



GREATER LAS VEGAS ORCHID SOCIETY
THE ORCHID COLUMN
SUNDAY, OCTOBER 1, 2006

2 pm BUILDING OPEN AT 1

Carol Siegel, Newsletter
Editor

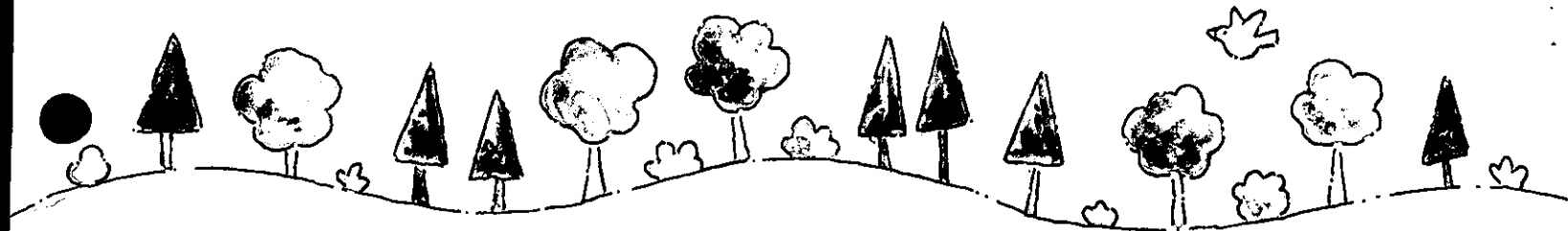
At our September meeting, we welcomed a packed room of our friends after a summer of vacations and activity. Hallelujah- it is cool at last. Both we and our orchids are thrilled to have the sweltering summer behind us and look forward to lots of blooming orchids in the next few months. We welcomed new member Lee White and hope she enjoys our friendly and fun club. We are glad to have her.

Our September speaker was the delightful Marni Turkel, a skilled potter, who also is a very knowledgeable and famous orchid grower. We enjoyed her introduction to the world of *coelogyne*, a diverse group of about 100 species from Asia. Everyone's favorite person, Diana Smith, has won an AOS award with her fabulous *Coelogyne lawrenceana*. I was so impressed with Marni's presentation that I went out and bought a *Coelogyne cristata*. I just have to remember that it needs no water from Halloween to

Valentine's Day (or so...) She also showed us many interesting plants in the related families of *pleione* and *dendrochilum*- a whole new direction for many of us. Our great librarian, Steve Ninemire, pointed out that we have a great book on *coelogyne* in our library.

Our Species of the Month, which Clarice researched before the meeting and Diana presented in her absence, was *Coelogyne nitida*. Called the "shining coelogyne" because the flower sparkles, this orchid is found in tropical wet forests at high elevations where it gets cool, sunny and dry winters. It likes to be mounted and needs a drier rest after the growth matures.

We really thank Eileen and Alex McKyton who graciously housed and transported the speaker. Eileen, Alex, and the friendliest man in the world, Dan Hawley, make up the welcoming table every month. They are all



such an addition to our club.

Our raffle table was overflowing with orchid supplies and donated hotel plants. Tony Billitere did a fabulous job of garnering orchids from the Mirage, Treasure Island, English Garden Florist, and the Wynn, and I even got a few plants from Plant World. We especially thank "Doc" Myra Lee Glassman for housing the plants and bringing them to the meeting for Tony. Such a sweet lady!

We had a glorious feast after the meeting thanks to the culinary skill of Melissa Knight, Aaron Schave, Ron Janke and Nicole Gazza. We thank Bill Whaley, Gail Harris, Diana Smith, and Marsha Hawley in advance for the treats for our October meeting. We thank everyone for taking a turn in making our meetings truly "dinner and a show."

We had lots of supplies for members to buy- Aussie Gold, fertilizers, seaweed extract- as well as dozens of blooming papahs, phrags, and intergeneric hybrids from the Hilo Orchid Farm (which Eileen ordered and I unwrapped...). They were gorgeous. I distributed a sheet telling us what all those intergeneric-type oncidiums are made of and what all the abbreviations on the tag really mean. Marsha Hawley, our lovely fund-raising chairman, did a great job selling all our stuff. She is so enthusiastic and gracious that people just turn over their money to her and happily cart off their stuff. Mike Levin sold really nice orchids as did our speaker. We don't know what happened to Daniel Vong, but we still have lots of plants to buy at the meeting- **OUR VERY FAVORITE THING!** Our orchid and supply sales do double duty- They provide members with what they want and need- and also keep our treasury fat and our speakers top-notch.

We thank Myra Lee Glassman and Gail Harris, our two Nevada Garden Club

representatives, for attending the Fall Conference. We could not have better ladies representing us. We hope Alana Sullivan is elected vice-president of the Garden Club. She has our vote! We are also proud that our Leslie Doyle does a great job editing the Silver State Gardener.

Before we left from Las Vegas in July to hunt for *Spiranthes diluvialis* in Panaca Springs, I got permission for us to collect a sample for the herbarium (dried plant collection) at UNLV. Diana and I brought the dried specimen over to UNLV a few days ago. They told us what an important contribution our club had made to the university, the herbarium, and to conservation. You would have been so proud.

On October 14th, we will be participating in the Southern Nevada Water Authority's annual Day with the Experts from 8 am to 4pm at the Gardens at the Springs Preserve located at 3701 West Alta Drive just east of Valley View. An estimated 3,000 people are expected, making it a great opportunity to showcase our club to the community. We will be asking for good will ambassadors at the meeting.

On the October 21-22, the Nevada Garden Clubs will be holding its Fall Flower Show at our usual meeting place. They have asked us NOT to have a display this year (!) but just to bring plants in for judging. Tex and Gidget Severance have graciously agreed to serve as our judges. Bring your plants to the Garden Club Building after 4pm on Friday the 20th. There are TONS of ribbons to win, and you are assured of getting something if you show up with your beauty. If you can't make it on Friday, call me (254-4168), and you can leave your plants off, and I will bring them down for you. We will be selling plants, too, at the show. We will ask for volunteers

at the meeting. The show opens at noon on Saturday and 10 on Sunday.

Our October speaker, Michael Glikbarg, owner of Orchids of Los Osos, will present a slide lecture on my very favorite orchid, multi-floral paphiopedilum. I always look forward to Michael's visit because he brings HUNDREDS of the most gorgeous blooming orchids. Mike's plants are, to me, the most beautifully grown plants, and I, have saved up for his visit. Oh, I can hardly wait!! Flowers, flowers, flowers- and all for us.

Multifloral paphs are my favorite orchids because they are so spectacularly beautiful, odd and exotic, with many flowers to a spike, which last for months and months. Heaven. I took a class from Helen Congleton, paph expert, and she said that most of these strap-leaf species and hybrids do best grown under bright light. (When I first grew these plants, I kept looking for the straps on the leaves and couldn't find them. They mean the leaves look like green straps- long and thin.) She hangs the bigger plants near the roof of her greenhouse where they receive 2000-2500 footcandles of light. I try to grow them under my HID lights, toward the sides of my cart. Light this bright, she says, makes for smaller more compact growth and shorter spikes. When the plant starts to spike, she places them on a bench with less light to stretch the spikes. I have not noticed this "short spike" problem under my lights and don't move them there when in spike. I find that moving the paphs in spike around makes the flower stem twist unattractively.

Helen notes that *Paph rothschildianum* and *Paph stonei* and their hybrids benefit from a slight cooling in the fall to initiate spikes. I leave my garage door open for first three weeks in October which lowers my

temperature to 60 degrees or so in my area, enough to initiate spikes in paphs and phals. REMEMBER TO DO THE OCTOBER CHILL FOR YOUR PAPHS AND PHALAENOPSIS NOW. Grow in the house? Perhaps you need to open the window a crack. Grow in a greenhouse? Nature should do the trick.

