be remembered that the senses of sight and smell of a bee are quite

different from ours).

Some people have suggested to me that the wind would be the pollinating agent in begonias, but I am inclined to keep to the insect hypothesis. Two observations are pertinent here. The first is that the buds of *Begonia squamulosa* are covered with nectar. True, it sits on the outside rather than the inside of the petals, but nevertheless it is hard to see what its function could be if it is not to attract insects to the inflorescence. In the second place I would like to point out that the male flower of *Symbegonia sanguinea* has the shape of a half-closed shell (the petals are partly joined) and it is hard to see what other agent than an insect could bring the pollen to the stigmas of the female flower which are at the bottom of an inch-long tube.

The absence of natural pollinators in our greenhouses has the advantage that (unless one wants to do scientific experiments) no special measures are required to prevent undesired cross-pollination. We ourselves have to be the pollinating agent.

The pollen is formed in the anthers. These are round or oblong, and usually numerous. They open by slits or pores to release the pollen, at least in the natural habitat. Under our greenhouse conditions the anthers often remain closed. To cause them to open, it often helps to let the flower dry out. Producers of hybrid seed of *B. semperflorens* pick the male flowers and leave them overnight under a strong lamp.

To see if the pollen is being released one can take a flower between thumb and second finger of the right hand and hold it above the thumb nail of the left hand. The flower is now tapped gently with the forefinger of the right hand. If all is well the pollen will be seen to descend on the thumb nail. To pollinate, the same procedure is repeated above the stigmas of a female flower (see photo).

If the anther does not open by itself, one can try to open it with a needle. This usually means that the pollen must be brought on the female flowers by mechanical means. One should take care not to damage the stigmas; the best instrument to use is a soft artist's brush.

In some cases, there is no pollen. Sometimes the male flower drops off prematurely. This is usually an indication that the plant in question is a hybrid, but bud drop may also occur in true species when these are grown under adverse conditions (too wet, too dry, too dark, etc.). Some species, for instance *B. brevirimosa*, *B. serratifolia* and *B. violifolia*, have never formed pollen with us yet. In *B. venusta* and occasionally in other Asiatic species the anthers are enlarged and spongy, and no pollen is formed. No doubt the growing conditions are at fault, but we don't know yet in which way.

When the female flowers open later than the male ones, one can try to store the pollen. I am not aware of any serious work on this aspect with begonias but it seems safe to advise that if pollen is to be stored it should be kept

out of the light in a cool and dry place. Perhaps it keeps well in a refrigerator (many pollens do) but if one starts to experiment in this direction one should take care that when the pollen is taken out it should warm up slowly and in a closed container, so that no water can condense on it which would have a detrimental effect.

In most species plants will set seed with their own pollen. There are a few cases of self-incompatibility, however. Our plants of *B. minor* (syn. *B. nitida*) form clouds of pollen, but never set seed. The same holds true, unfortunately, for *Symbegonia sanguinea*. Before concluding that these species are incompatible we must of course consider the possibility that the external conditions are not right (although I have pollinated *B. minor* in all seasons). We have been pollinating *B. staudtii* for years but only once obtained a good seed set. When a plant sets seed after self-pollination there usually is no sign of a decrease of vigour of the seedlings as a result of inbreeding. However, adverse effects of inbreeding have been reported for tuberous begonias, so it seems wise to cross-pollinate the plants whenever possible.

When the female flower has been pollinated fertilization can take place. The first outside indication that this has taken place is that the petals fall off. Unfertilized flowers drop off as a whole, although in some cases, e.g. *B. incarnata* and *B. malabarica*, they may remain on the plants for months. These species and a few others, e.g. *B. wollnyi*, are also exceptional in that in fertilized flowers the petals are retained (and sometimes even stay colored) until the fruit is ripe.

The fact that the fruit has set does not mean that it will also reach maturity. The developing seeds produce hormones which attract food substances to the fruit. If the number of seeds is too small, this food stream is not sufficient and the fruit aborts. The same happens when too small a number of fruits develops on a large inflorescence. In this case, the whole inflorescence drops off. Therefore, when pollinating plants with large inflorescences (*B. vitifolia* var. *grandis*, *B. parviflora* A.O.) one has to take care to pollinate a large number of female flowers. The shedding of fruits or

whole inflorescences may be prevented by the application of an auxin (e.g. naphthyl acetic acid). In this way it is sometimes possible to obtain seed from plants where self- or cross-pollination would otherwise be unsuccessful. However, this technique is perhaps a bit too sophisticated for the amateur.

