

Primroses

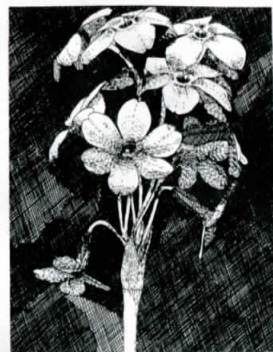


Vol. 49

Winter, 1991

No. 1

Editor's Committee:
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P. parryi

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Cover drawing by Larry A. Bailey
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PRIMULA CONSERVATION

by Geoffrey Nicolle
 Noltan Haven, Wales, U.K.

Some 25 years ago, when I moved to the Welsh village of Rosemarket, I was impressed by two plants growing in cottage gardens there. Both of these plants were primulas, both were old. In the garden of the tiny cottage built for the Railway Crossing keeper grew the double lilac primrose *P. v. lilacina plena* otherwise known as 'Quakers Bonnet'. All of the older gardens grew a grey leaved pink-purple primula which everyone assured me was a 'rackler'.

My interest in these plants inspired me to seek out and collect all the old double primroses and garden auriculas I could trace. I joined N.A.P.S. I also became a member of an informal group of plant lovers whose passion was finding growing and exchanging old cottage garden plants.

In the late 1970's a group of plantmen and plantwomen connected with the Royal Horticultural Society called a conference which formed N.C.C.P.G. (The National Council for the Conservation of Plants and Gardens). This organization now has several thousand members organized into local groups and seeks to preserve all types of plants and gardens. N.C.C.P.G. works to identify plants in need of conservation, helps to find, protect and distribute them, with the purpose of preserving Britain's rich garden heritage.

Based at Wisley Gardens, N.C.C.P.G. has a staff of two. R.A.W. Lowe is secretary and G. Pattison the Horticultural Advisor. N.C.C.P.G.'s official

address is 'The Pines', Wisley Garden, Woking, Surrey, GU23 6QB.

There are now 500 different National Collections covering all types of ornamental plants from alpines to trees. It is not only 'old fashioned' plants that are in danger of extinction.

National Collections are located in all parts and all types of gardens from stately homes and municipal parks to nurseries and private gardens of all sorts and sizes. Prince Charles is a National Collection holder - beech trees, but A.P.S. members will be especially interested in the Primula categories covered. As the Collection holder for Garden/Border Auriculas I grow more than a hundred different named auricula cultivars of this type.

PRIMULA NATIONAL COLLECTIONS

Primula Auricula:

1. Edged Shows and Fancies, including the Douglas collection
2. Alpines
3. Doubles
4. Garden/Border
P. Vernales Cultivars
P. Vulgaris
P. Allionii Cultivars
P. Candelabra and *Sikkimensis*
P. European Spp. and
P. Marginata.

PRIMULA PARRYI

by Larry Bailey
Edmonds, Washington

A few years back, I was nosing around a small alpine nursery on the outskirts of Hochheim, near Weisbaden, Germany and stumbled across a large selection of *Primula parryi*. What a pleasant surprise to find a piece of 'home' thousands of miles from the United States.

I was struck by the robust plants, being grown in direct sunlight, in pots and as casual as Iris and Day Lilies. It did not take long to strike up a broken conversation with the proprietor (her in German and me in English). After a period of arm waving, crude hieroglyphics in the soil, and nodding and shaking of heads, I did find out a little more about the present of this Native American primula in Europe.

Much to my amazement, many of the smaller, alpine type nurseries in Europe grow *Primula parryi* as well as others in the Section Parryi (*P. ellisiae*, *P. rusbyi*, etc.). There, they cultivate it in the same manner as other alpine plants. The soil in the pots is a gritty, peaty mix with a lot of loam and nutrients. I did find out that keeping the plants well watered in the summer months is the nurseries biggest problems. Often, the plants are divided in the early spring and cultivars are kept of the most promising colors and plant forms.

Over the years, I was lead to believe that *P. parryi* was a very difficult plant to grow (A.P.S. Pictorial Dictionary; Blasdale; etc.) and took great satisfac-

tion in having some personal success with this "difficult" primrose. My success, as so often is the case, is just planting seedlings in what ever soil mix is at hand (usually an auricula mix), and placing the pots under the bench in the alpine house, water occasional, and pretty much just forget about them. Using this un-exacting format, I obtain some beautiful flower stalks about 18" high with deep magenta-mahogany colored pedals. The plants were kept alive for a number of years, until lack of care (watering and repotting) gradually took it's toll.

Of all the Native American Primula, *P. parryi* and *P. ellisiae* are probably the easiest to grow, both requiring pretty much the same care: gritty, loamy, peaty soil with ample water in the spring and summer months. Like many primulas of this section, I found it enjoys filtered, indirect sunlight in a cool location to bloom well. When the plants receive direct sunlight for much of the day, the plants are smaller and the blooms are shy in coming.

First discovered growing in the Colorado Rocky Mountains by Dr. C.C. Parry in 1861, it was soon being grown in England. By 1865 (just four years later) it received a First-Class Certificate of Merit from the Royal Horticultural Society.

Further explorations by Dr. Parry and other botanist indicate this species is distributed in alpine and sub-alpine regions (9000' to 14000') from New

Mexico and Arizona in the south to Montana in the north. It has also been found in Nevada, Idaho and Wyoming. The plants and flowers vary considerably in size and form depending on the location and micro climates.

It is interesting to note that *P. parryi* is customarily found growing in areas with snow runoff and by the boarders of alpine streams near the snow-line. Often, in the late summer, the soils become dry and parched, forcing the plant into it's annual dormancy. When first introduced to cultivation, it was

thought that the plant needed cold, subsurface irrigation to enable it to bloom. Trying to emulate alpine snow-runoff conditions and late summer drying led to the misunderstandings about the degree of difficulty in its cultivation.

Primula parryi, an exciting plant for the alpine house or shaded, damp rock garden. A truly beautiful native American specie Primula that is easy to cultivate from seed. A plant that American Primrose growers should be embarrassed by having not grown at least once.

* * *

APS SHOW DATES

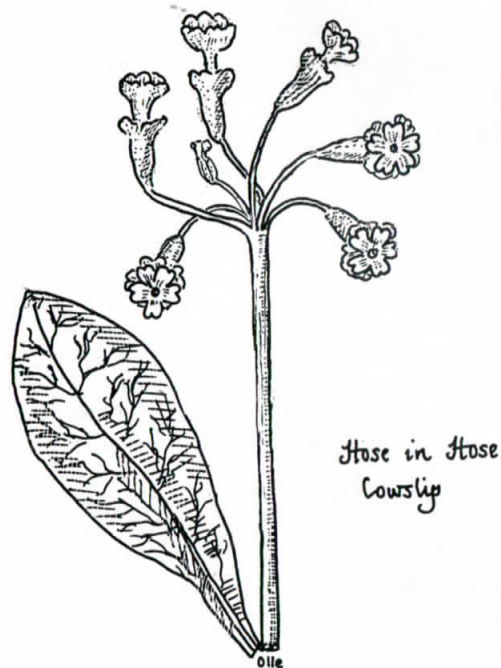
Most shows open between 9:00 and 10:00 AM and close around 5:00 PM. Contact the Chapter's representative for additional information on the exact times, schedules, plant sales, directions, etc.

- April 6th & 7th, 1991**Tacoma Chapter, APS Show
Lakewood Mall, Tacoma, Washington
(Candy Strickland (206) 531-4449)
- April 13th & 14th, 1991** National Show
Washington State Chapter
South Center Pavilion, Seattle
(Rosetta Jones (206) 426-7913)
- April 20th & 21st, 1991**Oregon Primrose Society, APS Show
Milwaukie Community Club
41st & Jackson St, Milwaukie, Oregon
(Frank Berthold (503) 252-1614)
- April 20th & 21st, 1991**Eastside Chapter, APS Show
Totem Lake Mall, Kirkland, Washington
(Thea Oakley (206) 880-6177)

RISING SUN COWSLIPS

by Geoffrey Nicolle
Noltan Haven, Wales, U.K.

Some ten years ago I became very interested in an illustration in John Parkinson's 'Paradisi in sole; Paradisus terrestris', published in the year 1629. It depicted several 'anomalous' forms of the cowslip *Primula veris* that were grown in gardens in Britain in the 17th Century. They included the single green and 'double green feathered' cowslip, the hose-in-hose, the 'curled cowslip or galligaskins', 'the franticke or foolish cowslip or jackanapes on horseback' (apparently the form now called jack-in-the-green') and also the hose-in-hose form of the oxlip *Primula elatior*.



Hose cowslips and oxlips have appeared in gardens since the 17th Century, but have always been uncommon. I had failed to find more recent records of the other described forms. The question arose, would it be possible to 're-create' plants of the same type as these long lost historic garden primulas? I decided I would at least make an attempt to do this.

I started by hand-pollinating a form of the wild cowslip using pollen from a hose-in-hose polyanthus. The polyanthus was of unknown origin and had yellowish flowers. It appeared to have no special qualities except that its small pips were nearer in size to those of the cowslip than anything else available. Over the years I have crossed and re-crossed their descendants, reintroducing from time to time the 'fresh blood' of the wild cowslip plus red and orange cowslip forms.

My original strain now produces plants of cowslip form only, polyanthus types having been almost completely eliminated. The seedlings include single cowslips in yellow, red, orange and tawny shades, together with 'anomalous' cultivars in variety. I have bred many hose-in-hose forms, named after the 16th Century gentlemen's fashion of wearing two pairs of stockings. The inside pair were turned over at the knee, the outside pair at the thigh. Other flower forms I have developed include the 'galligaskins' with an enlarged 'curled' calyx and another old form not illustrated in Parkinson, called a 'pantaloon'. This is of hose-in-hose

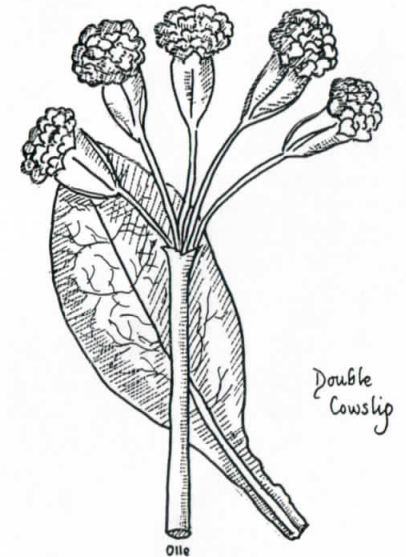
type, but the 'back' flower is partly green, being striped with the colour of the 'front' flower. I have raised only one jack-in-the-green. This appeared early in the development of the strain and was of polyanthus form. So far I have kept it but not used its pollen, preferring to breed from cowslip type plants only.



In 1989 I was delighted to raise two doubles, one orange, one red. The red double, a flower of excellent colour and form, won the award for best double in the primrose/polyanthus class at the London Auricula Show of the National Auricula and Primula Society and appears on the video of the Show. Unfortunately it succumbed to weevil attack later in the year. In 1990 five more doubles were raised, each one a true yellow cowslip, but showing different degrees of doubling. The best was a very full double that appears identical to the double illustrated by Parkinson. Later the plant rotted away. Fortunately I found one tiny healthy shoot. Potted in sand and

treated in my 'intensive care unit', it rooted and produced new leaves. Where there is life there is hope.