Keep the plants evenly moist at all times. Paphs don't have pseudobulbs like cattleyas and can't store water. Water plants about once a week most of the year, a little more in the summer and a little less in the winter. Water early in the day and try to keep water out of the crown of the plant to prevent developing flower spikes from rotting. Just tip the plant over a little after watering. Remember to feed regularly

When you repot the plant, DO NOT DIVIDE the multifloral paphs until they fall apart on their own when repotting. Most strap-leaf paphs do not make roots for the new growth until the new growth is two years old. The new growth won't bloom until it is three years old. The bigger the plant, the more new growths it will make, and the more it will flower. Be patient. Allow the plants to get big.

After the newsletter, I have included two articles reprinted from the 1995 and 2000 ORCHID DIGEST, reprinted with permission of Harold Koopowitz. The first is an excellent article on paph culture by Helen Congleton. It deals with paph culture for both mottled-leaf and strap-leaf orchids. There is also an article on multifloral paphs by Marliyn Levy. Read through it. It describes the species and hybrids. You can use the article to get familiar with the spelling of the names and use it as a reference to learn what makes up what hybrids. For example, the article tells you that Paph Lady Isabel is a cross between

stonei and rothschildianum. You can know from that that it will appreciate an October chill.

In October, we will have supplies including bloom booster fertilizers, seaweed extract, regular fertilizer, and note pads for sale. We will also have a new supply of Aussie Gold which we are still selling for \$17.50 (Charley's Greenhouse charges \$23). Those who have plants in Aussie Gold are reporting great results! Try it and see how you like it.

Our raffle in October will feature what Myra Lee Glassman calls "Orchidis hotelis," the famous tagless beauties that Tony skillfully gets for us. We will buy a \$250 raffle table from Mike Glikbarg, owner of Orchids of Los Osos. He has promised a "very generous raffle table"—I am excited! Stay safe and keep blooming.

Love, Carol 254-4168 growlove@cox.net

THE PEOPLE WHO MAKE IT HAPPEN:

CAROL SIEGEL- PRESIDENT
CLARICE DEAN -VICE-PRESIDENT
EILEEN MCKYTON- SECRETARY
DIANA SMITH-TREASURER
Dan Mumau, Michael Lawless, Marsha Hawley
- Membership Hospitality Chairmen
Eileen McKyton and Dan Hawley- Welcome
Desk
Lillian Patterson- Photographer and
Historian
Dan Mumau, Mike Lawless, and Tony
Billitere- Raffle Chairmen
Marsha Hawley- Fund Raising Chairlady
Phyllis Bond, Leslie Doyle, Shelly North and
Eileen McKyton- Special Events Chairmen
Jeri Lee and Terry Wilsey- Nevada State
Garden Club Representative
Alex McKyton -Building Chairmen and
Webmaster
Tex Severance and Mike Levin- Show and
Tell Gurus
Tex and Gidget Severance- Judging
Chairmen
Scotty Nogaim- Election Chairman, Raffle
Lady
Terry Wilsey- Club Travel Agent
Extraordinaire
Steve Ninemire Library Chairman Clarice
Dean, Assistant Librarian, Trip Chairman
Dan Vong-Favorite Member
Shelly North-Classy Club Apparel Chairlady
.....

COMING ATTRACTIONS...

Our meetings are held at the Nevada Garden Club Building at Twin Lakes and Washington between Valley View and Rancho at the western edge of Lorenzi Park. The meeting starts at 2, but I open the building at 1 for shopping and setup.

October 1, 2006	Mike Glikbarg, "Multifloral Paphs"
November 5, 2006	Bill Bergstrom, "The Orchids of Mexico"
December 3, 2006	Seventh Annual Holiday Party
January 7, 2007	Jason Fischer, "World of Phragmipedium"
February 4, 2007	Steve Frowine, "Orchids for Dummies"
March 4, 2007	Doug Conkin, "Growing Cattleyas"
April 1, 2007	Dr. Paul Johnson "Insects and Orchids: Complexities of Global Domination"
May 6, 2006	Glen Decker, "European Orchid Growing"- "The Spectacular Phrag Kovachii" (a double-header)
June 3, 2007	Fred Clarke, Sunset Orchids, "The Exciting World of Bulbophyllum"
July 8, 2007	
August 5, 2007	Barbecue Mt Charleston
September 9, 2007	Leon Glicenstein, Hoosier Orchids, "Jewel Orchids"
October 7, 2007	Helen Hersch, "Advanced Windowsill Growing"
November 4, 2007	Greenhouse Tour
December 2, 2007	Eighth Annual Holiday Party

PAPHIOPEDILUM CULTURE

HELEN CONGLETON

Distribution and Natural Habitat

Paphiopedilums are slipper orchids native to tropical regions of Southeast Asia. They have been found growing in nature from approximately 27° north to 10° south latitude and from 77° to 160° east longitude. Their range extends throughout the foothills of the Himalayas in northern India, southeastern China, northern and eastern Burma, Laos, Thailand, Cambodia, Vietnam, the Philippines, the Malay Peninsula, the Malay Archipelago, Borneo, Indonesia, New Guinea, and the Solomon Islands. Such wide distribution accounts for the great diversity of flower shapes and plant-growth habits found in the genus *Paphiopedilum*.

The plants grow at altitudes from sea level to 7,500 feet (2,300 meters). Habitats of some species are limited to just a few plants in a single location. Other species are widely distributed, succeeding under a relatively wide range of temperatures and growing conditions.

All *Paphiopedilum* species grow in essentially frost-free areas, where the weather is mainly defined by monsoon seasons. In the areas near the equator, there are no distinct winter/summer seasons. Instead, the extreme cold and extreme warm temperatures are determined by the altitude of the habitat above sea level and exposure to prevailing winds. Some species from northernmost mild mountain regions prefer cool-growing conditions. Other species from lower altitudes and areas near the equator prefer warmer, more humid conditions. Most paphiopedilums grow in mountain regions covered with primary forests. Here the humidity is high all year, and the plants get sufficient moisture from morning dews even in dry season.

Growth Habit and Flowering Season

Although they are often referred to as semi-terrestrial orchids, paphiopedilums do not actually grow in soil but in open, fast-draining forest litter. Most are terrestrial plants that grow on steep mountain slopes in decaying leaves and bark. Many are lithophytic plants that grow in rock crevices covered with moss and organic debris. Some are epiphytic, growing on mossy tree limbs.

Paphiopedilums have no pseudobulbs. The growths are produced sequentially along the rhizomes. With few exceptions (*P. druryi* and the species belonging to the subgenus *Parvisepalum*) paphiopedilums have very short rhizomes so that the growths appear to be attached to each other at their bases. Each growth consists of a fan of several linear to oblong leaves with an apical inflorescence (flower spike emerging from its center) bearing one or multiple flowers. Each growth blooms only once but may continue to provide support and nourishment for the plant for many years.

The blooming season for the majority of paphiopedilums is winter through early spring. Species from subgenus *Parvisepalum* bloom mainly in the late spring. The peak flowering time for most multifloral paphiopedilums, *P. tigrinum*, and the species from subgenus

Brachypetalum is during summer, and for a few species (*P. charlesworthii*, *P. helenae*, *P. henryanum*, *P. sukhakulii*, and *P. purpuratum*) it is in the fall. Many Maudiae-type hybrids with species from the section *Barbata* in their background produce new growths year-round and flower as each growth matures. *Paphiopedilum* flowers last from one to three months.

The Paphiopedilum Mystique

Paphiopedilums owe their popularity to the unusual flowers that inevitably invoke curiosity. The plants are compact and handsome even out of bloom. Some are worth growing just for their attractively mottled leaves. Somewhat limited availability of proven good cultivars has kept their prices high and unaffordable for the average grower. So far, all attempts of developing a commercially viable cloning process for paphiopedilums have been unsuccessful. Fortunately, the lack of effective techniques for asexual propagation has spurred a frenzy of hybridization, resulting in over 10,000 hybrids registered by 1998. The resulting variety of shapes and colors is quite extensive, contributing to the fascination held by these remarkable orchids.