The fruits of begonias are very diverse. Most species have dry fruits but there are also species with spindlelike or round fleshy fruits. The dry fruits open with slits at the bottom end (near the stem). These should be harvested timely, preferably just before they open, i.e. at the moment the fruit stem turns brown, otherwise the seed will be lost. The fleshy fruits of species like *B. mollerii* and *B. seychellensis* have a green leathery coat which envelops spongy tissue (yellow in *B. mollerii*, red in *B. seychellensis*) in which the seeds are embedded. These fruits split open lengthwise when ripe. The fruits of *B. ficicola* and others of the same section (Scutobegonia) do not seem to open at all. When they are ripe, the fleshy tissue just rots away and the seeds are liberated. These seeds are very difficult to harvest.

The seeds of begonias are usually round or elliptic, sometimes spindlelike (e.g. *B. eminii*) or beaked (e.g. *B. solanathera*). Their color is brown in various shades (yellowish, light, dark, etc.) The seed of *B. villipetiola* is orange, that of *B. olsoniae* (syn. *B. vellozoana*) is purple. In storage the seed of most species becomes dark brown in the long run. The seed can be kept for months without losing its viability. Even seed stored for over a year often germinates.

Shipping seed is more difficult than one would think. In the first place, the tiny seeds creep through every slit of a paper bag. These bags have therefore to be sealed off very carefully with tape. In the second place, the seed is very sensitive to the pressure that is likely to occur in the mail bags. If the seed bags are not protected by cotton wool, plastic foam or a similar shock absorber it is likely to lose its capacity to germinate. It may still look all right to the naked eye, but the microscope will reveal the cracks caused by pressure. I have received seed irretrievably damaged by the postmark!

Articles By Jan Doorenbos

The month, year, titles, and page numbers of articles written by Dr. Doorenbos have been printed in the *Begonian* are listed here, 30 in all.

- Apr 1969. Colchicine Treatment of *Begonia*, cover, 75, 76-7, 94
- Sep 1970. Chromosome Numbers in Begonias, 203-4, 207
- Oct 1970. Chromosome Numbers (continued), 233-4
- Nov 1970. Self-Pollinating Begonias, 251-2
- Jun 1971. An Unusual Begoniaceous Plant, cover, 127-8
- May 1972. Chromosome Numbers, 102-3
- Oct 1972. What is *Begonia* 'Fireflush'?-1, 230-1
- Aug 1973. *Begonia acaulis*, cover, 171
- Dec 1973. Breeding Elatior Begonias, 275-278, 290-1
- Mar 1974. What is *Begonia* 'Tingley Mallet'? 72-3
- May 1974. Chromosome Numbers in *Begonia*, 129-32
- Jul 1974. *Begonia* 'Tripetala' is *Begonia* \times sunorchis, 168-9, 193
- Feb 1975. What is *Begonia* 'Fireflush'? (Part 2), 41, 49
- Feb 1975. Another *Symbegonia*, 42-3
- Jul 1975. How to Produce Begonia Seed, 159-163, 165
- Sep 1975. How *Begonia wallichiana* Got Its Name by Mistake, 213-5
- Apr 1976. X-ray Induced Mutations in *Begonia* \times hiemalis, 97-9
- Aug 1976. Begonia Mysteries-1 (*lynchiana* et al), 211-3, 227
- Sep 1976. *Begonia* 'Kew species', 246-9
- Oct 1976. Begonia Mysteries-2 ('alnifolia'), 262-4
- Oct 1976. *Begonia* 'Velvet Queen', 271
- Aug 1978. The Omati Begonia Cultivated, 199-201
- Oct 1979. *B. vittifolia* and Other Elusive Treelike Begonias, 234-40
- Jan 1980. The Yellow-Flowering Species From Africa, 12-6
- Feb 1980. More of the Fascinating Yellow Flowerers, 34-7
- Apr 1980. *B. rhopalocarpa*, a *Begonia* With Colorful Fruit, 102-3
- Apr 1980. Borneo's Large-flowered *B. burbidgei*, 105, 112
- Aug 1980. Two Species from Java New to Cultivation, 213-5
- Sep 1980. *B. lindleyana*: Straightening Out the Confusion, 244-8, 253
- Dec 1980. A Farewell to *Begonia* "nurii," 326-7
- Jan 1981. A Begonia People Grow as a Vegetable, 14, 17
- May 1981. *B. californica*: Is It Really *B. boissieri*? 108-10
- Jun 1981. Lots of Names, But It's *B. oxyloba*, 136-8
- M-A 1982. *B. pearcei*: a Favorite Early Tuberous Species, 30-2, 39

Dr. R. A. H. Legro is co-author of the articles dealing with chromosome numbers. J. J. Karper is co-author of article on X-ray mutations. Many photographs that appeared in the articles were taken by R. Jansen.