I have raised no cowslips like Parkinson's single or double green. I once grew the green primrose but lost it. This was not to rot or weevil attack but to flood. The stream in my garden overflowed and washed it away into the Atlantic Ocean. Perhaps A.P.S. members on the East Coast can keep a look out for it for me! If I still had this plant I might use its pollen to try to introduce a 'virescent' factor into the strain. In 1987 I started a separate strain of oxlip *Primula elatior* x hose-in-hose cowslip and am near to raising a hose oxlip.



My cowslips are known as the 'Rising Sun' Strain. This has nothing to do with attracting Japanese industry to Wales, but is named after my home 'Rising Sun Cottage'. This is a historic former pub., which was called the 'Rising Sun'. A small quantity of this seed has been donated to A.P.S. Seed Exchange. If anyone sowing it raises an interesting plant or two, please write and let me know.

PRIMULA WORLD WIDE 1992 CONFERENCE

APS members should mark their calendars for next year's Primula Conference to be held April 10th through the 12th, 1992, in Portland, Oregon.

This Conference, the first to be held in the United States (or the Western Hemisphere), will be in conjunction with the 50th Anniversary of the American Primrose, Primula and Auricula Society.

Sponsored by the Royal Horticultural Society, the Berry Botanic Garden, and the American Primrose Society, Primula World Wide will feature keynote speakers from Great Britain, Japan and North America. These speakers have been carefully chosen for their individual areas of expertise.

Already scheduled events include the National Primrose Show for 1992, Tours of the Berry Botanic Garden's Primula Collection and noted gardens in the Portland Area, Displays of Artworks and Old Prints of Primulas, and Plant and Book Sales. Work Shops are also scheduled on hybridizing, propagating and the cultivation of Primulas.

Those members who would like to help out in the various committees (Registration, Program, Seed and Plant Sales, Hospitality, Publications, Trans-

portation, Exhibits, Flower Show and Judging, Special Events, Publicity, Facilities, etc.) are urged to contact the Conference Chairman, Mr. Gregory (Greg) E. Becker, P.O. Box 3723, Eureka, CA 95501. In any Conference of this scope there is a need for volunteers.

A once in a life time event for Primrose Growers and Enthusiasts, APS members are prompted to make their reservations early. This event, attracting world wide attention from Primula experts and gardeners alike, will be one in which APS members will have the opportunity to meet some of those famous growers and experts they so often read about.

To be insured of getting the Registration Forms as soon as they come off the Press, APS members should write to the Society's Secretary. For early Registration Forms write to the following:

**Primula Conference 1992
c/o Mrs. Ann Lunn, APS Secretary
6620 N.W. 271st Ave.
Hillsboro, OR 971124**

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PRIMROSES IN ALASKA

by John A. O'Brien, Sr.
Juneau, Alaska

Although perhaps near their Northern limits for some species, Primroses do well here in the Southeastern part of Alaska.

We have been growing Primroses in Glacier Valley, near Juneau, for about a quarter of a century, with oftentimes good success, and gradually learning as we go.

There are perhaps half a dozen members of the American Primrose Society here, along with a great many of the general public who are enthused about Primroses, and avidly buy some at Spring plant sales.

The Denticulatas called Purple Ball Primroses by some, are often seen happily growing in the Juneau-Douglas area. Most often seen are the pale lavender blooms, and occasionally and strongly sought by gardeners are the pure white, deep purple, red, and on very rare occasion a bluish purple. Only once have we had a very dark purple, which lasted only the one year for us.

Overall the Denticulatas do very well here in most any soil and situation, although they seem to flourish best in damp, very humusy soil. Some peat moss and composted steer manure mixed into the growing rows or garden soil goes over very well with the plants. We have experienced strong growth and good big healthy looking plants, along with self seeding on the north sides of the rows, when we have added peat moss and steer manure to the growing-on rows. In addition we

improve our garden soil as we get the chance, with mixing in compost, seaweed, starfish, and on rare occasion some marine shell from the beaches.

Of the kinds of Primroses most known and popular with the public here, the Denticulatas are first and next the Juliana Hybrids, of which Primula Dorothy is a strong persistent grower in this area. Auriculas are seen fairly often in gardens but since they bloom a bit later in Spring after the plant sale rush, gardeners are not as acquainted with Auriculas as they are with the earlier bloomers.

Long experience and learning from our mistakes leads me to believe and practice that Auricula Primroses, rather than preferring a damp humusy soil like some other types of Primroses, actually like to be associated with rocks! They like some coarse sand and small gravel mixed with the soil and we mix in a bit of crushed egg shells and a bit of composted steer manure, and a bit of bone meal when we are redoing the Auricula beds once each year or two.

We no longer plant Auriculas in shady damp humusy spots where the root carrot sometimes rotted off in our damp climate here, but instead we plant in a gritty type soil mentioned, near rocks, and with a sunny exposure. We have a cool climate, to say the least. Where a sunny exposure might be too hot in some more southern areas of the country, here, it is just right for some Primroses.

Also starting to take hold in Juneau-Douglas area with gardeners (as they learn of them and get the chance to obtain some) are the Florindae Primroses. These are extra strong growers here and completely hardy. The kinds we have bloom are in soft yellows and another color which I can only call an 'art shade'. It has red on the bud stage, then opens up in a coppery-orange. The Florindae has a nutmeg fragrance, self seeds, grows extra strong and by the second year is a large plant. Japonica and what we were told were Bulleyana Primroses are also strong and happy growers here.

Almost forgotten is the Rosea Grandiflora. This is a smaller primrose that blooms in a bright pink following just after the Denticulata bloom. It doesn't self seed much for us, and for several years didn't do much in our garden until I started to fertilize it quite a bit organically, and also dug it up and separated it and transplanted it in new spots here and there. That seems to be what it wanted, it had perhaps used up the nutrients it needed to flourish when left too long in one spot.

In addition to the organic fertilizers mentioned earlier, straw rabbit manure that has not been exposed to leaching out in the rain, is extra good for our Primroses. They just perk up, thrive, flourish and increase when given an application of straw rabbit manure in the Spring, which is placed

on top of the garden soil and then scratched in a bit with a hand cultivator.

We fertilize principally in the Spring and also a bit here and there throughout the early summer. Watering now and then with manure tea is good for the garden, but to avoid the chance of winter kill we do not stimulate any of our plants after mid-summer.

In the Fall gardeners gather up and put seaweed around the plants but not over the crowns, and then cover the garden beds loosely with evergreen boughs. That is usually done about the first of November. In the Spring, say from about the middle to late March, gardeners can start taking the evergreen branches off. I favored taking them off gradually, something like a third at first, then after a few days to a week another third and so on, so that the plants are not shocked by too abrupt a change.

If one doesn't use seaweed and evergreen branches, in some winters lots of Primroses will be lost, due perhaps to the weather changing back and forth so much here. The weather in winter varies from gray overcast with wind and pouring rains, to cold and snowy, and in some areas extra cold, clear and windy.

In spite of the often rainy weather, people and primroses grow accustomed to it, and some quite like it!

* * *

The new editor will be
Mrs. Peter T. Martin
951 Joan Crescent
Victoria, BC V853L3
604-370-2957

NEWS and NOTES III

by G. K. Fenderson
South Ackworth, New Hampshire

The following is a continuation of the synopsis began in the preceding issue of changes in the genus *Primula* as treated by C.M. Hu in the **Flora Reipublicae Popularis Sinicae** Vol 59(2). New Taxa are described in the addenda of that volume on pages 288-295. As I stated in that issue the following summary of distinguishing features of these new taxa are based on my hurried and inexperienced translation of the latin and are provided as a matter of convenience to the general reader until the appearance of the English language version; for accuracy in these or other matters of nomenclature of synonymy the original text should be always consulted. Any inaccuracies or omissions are my responsibility and should not reflect the work of the original author.

section Petiolares:

continued from Vol. 48, No. 4

- P. tsariensis** W.W. Smith (restored from a subsp. of **P. tanneri** King)
var. **porrecta** W.W. Smith
var. **tsariensis**
P. calderiana Balfour f. & Cooper
var. **alba** W.W. Smith (now included within the type variety)
P. sonchifolia Franchet
subsp. **emeiensis** C.M. Hu (new subsp.)

This differs from subsp. *sonchifolia* in that the plants are without farina,

the leaves are deeply pinnatisect, and the corolla lobes obovate-oblong or elliptic and entire. The holotype (*K.H. Yang 54456*) was collected in Sichuan at an elevation of 2300-3800 m growing in forests and is preserved at IBSC.

subsp. **sonchifolia**

P. bhutanica Fletcher (reduced to a synonym of **P. whitei** W.W. Smith)

P. hookeri Watt

var. **hookeri**

var. **violacea** (W.W. Smith) C.M. Hu (new combination)

P. vernicosa Ward (reduced to a synonym of **P. hookeri** var. **violacea** (W.W. Smith) C.M. Hu)

P. ovalifolia Franchet

subsp. **ovalifolia**

subsp. **tardiflora** C.M. Hu (new subsp.)

It differs from subsp. **ovalifolia** in that before anthesis the previous years leaves are absent, the present years leaves are completely developed and have bases that are attenuate or suddenly and narrowly decurrent. It differs in being pubescent along the midrib and nerves but otherwise glabrous and by its later period of flowering. The holotype (*K.H. Yang 54421*) was collected on Mt. Omei in Sichuan at an elevation of 2100-2400 m growing in forests and is at IBSC.

P. crassa Hand.-Mazz. (reduced to a synonym of **P. ovalifolia** Franchet)

P. cheniana Fang (reduced to a synonym of **P. epilosa** Craib)

P. tridentifera [F.W.] Chen & C.M. Hu (new species)

It is a decidedly distinct species of which the affinity is with *P. epilosa* Craib and *P. fagosa* Franchet, from which it differs in its smaller flowers, and shorter calyx lobes with tridentulate tips. The holotype (*Sichuan Economic Plant Exped. 1303*) was collected in Sichuan at 3000 m on the edge of rocks on May 17, 1959.

P. excapa [F.W.] Chen & C.M. Hu (new species)

At first aspect this species is greatly similar to *P. coerulea* Forrest but it differs mostly in having the scape scarcely developed, the flowers smaller, and the pedicels longer. The holotype (*S.G. Xu 3568*) was collected in Yunnan along a stream at 2400 m on May 4, 1959 and is preserved at KUN.