Most *Paphiopedilum* plants are sold as first-bloom or unbloomed seedlings. To see these seedlings bloom for the first time, to exhibit them, and possibly to win awards have been a special thrill for many a grower.

Cultivation

Paphiopedilums prefer a shady location with adequate air circulation around the plants and roots and a slightly moist compost at all times. Ideally, they should be grown in an intermediate greenhouse; however, the plants generally adapt to growing conditions that may be quite different from those of their native habitat. They tolerate lower light levels than most orchids, making them ideal plants to grow under artificial lights. Some even succeed on a windowsill. In mild, frost-free climates most plants can be grown outdoors under a lath.

Many aspects of culture are interrelated. For example, the plants growing under brighter light need higher humidity and more water, and can utilize a little more fertilizer than the plants growing under shadier conditions. Since every growing area is slightly different, each grower must determine the optimum shading, watering, feeding, and repotting routine for his/her plants. If the plants are doing well under established conditions, it is best to avoid making any cultural changes for the entire collection without experimenting with a few plants first. No matter how tempting the new "miracle fertilizer" or compost may appear, the grower should try it on a small group of plants and observe the long-term effects for at least one year before making a changeover.

Light

Paphiopedilums grow best under diffused light and tolerate shadier conditions than most orchids. Optimum

growth and flowering are achieved at 1,000 to 2,500 foot-candles (11,000 to 27,000 lux) of light, roughly equivalent to 75 to 90 percent shading on a summer day at noon. By comparison, cymbidiums prefer 35 to 60 percent shading, and cattleyas 55 to 70 percent shading.

Young seedling plants need the least light (800 to 1000 foot-candles) and grow well under artificial lights. Soft-leaved plants such as Maudiae-types also prefer shadier conditions. Plants with harder leaves (such as multiflorals or parvisepalums) generally tolerate higher light levels, particularly when provided high humidity, sufficient water, and good air movement. Good indications of insufficient lighting are long and weak flower stems and entire plants "stretching" towards the light. Sunburn, desiccation, excessive yellowing of leaves, and short flower stems are indications that the plant is getting too much light. The ideal amount of light received by the plant depends on the light intensity as well as the time of exposure.

A little more shading should be added in locations closer to the equator or in sunny climates. Less shading is needed in the winter when the days are short, where the skies are often overcast, or where the greenhouse is shaded by trees or buildings for at least part of the day. Artificial lighting may be added to extend daylight hours.

Shade cloth is the preferred shading material because it provides even, diffused light. The shade cloth is available in several densities (from 30 to 90 percent shade). The panels of different densities can be sewn together, providing either more or fewer shaded areas to suit the needs of different plants in a collection. Each grower must select the optimum shading for his/her individual conditions, such as climate, the sun angle, and the shading added by buildings and trees. For most growers in warmer climates, it will be between 65 and 75 percent shade density, possibly with some shade added inside to protect young seedlings and more shade loving plants. Installed approximately twelve inches (thirty centimeters) above the roof of the greenhouse or lath house, the shade cloth serves a dual purpose: it provides shade for the plants, and it shades the glass or plastic roof, keeping the growing area cooler in hot weather. The air space between the roof and the shade cloth provides some additional insulation. The shade cloth may be stationary, stretched, and affixed to a frame or movable on rollers. Automatic movable roller shades may be well worth their higher cost in some climates where the skies are often overcast.

Shading can also be applied by painting the greenhouse roof with a water-soluble shading compound. The paint is applied in the spring as the light intensity increases and allowed to wash away by the winter rains. This method of shading requires low initial expense; however, the obvious disadvantages are that the paint may need to be reapplied several times each year and that sudden changes in weather may result in sunburned plants.

Wooden or plastic lattice also provides a satisfactory method of shading. A lattice-covered patio near a home may be an ideal place to grow some plants. If the grower finds that the lattice does not provide enough shading or that the light is not sufficiently diffused, the grower can easily staple a sheet of shade cloth on top of the wood. To add protection from rain and frost, the grower

can install corrugated or double-walled plastic on top of the lattice.

Artificial lighting may be used to extend the daylight during short winter days or in greenhouses that are excessively shaded by trees or structures. The plants may also be grown solely under lighting fixtures designed especially for optimum plant growth. In either case, the light intensity should be measured at the level of the leaves, and the height of the light fixtures above the plants adjusted as needed. To compensate for lower than optimum light levels, the time that the lights are on may be extended to fourteen or sixteen hours a day. The plants need approximately eight hours of darkness for proper growth. The lights may be turned on and off automatically with an inexpensive timer.

Temperature

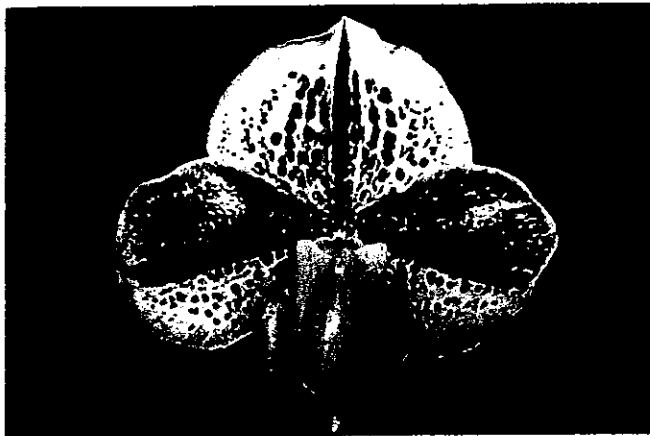
Paphiopedilums prefer intermediate- to cool-growing conditions. The optimum temperature range is between 60°F (16°C) at night and 80°F (27°C) in the daytime. All paphiopedilums can be grown in an intermediate greenhouse where such temperatures are maintained. However, most plants are not harmed by short exposures to greater temperature extremes from 40°F to 100°F (4°C to 38°C). Warm-growing paphiopedilums, such as the multifloral types and the species from the subgenus *Brachypetalum*, tolerate higher daytime temperatures, but dislike cold nights when temperatures drop below 50°F (10°F). Some cool-growing types can withstand an occasional nighttime temperature dip down to 32°F (0°C) and even slightly lower. In mild, frost-free climates many cool-growing species and hybrids can be grown outdoors under a lath all year.

Some species require a diurnal range (drop in night temperature) of at least 10°F to 15°F (5.5°C to 8°C) to initiate flower production. Species from the cool-growing *P. insigne* group and their progeny, including most of the complex hybrids, fall in that category. They are notoriously difficult to bloom in climates where summer nights are warm or in a home where temperatures remain nearly constant. *Paphiopedilum rothschildianum*, a warm-growing multifloral species from the high mountains of Borneo, requires a similar diurnal range. To initiate flower production, it needs a three- to four-week "rest" in late fall, during which time the night temperature should be dropped to 50°F or 55°F (10°C or 13°C).

In some *Paphiopedilum* species the drop in night temperature is not required to initiate bud formation. The species from the section *Barbata* and their hybrids—the "Maudiae-types"—fall into that category. Most prefer intermediate to warm temperatures and grow well under lights or on a windowsill. They are probably better suited for growing in a home than any other slipper orchid.