ERRATA

- Page 17, lower left: Leslie Woodriff is the hybridizer of *B. 'Whirlwind'*.
- Page 38, mid page: ABM should read IBM.
- Page 64, top: *Begonia cummingii* is *B. U015*, as stated elsewhere in the article.

Clayton M. Kelly Seed Fund

Joan Campbell, Seed Fund Director

Traditionally, seeds of the tuberous species and *Tuberhybrida* are offered in the Seed Fund at this time of year. There are many more kinds of species on hand than I will list in this issue. If you are looking for something in particular, very likely it is on hand. Write and let me know what you want.

B. veitchii N-D 1

Peruvian tuberous species pictured on the cover of the *Begonian* for July-August 1983, photographed at Machu-Picchu. It is low growing with thick, leathery, green leaves and vermilion blooms. This plant is considered by authorities to be the same as *B. rosiflora*. Seeds have not been offered since 1980.

B. acaulis N-D 2

Small New Guinea tuberous species with round leaves marked red at the sinus. Bloom buds appear when this plant is just past the seedling stage. Grown under lights, there is a blue tint to the dark pink, 1" blooms. Easy to grow, it requires high humidity or terrarium care and is well worth the effort.

B. cinnabarina N-D 3

Bolivian tuberous species, low growing with cinnabar red flowers. Grows quickly and easily and is often the first of the tuberous species to bloom.

B. socotrana N-D 4

Bulbous species native to the Indian Ocean island of Socotra. Round peltate leaves and profuse pink flowers in winter. Young plantlets go dormant in April and resume growth in August. Add lime to both the seeding and growing mixes.

B. picta N-D 5

Small Indian tuberous species requiring terrarium care or high humidity. Young seedlings have mottled, streaked or plain leaves, none alike at this stage. Frilly, pale pink flowers will appear within 4-6 months

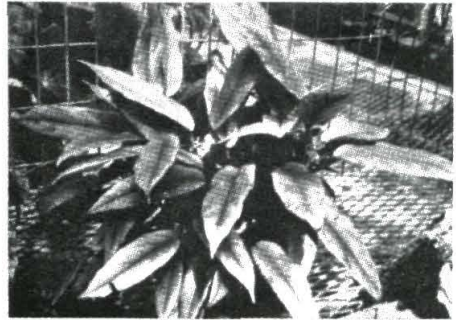
from germination. Avoid sharp temperature changes.

B. grandis ssp. *evansiana* N-D 6

Hardy tuberous species from China with 6" x 9" heart-shaped leaves and fragrant 1-1 1/2" pink flowers from August to frost. Seedlings may be planted outside in a shady spot and will multiply from bulbils. In northern latitudes, mulch well for winter protection.

B. wollnyi N-D 7

Bolivian species, thick stemmed with underground bulbous root which goes partially dormant in winter. May drop its leaves when ready to bloom. This seed is from a form which has spotted leaves. The blooms are white with prominent orange stamens and pistils. Syn. *B. williamsii*.



Begonia taiwaniana

Photo from the *Eastern Regional Begonia News*
by M. Thompson

B. taiwaniana N-D 8

Asian species, rhizomatous with erect stems reaching 2' in height. The medium-sized leaves require filtered light and regular fertilizing for good foliage color. This is the first time this seed has been offered in the Seed Fund, and the supply is limited.

B. formosana N-D 9

Asian species with underground rhizome producing branched, upright stems, large pink flowers. This is another form of *B. palmata* syn. *laciniata*.

B. reniformis N-D 10

Brazilian species formerly known as *B. vitifolia* var. *grandis*. This old favorite is thick stemmed with large leaves and tall sprays of long-lasting, white flowers. Has not been offered since 1978.

B. roxburghii N-D 11

Indian (Himalayan) species introduced to the United States by Clayton M. Kelly in 1939. A rhizomatous begonia, it prefers cool growing conditions. It will grow to 2' in height with shining, green, heart-shaped leaves and produces fragrant white flowers. It is *dioecious*; the male plant is reported to be smaller than the female, but the only way to be sure which is which is to grow several plants to the blooming stage. Seed pods will show rare four-celled, wingless structure. Seed has not been offered since 1976.