P. praeflorens [F.W.] Chen & C.M. Hu (new species)

A species similar to the preceding but it differs in that the leaves are not at all bullate, the pedicels are minutely pubescent (not rusty-villous) and the shorter calyxes. The holotype (*M.K. Li 2492*) was collected in Yunnan at 2400 m elevation on rock surfaces on November 18, 1939 and is at KUN.

section Proliferae:

P. shihmiiensis Fang (reduced to a synonym of *P. pulverulenta*)

P. burmanica Balfour f. & Kingdon-Ward (reduced to a synonym of *P. Beesiana*)

P. bulleyana Forrest (retained)

P. smithiana Craib (retained)

P. melodoxa Balfour f. (retained)

P. prenantha Balfour f. & Kingdon-Ward

subsp. *morsheadiana* (Balfour f. & Kingdon-Ward) [F.W.] Chen & C.M. Hu (new combination)

subsp. *prenantha*

P. morsheadiana Kingdon-Ward (reduced to a subspecies of *P. prenantha* Balfour f. & Kingdon-Ward)

section Amethystina:

P. dickieana Watt.

var. *gouldii* Fletcher reduced to a synonym of *P. kingii* Watt)

section Sikkimensis:

P. sikkimensis Hooker

var. *pudibunda* (now included within the type variety)

P. alpicola (W.W. Smith) Stapf

var. *alba* (now included within the type variety)

section Crystallophloemis:

P. aemula Balfour f. & Forrest (reduced to a synonym of *P. szechuanica* Pax)

P. advena W.W. Smith

var. *argentata* W.W. Smith (now included within the type variety)

var. *concolor* W.W. Smith (now included within the type variety)

var. *advena*

var. *euprepes* (retained unchanged)

P. amabilis Balfour f. & Forrest (reduced to a synonym of *P. diantha* Bureau & Franchet)

P. barnardoana W.W. Smith & Fletcher (reduced to a var. of *P. elongata* Watt)

P. brevicula Balfour f. & Forrest (reduced to a synonym of *P. diantha* Bureau & Franchet)

P. bryophila Balfour f. & Farrer (reduced to subspecies of *P. calliantha* Franchet)

P. calliantha Franchet

var. *albiflos* W.W. Smith & Forrest (reduced to a synonym subsp. *bryophila*)

subsp. *calliantha*

subsp. *mishmiensis* (Kingdon-Ward)

C.M. Hu (new combination)

subsp. *bryophila* (Balfour f. & Farrer) W.W. Smith & Forrest

P. chionantha Balfour f. & Forrest (reduced to a synonym of *P. sinopurpurea* Balfour f. ex Hutchinson)

P. elongata Watt

var. *elongata*

var. *barnardoana* (W.W. Smith & Kingdon-Ward) C.M. Hu (new combination)

P. falcifolia Kingdon-Ward

var. *falcifolia*

var. *farinafolia* C.M. Hu (new var.)

This departs from var. *falcifolia* in that the plants are yellow-farinose. The holotype (Xizang nature Resource Exped. 76-409) was collected in Xizang growing in alpine scrub on July 20, 1976 and is at PE.

P. graminifolia Pax & K. Hoffm. (restored to the rank of species)

P. kiuchiensis Balfour f. & Forrest (reduced to a synonym of *P. diantha* Bureau & Franchet)

P. lactuoides [F.W.] Chen & C.M. Hu (new species)

This species is very much allied to *P. lungchiensis* Fang from which it differs by white flowers and leaves pinnatifid- incised nearly to the mid-point. The holotype (*D.S. Lou and Z.C. Zuo 800103*) was collected in Qinghai at 3950 m on June 20, 1980 and is at IBSC.

P. mishmiensis Kingdon-Ward (reduced to a subspecies of *P. calliantha* Franchet)

P. nivalis Pallas

var. *colorata* Regel (reduced to a synonym of var. *farinosa* Schrenk)

var. *farinosa* Schrenk

var. *nivalis*

P. ninguida W.W. Smith (restored to the rank of species)

P. rigida Balfour f. & Forrest (reduced to a synonym of *P. diantha* Bureau & Franchet)

P. soongii [F.W.] Chen & C.M. Hu (new species)

At first glance it is almost similar to *P. orbicularis* Hemsley despite no close affinity, from which it differs in that the plants are without farina, lack basal scales, and the leaf margins are erose-dentate. Its true affinity is with *P. szechuanica* Pax, but it diverges decidedly in that the lobes of the corolla are sub-orbulate, not at all reflexed, and the calyxes are longer. The holotype (Z.P. Soong 38586) was collected in June 1959 from Sichuan at 3900 m where it grew on banks and pastures. It is at IBSC.

P. tangutica Duthie

var. *tangutica*

var. *flavescens* F.W. Chen & C.M. Hu (cited from the text but description absent from the addenda)

P. tsiangiae Fang (reduced to a synonym of *P. szechuanica* Pax)

P. yuana Chen (reduced to a synonym of *P. tsetsouensis* Petitm.)

section Cordifoliae:

P. cardiophylla Balfour f. & W.W. Smith (restored as a name for *P. roxburghii* Balakr.)

P. consocia W.W. Smith (reduced to a synonym of *P. littledalei* Balfour f.)

P. roxburghii Balakr. (rejected as a name for *P. cardiophylla* Balfour f. & W.W. Smith)

section Aleuritia:

P. caldaria W.W. Smith

var. *nana* W.W. Smith & Forrest (now included within the type variety)

P. fangii [F.W.] Chen & C.M. Hu (new species)

This is near to *P. fernaldiana* W.W. Smith but the corolla tube is shorter and the stamens are inserted differently. The holotype (X. Li 71088) was collected in Sichuan at 2700-3100 m

where it grows on thicket covered slopes. It is preserved at IBSC.

P. fangingensis [F.W.] Chen & C.M. Hu (new species)

This species is near to ***P. efarinosa*** Pax but it differs in its white-farinose inflorescence and in the calyx divided for less than half the length. ***P. pseudodenticulata*** Pax is similar in habit to the new species but it diverges from it in the shorter pedicels and much smaller bracts and calyxes. The holotype (Z.S. Chang et al. 400670) was gathered in Guizhou growing on summit grasslands at 2400 m on May 8, 1964 and is preserved at IBSC.

P. fragilis Balfour f. & Kingdon-Ward (reduced to a synonym of ***P. yannanensis*** Franchet)

P. gemmifera Batalin

var. ***amoena*** Chen

var. ***gemmifera***

var. ***licentii*** (W.W. Smith & Forrest) W.W. Smith & Fletcher (reduced to a synonym of ***P. conspersa*** Balfour f. & Purdom)

var. ***monantha*** (W.W. Smith & Forrest) W.W. Smith & Fletcher (reduced to a synonym of var. ***amoena*** Chen)

var. ***rupestris*** (Pax & K. Hoffm.) W.W. Smith & Fletcher (reduced to synonym of var. ***amoena*** Chen)

var. ***zambalensis*** (Petitm.) W.W. Smith & Fletcher (reduced to synonym of var. ***amoena*** Chen)

P. genesteriana Hand.-Mazz. (reduced to a subspecies of ***P. glabra*** Watt)

P. geraldinae W.W. Smith (reduced to a variety of ***P. rhodochroa*** W.W. Smith)

P. gigantea Jacquin (reduced to a synonym of ***P. farinosa*** var. ***denudata*** Koch)

P. glabra Klatt

subsp. ***glabra***

subsp. ***genesteriana*** (Hand.-Mazz.) C.M. Hu (new combination)

P. huashanensis [F.W.] Chen & C.M. Hu (new species)

This species is akin to ***P. erratica*** W.W. Smith but differs in the larger flowers, and the calyxes divided above the midpoint into oblong lobes. The holotype (W.S.Y. Hsia et al. 117) was collected in Shaanxi, growing on slopes on May 2, 1937. There is an isotype at PE.

P. involucrata Wallich

subsp. ***involucrata***

subsp. ***yargongensis*** (Petitm.) W.W. Smith & Forrest

var. ***liensis*** Fang (reduced to a synonym of subsp. ***yargongensis***)

P. kialensis Franchet

var. ***kialensis***

var. ***breviloba*** C.M. Hu (new variety)

This differs from subspecies ***kialensis*** by its more robust stature and the corolla tube one and one half the length of the calyx. The holotype (H.L. Tsiang 33906) was gathered in Sichuan at 2100 m growing on cliffs and is at IBSC.

P. maikhaensis Balfour f. (restored to rank of species)

P. meiotera (W.W. Smith & Fletcher) C.M. Hu (raised from the rank of variety to species)

P. pulchelloides Kingdon-Ward (reduced to a synonym of ***P. pulchella*** Franchet)

P. quinghaiensis [F.W.] Chen & C.M. Hu (new species)

This species is akin to ***P. flava*** Maxim. but it differs in the broadly ovate or reniform leaves, equal in length and width or a little wider than long, with the margins deeply incised-dentate. The holotype (D.S. Lou et Z.C. Zou 800102) was collected in Qinghai growing in a Picea forest at 3950 m on June 20, 1980. It is at IBSC.

P. rhodochroa W.W. Smith

var. ***rhodochroa***

var. ***geraldinae*** (W.W. Smith) [F.W.] Chen & C.M. Hu (new combination)

var. ***meiotera*** W.W. Smith & Fletcher (raised to the rank of species)

P. scopulorum Balour f. (restored to the rank of species)

P. socialis [F.W.] Chen & C.M. Hu (new species)

This is similar in habit to ***P. yunnanensis*** Franchet but differs from it primarily in the undeveloped scapes, solitary flowers, and the single linear bract inserted at the base of the pedicel. The holotype (S.K. Wu 6746) was collected in Yunnan growing at an elevation of 2950 on moist cliffs and it is at KUN.

P. tenuipes [F.W.] Chen & C.M. Hu (new species)

This is similar to ***P. quinghaiensis*** F.W. Chen & C.M. Hu in habit; it differs from it chiefly in the rose flowers and the slender unwinged petioles. The holotype (X. Li 78179) was collected in Sichuan growing on sunny slopes at 4400 m on July 23, 1958. It is at PE.

P. umbrella Forrest (reduced to a synonym of ***P. yunnanensis*** Franchet)

P. yargongensis Petitm. (reduced to a subsp. of ***P. involucrata*** Wallich)

section **Minutissimae:**

P. bella Franchet

subsp. ***bonatiana*** (Petitm.) W.W. Smith & Forrest (now included within the type subsp.)

subsp. ***cyclostegia*** (Hand.-Mazz.) W.W. Smith & Forrest (now included within the type subsp.)

subsp. ***nanobella*** (Balfour f. & Kingdon-Ward) W.W. Smith and Forrest (now included within the type subsp.)

P. heydei Watt (reduced to a synonym of ***P. minutissima*** Watt)

P. hsiungiana Fang (reduced to a synonym of ***P. walshii*** Craib)

section **Souliei:**

P. asperulata Balakr. (rejected as a name for ***P. blinii*** Le'vl.)

P. blinii Le'vl. (nomenclatural change for ***P. asperulata*** Balakr.)

P. homogama [F.W.] Chen & C.M. Hu (new species)

This is distinguished from all species of section **Souliei** Balfour f. by its smaller stature, and homomorphic flowers. ***P. nutaniflora*** Hemsley is somewhat similar in habit and aspect to the new species but it diverges in the form of the corolla.