An old myth is still being perpetuated: that the paphiopedilums with mottled leaves are warm growing, and those with plain green leaves are cool growing—and therefore suitable for outdoor culture in mild climates. Oh, if it were only that simple! Maudiae-type hybrids with mottled leaves indeed prefer a warm environment, because of the warm-growing species from section *Barbata* in their background. The plain-leaved *P. insigne* prefers

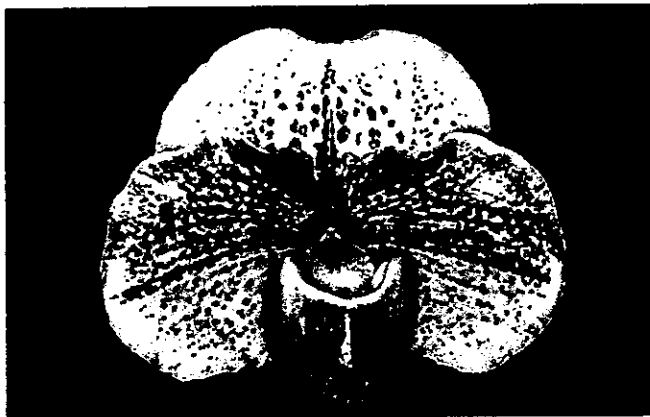
Richard Clark



Paphiopedilum Anna Bachmann 'Swiss Miss' HCC/AOS

cooler temperatures. So do all plain-leaved standard-complex hybrids that have *P. insigne*, *P. villosum*, *P. boxallii*, *P. spicerianum*, *P. druryi*, and other cool-growing species in their background. However, there are many exceptions to this rule. For example, the multifloral paphiopedilums have solid green leaves, yet they prefer warmer temperatures than most paphiopedilums, as well as high humidity. In temperate climates they rarely succeed outside of the greenhouse. On the other hand, many species with mottled leaves are cool growing: *P. venustum*, *P. sukhakulii*, *P. wardii*, and some species from the subgenus *Parvisepalum* (*P. armeniacum*, *P. micranthum*, and *P. malipoense*) are just a few examples of species with mottled leaves that I grow very

Courtesy of The Orchid Zone



Paphiopedilum Lady Luck 'Change Up' HCC/AOS

successfully outdoors in the mild coastal climate of Southern California. All have survived several nights of light frost when temperatures dipped to 30°F (-1°C) with no damage whatsoever to either the plants or the developing buds.

It is no easy task to decide which plants are cool growing and possibly suitable for outdoor culture, which need warmer temperatures, and which will bloom well in the home. The only safe method is to study the plant's background. If it is a species, much can be deduced from the climatic conditions in its natural habitat. Several excellent references are available which describe these conditions in great detail (Birk 1983; Braem 1988). The best source of information is the nurseryman who sells the plant and who is very familiar with its needs.

Air Movement and Humidity

Good air circulation, which prevents bacterial and fungal diseases, is essential for the general health of plants. While paphiopedilums dislike strong winds or drying drafts, they benefit greatly from a constant gentle breeze and good movement of air by convection. Greenhouse fans are used to circulate the air and also cool the plants in hot weather. The fan placement and capacity should be such that good air movement is assured throughout the entire greenhouse. There are many acceptable configurations for installing the fans. The only good rule to remember is that the fans should be placed so that they do not face one another, but rather push the air in the same direction to sweep the entire greenhouse area. One



unknown

Paphiopedilum Emerald Dream

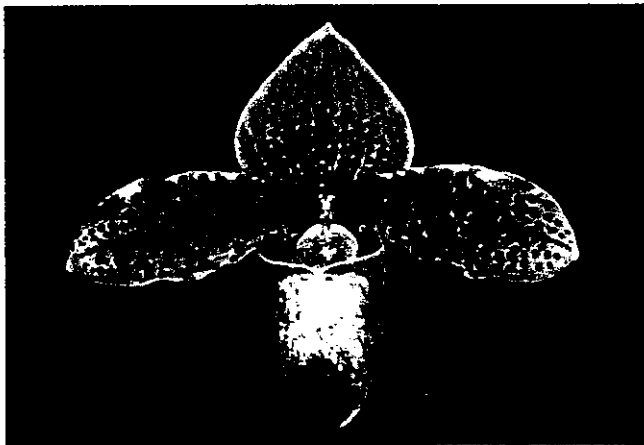
popular type of greenhouse fan attaches under the bench and freely swings into the aisle. It is designed to push the cool air from the floor upwards, where the hot air is exhausted through the top vents or windows in the roof of the greenhouse. The fans that hang from ceilings and pull the air up work in a similar fashion. Another system utilizes an intake fan installed outside near the eave of one of the narrower walls of the greenhouse. The fan pushes fresh air into the greenhouse through a long plastic tube suspended from the ceiling and extending the entire length of the greenhouse. Air streams downward towards the plants through several rows of holes in the bottom side of the tube. Excess hot air is expelled through the vents near the eave of the opposite wall. The system consisting of a wet pad installed in one wall of the greenhouse and a row of pull-through fans in the opposite wall provide good airflow as well as cooling and humidification. This system is particularly effective in dry climates, where the water trickling through the wet pad evaporates rapidly. Good air circulation combined with good humidity is particularly important for plants grown in Wardian cases or under lights. Similar principles apply to the greenhouse except on a smaller scale.

Good air circulation is seldom a problem for the plants grown outdoors. Some protection should be provided from cold winter drafts or from drying summer winds. Homes, fences, and lattices help break the force of the strong winds. Trees, shrubs, and hedges are excellent wind

barriers. Dense vegetation around the outdoor growing area also helps increase the humidity and moderate the temperature.

The plants should not be crowded to assure good air movement around the pots. The pots should never be placed in water or directly on the ground or under the benches. The best location is on a shelf or a bench with the top surface built of wooden slats, or covered with expanded metal or wire mesh. Such an open bench top allows the air to circulate freely around the pots, allowing good access of air into the compost through the drainage holes, which allows the water to drain freely from the pot and prevents the compost from staying too wet.

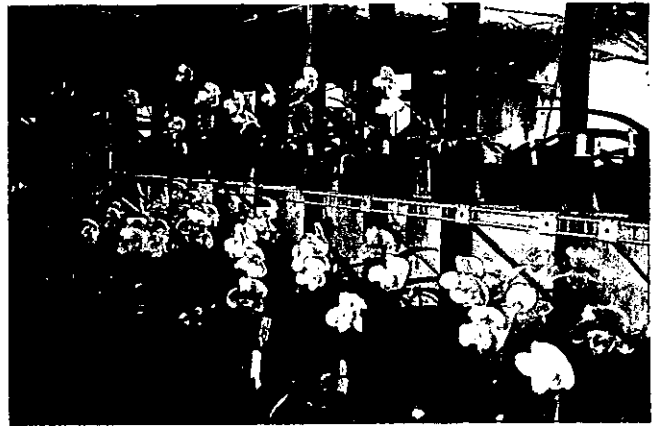
Good humidity is essential to the health and proper flowering of all orchids. High humidity is particularly beneficial during hot summers or during windy weather. Too much air movement or dry breezes can rapidly desiccate the plants even if they are given sufficient water at the root level. Multifloral paphiopedilums and the species from the subgenus *Brachypetalum* and their hybrids prefer warm temperatures and relatively high humidity (from 60 to 85 percent) during their summer growing season. Other paphiopedilums do not require such high humidity. They prefer between 50 and 75 percent relative humidity, but tolerate short spells of dryer conditions. Good air movement and humidity are particularly important when flower spikes are starting to extend above the leaf axils. If the air is stagnant and too humid, the buds damp off (become brown and rot). If the humidity is too low, the buds turn yellow and dry before the flowers have a chance to open. Species from



Paphiopedilum Graham Robertson

the subgenus *Parvisepalum* are particularly susceptible to damping off. They appreciate good air movement at all times, particularly as the buds are maturing.

The simplest, most inexpensive method of increasing humidity in the growing area is to wet down the flooring manually underneath the benches. Timer-activated misters are simple and inexpensive labor-saving devices. More sophisticated systems utilize humidifiers, evaporative coolers, foggers, and misters that are automatically activated by controllers as the humidity drops below a preset level.



The Congleton greenhouse.

Watering

Paphiopedilums have no pseudobulbs for storing water and need to be kept slightly moist all the time. The plants enjoy good air circulation around the roots. They quickly perish if the potting mix stays waterlogged or if the pots are allowed to stand in water.