B. elatostematoideis N-D 12

Philippine species, shrublike growth, lightly branched, with green leaves, red beneath, and pink and white flowers. Will grow 8" to 16" in height. First time offered in the Seed Fund.

B. U025 N-D 13

Philippine species, with upright rhizome and medium-sized, ovate, green leaves and white flowers. Easy to grow from seed.

B. guaduensis N-D 14

Collected by Scott Hoover in Panama (SH523), thick-stemmed habit of growth. Plant was found on a dry embankment at about 2300'. I have no further information on this species, but I believe this is the first time it has been offered in the Seed Fund.

B. glabra N-D 15

Collected by Scott Hoover in Panama and Costa Rica (SH525, SH589), trailing begonia commonly found in many places in Central America, easy to grow. Specify one or both.

B. stigmosa N-D 16

Collected by Scott Hoover in Panama (SH559) from a shady embankment at

about 3000'. Rhizomatous begonia with large, lobed leaves.

B. alnifolia N-D 17

Collected by Scott Hoover in Costa Rica (SH582) at about 2500'. Shrublike species with many branches.

B. Tuberhybrida, upright types N-D 18

B. Tuberhybrida, pendula types N-D 19

Both offerings from a world-famous grower. At this writing I do not know whether the colors will be separate or mixed.

Platyserium grande N-D 20

Staghorn fern spores, choice and exotic. This type has been confused with *P. superbum*. The spores may take months to germinate, but this epiphytic wonder is worth your patience. 50¢ per packet.

All packets of seed \$1.00 unless noted otherwise. "Growing From Seed" pamphlet is 25 cents.

Orders from U.S., Mexico, and Canada need 45¢ over seed price for postage (60¢ if over 12 packets are ordered). Overseas orders require \$1.20 for postage. Send checks or money orders in U.S. funds made payable to Clayton M. Kelly Seed Fund. Mail to Joan Campbell, 814 NE Honey House, Corvallis MT 59828.



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NEW CULTIVARS

Official International Registrations

Numbers 909-914

Carrie Karegeannes, Nomenclature Director

Applications to register *Begonia* cultivars may be obtained from Carrie Karegeannes, 3916 Lake Boulevard, Annandale, VA 22003. Each form must be typed or printed in ink and accompanied by a \$2 check or money order payable to the American Begonia Society. Photos, drawings, and dried specimens of new cultivars are encouraged. ABS is the International Registration Authority for *Begonia* cultivar names.

In the citations of cultivar parents below, the female (seed) parent is listed first.

***Begonia* 'Frost's Dorothy Behrends'**

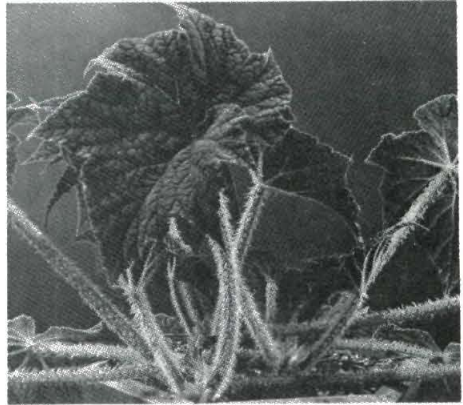
No. 909—*Begonia* 'Kosmatka' × *carrieae* 'Frost's Dorothy Behrends'

Rhizomatous cultivar with ample basal growth; large, black, quilted leaves; white-hairy petioles; and pink flowers. Broadly ovate leaf blades measuring up to 13" × 8" have acuminate-tipped lobes and faintly serrate margins. The richly textured, black green surface, marked by 8 light green main veins, contrasts with the dark red underside. Green petioles, 20" long, are thickly covered with long, white, scaly hairs, each with a red dot at its base. The pink 2-tepaled male and 4-tepaled female flowers are 1" across, borne in three-times-dichotomous upright clusters on 30" peduncles in early spring. Originated in 1980 by Goldie Frost (10622 Teal Drive, Garden Grove, CA 92643); first bloomed in 1981. Tested by Dorothy Behrends, Encinitas, CA, in whose honor it is named. Published with photo as *B. 'Dorothy Behrends'* (not Mrs. Miller's cultivar of 1957) in *Begonian* "49" [48]: 212-14, Oct. 1981, winner of New Introductions, Hobby Growers division, Distinctive Foliage subclass in 1981 ABS National Show. Registered Aug. 8, 1986.