P. longipinnatifida Chen (reduced to a synonym of ***P. blinii*** Le'vl.)

P. rupicola Balfour f. & Forrest

var. ***albicolor*** W.W. Smith & Fletcher (now included within the type variety)

P. souliei Franchet

subsp. ***legendrei*** (Bonati) W.W. Smith & Forrest (now included within the type)

section **Dryadifolia:**

P. dryadifolia Franchet

subsp. ***dryadifolia***

subsp. ***chlorodryas*** (W.W. Smith) Chen & C.M. Hu (new combination)

subsp. ***congestifolia*** (Forrest) W.W. Smith & Forrest (now included within the type subsp.)

subsp. ***chrysophylla*** (Forrest) W.W. Smith & Forrest (now included within the type subsp.)

subsp. ***cycliophylla*** (Forrest) W.W. Smith & Forrest (now included within the type subsp.)

subsp. ***jonarduni*** (W.W. Smith Chen & C.M. Hu (new combination)

P. chlorodryas W.W. Smith (reduced to a subspecies of ***P. dryadifolia*** Franchet)

P. jonarduni W.W. Smith (reduced to a subspecies of ***P. dryadifolia*** Franchet)

P. mystrophylla Balfour f. & Forrest (reduced to a synonym of *P. dryadifolia* Franchet)

section Denticulata:

P. denticulata J.E. Smith

subsp. *alta* (Balfour f. & Forrest) W.W. Smith & Fletcher (reduced to a synonym of subsp. *sinodenticulata*)

subsp. *denticulata*

subsp. *sinodenticulata* (Balfour f. & Forrest) W.W. Smith & Forrest

P. monticola (Hand.-Mazz.) Chen & C.M. Hu (restored to the rank of species)

section Capitatae:

P. capitata hooker

subsp. *capitata*

subsp. *craibeana* (Balfour f. & W.W. Smith) W.W. Smith & Forrest (now included within subsp. *lacteocapitata*)

subsp. *crispata* (Balour f. & W.W. Smith) W.W. Smith & Forrest (now included within subspecies *capitata*)

subsp. *lacteocapitata* (Balfour f. & W.W. Smith) W.W. Smith & Forrest

subsp. *mooreana* (Balfour f. & W.W. Smith) W.W. Smith & Forrest (now included within subsp. *capitata*)

subsp. *sphaerocephala* (Balfour f. & Forrest) W.W. Smith & Forrest (retained unchanged)

section Muscarioides:

P. hyacinthina W.W. Smith (reduced to a synonym of *P. bellidifolia* King ex Hooker f.)

P. muscarioides Hemsley (reduced to a synonym of *P. deflexa* Duthie)



P. capitata subsp. *mooreana* (formerly *P. mooreana*)
photo by Larry Bailey

PRIMULÁ JULIAE AND ITS HYBRIDS WITH THE PRIMROSE AND THE OXLIP

by C. Leonard Huskins, Ph.E., M.Sc.,
John Innes Horticultural Institution.

The following article is reprinted from the Fourth Primula Conference 1928, Royal Horticultural Society, London, England 1929.

The work to be described was begun at the John Innes Horticultural Institution by Miss Pellew in 1919, and was taken over in 1922 by Dr. R. J. Chittenden, who carried it on until his departure for the Malay States in 1927. An account by Dr. Chittenden on the results up to last spring has just appeared in the *Journal of Genetics*. This paper is a resume of those results together with a few observations made this spring on some hybrid progenies which had not flowered before his departure. It is the hybrids between *P. juliae* and the primrose, *P. acaulis*, or the oxlip, *P. elatior*, which have received most attention, but some results are available from other hybrids within the Vernaes section.

The first observation of interest is that in all cases the fertility of the first generation interspecific hybrids was quite high. In view of the distinctive appearance and geographic distribution of *P. juliae* this seems somewhat surprising. Microscopical examinations of the pollen showed from 50 to 70 percent of the grains apparently capable of functioning. Cytological studies of *P. juliae*, *P. acaulis*, the hybrids *acaulis* x *juliae*, *elatior* x *juliae*, *officinalis* x *juliae*, and Polyanthus Cloth of Gold x *juliae* showed chromosome

number to be 22 in each case, and where the reduction-divisions of the pollen-mother-cells were studied they were found to be surprisingly regular for interspecific hybrids. Any irregularities that were found were the exception.

The size of the hybrid families in which *P. juliae* was involved was limited, however, by irregular or delayed germination, which occurs also in selfed seed of pure *P. juliae*. With either pure *P. juliae* or any of its descendants, it was found that some of the seeds would germinate almost at once, while others would lie dormant in the seed pans for any period up to several years.

A number of different crosses were made each way between the primrose and *P. juliae*, and in each case the first generation bore coloured flowers, though there were two shades of colour. In other respects the plants were comparatively uniform. In habit of growth, shape of leaves, size and shape of flower, and colour and size of eye, the first generation resembles the primrose more than *P. juliae*. It resembles *P. juliae* in being semi-glabrous and in its distribution of anthocyanin and its general foliage colour. It flowers before either of the parents.

The segregation of pin and thrum style was found to be sharp in all the generations raised, though minor differences occur in the length of the long

or pin style. The thrum or short style is dominant to pin and the segregation appears to be due to a single Mendelian factor. It may be noted that in those species crosses involving *P. juliae*, little significant difference was found in the number of seeds obtained from "legitimate" or "illegitimate" matings, and after the first few years crosses were generally made without regard to length of style of the parents.

The inheritance of flower colour was found to be rather complex. In the second generation at least six shades of anthocyanin or magenta colour were noted, but they could not be scored accurately owing to the large degree of fluctuation which occurs. All the anthocyanin colours were therefore grouped together and only the segregation with respect to the three classes, anthocyanin coloured, Yellow and white, was considered. With the exception of some progenies from one plant of *Juliae*, the second generation and back-cross progenies gave ratios for colour which agree fairly well with those expected if the primrose carries on factor for yellow colour, and *P. juliae* carries both an anthocyanin colour factor and a colour intensifying factor.

The inheritance of hairiness is fairly complex. In the first generation the plants are semi-glabrous as in *P. juliae*. In the second generation and back-cross families the degree of hairiness was scored by the appearance of the pedicel. The observed numbers are fitted fairly well by the assumption that the primrose contributes two factors for hairiness, and *P. juliae* one factor which inhibits hairiness. The suppression of hairiness appears to be more or less complete when the primrose factors for hairs are present in the single dose or heterozygous condition, as in the first generation, but only partially so when either of these factors is

present in the double dose or homozygous condition.

The foregoing three characters, length of style, colour of flower, and degree of hairiness, were the only ones which it was possible to score and analyse accurately, but notes were made on a number of other characters.

The eye of the flower is yellow in both *Juliae* and the primrose, and no segregation of eye colour was noted in the crosses between them. Both species normally have solitary flowers, but pure primrose plants may occasionally produce pedunculate or polyanthus type inflorescences, and this was found to occur also in these hybrid progenies.

The eye shape was, rather surprisingly, found very difficult to score. At first glance the eye shape of the two species is very different, the points of the eye occurring at the junction of the petals in *P. juliae* and at the middle of the petals in the primrose. But in young primrose flowers a trace or ghost of the *Juliae* eye shape occasionally appears, and there is likewise a ghost of the primrose eye in *P. juliae*.

Practically a complete series of intergrading forms was found to occur with such characters as leaf shape and size, length of pedicel, and amount of anthocyanin in the vegetative parts.

Several characters which were not present in either parent, such as petals with a frilled margin and without an apical notch as in *P. sinensis*, and other types with petals not noticeably frilled, yet without an apical notch, as well as plants with extremely narrow petals appeared in the second generation and back-cross families. A few types of possible horticultural interest appeared, and these are now being multiplied for showing next year.

Certain groups of characters were found in general to be strongly associated or dissociated. For instance, the

deeper flower colour and the *Juliae* eye shape rarely if ever occurred on a plant with leaves of the primrose type. Dr. Chittenden suggests that this may be explained on the basis that many factors, probably located in many different chromosomes, are required to produce the primrose leaf type, and a plant which has this leaf type is therefore predominantly primrose in its chromosome constitution. He considers that similar arguments may be used to explain the observations that the deeper flower colours occur most frequently on plants with small leaves and flowers, and that the *Juliae* eye shape is usually found on a small flower.

A repulsion between deep flower colour and the hairy or very hairy condition is suggested, he says, by his observations that both the deep flower colour and the *Juliae* eye shape are almost invariably associated with the semi-glabrous condition characteristic of *Juliae*. While this has not yet been proved, there is some evidence that the yellow factor of the primrose is genetically linked with the factor for hairiness.

Finally, he notes that the *Juliae* eye shape has never been seen on a white or yellow flower, though it may occur on either a pale or a dark coloured one. His explanation of this is that the presence of anthocyanin is probably necessary to mask part of the primrose eye and thus produce one of the *Juliae* shapes.

The results from crosses between *P. juliae* and the true or Bardfield oxlip, *P. elatior*, in general were similar to those from *Juliae* x primrose crosses. The first generation plants were more or less similar to the oxlip in habit, amount of anthocyanin in the vegetative parts, colour and shape of eye, and pedunculate or polyanthus character of inflorescence. The inflorescence, however, was either drooping or erect, and not one-sided, whereas

in the oxlip it is drooping and one-sided. Usually the flower was yellow, similar to that of the oxlip, but with a tinge of colour under certain cultural conditions. Some plants of *P. elatior*, however, gave yellow-flowered and anthocyanin-coloured first generation progeny in approximately equal proportions when crossed with *Juliae*. The leaves in general were more or less intermediate in shape between those of the parents. All the plants were semi-glabrous like *P. juliae*, and the flower size was also similar to that of *Juliae*. The time of flowering was before that of either parent. Excepting for colour of the flowers, all first generation plants of this cross, made either way, were similar.

In all the generations raised the thrum style was again found to be dominant to pin. The numbers agree very closely with the ratio expected from a single factor difference.

In the second generation and back-cross families the inheritance of flower colour was again found to be that which would be expected if *Juliae* carries two factors for anthocyanin colour, one an intensifier of the other, and the oxlip one factor for yellow, but the latter carries in addition a factor which inhibits anthocyanin colour. This factor obviously carried this factor in double dose, as all their first generation progeny with *Juliae* were yellow. The oxlips which gave half coloured and half yellow progeny when crossed with *Juliae* were obviously heterozygous for this factor. Presumably some oxlips must exist which lack this inhibitory factor altogether.

Mr. W.B. Turrill and Mr. E.M. Marsden-Jones likewise found some oxlips which were heterozygous for this factor, and have kindly sent me a large first-generation family, in which about half are coloured and half yellow.

The numbers in the different classes of the second generation and back-cross families of the Oxlip-Juliae crosses, that is, anthocyanin coloured, yellow and white are unfortunately not very regular. On the whole they are most in accordance with the assumption that even a single dose of the inhibitory factor is sufficient to suppress the effect of any combination of the two pairs of anthocyanin colour factors. Taking the second generation figures alone, however, they agree best with the view that a single dose of the inhibitory factor is sufficient to suppress the colour factors in all combinations except where both of them are present in double dose. One plant in the second generation and two in the back-cross with Juliae were scored as cream-flowered, but the genetic character of these plants has not been worked out.