The best time to water is the mornings on sunny days so that the leaves can dry quickly. Water should not be allowed to stand overnight in the crowns of plants since cool, wet conditions promote the spread of fungal and bacterial diseases. For most collections, watering once a week is about right, adjusting the frequency to compensate for the pot size, the weather extremes, and the type of mix. During hot and dry western summer months, the plants may need to be watered twice a week. In the winter when the skies are overcast, it may be sufficient to water once every ten to fourteen days. Seedlings in small pots should be watered two or three times as often as mature plants. A novice grower tends to over-water, since the potting medium appears dry on the surface well before it dries out at the root zone. The best way to tell if the plant needs water is to test the dampness with a finger. When the soil feels only slightly damp an inch (2.5 centimeters) under the surface, it is time to water. An experienced grower can generally tell when the plant needs water by just lifting the pot to feel its weight. To simplify the watering routine, all plants should be grouped by pot size and by type requiring similar watering schedules.



Paphiopedilum Ross Newman 'Antique Gold'

Paphanatics, unlimited

Good water quality is important. The optimum content of dissolved calcium and other salts in the water should be less than 100 parts per million (ppm). If the content is much higher, the water is considered "hard." Over time, salt residues from such water accumulate on the walls of the pot and in the potting medium, causing "salt burn"—the collapse and death of leaf-tip and root-tip tissues. The grower with a "hard" water supply has three possible remedies: (1) to collect and use rain water, (2) to purify the water by reverse osmosis filtering or deionization, and (3) to adapt his/her watering and potting techniques to minimize salt burn. The first two alternatives involve installation of storage tanks or purification equipment and usually require services of specialists. Many backyard growers, including me, choose the third approach, which consists of periodic leaching of the accumulated salts from the growing medium. This is accomplished by watering the plants heavily once a month, while allowing the water to flow freely through the mix inside the pot and out of the bottom drainage holes. Plastic pots are best for this purpose, since clay pots absorb water and over time become encrusted with salt deposits. It's also best to repot plants frequently (generally once a year) to replace the old salt-laden mix with a fresh growing medium. In my experience, only a few salt-sensitive species from the subgenus *Brachypetalum* have shown signs of stress and leaf-tip burn when watered with hard water (300 to 500 ppm of dissolved salts). Most other paphiopedilums grow into healthy specimens, showing no ill effects from such treatment except for a few telltale marks of calcium residues on their leaves.

Feeding

Paphiopedilums are light feeders. It is always safer to feed lightly but often and to water before feeding. Dry and granular fertilizer should be avoided, since they can burn the roots. Water-soluble fertilizers formulated for orchids are best. They must be diluted to concentrations between 50 ppm of soluble nitrogen for continuous feeding and 100 ppm of nitrogen for periodic feeding. Generally the amount of powder or concentrate needed to get the 100 ppm of nitrogen in the solution is given right on the fertilizer label. If this information is not provided, the manufacturer should be able to provide it upon request. The manufacturer sometimes provides recommendations for specific types of orchids, such as cymbidiums or cattleyas. *Paphiopedilums* prefer less fertilizer (one-tenth to one-eighth of the concentration recommended for cymbidiums or one-fourth of the concentration recommended for cattleyas).

Balanced fertilizers with approximately equal percentages of nitrogen, phosphorus, and potassium (N-P-K concentrations of 20-10-20, 20-20-20, or 18-18-18) may be used year-round. High-nitrogen formulas, such as 30-10-10, should be used with caution only to promote new growth during warm weather.

During their active growth cycle in spring and summer, the plants should be fed with a dilute fertilizer solution after every watering. "Weekly-weakly" is the expression used by paphiopedilum growers to describe this feeding technique. A balanced fertilizer may be used alone or

alternated with high nitrogen fertilizer. Use of high-nitrogen fertilizer should be discontinued in the early fall to discourage new growth and "harden-off" the plants before winter. As the weather begins to cool, the feeding should be gradually tapered off. Most plants need less water and very little fertilizer during the overcast winter weather. Some paphiopedilums require a winter rest, as described below. During this time they should be watered lightly and not fed at all. The feeding should be gradually resumed as the days get longer in late winter.

Rest

Several *Paphiopedilum* species and some of their hybrids require a winter "rest." Although the plants may survive without a proper rest for many years, they sometimes lose vigor or do not bloom regularly. Small seedlings require more heat and water than mature plants and should not be rested until they reach near blooming size. The natural rest period for certain species is during the cool season when the growth slows down; others rest during the dry season when there is little or no rain. In the natural habitats some moisture is provided even in dry season. It may come from heavy dew, the mist from a waterfall, or from the trickle of a mountain rivulet, so that the plants never dry out completely. For most plants cultivated in temperate climates, the shorter daylight hours and lower temperatures during winter season provide sufficient rest. In cooler weather the pots dry out slower, so that the plants must be watered less frequently. With the onset of cooler weather, the use of high-nitrogen fertilizer must be discontinued to discourage new growth and switched to the balanced or low-nitrogen fertilizer.

Certain species need a well-defined rest period. Many cool-growing species and the multifloral *P. rothschildianum* require chilling by lowering the night temperature to 50°F or 55°F (10°C to 13°C). Other simultaneously flowering multifloral paphiopedilums and the species from the subgenus *Parvisepalum* prefer to be kept slightly dryer (but never completely dry) for at least one or two winter months. The plants need to be prepared for the dry rest to avoid salt-burn damage. Before the compost is allowed to get dryer, the plants must be watered very heavily. This will leach out residual salts and prevent them from reaching dangerously high concentrations as the watering is reduced. For at least two months the plants need to be watered only once every three weeks (or once every four weeks during wet, rainy weather). During that time, close attention must be paid that the compost does not become completely dry. As the days grow longer, the frequency of watering and fertilizing may be gradually increased.

Repotting

Although repotting may be done at any time of the year, springtime right after flowering is best. *Paphiopedilums* should be repotted every year to two years before the growing medium starts to break down. Fresh mix allows good air circulation around the roots, which is essential to plant health. The optimum frequency of repotting depends on the quality of water and the type and frequency of application of the nutrients. Salt residues from hard water and fertilizer accumulate in the mix over time,

contributing to leaf and root-tip burn. The lower the content of dissolved salts is in the water and the less fertilizer the grower uses, the less frequently will he/she need to re-pot the plants. Fertilizer, particularly high-nitrogen fertilizer, promotes bacterial action and speeds up the decomposition of the mix. A badly decomposed mix tends to become waterlogged, preventing good air circulation around the roots. Such conditions contribute to rot and rapid root loss. The plant that has lost its roots may appear dehydrated. Noticing the limp, wilting leaves, an inexperienced grower tends to water more. Such action often leads to a rapid demise of the plant. If the leaves appear wilted even after the plant has been watered or the leaf tips turn brown and dry, the plant probably needs to be repotted. With some experience, each grower learns when his/her *Paphiopedilum* collection needs to be repotted. A simple method of keeping track of the date when the plant was last repotted is to write it on the back of the nametag.

To take the plant out of the pot, the grower should support the root ball by placing the palm of one hand on top of the mix around the base of the plant, then turn the pot upside down, and tap the edge of the pot on the edge of the bench until the plant slips out of the pot. At this point the roots and the condition of the mix can be inspected. If the roots look healthy and the mix appears open and clean, the grower may decide to postpone repotting. The root ball with mix intact can then be placed back into the pot, and the plant is no worse for wear.

If the plant needs to be repotted, the old compost must be carefully removed from the roots. Live roots should be disturbed as little as possible. This is important, because paphiopedilums do not readily regrow roots on old growths. The dead, dry, or rotting roots should be gently pulled off and removed.

Since large specimens grow better and produce more flowers, the grower should not be too eager to divide the plants except when he/she wishes to sell or trade a division. The plant can be divided by simply pulling it apart. The rhizome will generally break easily between old growths or in a place where an old growth has died. The plants should not be broken into single-growth pieces, since they will take a long time to get reestablished. Three- to five-growth divisions are preferable.

The pot for each division should be of smallest size that can accommodate the roots. If the pot is too large, the compost does not dry evenly and can become stagnant. The pot, either clay or plastic, must be clean, with ample drainage holes. A plastic pot may be reused after it has been scrubbed clean, soaked in a 10 percent bleach solution, and rinsed in water.