***Begonia* 'Danna Irene'**

No. 910—*Begonia* 'Alice G.' × *carrieae* 'Danna Irene'

Rhizomatous with dark green leaves and



No. 909—*Begonia* 'Frost's Dorothy Behrends'

pink flowers. Shallowly lobed, 16" × 14" leaf blades with serrate, slightly ruffled margins have heavy texture, very short hairs, and 7 lighter green main veins. Petioles about 15" long are covered with close-set scales; stipules fall off. Pink 2-tepaled male and 4-tepaled female flowers measure 1" × 1" in large open clusters on 30" peduncles February into May. Originated in 1981 by Goldie Frost (address above); first bloomed in 1982; first distributed in 1982. Tested by Dan Stocks, Costa Mesa, CA. Name published in Mildred L. Thompson, *Begonias: 1984 Update*, p. 13. Registered Aug. 9, 1986.

***Begonia* 'Pink Parasol'**

No. 911—*Begonia sutherlandii* × *partita* 'Pink Parasol'

Semituberous, "maple-leaved" basket plant with bright pink flowers. Green, 2" × 3/4", thin, lobed leaf blades have serrate margin, pointed tip, and 5 main veins. Smooth petioles are 3/4" long; bulbils form in the axils. Flowers, shaped like those of *B. sutherlandii*, are bright pink, opening flat to 1" across. Males with 2 tepals and females with 5 are borne on 3/4" peduncles profusely in summer and fall, on a dense,

compact plant resembling a pink parasol. Originated in 1981 by Goldie Frost (address above); first bloomed in 1981; first distributed in 1982. Tested by Ronnie Nevins of Fullerton, CA. and Mae Light of Garden Grove, CA. Published by Pat Maley, *Begonian* 50: 138, Sept.-Oct. 1983. Registered Aug. 9, 1986.

***Begonia* 'Mount Saint Helens'**

No. 912—*Begonia* 'Colonel Gale' × *carrieae* 'Mount Saint Helens'

Rhizomatous with erect rhizome, large, red-edged, dark green leaves, and large bunches of airy flowers. Leathery leaf blades, 12" × 10", are shallowly lobed and slightly serrate, with 5 main veins. Light green petioles are clothed with patterned scales; stipules are not persistent. Pink 2-tepaled male and 4-tepaled female flowers are 1 1/2" across in large clusters on 36" peduncles February into May. The red coloring on the leaf edge and some red splotching underneath distinguish the cultivar from others. Originated in 1981 by Goldie Frost (address above); first bloomed in 1982; first distributed in 1982. Tested by Dorothy Behrends of Encinitas, CA. Name published in Mildred L. Thompson, *Begonias: 1984 Update*, p. 21. Registered Aug. 9, 1986.

***Begonia* 'Estrada'**

No. 913—*Begonia carolineifolia* × *carrieae* 'Estrada'

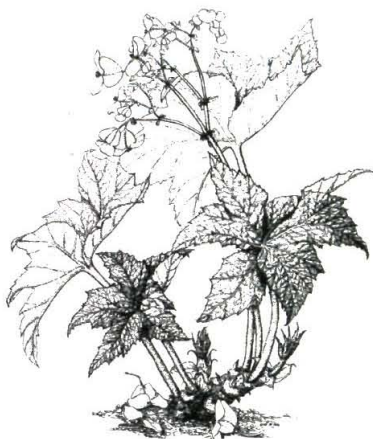
Rhizomatous with large, deeply parted, bright green leaves and light pink flowers. Leaf blades—influenced by the seed parent's shape and the pollen parent's surface—are quilted, hairy, soft textured, and up to 20" × 18", with wavy, long-triangular, acuminate, coarsely serrate lobes. They are marked by 9 lighter green main veins. Petioles up to 36" long are slightly hairy; stipules are not persistent. The light pink 2-tepaled male and 4-tepaled female flowers are 1" across on peduncles up to 48" tall in the spring. Bracteoles are paired at each forking of the large clusters. Originated in 1981 by Goldie Frost (address above); first bloomed in 1982; first distributed in 1981. Tested by Gil Estrada of

Downey, CA., for whom it is named, and by Pat Maley of Placerville, CA. Published by Pat Maley with a drawing, *Begonian* 50: 127, 138, Sept.-Oct. 1983. Registered Aug. 9, 1986.