Hairiness likewise seems to be inherited similarly in both primrose x Juliae and oxlip x Juliae crosses. In the experiments with the latter the numbers of the different classes do not fit the expectation as closely as in the former case, but nevertheless they are reasonably well accounted for by the assumption that the oxlip carries two factors for hairiness, as does the primrose, and again that *P. juliae* carries a factor that inhibits the production of hairs. As in the case of the inhibitor of flower colour it appears most probable that this inhibitor of flower colour it appears most probable that this inhibitor of hairs is able to suppress the effect of the factors for hairs in all cases except where they are both present in double dose, and the inhibitor present only in the heterozygous condition.

The pedunculate nature of the inflorescence typical of the oxlip is dominant to the non-pedunculate or solitary flowered condition of Juliae, through the first generation hybrids

may throw up a few solitary flowers early in the season. In back-crosses with *P. juliae* a good 1:1 ratio of pedunculate to non-pedunculate plants was obtained, as expected on the basis of a single factor difference. In the second generation families, however, there is rather a large excess of pedunculate plants, the numbers being 87:11 instead of the expected 3:1. The pedunculate condition is one which is greatly affected by the physiological condition of the plant, which probably accounts for this deviation.

The eye color of the oxlip is orange, and that of *P. juliae* yellow. All the first generation plants have an orange eye. The inheritance of eye color appears to be determined by a single factor difference, as a good 3:1 ration (70:24) of orange and yellow-eyed plants was obtained in the second generation. In the back-cross to Juliae, however, the ratio was 35:56 instead of the expected 1:1, and out of 59 plants from the back-cross to the oxlip, 16 had yellow eyes instead of all being orange. These divergences from expectation are probably due to the fact that in young flowers the eye is always yellow, even though later it becomes orange, and in the particular cross this character was scored only once.

A number of crosses were made between the cowslip *P. officinalis* and various other species and forms including *P. juliae*, *P. elatior*, *P. acaulis*, and two polyanthus varieties, but the number of plants obtained from any of these crosses has so far been too limited to warrant genetic analysis.

Several crosses were made reciprocally between *P. juliae* and the polyanthus variety 'Cloth of Gold.' In the second generation only twelve plants have yet flowered, but out of these it has surprisingly been found that three are practically identical in appearance with *P. juliae*. In the original crosses

from which these three plants have come the polyanthus was the female parent. The recovery of three plants of one parental type is the more remarkable in view of the fact that out of 32 plants obtained from the crossing the first generation 'Cloth of Gold' x Juliae hybrids back on to Juliae, none is typical Juliae in appearance. Chromosome counts have been made in root tip cells of two of the first generation hybrids, and two of the Juliae-like segregates. All have the normal chromosome number. The case is being studied further.

The abnormal forms of polyanthus, 'Jack in the Green,' and 'Hose in Hose,' when crossed with the primrose and *P. juliae* were found to be dominant to the normal type. A cross between 'Jack in the Green' and Juliae, for instance, gave foliaceous calyx and half normal type progeny.

The pedunculate type of inflorescence and the orange eye of the oxlip have been found to be dominant to the solitary flowered condition and the yellow eye of the primrose, but this cross has not been studied in detail.

Sixty-five plants have so far flowered from crosses of short-styled common primroses with blue primroses. Of these 33 were long styled and 32 short styled, which accords with the previous observations that inheritance of this character depends upon a single Mendelian factor difference. Apart from length of style, these 65 plants are uniform in appearance. The flower is large, the eye shape and colour is that typical of the common primrose, but it is rather larger. The leaf shape, distribution of anthocyanin, and degree of hairiness are similar to those of the primrose. The tube of the corolla is tinged with colour. The flower colour is magenta, but varies greatly with age, ranging from a bright red to blue. No second generation or back-cross fam-

ilies have yet been studied from this cross.

Numerous other crosses have been made between various polyanthus and primrose forms, but only small progenies have been raised in most cases and no conclusions have yet been drawn from them.

In conclusion, some of the general observations on the species crosses may briefly be re-stated. The characters of thrum and pin style occur in all the species used, and their genetic relationships are the same in all cases. Thus the thrum style is dominant to pin in all crosses either within a species or between any of them. Likewise, whenever the members of a pair of characters are present in different species, instead of both being in each as are pin and thrum style, their genetic relationship is the same whichever species are crossed. Thus the pedunculate character of the inflorescence whether on the cowslip, the oxlip or the polyanthus is dominant to the single-flowered condition of either the primrose or *P. juliae*. The semi-glabrous character of *P. juliae* is dominant to the very hairy condition of all the other species used; the orange-coloured eye of the oxlip is dominant to the yellow eye of either the primrose or *P. juliae*. And finally, the anthocyanin coloured flower is dominant to either the white or the yellow flower of any species except where an inhibitor is present, as in most oxlips.

* * *

KITTY SCHWARZ

by Beth Tait
Bothell, Washington

The Primrose Society lost another great Plant-lover, as Kitty Schwarz passed away in November, 1990. Kitty was 90 years old, still lived alone, and cared for all her own plants and shrubs. She invariably bought boxes of plants at the club's sales.

Active in the Eastside Primula Society, Kitty helped with the shows every spring. She was unceasingly available to help when needed. For many years, she and her late husband had a floor exhibit of primroses at the Eastside Primrose Shows. Kitty won many blue ribbons on her beautiful plants.

Kitty was a member of the American Primrose Society since 1958. She sponsored two overseas members for many years. Kitty also belonged to numerous other horticultural societies as she loved flowers, made them grow, and shared with all.

We will miss Kitty Schwarz's help, her wonderful smile, and her glowing and vibrant flowers. Kitty's plants always seemed to be returning their love to her.

* * *

MEMORIALS

Pictorial Dictionary Fund

In Memory of Brian Skidmore
Mary Sambrook

In Memory of Kitty Schwarz
Eastside Primula Society

LIFE IS BUT A STREAM

by Thea Service Foster
North Vancouver, B.C.

My dream of a garden has always included a small natural stream or pond but such sites are as scarce as hen's teeth in our urban areas. About thirty-five years ago we settled for a 'waterless' lot that was densely treed with several large conifers plus vine maples, cascaras, mountain ash and other small native trees. The soil was very moist. On hand-clearing to make a space for the house we found that the moisture came from a little waterway that had been dammed by tree roots, deadfalls and debris. When cleared and channeled it made a wonderful setting for waterside plants. We were very sad to leave it behind when we moved in the Fall of 1989.

Our new location is only about three miles to the East but 600 feet higher up in elevation. The new main garden consisted of a 70' x 70' square of south-sloping lawn - which had all the charm of a football field. Over the fence at the bottom was a further 70' of property with a copse of small Hankow twisted willows. It was clothed in a dense cover of rank perennial weeds and grasses almost knee-deep.

One winter day my husband took a stroll through the 'back-forty' as we now call it, investigating a lengthwise dip in the weed cover. Deep beneath the tangle of buttercup was a narrow rill. At sometime in the past this little waterway had been put into a culvert under the lawn and this was its natural outlet. For a second time we had

received the unexpected gift of a stream. Lightning does strike twice!

The dividing fence has now been removed giving us a lovely long vista. We have made a small stab at clearing the ground and developing and grading the previously vertical stream banks. The soil is perpetually moist as the water table is less the 2' below the main level. It is like chocolate pudding to dig - though it does cling to a shovel like glue.

We now have a home for about a dozen large clumps of waterside primulas, mostly of multi-species Candelabra (Proliferiae Section) hybrids from our old garden. A little history of these plants might be of interest.

Over twenty years ago Dr. Fletcher, Regius Keeper of the Edinburgh Botanical Garden, came to Vancouver. He visited Stanley Park and was given a tour of an area under the care of Rhododendron specialist Alleyne Cook. Dr. Fletcher told Alleyne that the areas between and edging the beds of his Rhodos and Azaleas would be ideal for moisture loving primulas. On returning to Scotland he sent back seed of many Candelabra and Sikkemense Section species.

Thirty-two thousand seedlings were raised by 'Cookie' and his staff, and were set out beside the pathways in very large drifts of each species, an overwhelming sight extending as far as the eyes could see. The broad brush-strokes of colour included the gold and

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orange shades of *Primula bulleyana*, *P. chungensis* and *P. aurantiaca*, the clear yellow of *P. helodoxa* and *P. beesiana*'s carmine-rose. An anonymous yellow-eyed vivid lilac species matched the colour of *Iris versicolor* which edged the bed. The lilac ones had come to 'Cookie' unnamed, from a friend who had raised them from seed. The leaves were long and rather floppy with very pale wide midribs. They were likely *P. burmanica*, the only yellow-eyed lilac species mentioned in my books and journals.

In very short order the Candelabra species cross-pollinated, and by the 1980's had swamped most of the original parent species. Little *P. chungensis* has been a survivor and has maintained itself as have *P. japonica* and *P. pulverulenta*.

'Stanley Park' volunteer hybrid Candelabras are a glorious tribe, presenting a colour-wheel of shades. From golds to apricots to rich red-orange, from pastel pinks to deep rose-red. There are pale to vivid lilac ones as well. The lilacs resemble the original unnamed drift of 20 years ago. It has passed on its conspicuous yellow eye to the strain, enhancing all of the other colours.

One of the species has endowed many of the plants with showy whorls of slender curved bracts which extend out to almost the full span of the flower tiers. When the upper bud clusters are erect and close to the stalks they are surrounded by scabiosa-like pin cushions of bracts.

The strain has good looking deep green leaves, with rosy tinting on the petioles like *P. bulleyana*. Some of the flowers are frilled and upper flower stalks often show dense mealiness. For plants that are as easy to grow as radishes, they have many marks of grace and distinction.

We have recent evidence of this strain's toughness. Our plants were

moved in the fall of 1989 and left on the surface of the ground with their roots wrapped in black plastic bags. Winter rains penetrated and washed away the soil and the clumps endured the New Year's unusual cold and snow unprotected. When unwrapped the roots were broken and weather damaged. They were reduced to 3" long and 1/4" thick pinky-orange stubs, without any sign of hair-roots. As their usual roots are at least a foot long I didn't expect the poor mistreated plants to flower in 1990.

They were planted in our new damp area here in March, and not only bloomed normally but produced multiple stalks of flowers as if they had spent the previous six months in the Garden of Eden. After this prodigious display of bloom they went on to add crowns throughout the summer. The coral and apricot colour forms produced their usual nice flush of August and September re-bloom. It has been necessary to divide them with a yield of 4 to 6 large individual plants to each original clump. When told of this 'Cookie' harumphed (in his gruff New Zealand manner) that this was "Hybrid vigour". After all, they had almost succeeded in taking over his Stanley Park beds!

Alleyne Cook's use of the parent species in broad swaths of each colour was a master stroke. Although I do not have any of the individual species that he used so beautifully, a similar effect can be made from the Hybrids. If especially good colour forms are divided and set into groupings, they can come close to duplicating all of the vivid original colours of the species. Inferior forms and colours will appear from seed. Junk them immediately! This strain produces such great numbers of seedlings that no grower should be found wanting of splendid colour forms.