Any water-retentive, fast-draining soil less mix may be used. Some favorite materials include combinations of bark, sphagnum moss, charcoal, lava or sponge rock, chopped coconut husks, calcined clay nuggets, or osunda. My personal favorite consists of the following:

- 8 parts clean fir or pine bark—one-eighth to one-quarter inch (three to six millimeter) chunks
- 2 parts coarse perlite (sponge rock)—one-eighth to one-half inch (three to twelve millimeter) chunks
- 1 part charcoal (optional)—One-eighth to one-half inch (three to twelve millimeter) chunks

Different potting mixes dry at different rates. The compost dries faster in clay than in plastic pots. To simplify watering, it is important to use the same mix and the same type of pots for the entire collection.

The process of potting paphiopedilums is rather simple. The mix needs to be moistened before potting. The plant should be centered in the pot, and supported with one hand while the fresh mix is poured around the roots until it just covers the rhizomes no deeper than one-quarter to one-half inches (six to twelve millimeters). The mix should not be compacted. It is generally sufficient just to tap the pot on its side to shake the mix between the roots and then press the mix down gently.

The newly potted plant should be stable and not wobble in the pot when it is watered. Any movement bruises the new root tips, causing them to die back. Without new roots, the plant will be severely set back and may never get reestablished. A strong root system is generally sufficient to anchor the plant securely. However, if the plant has lost its roots, it needs to be anchored by some other means until it can grow new roots. This can be accomplished by any method that will immobilize the plant. For example, thin bamboo stakes may be placed on each side of a growth, holding it in place; for extra security, a leaf may be taped to the stake. Another good method is to use a six-inch long piece of paper or plastic-coated wire to make artificial "roots." The middle of the wire is looped around the rhizome and secured in place by twisting the ends, allowing the two three-inch-long ends to hang down. When the mix is compacted around them, the wire anchors the plant in place.

After repotting, the plant should be given a little more shading and humidity. It may be watered, but not fertilized, for about four weeks until it is reestablished.

Pest and Disease Control

Paphiopedilums are less susceptible to pests than most orchids. Perhaps the reason is that their flowers do not exude nectar. Ants that bring in pests such as aphids and scale prefer many other orchids found in typical mixed collections. They generally infest the pots of cattleyas or phalaenopsis first. An observant grower has time to spot the problem and treat the infestation before it spreads to paphiopedilums. Ant baits spread around the entire perimeter of the greenhouse are generally very effective. The poison is carried by worker ants back to the nest, killing the queen and the entire colony.

The most common pests are mealy bug, scale, and aphids. Broad-spectrum insecticides recommended for use on orchids can control both. Mites can be a problem during hot, dry weather. These tiny pests are hard to see and often escape detection until some damage occurs. The signs of damage are irregular, rust-colored pitted areas predominantly on the underside of leaves. These may be easily mistaken for rust, a fungal infection. A close inspection with a magnifier will disclose tiny spider-like pests and very fine, silver-colored webbing. Faint reddish streaks (bug-juice) left on a piece of tissue rubbed on the rust-colored spots will confirm the presence of spider mites. Formulas that are specifically recommended for controlling mites should be used to eradicate the

infestation. Most broad-spectrum insecticides are completely ineffective against these pests. Snails and slugs can be easily kept in check by regular use of special baits.

Poor sanitation, inadequate air circulation, and wet conditions on cool nights encourage fungal and bacterial diseases. Providing excellent air circulation can prevent most problems. The plants should not be crowded. Watering should be done early in the morning to allow the water to dry by nightfall. A few, dry brown leaves are not cause for alarm. However, large areas of soft brown-rot (leaves remaining soft, with wet droplets forming on undersides) may indicate common fungal diseases such as *Pseudomonas cypripedii* or *Erwinia cypripedii*. Round necrotic spots may be either a bacterial or fungal disease. An infested plant needs to be isolated immediately to prevent the spread of disease. All affected leaves, sometimes including entire growths, should be removed and disposed off outside of the growing area. Cinnamon powder sprinkled generously on affected areas is an excellent natural fungicide. If the problem is new or widespread, an infected leaf may be sent for diagnosis of the disease to the nearest available agricultural inspector, who can recommend the best treatment and most effective fungicide or bactericide. After treatment, the plant should be kept a little dryer and placed in an area where it will get excellent ventilation.



Paphanatics, unlimited

Paphiopedilum Frank Hughes

Prevention of any pest or disease is always the best approach. Even if they appear healthy, new plants introduced into a collection should undergo a thorough inspection and quarantine. Any infestation should be treated as soon as it is detected. The least damaging treatment should be tried first. A few mealy bugs can be easily removed with a cotton swab dipped in alcohol; insecticidal soaps are also quite effective. Wettable powders made into a spraying solution cause less damage to plants than petroleum and oil-based products. Frequent use of systemics should be avoided. Many have cumulative toxic effects on the plants that may cause crippling of flowers and retard growth.

Before using any pesticide or fungicide the grower must read and follow all instructions and warnings provided by the manufacturer. The person applying the treatment should wear protective clothing and goggles and refrain from smoking during the application. Skin contact or spray inhalation should be avoided—this cannot



Miniature complex slippers compared to a standard flower.

be emphasized strongly enough. Many compounds available to the grower are dangerous and may cause severe damage both to the grower and to the plants.

Growing Paphiopedilums Outdoors

In frost-free, mild climates paphiopedilums can be easily grown outdoors. They need to be provided with some wind shelter, adequate shade, and overhead protection from cold winter rains and the occasional frost. A combination of clear-plastic roofing with added shade cloth or lattice is ideal. Shrubbery and trees are excellent windbreaks.

The outdoor grower must monitor the weather closely. In case of unexpected frost, the plants may be brought indoors at night. Other emergency measures may include lighting a string of light bulbs under the benches on a cold night. Fans may provide sufficient air movement to prevent cold air from settling on top of plants and cause frost damage. Misters and foggers help increase humidity and cool the plants during hot, dry summer weather.

The cool-growing *Paphiopedilum* species and their hybrids are generally best suited for outdoor culture. The novice should try the hybrids first, since they are generally more vigorous and adaptive.✽

Helen Congleton
18341 Rain Circle
Huntington Beach, CA 92648

Bibliography

- Birk, Lance. 1983. *The Paphiopedilum Grower's Manual*. Santa Barbara, California: Pisang Press.
- Braem, Guido J. 1988. *Paphiopedilum. A Monograph of All Tropical and Subtropical Asiatic Slipper Orchids*. Hildesheim, Germany: Brucke-Verlag Kurt Schmiersow.
- Braem, Guido J., Charles O. Baker, and Margaret L. Baker. 1998. *The Genus Paphiopedilum. Natural History and Cultivation*, vol. 1. Kissimmee, Florida: Botanical Publishers, Inc.
- . 1999. *The Genus Paphiopedilum. Natural History and Cultivation*, vol. 2. Kissimmee, Florida: Botanical Publishers, Inc.
- Cribb, Phillip. J. 1998. *The Genus Paphiopedilum*, second edition. Kota Kinabalu, Sabah, Malaysia: Natural History Publications (Borneo) in association with Royal Botanical Gardens, Kew.

MULTI-FLORAL PAPHIOPEDILUM THE SIMULTANEOUS BLOOMERS

MARILYN LEVY

A teacher by profession, Marilyn Levy lives in southern California where she grows her orchids. She is a member of the Orchid Society of Southern California and an American Orchid Society student judge of the Pacific South region.

MULTI-FLORAL PAPHIOPEDILUM species are having a strong rebirth. Although multi-floral breeding has been going on since before the turn of the century, the acquisition of new species, plus the reintroduction of *Paphiopedilum sanderianum*, has increased the output of new crosses as well as the remakes of many that have not been seen for many years.

The multi-florals include simultaneous and sequential bloomers. The simultaneous bloomers have given us some unique and dramatic results. Besides many purely simultaneous hybrids, many crosses have been made using sequential multi-florals and other species.