***Begonia* 'Meadowlark'**

No. 914—*Begonia* 'Leocon' × *carrieae* 'Meadowlark'

Rhizomatous with yellowish green, brown-marked, quilted leaves and pink flowers. Leaf blades are 8" × 6", shallowly lobed and serrate, with 7 main veins and short hairs on upper and lower surfaces. The yellow green upper surface is dotted with many brown spots and edged in brown; veins are red underneath. Slender petioles are 12" long and very white-hairy; stipules are not persistent. Originated in 1981 by Goldie Frost (address above); first bloomed in 1982; first distributed in 1982. Tested by Dorothy Behrends of Encinitas, CA. Name published in Mildred L. Thompson, *Begonias: 1984 Update*, p. 21. Registered Aug. 9, 1986.



No. 913—*Begonia* 'Estrada'

ERRATA

Page 17, lower left: Leslie Woodriff is the hybridizer of *B. 'Whirlwind'*.
 Page 38, mid page: ABM should read IBM.
 Page 64, top: *Begonia cummingii* is *B. U015*, as stated elsewhere in the article.

The Big Tuberhybrida

Continued from page 153.

When sowing the seed use one of the many soilless seed composts; don't use a peat and sand mixture as suggested by some writers. You can make up your own mix with Chem-pak seed fertilizer (1) added. If you use a peat and sand mixture without the addition of the above fertilizer, then the pH of the mixture will be in the region of pH 4, in which your seedlings will not grow. I am talking from experience when I tell you this.

Once your seed braids (germinates), it will be ready for pricking out in about five weeks, and in a further five weeks another move will be necessary. In a further five weeks you will move the plants into three-inch pots, and by early May transfer the seedlings into a frame, which is covered at night in the event of a frost warning. Give them more space as necessary—I flower them in five-inch pots.

As my greenhouses are occupied with plants I intend using for our Society Show at Ayr, my seedlings are kept in the frame until the show is past. (Scheduled for the last Tuesday, Wednesday, and Thursday of August each year.) I then empty one of the houses and transfer the seedlings into the house. By this time I have had flowering buds on for roughly three weeks, and in another three weeks or so these plants are in flower. Once my seedlings are moved into their flowering pots, in a further three weeks or so I commence feeding with a half strength feed of Phostrogen (2) twice weekly. This I continue right up until flowering time. With this method I can secure flowers well up to exhibition size, as some of our members can confirm.

If you grow tuberous begonias by this method it will restrict your growing numbers, a hundred is about the most I ever grow and very often a good deal less. I have never grown my seedlings any other way than this, and in my opinion, it is the method to follow if you hope to be successful.

I think the proverb of the four-leafed clover covers this whole plan pretty well:

The first leaf is for *patience*,
The second leaf for *pluck*,
The third leaf for *perseverance*,
And the fourth leaf for *luck*.



McCormick's plants with display collars. Frilly flower is *B. 'Evelyn Dunn'*.

(1) Composition (N-P-K) of seed fertilizer is 2.3-3.9-2.796 and of potting formula (N-P-K) is 7.5-3.6-5.2 with trace elements incorporated. These fertilisers are for use in peat-based composts only and contain sufficient lime to produce an acceptable pH.

(2) Phostrogen is a high potash fertiliser used to strengthen and build up the flowers.

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The Newcomer's Notebook

About Begonias and Other Things

Jim Whistler

Our Plant Society

Did you know that the ABS has a historian? Her name is Norma Pfrunder and she is part of the board of directors. Her job is to gather various items about the society, which she puts into a large scrapbook or otherwise stores. She is the Keeper of our Keepsakes. She has convention programs, lists of past officers, various souvenirs, an accumulation of 53 years. Some years apparently the members didn't remember to save much, and some photographs are not named. Guess folks thought they'd be so famous that even a hundred years from now they'd be recognized.

Colors and Words

Last June Rudy Ziesenhenné wrote about *Begonia grisea* and it made me curious. It took a bit of searching to find out that *grisea* meant gray in color. It is pronounced GRIS(as in gristle)-ee-a.

I heard that Thelma O'Reilly says the color of the blooms on the front cover should not be so blue; they should be more scarlet. This has something to do with lighting when the photograph was taken. This set me to thinking about words for red colors.

Our English word for bright red with a blue tinge is crimson, and for orange red it's scarlet or vermilion—though maybe this is best described as reddish orange. *Begonia cinnabarina* is in the scarlet group. Cinnabar is a bright orange red pigment.

We have a *Begonia rubra*, that is, just plain red. Carmine means the same thing. *Begonia coccinea* is red and *Begonia erythrophylla* means the red-leaved begonia but it's named using words coming from Greek.