Easy Candelabras

P. bulleyana (27"-30") Gold with orange buds; is easy and will persist well. If you have hybrid strains of the Stanley Park type in your garden re-sowing of *P. bulleyana* will likely be needed as the hybrids tend to take over.

P. pulverulenta (27"-30") Cerise to crimson to purple-red, with pinks in the 'Bartley' strain; very long lived and will remain pure. A grouping of plants in our previous garden were going strong after 15 years. Keep an eye out for better (closer to crimson) colour forms, divide these and collect seed from them. Although *P. pulverulenta* and *P. japonica* often have similar coloured deep carmine to fuchsia-red flowers they can be easily identified by their foliage. *P. pulverulenta* has rather dull surfaced leaves with sand-paper textured margins. *P. japonica* has crisp leaves rather like romaine lettuce.

P. japonica (27") White to fuchsia-red; possibly the easiest to grow. Colours come true from seed.

P. chungensis (12"-15") A good easy species. Smaller and paler coloured and less showy than *P. bulleyana* but reliable and attractive in drifts. Manages on less moisture than the larger Candelabras.

P. cockburniana (6"-8") Small vivid orange flowers. In the occasional garden it has been known to seed into pathways so obviously needs less water than most of the section.

Less Easy Candelabra

P. anisidora and *P. helodoxa* are the only two evergreen species from the Candelabra (Proliferae) section that are at all 'commonly' grown. Neither one is easy to maintain. The species are so dissimilar that there should be no problem in identification.

P. anisidora (18"-21") Evergreen, aniseed scented. A victim of poor press, the colour is usually described as dull purple-red but I was given a plant from

the U.B.C. Botanical Garden that was a very dark glowing scarlet-red with a showy vivid gold eye. The reverse of the petals is blackish crimson. The leaves were strong textured and ruffled - the best looking of all the Candelabra crowns I've seen. The drawing of my plant from the UBC Botanical Gardens is included here because illustrations



Stanley Park Multi-cross Candelabra sketch by Thea Service Foster

of it are so rare. I have seen only one photograph of a very drawn-up plant which looked most undesirable and left me with no urge to grow the species until I was presented with the UBC's brighter coloured superior form.

P. helodoxa (27") Evergreen, bright citron-yellow. It is not easy to keep going but is worth every effort as it lights up the garden with its glorious yellow.

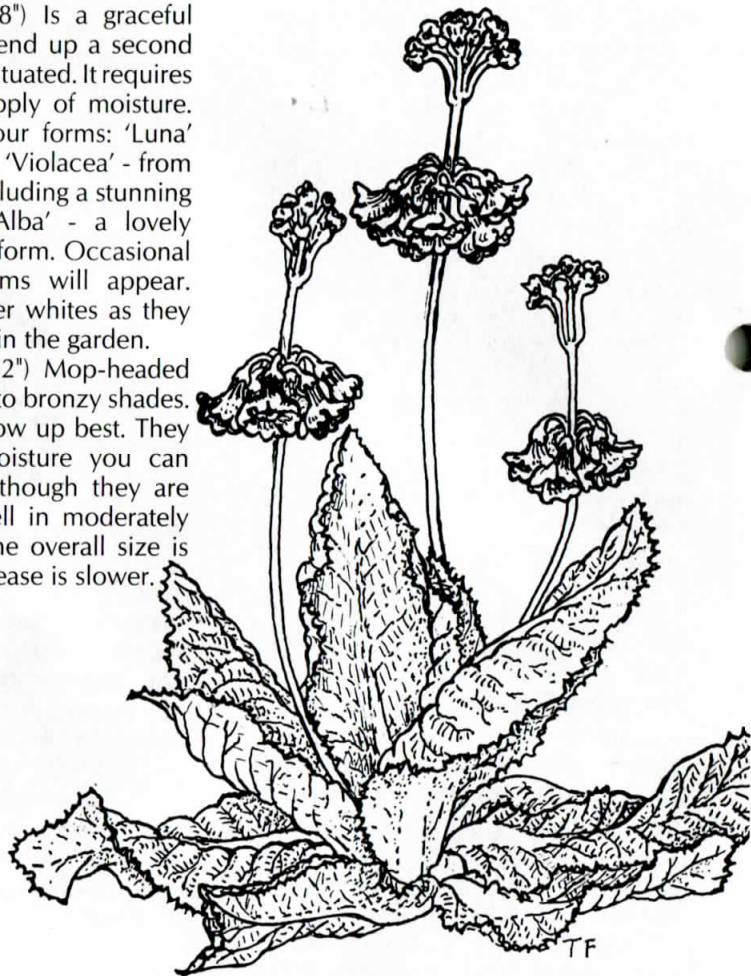
P. florindae x waltoni (15") is a spectacular scarlet-red. It has very handsome heart-shaped red-petioled leaves. This attractive plant can persist for years given the right conditions. Moderately moist soil with ample leaf mold seems to be to its taste. As it is a late blooming variety - coming out with the Hostas - it is very useful in the garden.

* * *

Easy Companions from the Sikkimense Section

P. alpicola (15"-18") Is a graceful species which will send up a second tier of flowers if well situated. It requires only a moderate supply of moisture. There are three colour forms: 'Luna' - a misty pale yellow. 'Violacea' - from light to deep blue including a stunning blue-violet shade. 'Alba' - a lovely white to ivory-white form. Occasional dirty grey-white forms will appear. Select out the cleaner whites as they shine out beautifully in the garden.

P. florindae (36"-42") Mop-headed species, clear yellow to bronzy shades. The clear yellows show up best. They will take all the moisture you can supply them, and although they are often seen doing well in moderately moist garden beds the overall size is reduced and the increase is slower.



P. anisidora - UBC form

GROWING PRIMROSES ON THE BRUCE PENINSULA

by Elinor Moyer
Warton, Ontario

The Bruce Peninsula is famous among naturalists, and thousands of people visit this area each year to see many rare and unusual plants. There are over forty species of orchids, some of which start to bloom in mid-May and others follow through until early October. In June a great display of other wildflowers may be seen on the Peninsula.

The Yellow Lady Slipper orchid is the most abundant native orchid on the Bruce and can be seen thriving along roadsides in the upper Peninsula. It starts to bloom around May 22nd to the first half of June.

Several years ago we retired to the Bruce Peninsula in Central Ontario, Canada. Since coming to live on the Bruce, we have built many varieties of gardens, including five large rock gardens with many rare alpine, several beds of perennials and Primroses.

We find that Primroses grow very well in this area, with the climate being on the damp side. Although the days are warm in summer, the nights are very cool. The weather is modified in winter by the surrounding waters of the Lake Huron and Georgian Bay. Winter temperatures rarely drop below -10 degrees F. and usually stay about 15-20 degrees above zero F.

I was fortunate to obtain seeds from Barnhaven, just before they closed; Polyanthus, Acaulis, Sieboldii, Gold Laced, Elizabethan Primroses, and all the colours of the Victorians. The germination was excellent and produced a thousand plants, many of which bloomed the same year in the fall.

At present we have over three thousand Primroses in about sixty species. These and other perennials were started under fluorescent lights in a spare room in our home in January and February. This year I started the seeds of auriculas and double primroses, which I have never grown before, so this will be a new adventure.

The Primrose gardens are surrounded by a woodland, which gives them part shade and shelter. The beds are built up of a loamy topsoil, composted manure and some gravel for drainage. Fish emulsion is applied in the spring and again in early summer.

We have many garden visitors each year, starting about the middle of May until early fall. Anyone visiting in our area wishing to see the gardens would be most welcome. We are one mile north of Warton on No. 6 highway.

* * *

SEED SOURCES

The following listings for the APS Quarterly is a revision of one printed in the Winter, 1990 APS Quarterly. Verification of the data was obtained from horticultural documents located at the University of Washington's Miller Library, as well as from June Skidmore, Thea Oakley, Barbara Flynn, and Valerie Woolley. The data copied from the Winter 1990 Quarterly that was not verified this year is identified by an asterisk "*".

HORTICULTURAL SOCIETIES THAT OFFER SEED EXCHANGES WITH PRIMULA SEED

- American Primrose SocietyJay Lunn, Treasurer
Route 5, Box 93
Hillsboro, OR 97124
- Alpine Garden Club of B.C.Vera Peck, Seed Director,
4875 Skyline Drive,
No. Vancouver, V7R 3J2, B. C.
- American Rock Garden SocietyCarole Wilder, Membership Sec.
221 West 86th Street
Hastings, MN 55033
- Matsumoto Sakurasoh & Primula ClubKazuo Hara, Secretary
9-21 Miyata, Matsumoto
Nagano 399, Japan
- The Alpine Garden SocietyMr. E. M. Upward, Secretary,
Lye End Link,
St. John's,
Woking, Surry, England
- The Scottish Rock Garden ClubMiss Kirsten M. Gibb.
21 Merchiston Park
Edinburgh, EH10 4PW, Scotland

HORTICULTURAL SOCIETIES WITH INFORMAL PRIMULA SEED EXCHANGES

- Dansk Primula Klub (See noteOve Leth-Møller
at the end of this article)
Danmarksvej 41B,
2800 Lyngby, Denmark
- National Auricula and Primula*Mr. D. G. Hadfield, Hon Sec.
Society - Northern Section
148 Queens Road,
Cheadle Hulme,
Cheadle, Cheshire, SK8
5HY England
- National Auricula and Primula*Mr. Peter Ward, Sec. of Info.
Society - Midland & West Sect.
6 Lawson Close
Saltford, Bristol BS1
83LB, England
- National Auricula and Primula*Mr. L. E. Wigley, Hon. Sec.
Society - Southern Section
67 Warnham Court Road
Carshalton Beeches,
Surrey, SM5 3ND,
England

COMMERCIAL SOURCES FOR PRIMULA SEED

A book titled 'Andersen Horticultural Library's Source List of Plants and Seeds', compiled by Richard T. Isaacson, Head Librarian and Bibliographer, and the staff of the Library, contains a listing of 1988-89 seed catalogues from the United States and Canada, that includes seed from 212 types of primulas (species, hybrids, strains, varieties, etc.) and the names and addresses of the suppliers. The Library, located in Minneapolis, is one of the University of Minnesota Libraries. No doubt many other college and university library systems, and botanical gardens, contain lists of primula seed suppliers.

Many commercial seed companies sell only to wholesale seed dealers, usually in large quantities. You are encouraged to write to the following commercial outlets to obtain a current catalog and/or the address of a local or regional seed dealer. When writing, it is suggested you mention the company's name and address was supplied by the American Primrose Society.