There are twelve species in the simultaneous bloomers category. Taxonomists have divided them into different sections. This article will use two, the section *Pardalopetalum* and the section *Coryopetalum*. The *Pardalopetalum* include *P. haynaldianum*, *P. lowii* and *P. parishii*. The *Coryopetalum* include *P. philippinense*, *P. stonei*, *P. glanduliferum* (syn. *P. praestans*), *P. adductum*, *P. kolopakingii*, *P. randsii*, *P. supardii*, *P. sanderianum* and *P. rothschildianum*.

Among the attributes these multi-florals share are: plain, not tessellated, strap leaves; boot or helmet-shaped pouches and long, sometimes twisted petals.

Pardalopetalums and coryopetalums are indigenous to areas of southeast Asia. Their growing conditions include high elevations and high humidity. Most grow epiphytically or lithophytically with their roots in detritus and decomposing plant debris. They generally experience a dry and cold period during the year.

Some of the things which can approximate their natural conditions include providing pots with excellent drainage (some people mount their plants on cork), hanging the pots near the top of the greenhouse for increased air circulation and light, and making sure that the humidity does not get below 50 percent. Because many of us grow a variety of genera, providing proper humidity can be a challenge.

In California, many growers take multi-florals outdoors between August 1st and November 1st in order to give them a cool period.

Now, if we take a close look at each of these species, we can study the characteristics that make each of them unique. Besides helping us to heighten our recognition, this can give us insight into breeding possibilities and liabilities. Because there are many color forms among these paphiopedilums, it is difficult

to be very specific about color descriptions. Unless the color is a major contributor to the hybrids, the following descriptions will concentrate on distinctive form.

Paphiopedilum haynaldianum

Paphiopedilum haynaldianum is endemic to the islands of Luzon and Negros in the Philippines. Its arching inflorescences cling to rocks and trees at elevations from sea level to 4,800 feet. Humidity is usually high and rainfall is abundant.

Important floral characteristics include a very reflexed boldly-spotted dorsal, spatulate (oblong with spatula-like ends), spotted petals and a helmet-shaped pouch.

Paphiopedilum Bengal Lancers (*haynaldianum* × *parishii*) is a cross of two Pardalopetalums.

Paphiopedilum Neeri-Twist (*haynaldianum* × *praestans*) crosses a *Pardalopetalum* and a *Coryopetalum*, and *P. Henrietta Fujiwara* (*haynaldianum* × *primulinum*) is a well-known hybrid with a sequential bloomer as one parent.

Paphiopedilum lowii

Paphiopedilum lowii has wide distribution throughout the Malay Peninsula, Sumatra, Borneo and the Celebes. It is usually epiphytic but at times grows lithophytically. Its elevation ranges from 860 to 5,500 feet. It also experiences a dry period in winter.

The dorsal appears very narrow because of reflexing, and unlike *P. haynaldianum*, has no spotting, the petals are spatulate, have a full spiral and are spotted. The ends of the petals can range in color from light to deep magenta. The pouch is helmet-shaped.

Paphiopedilum Julius (*lowii* × *rothschildianum*) is a popular multi-floral. *Paphiopedilum Berenice* (*lowii* × *philippinense*) has produced some beautifully arched inflorescences.

Paphiopedilum parishii

Paphiopedilum parishii has a wide gap in geographical range from the other pardalopetalums. It is found in Burma, northern Thailand and southern China. The sub-erect inflorescences grow epiphytically and lithophytically at elevations of 4,300 to 7,600 feet. Fog and rain keep roots moist. Overnight lows during winter can drop to 42°F.

The dorsal sepal is distinctive with reflexing at the base and first reflexing then keeling forward at the top. The petals are narrow, very twisted and tapered. The pouch has a narrow helmet shape.

Besides the popular primary *P. Bengal Lancers*, *P. parishii* has been crossed with *P. stonei* to produce *P. Frank Booth* and with the sequential bloomer *P. glaucophyllum* to produce *P. Glaucompar*.

Paphiopedilum philippinense

There are nine coryopetalums. *Paphiopedilum philippinense* grows in the Philippines and on islands near Borneo. The plant grows on limestone outcrops near coastal regions. Its low elevation (sea level to 1,700 feet) gives it abundant warmth and humidity.

The dorsal sepal is white with dark maroon stripes, the synsepalum is similar in color and size. The petals are long and can be quite twisted. The helmet-shaped pouch is a buff yellow (a color often passed on to its progeny).

Paphiopedilum St. Swithin (*philippinense* × *rothschildianum*) and *P.* Mount Toro (*philippinense* × *stonei*) are crosses using simultaneous bloomers, but *P.* Honey (*philippinense* × *primulinum*) uses a sequential bloomer.

Paphiopedilum stonei

Paphiopedilum stonei is found in Sarawak, Borneo. It grows on limestone rock as well as epiphytically on tall trees. The area is continually wet, and humidity is always high. It grows at an elevation of between 2,000 and 3,000 feet.

The plant is upright to sub-erect. The dorsal sepal is white with dark maroon streaks. It hangs over the pouch at a 45° angle. The petals are straight, rather bowlegged and spotted. It has a boot-shaped pouch with a groove in the lower half.

Some important primary hybrids include *P.* Lady Isabel (*stonei* × *rothschildianum*), *P.* Mount Toro and *P.* Yellow Tiger (*stonei* × *praestans*).

Paphiopedilum glanduliferum

Paphiopedilum glanduliferum (syn. *praestans*) grows lithophytically (on limestone rocks) in New Guinea. Because the growing area is so close to the equator, there is very little temperature difference throughout the year. Rainfall is plentiful and the humidity is high. It grows at elevations of 5,900 to 6,200 feet.

The dorsal sepal is quite ovate with very well-defined, deep purple stripes. The petals are pendulous and very twisted. The pouch distinguishes itself by its narrow appearance, especially noticeable from the front.

Paphiopedilum glanduliferum has been used to make some rather recent hybrids including *P.* Predacious (*praestans* × *adductum*) registered in 1989, *P.* Susan Booth (*praestans* × *rothschildianum*) registered in 1983 and *P.* Prim and Proper (*praestans* × *primulinum*) a sequential bloomer registered in 1981.

Paphiopedilum adductum

Paphiopedilum adductum is a fairly recent addition to hybridizing, although it was discovered in 1933. It is found in the southern Philippines (Mindanao) at elevations up to 4,600 feet, among rocks and decaying plants.

The dorsal sepal is large and vertically striped, the petals are straight and pendulous, the boot-shaped pouch has a prominent groove on the distal half. It is the groove and the shape of the pouch which are quite distinctive.

The hybrids of this species were first registered in 1989. Among the primary hybrids, *P.* Predacious has become well known. *Paphiopedilum adductum* has been crossed recently with *P. lowii* to make *P.* Low Hum and *P. stonei* to make *P.* Stone Addict.

Paphiopedilum kolopakingii

Paphiopedilum kolopakingii was first introduced in its albanistic form as *P. toppei*. There is not a great deal known about its habitat. Its geographical location is Kalimantan on Borneo. The very large sub-erect plant grows as an epiphyte in the cracks and crevices of steep cliffs. This is the most floriferous of the simultaneous bloomers, and can have more than twelve flowers open at a time (as opposed to three to five).

This large and arching plant has very large flowers. The dorsal is narrow and hooded. The synsepalum is usually longer than the dorsal. Both dorsal sepal and synsepalum have prominent longitudinal stripes. The petals, also striped, are pendulous with a slight twist at the ends. The pouch is pointed at the apex and juts forward with a deep groove on the underside.

Hybrids of this species are just being developed. The high flower count, as well as the large size of the plant, can pose interesting results.