Jim Whistler is a busy grower who wants your suggestions for future topics. You can write to him in care of the ABS, Box 1129, Encinitas, CA 92024—but he says don't expect a personal answer.

Sanguinea is often used to describe the underside of begonia leaves. It means blood colored. Sometimes the reverse of the leaf is wine (brownish red) or burgundy colored. *Purpurea* is a dull bluish red. There is also *atropurpurea* and that is very dark purple.

Rosea is rosy (paler and with just the tiniest hint of blue), and this is a very common occurrence, Begonia pink. There are a lot of variations on that color, best left to another time. Begonias seldom seem to be just plain red or pink, so we seek better descriptions.

A Rosy Begonia

This naturally leads me to talk about one of the nice unidentified rosy begonias, *B. U087*. This is a vining plant and it does very well in a greenhouse or terrarium under lights. With very bright light the plant tends to be rather compact. Its thick leaves are rounded with a single little point and the stem joins near the center of the deep green leaf (peltate).

Everything else about this begonia is rosy, leaf stems, flower stems, and flowers the rosiest of all. On a dreary late fall day it is cheerful to see the pink flowers with the darker rose margins. I'd nominate this one for ABS members to try in a terrarium before they go on to try some of the reputed difficult and exotic kinds. I hope this one gets a name soon.

Just in case you are wondering how to pronounce some of the words above, I'll make a list:

cinnabarina, SIN-na-bar-EEN-a
or kin-a-bar-EYEn-a
coccinea, COCK-sin-ee-a
erythrophylla, e(as in red)-RITH(as in arithmetic)-row-fill-a
purpurea, purr-purr-EE-a

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MINUTES OF THE BOARD OF DIRECTORS' MEETING

September 6, 1986

The annual business meeting of the American Begonia Society was held after the Saturday luncheon at the 54th Convention, "Pua Nani" Begonias, in San Diego. President Margaret Lee called the roll of Branches and States. We were pleased to welcome so many members from around the country and from Japan.

Vice President Arlene Davis read the Aims and Purposes. The minutes from the July 13 Board meeting were not read. Treasurer reported income from August 1, 1985 to July 31, 1986 was \$49,433.85; expenses were \$48,637.96, leaving a total of \$13,444.09 in the checking accounts, and \$45,237.05 in savings.

The election results were as follows: 243 ballots received, 28 ballots declared invalid because all boxes were checked. The elected officers are as follows: President, Margaret Lee; First Vice President, Arlene Davis; Second Vice President, Charles Jaros; Third Vice President, Tamsin Boardman; Secretary, Jeannette Gilbertson; Treasurer, Eleanor Calkins.

End of the year reports were received from the Branches: Barkley, Alfred D. Robinson, Buxton, Greater Atlanta, Jacksonville, Monterey, Orange County, Sacramento, San Miguel, Whittier, Knickerbocker, and Eastern Region. We thank you for your cooperation, and apologize for any omissions.

Membership Chairman reported 1448 members as of August 31, 1986. Branch Relations reported one new branch was formed in 1986—the Greater Atlanta Branch, and one new Region—the Eastern Region.

Editor Phyllis Bates reported all areas, printing, mailing service, etc. are finally coordinated. She recognized and thanked all those present who had written articles for the *Begonian* the past year. A new set of slides for the color covers will be selected soon. The 35mm color slides must be vertically oriented, and ones with an accompanying article or story are preferred. The deadline for the Jan/Feb. issue is November 10.

A written report was received from the Nomenclature Committee, which has been very active this past year. There were 19 new cultivar registrations, reaching a total of 914. Assigned "U numbers" for the unidentified species have reached 216, with much work and research around the country. Two major publications came off the press: Volume 1, of the *Catalog of Registered Cultivars of the Genus Begonia*, (available from the ABS Bookstore) and *Begoniaceae: Illustrated Key and Annotated Species List*, distributed by the Smithsonian Institution to universities, botanic gardens, etc. A copy will be sent to each ABS branch and key officer.

President Margaret Lee thanked all committee and chairmen for their hard work, and recognized the past presidents who were present.

Past President and Convention Chairman Bob Ammerman welcomed all the convention participants, and encouraged them to work for a more unified ABS. In order to standardize future convention awards, a motion was made and passed that the Showing and

Sharing trophy not be accepted unless it is offered to all conventions. A motion was then made and passed that the ABS will establish an award for the person bringing the most begonia plants to a show. It will be called the "Showing and Sharing" award, and the previous sponsors, or any other person(s) who would like to sponsor the award will be encouraged to do so. The show chairman announced there were 38 people who entered plants, and 237 entries. He then passed out the Certificates for Culture awards.