* * *

- AlbifloraP.O. Box 24, Gyotoku, Ichikawa, Chiba 272-01, Japan
- American Takii, Inc.(*)301 Natividad Rd., Salinas, CA 93906
- Anita Alexander(*)35180 S.E. Hwy. 211, Boring, OR 97009
- Appalachian Wildflowers.....(*)Route 1, Box 275A, Reedsville, PA 17084
- Ball Seed Co.P.O. Box 335, W. Chicago, IL 60185
- Bodger Seeds Intl.(*)P.O. Box 5090, El Monte, CA 91734
- Brenda Hyatt Auriculas....1 Toddington Crescent, Bluebell Hill, Nr. Chatham, Kent,
ME5 9QT, England
- Carter Seeds.....475 Mar Vista Dr., Vista, CA 92083
- Chehalis Rare Plant Nursery.....2568 Jackson Highway, Chehalis, WA 98532
- American Primrose Society

Chiltern Seeds.....(*)Bortree Stile, Ulverston, Cumbria, LA12 7PB, England
 Chris Chadwell.....(*)81 Parlaunt Road, Slough, Berkshire, SI3 8BE, England
 Colorado Alpines, Inc.....P.O. Box 2708, Avon, CO 81620
 Craven's Nursery Hall Barn Nursery, Windsor End, Beaconsfield, Bucks, HP9 2SG, England
 Cricklewood Nursery907 Nevers Road, Snohomish, WA 98290
 Daehnfeldt Inc.....P.O. Box 947, Albany, OR 97321
 Donnington Nursery Donnington House, Main Rd., Wrangle, Boston, Lincolnshire, PE22 9AT, England
 Edrom Nurseries.....Coldingham, Eyemouth, Berwickshire, TD14 5TZ, England
 Ernst Benary.....Postfach/P.O. Box 1127-D-3510, Hann, Munden 1, Germany
 Field House Alpines.....Leake Road, Gotham, Nottingham, NG11 OJN, England
 G. S. Grimes Seeds.....201 West Main St., Smethport, PA 16749
 G. Ghose and Co.....Townsend, Darjeeling, India
 Germania Seed Co.....(*)5952 No. Milwaukee Avenue, Chicago, IL 60646
 Harris Moran Seed Co.....(*)1155 Harkins Rd., Salinas, CA 93901
 Hillview Gardens.....120 South Fillmore St., Kennewick, WA 98501
 Insiach Alpine Plant NurseryAviemore, Inverness-shire, PH22 1QS, Scotland
 Jim & Jenny Archibald 'Bryn Collen', Ffostrasol, Llandysul, Dyfed, SA44 5SB, Wales
 Jellito Staudensamen.....Postfach 560 127, D-2000, Hamburg 56, Germany
 Kieft Blumensamen.....(*)P.O. Box 1000, 1695 ZG Blokker, Holland
 L. S. A. Goodwin & Son.....Goodwyn's Road, Bagdad STH 747, Tasmania, Australia
 Mt. Tahoma Nursery2811 112th Ave. E., Graham, WA 98338
 Northrup King Co.....P.O. Box 959, Minneapolis, MN 55440
 P. Kohli and Co.....Park Road, Srinagar, Kashmir, India 190009
 Park SeedCokesbury Road, Greenwood, SC 29647-0001
 Plant WorldSt. Mary Church Road, Newton Abbot, S. Devon, England
 Rocky Mountain Rare Plants.....(*)P.O. Box 20092, Denver, CO 80224
 Rosetta JonesE. 170 Dunoon Pl., Shelton, WA 98584
 Sahin, Zaden B. V.....(*)Postbus 227, Gerard Doustraat, 32400 AE Alphen a/d Rijn, Holland
 Sakata Seed America Inc.....P.O. Box 880, Morgan Hill, CA., 95038-880 (wholesale only)
 Sakata Seed CorporationP.O. Box Yokohama Minami No. 20, Yokohama, Japan 232 (wholesale only)
 Saltspring Primroses (*)2426 W. 47th Avenue, Vancouver, B. C. V6M 2N2, Canada
 Samen Mauser AG Dubendorf.....(*)Zurichstrasse 98, CH-8600, Dubendorf 1, Switzerland
 Sluis & Groot.....(*)4600 S. Ulster St., Suite 700, (Flower Seed Div.) Denver, CO 80237
 Southwestern Native Seeds.....P.O. Box 50503, Tucson, AZ 85703
 Stokes Seed Co.....Box 548, Buffalo, N.Y. 14240
 Syon Park Garden Center.....Isleworth, Middlesex, England
 The Primrose PathRD 2, Box 110, Scottsdale, PA 15683
 Thompson and Morgan, Inc.....P.O. Box 1308, Jackson, NJ 08527

Reference

Isaacson, Richard T., & the Library Staff. 'Andersen Horticultural Library's Source List of Plants & Seeds', A Completely Revised Listing of 1988-89 Catalogues, University of Minnesota Libraries, Minnesota Landscape Arboretum, 1989.

* * *

American Primrose, Primula and Auricula Society

- 1991 Seed Exchange -

The A.P.S. seed exchange is open to all members in good standing. Any member who has not paid his 1991 dues can renew by including a check or money order for \$15 U.S. dollars, payable to Jay Lunn, A.P.S. Treasurer with your seed order.

Seed prices are 40 cents (U.S.) per packet, with a minimum order of \$4.00 (U.S.) for 10 packets. Make all remittances payable to American Primrose Society Seed Exchange by personal check, money order or bank draft.

Personal checks from foreign members will be accepted in currencies of the following countries: Australia, Belgium, Canada, Denmark, Holland, Federal Republic of Germany, Great Britain and Northern Ireland, Japan (Roman Alphabet and Arabic numerals, please) New Zealand, Norway, Sweden, and Switzerland. Please insure that foreign checks are made out to cover the U.S. dollar amount plus 5%.

Mail all orders to Candy Strickland, A.P.S. Seed Exchange, 8518 - 28th Avenue East, Tacoma, Washington 98445.

The seed is listed, first by Primula Section and then the species name. G.K. Fenderson's book "A Synoptic Guide to the Genus Primula" was used for classification and spelling. I chose to list under both the Fenderson listing and the Pictorial Dictionary listing for the benefit of those not having Mr. Fenderson's book.

Abbreviations and symbols used in the seed listing are as follows:

HP = hand Pollinated

OP = open Pollinated

I = open pollinated in isolation

ssp = sub species

var = variety

(15) = number of seed per packet

[D1] or [-] = either the person donating the seed or in [-] indicates several donors

B.G. = Botanical Gardens

The number of seed in each packet varies according to the quantity of seed available. The director reserves the right to limit the number of packets of the scarcer seed to each order. In case you do not list substitutes the director will substitute with like seed when ever possible.

Orders will be processed in the order they are received with the donor orders being processed first.

Contributions to the seed exchange are welcomed until Nov. 30, 1991 at which time the seed list will be compiled for 1992. Orders for seed this year will be filled until May 15, 1991.

All contributions of seed should be made to:
 American Primrose Seed Exchange
 P.O. Box 112157
 Tacoma, Washington 98411-2157

SECTION ALEURITIA (Farinosae)

- 1 conspersa [C6] (10)
 2 conspersa [D37] (10)
 3 darialica [BG] (10)
 4 darialica [D39] [D35] (10)
 5 farinosa [BG] (15)
 6 farinosa [C21] (15)
 7 farinosa [D39] (15)
 8 frondosa [BG] (15)
 9 frondosa [D38] (15)
 10 frondosa [C22] (15)
 11 halleri [BG] (10)
 12 halleri [D20] [D25] (10)
 13 inayatii [D39] (5)

14 laurentiana from Newfoundland

- [D20] (5)
 15 laurentiana [D34] (5)
 16 mistassinica [BG] (10)
 17 mistassinica [D20] (10)
 18 mistassinica [D34] (10)
 19 modesta alba [D39] (5)
 20 scandinavica [C2] (10)
 21 scotica [C2] (5)
 22 scotica [D33] (5)
 23 specuicola [C30] (5)
 24 stricta [D18] (5)
 25 egalikensis - Newfoundland [D34] (10)
 26 involucrata [D29] (10)
 27 involucrata [D38] (10)
 28 nutans - sibirica [D44] (10)

SECTION AUGANTHUS (Sinensis)

- 29 praenitens [C3] (5)

SECTION AURICULA

- 30 auricula [BG] (10)
 31 auricula [C21] (10)
 32 auricula Switzerland [D34] (10)
 33 auricula ssp bauhinii [D37] (10)
 34 auricula ssp ciliata [BG] (10)
 35 auricula [D1] (10)
 36 clusiana [D39] [D37] (10)
 37 glaucescens [BG] (5)
 38 glaucescens [D39] (5)
 39 glutinosa [C21] (10)
 40 glutinosa Austrian Alps [D18] (10)
 41 glutinosa [D37] [D39] (10)
 42 hirsuta [C22] (10)
 43 hirsuta [C21] (10)

- 44 hirsuta [D39] (10)
 45 integrifolia (viscosa) [C22] (10)
 46 latifolia [C22] (10)
 47 latifolia (viscosa) [BG] (10)
 48 marginata [C3] (5)
 49 minima [C21] (5)
 50 minima [C22] (5)
 51 pedemontana [BG] (10)
 52 pubescens [C15] (10)
 53 pubescens [C6] (10)
 54 pubescens gigantic [C6] (10)
 55 spectabilis [BG] (10)
 56 villosa [D39] (5)
 57 viscosa [D37] (5)

SECTION CAPITATA

- 58 capitata [BG] (15)
 59 capitata [D25] (15)
 60 capitata var mooreana [D22] (15)

SECTION CORDIFOLIAE (Rotundifolia)

- 61 rotundifolia [D22] (5)

SECTION CORTUSOIDES

- 62 cortusoides [D35] (10)
 63 cortusoides [D20] (10)
 64 cortusoides Quebec Garden [D15] (10)
 65 heucherifolia [D20] (10)
 66 jesoana [D15] (5)
 67 polyneura [D25] (10)
 68 polyneura [D7] (10)
 69 polyneura [BG] (10)
 70 saxatalis [D7] (10)
 71 saxatalis [C13] (10)
 72 sieboldii [D9] (5)
 73 sieboldii [D20] (5)
 74 sieboldii mix [D8] (5)
 75 sieboldii saved from Barnhaven galaxy series [D43] (5)
 76 sieboldii (Patens) [D38] (5)

SECTION CRYSTALLOPHLOMIS**(Nivales)**

- 77 chionantha [D44] (10)
 78 chionantha and sinopurpurea mix [D25] (20)
 79 turkestanica [D38] (10)
 80 sinopurpurea [D22] (10)

SECTION CUNEIFOLIA

- 81 suffrutescens [C18] [C30] (10)

SECTION DENTICULATA

- 82 denticulata [BG] (25)
 83 denticulata alba [C22] (15)
 84 denticulata mix [D35] (25)
 85 denticulata rubra [C25] (15)
 86 denticulata [D31] (25)
 87 cashmiriana [D39] (25)
 88 cashmiriana [C29] (25)

SECTION GRANDIS

- 89 sredinskya grandis [D6] (10)

SECTION MONOCARPICAE (Malacoides)

- 90 malacoides [BG] (10)
 91 malacoides mix [C28] (10)
 92 malacoides mix [C27] (10)
 93 malacoides pink [C28] (10)
 94 malacoides Carmine Rose [C28] (10)
 95 malacoides white [C28] (10)
 96 androsaceae grandifolia [C29] (10)
 97 androsaceae lanuginosa [C29] (10)
 98 forbesii - Yunnan China pink [D39] (10)