Paphiopedilum randsii

Paphiopedilum randsii, discovered in 1968, is another recent multi-floral. It is endemic to the northern end of Mindanao in the Philippines, where it experiences a number of weather patterns including a dry spring season. It is usually epiphytic and grows at elevations from 1,400 to 1,700 feet. Its yellowish green color and its petal size and stance make it distinctive. The dorsal sepal and synsepalum are approximately the same size and have prominent longitudinal stripes. The petals are shorter than most multi-florals and bend inward toward the pouch. The pouch is helmet-shaped with a distinctive groove from the mid-lobe to the apex. Because hybrids are just becoming available, only few have been seen. *Paphiopedilum randsii* has been crossed with *P. rothschildianum* to create *P.* Gemstone Randchild.

Paphiopedilum supardii

Paphiopedilum supardii is endemic to southeast Kalimantan, Borneo. When it was first introduced into cultivation, it was called *Paphiopedilum devogelii*. A lithophyte, it grows in shady areas at elevations ranging from 2,000 to 3,300 feet.

The dorsal sepal has an acute apex, the synsepalum is similar but narrower. Both have longitudinal maroon stripes. The pendulous petals are not uniform and have a curled, almost crimped appearance. This species has a very distinct club-shaped staminode. Its pouch is boot-shaped.

Because of its recent introduction, hybridizing is in the early stages. A recent sequential blooming primary hybrid is *P.* Goldwesp (*supardii* × *glaucophyllum*).

Paphiopedilum sanderianum

Paphiopedilum sanderianum has made an exciting comeback since its rediscovery. Hybrids from the turn of the century are being remade, and exciting new hybrids are also available.

The species was found in Sarawak, Borneo growing on southeastern cliffs at elevations ranging from 500 to 2,100 feet. In that area, humidity is high and rainfall is plentiful.

Paphiopedilum sanderianum has an acute dorsal sepal with deep maroon stripes. The synsepalum is similar but smaller. The sepal deeply angles over the pouch. The petals are the most outstanding feature of this species, being pendulous and twisting, reaching amazing lengths (some up to thirty-five inches). The pouch is boot-shaped.

One of the older primary hybrids recently remade is *P. Prince Edward of York* (*sanderianum* × *rothschildianum*). A new cross is *P. Michael Koopowitz* (*sanderianum* × *philippinense*). Both of the above hybrids have inherited the long ribbon-like petals of *P. sanderianum*.

Paphiopedilum rothschildianum

Paphiopedilum rothschildianum is known for its dramatic flowers on erect inflorescences. It grows on the steep cliffs of Mt. Kinabalu in northern Borneo at elevations from 2,000 to 4,000 feet. The area has high humidity and a definite cool period. It has a dramatic upright stance.

The dorsal sepal is slightly larger than the synsepalum, both have longitudinal purple stripes. The petals are almost horizontal. *Paphiopedilum rothschildianum* has a unique bent knee-shaped staminode, which makes it easily recognizable. The pouch is boot-shaped and rosy or maroon red.

Some of its well-known simultaneous primary hybrids include *P. Juluis*, *P. St. Swithin*, *P. Susan Booth* and *P. Lady Isabel*. Among the sequential primaries are *P. Vanguard* (*rothschildianum* × *glaucophyllum*) and *P. Prime Child* (*rothschildianum* × *primulinum*).

Many simultaneous bloomers have been hybridized using *Paphiopedilum* species that are not multi-floral. Two subgenera used frequently are *Brachypetalum* (the *niveum-bellatulum* group) and *Parvisepalum* (the *delenatii-armeniaceum* group). Among the older crosses are *P. Ariel* (*bellatulum* × *haynaldianum*), *P. Rolfei* (*bellatulum* × *rothschildianum*) and *P. Woluwense* (*niveum* × *rothschildianum*).

Recent *Parvisepalum* crosses include *P. Weltz Ballad* (*bellatulum* × *adductum*), *P. Dallgoldi* (*armeniaceum* × *rothschildianum*) and *P. Marilyn Hanson* (*delenatii* × *stonei*).

New complex crosses have included *P. Lady Mirabel* (*Transval* × *stonei*), *P. Manahawkin* (*Maudiae* × *praestans*), *P. Lisa Hasegawa* (*sanderianum* × *Delrosi*) and *P. Screaming Eagle* (*sanderianum* × *Berenice*).

We've taken a look at the past of our dozen bloomers and we look forward to an exciting future.

New horizons beckon. Perhaps, for our "simultaneous bloomers" the best is yet to come! ♦

Bibliography

- American Orchid Society (1990) *The Paphiopedilum Reference Book*. U.S.A.
Birk, Lance (1983) *The Paphiopedilum Growers Manual*. Pisang Press, Santa Barbara, CA, U.S.A.
Braem, Dr. Guido (1988) *Paphiopedilum*. Brücke-verlag Kurt Schmiersow, Germany.
Cash, Catherine (1991) *The Slipper Orchids*. Timber Press, Portland, Oregon, U.S.A.
Cribb, Phillip (1987) *The Genus Paphiopedilum*. The Royal Botanic Gardens, Kew. Timber Press, Portland, Oregon, U.S.A.
Koopowitz, Harold and Norito Hasegawa (1989) *Novelty Slipper Orchids*. Angus and Robertson, Australia.

Acknowledgment

A special "thank you" to Helen Congleton who compiled recent hybrid lists which would have been otherwise unavailable.

Marilyn Levy
7632 Reposado Drive
Carlsbad, CA 92009

Continued from page 139

- P. mastersianum* 'White Sail' / Paphanatics, unLtd. / Charles Rowden
P. micranthum 'Jumbo Jamboree' / Paphanatics, unLtd. / Richard Clark
P. moquetteanum 'Opal' / Gordon Clayton / Charles Rowden
P. niveum 'Alabaster' / Paphanatics, unLtd.
P. papuanum / Fox Valley Orchids, Ltd. / Tom Kalina
P. parishii / Paphanatics, unLtd.
P. philippinense / Dragonstone Orchids / Paul Bechtel
P. philippinense var. *roebelenii* / Robert Wertz / Charles Rowden
P. primulinum var. *purpurascens* & *P. primulinum* / Paphanatics, unLtd.
P. purpuratum / Paphanatics, unLtd.
P. randsii / Paphanatics, unLtd.
P. robinsonii / Dragonstone Orchids / Paul Bechtel
P. rothschildianum 'Wayne' / Paphanatics, unLtd. / W. Fogarty
P. sanderianum 'Jacob's Ladder' / Orchid Zone / Charles Rowden
P. sangii / Paphanatics, unLtd.
P. spicerianum 'Gundlach' / L. Gundlach / Tom McIntosh
P. stonei 'Norman' / Norman Atkinson / Beauford B. Fisher
P. sukhalakulii 'Muscle Bound' / Paphanatics, unLtd. / Charles Rowden
P. supardii 'Fox Valley' / Fox Valley Orchids, Ltd. / Tom Kalina
P. superbians 'Malaysian Mist' / C. Spain / Richard Clark
P. superbians var. *curtisii* 'Althea' / Val & Jack Tonkin / Beauford B. Fisher
P. tigrinum / Paphanatics, unLtd.
P. tonsum / Paphanatics, unLtd. / W. Fogarty
P. tonsum var. *braemii* / Paphanatics, unLtd.
P. urbanianum / Paphanatics, unLtd.
P. venustum 'McQuerry' / J. McQuerry / Louis Ellsworth
P. victoria-mariae 'Gordon' / Gordon Clayton / Charles Rowden
P. victoria-regina 'Birchwood's Kew' / Fox Valley Orchids, Ltd. / Tom Kalina
P. victoria-regina var. *kalinae* / Paphanatics, unLtd.
P. villosum / Paphanatics, unLtd.
P. villosum var. *boxallii* / Fox Valley Orchids, Ltd. / Tom Kalina
P. violascens 'Lil' / H. J. Severin / Beauford B. Fisher
P. violascens var. *bougainvilleanum* 'Fox Valley' / Fox Valley Orchids, Ltd. / Tom Kalina
P. wardii 'Jamboree Magic' / Paphanatics, unLtd. / Charles Rowden
P. wentworthianum / Fox Valley Orchids, Ltd. / Tom Kalina
P. wilhelminiae / Truford Orchids / Trudi Marsh