The meeting was adjourned, and a delightful program of old glass slides of the Rosecroft Gardens of Alfred D. Robinson was presented by his daughter, Virginia Perkins.

Jeannette Gilbertson, Secretary

MEETING CALL

The next board meeting will be held November 2, at 11:00 a.m. at Mike and Sharon Ludwig's house, 7007 Mt. Vernon Ave, Lemon Grove.



Peruvian Puzzle

Thelma O' Reilly removed the first set of floral bracts from the emerging inflorescence and pressed them. She then photocopied the dried specimen, and the photocopy is printed here in full size. The floral bracts of *Begonia* U095 are joined at the base. The veins are evident and can be seen in the photograph on page 155.

AMERICAN BEGONIA SOCIETY

Founded January 1932 by Herbert P. Dyckman

ABS AIMS AND PURPOSES

- TO** stimulate and promote interest in begonias and other shade-loving plants.
- TO** encourage the introduction and development of new types of these plants.
- TO** standardize the nomenclature of begonias.
- TO** gather and publish information in regard to kinds, propagation and culture of begonias and companion plants.
- TO** issue a bulletin which will be mailed to all members of the society.
- TO** bring into friendly contact all who love and grow begonias.

ABS Services

These services are available to all ABS members. For names and addresses of department heads, see inside front cover. Include a self-addressed envelope when you write.

AT-LARGE MEMBERS - Members who do not belong to branches are represented at board meetings by the members-at-large director. To find a branch in your area or to start a new one, contact the branch relations director for help.

BOOKSTORE - See information in this or next issue.

JUDGING DEPARTMENT - Mail order course for a member who wishes to become an accredited begonia show judge, \$10. Also available: a booklet on point scoring (\$2), the old (unofficial) classification booklet (\$2), information on fuchsia and fern judging, and other requirements to become a judge. Add \$1 for postage and handling on all orders and 6% tax for California residents.

NOMENCLATURE DEPARTMENT - Monitors newly published findings on *Begonia* names. Handles official international registrations of new *Begonia* cultivars and publishes these registrations. Gathers information about and assigns numbers to unidentified species.

QUESTION BOX - Prompt assistance with horticultural questions. Those of general interest will appear in the *Begonian* column.

ROUND ROBINS - Members exchange information about begonias and their culture through packets of letters which circulate among a small group of growers. There are dozens of these packets, called flights, on many specialized subjects. Contact the director for information.

SEED FUND - The Clayton M. Kelly Seed Fund offers seeds of begonia species and cultivars by mail. New offerings are listed in the *Begonian*. Donations of seeds are encouraged.

SLIDE LIBRARY - See information in this or next issue.

SPEAKERS BUREAU - The director maintains a list of speakers on begonias and related subjects.

ABS Slide Programs

Rhizomatous Begonias 200 slides with taped discussion by Mildred Thompson.

Japanese Cultivars grown in the United States. 127 slides, printed list. Taped program. By Mildred Thompson.

Begonias in their Natural Habitat by Scott Hoover. Slides from Mexico, Guatemala, Venezuela, Colombia, Ecuador, Papua New Guinea, and Jamaica. Taped program.

Begonias for Contained Atmospheres. 81 slides. Printed list, taped program. By Mildred Thompson.

The Tropical Rainforest by Scott Hoover. 45 minute tape narration. 78 slides.

The Making of a Begonia Show. 77 slides of the show being set up and the plants displayed by the Barkley Branch in 1982. Printed slide list.

A Trip to the Montreal Botanical Gardens. 92 slides by Jackie Davis and Joy Porter. Printed list.

Horticultural Grouping of Begonias. 140 slides by Mildred Thompson. Begonias divided into 8 groups. List.

This is a partial list of slide programs available for rental to ABS members and branches. The fee is usually \$10 plus First Class Insured return postage. Deposit required. Send SASE for complete list and detailed instructions.

Daniel Haseltine, Slide Librarian
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Mailing Notice

For Those With New Addresses

Issues sent by Third Class Mail are not rerouted to a new address unless the recipient has arranged for this service with the Post Office. The issues are destroyed, and the ABS pays for the notification of the new address if it is available. If the member misses an issue for failure to notify the Membership Secretary, he may purchase it from the ABS Bookstore.

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