SECTION MUSCARIOIDES

- 99 belledifolia [D6] (10)
 100 concholoba [BG] (10)
 101 muscarioides [C1] (10)
 102 muscarioides [D44] (10)
 103 vialii [BG] (50)
 104 vialii [D39] (50)

SECTION OBCONICOLISTERI**(Obconica)**

- 105 obconica [BG] (10)

SECTION OREOPHLOMIS (Farinosae)

- 106 luteola [D20] (5)
 107 macrocarpa [D39] (5)
 108 rosea [BG] (10)
 109 rosea [D38] (10)
 110 rosea [D36] (10)
 111 rosea grandiflora [C29] (10)

SECTION PARRYI

- 112 angustifolia [C30] (5)
 113 parryi col in Big Horn Mts. [D19] (5)
 114 parryi [D39] (10)

- 115 parryi [C30] (10)
 116 rusbyi [B6] (5)
 117 rusbyi [C30] (5)

SECTION PETIOLARIS

- 118 calderiana - Deane Balfour and Cooper [C22] (5)
 119 nepalensis from Nepal [D39] (5)
 120 petiolaris [C29] (5)

SECTION PRIMULA (Vernales)

- 121 amoena [BG] (10)
 122 amoena [D41] (10)
 123 elatior [BG] (10)
 124 elatior [C21] (10)
 125 elatior [D41] (10)
 126 elatior [D38] (10)
 127 elatior ssp intricata [D39] (10)
 128 elatior oxlip [D46] (10)
 129 flagellicaulis [C1] (10)
 130 tommasinii [C1] (10)
 131 pallesii [C6] (10)
 132 polyantha [C14] (10)
 133 saguramica [D39] (5)
 134 veris [BG] (10)
 135 veris [C22] (10)
 136 veris [D18] (10)
 137 veris from Finland [D34] (10)
 138 veris ss columnae [BG] (10)
 139 veris ssp macrocolyx [BG] (10)
 140 veris ssp macrocalyx [D39] (10)
 141 veris cowslip Rising Sun Cottage [D40] (10)
 142 veris orange - yellow red [D1] (10)
 143 vulgaris [C22] (10)
 144 vulgaris [D39] (10)
 145 vulgaris blue [D9] (10)

SECTION PROLIFERAEE

- 146 anisodora [D11] (10)
 147 anisodora [D22] (10)
 148 aurantiaca [BG] (10)
 149 aurantiaca [D35] (10)
 150 aurantiaca red orange dark stems [D8] (10)
 151 beesiana [BG] (15)
 152 beesiana [D18] (15)
 153 beesiana reddish purple [D16] (15)
 154 bulleesiana [C1] (15)
 155 bulleesiana [D7] (15)

156 bulleyana	[BG]	(15)
157 bulleyana	[D11]	(15)
158 bulleyana	[D24]	(15)
159 bulleyana	[D22]	(15)
160 bulleyana	[D6]	(15)
161 bulleyana yellow	[D16]	(15)
162 burmanica	[BG]	(15)
163 burmanica	[D25]	(15)
164 burmanica	[D6]	(15)
165 burmanica	[D41]	(15)
166 burmanica reddish purple	[D16]	(15)
167 chungensis	[BG]	(15)
168 chungensis	[D22]	(15)
169 cockburniana	[-]	(10)
170 cockburniana	[D39]	(10)
171 cockburniana orange	[D16]	(10)
172 helodoxa	[D36]	(10)
173 helodoxa	[D39]	(10)
174 helodoxa O.P.	[D13]	(10)
175 japonica	[BG]	(15)
176 japonica authentic ex Hokkaido	[D34]	(15)
177 japonica alba	[D18]	(15)
178 japonica brick red	[D18]	(15)
179 japonica terra cotta	[D29]	(15)
180 paonica red	[D16]	(15)
181 japonica rose	[D16]	(15)
182 japonica pink	[D16]	(15)
183 japonica Miller's Crimson	[-]	(15)
184 japonica Postford White	[-]	(15)
185 japonica Glowing Embers	[D27]	(15)
	[D7]	(15)
186 japonica Orient Sunrise	[D27]	(15)
187 japonica mottled white & purple	[D16]	(15)
188 japonica mottled purple & white	[D16]	(15)
189 japonica mixed colors	[-]	(15)
190 poissonii	[D22]	(10)
191 poissonii	[D25]	(10)
192 poissonii	[BG]	(10)
193 pulverulenta	[BG]	(10)
194 pulverulenta Bartley Strain	[D47]	(10)
195 pulverulenta dark rose	[D11]	(11)
196 pulverulenta	[D6]	(10)
197 pulverulenta	[D36]	(10)
198 pulverulenta	[D7]	(10)
199 smithiana	[D22]	(10)
200 wilsonii	[BG]	(10)

SECTION REINII

201 tosaensis	[D48]	(5)
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SECTION SIKKIMENSIS

202 alpicola	[BG]	(10)
203 alpicola	[D39]	(10)
204 alpicola mix	[D47]	(10)
205 alpicola mix	[D11]	(10)
206 alpicola alba	[BG]	(5)
207 alpicola alba	[D39]	(5)
208 alpicola var Luna	[BG]	(10)
209 alpicola var Luna	[D37]	(10)
210 alpicola violacea	[BG]	(10)
211 alpicola violacea	[D22]	(10)
212 firmipes	[BG]	(10)
213 firmipes	[D39]	(10)
214 florindae	[BG]	(25)
215 florindae	[D24]	(25)
216 florindae	[D7]	(25)
217 florindae	[D37]	(25)
218 florindae	[D15]	(25)
219 florindae rubra	[D20]	(15)
220 ioessa	[C17]	(10)
221 secundiflora	[D22]	(10)
222 secundiflora	[D15]	(10)
223 secundiflora	[D47]	(10)
224 sikkimensis	[BG]	(15)
225 sikkimensis	[D37]	(15)
226 sikkimensis	[-]	(15)
227 sikkimensis crimson & gold	[D39]	(10)
228 sikkimensis mix	[D22]	(15)
229 sikkimensis var hopeana	[BG]	(10)
230 sikkimensis var pudibunda	[BG]	(10)
231 sikkimensis x sikkimensis	[D28]	(10)
232 waltonii	[BG]	(10)
233 waltonii	[D37]	(10)
234 waltonii	[D47]	(10)

SECTION SOLDANELLOIDES

235 nutans (flaccida)	[D25]	(10)
236 nutans (flaccida)	[D39]	(10)
237 flaccida	[D22]	(10)
238 reidii williamsonii	[C26]	(5)
239 reidii williamsonii blue	[D39]	(5)

SECTION SPHONDYLIA (Floribundae)

240 boveane	[D37]	(5)
241 edelbergii	[D37]	(5)
242 floribunda var isabellina	[D21]	(5)

243 kewensis	[-]	(5)
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SECTION AURICULA HYBRIDS

244 auricula alpine mix	[D21]	(10)
245 auricula Border show alpine mix	[D37]	(10)
246 auricula Border named plants in National Collection	[D40]	(10)
247 auricula Border Beeshel Strain Mix	[D21]	(10)
248 auricula Garden Mix from Barnhaven seeds	[D43]	(10)
249 auricula Petite Alpine Hybrid	[D14]	(10)
250 auricula Garden mix	[D42]	(10)
251 auricula Garden mix	[D14]	(10)
252 auricula Garden autumn flowering	[D5]	(10)
253 auricula Garden white	[D16]	(5)
254 auricula Garden mix	[D14]	(10)
255 auricula Garden yellow	[D14]	(5)
256 auricula Garden blue	[D14]	(5)
257 auricula Garden white	[D14]	(5)
258 auricula Garden brown	[D14]	(5)
259 auricula Garden red	[D14]	(5)
260 auricula red show self	[D14]	(5)
261 auricula yellow show self	[D14]	(5)
262 auricula show mix	[D37]	(5)
263 auricula Winifred	[D46]	(5)
264 auricula doubles	[D14]	(5)

SECTION JULIA AND PRIMULA HYBRIDS

265 juliae - hybriden	[BG]	(5)
266 juliae Cheerleader	[D46]	(5)
267 juliae hybrid Gold Ridge	[D23]	(5)
268 juliae miniature acaulis	[C28]	(5)
269 juliae acaulis-bicolor	[C28]	(5)
270 primula x "Polyarde" polyanthus x Garryard F ₂ H.P. white, red, pink	[D13]	(5)
271 primula x juliardes (dwarf x juliana x Garryards) H.P.	[D13]	(5)

SECTION PRIMULA HYBRIDS

272 acaulis multiflora Asteroids	[C27]	(10)
273 acaulis Spectrum Series coral	[C27]	(10)
274 acaulis Spectrum Series primrose yellow	[C27]	(10)

275 acaulis Spectrum Seriesameleon	[C27]	(10)
276 acaulis Spectrum Series Stardust	[C27]	(10)
277 acaulis Spectrum Series new red	[C27]	(10)
278 acaulis Spectrum Series stereo blue	[C27]	(10)
279 acaulis Spectrum Series blue	[C27]	(10)
280 acaulis Spectrum Series mid blue	[C27]	(10)
281 acaulis Spectrum Series yellow orange eye	[C27]	(10)
282 acaulis Spectrum Series yellow	[C27]	(10)
283 acaulis Spectrum Series golden yellow	[C27]	(10)
284 acaulis Spectrum Series new gold	[C27]	(10)
285 acaulis Spectrum Series birds eye	[C27]	(10)
286 acaulis Spectrum Series pale cream	[C27]	(10)
287 acaulis Asteroid H.P. Small Flowered	[C27]	(10)
288 acaulis Encore and Patermo Crosses large flowered	[D23]	(10)
289 acaulis very robust mixed colors	[D37]	(10)
290 acaulis ssp bauhini	[D37]	(10)
291 acaulis doubles mix	[D3]	(5)
292 elatior ssp intricate	[D39]	(10)
293 elatior Hybrid Primula & Juliana white form - H.P.	[D13]	(5)
294 elatior x primula juliana F ₂ H.P.	[D13]	(5)
295 elatior hybrids - grandiflora	[C22]	(10)
296 polyanthus	[BG]	(10)
297 polyanthus from Barnhaven seeds	[D43]	(10)
298 polyanthus from 1950 plants veris or elatior X's small flowered white - red - yellow	[D17]	(10)
299 polyanthus from Barnhaven Casquet mostly darker colors	[D17]	(10)
300 polyanthus "Emily Byers" short plants - compact flowers	[D17]	(10)
301 polyanthus Silver Laced	[D17]	(10)

- 302 polyanthus x Gold Lace mix [D12] (10)
 303 polyanthus x poly Gold Lace [D2] (10)
 304 polyanthus Cowichan mixed red H.P. [D2] (10)
 305 polyanthus Cowichan mixed blue H.P. [D2] (10)
 306 polyanthus Cowichan from Barnhaven seeds, mixed colors [D43] (10)
 307 polyanthus "Super Giants" white [C28] (10)
 308 polyanthus "Super Giants" carmine rose [C28] (10)
 309 polyanthus "Super Giants" crimson [C28] (10)
 310 polyanthus "Super Giants" pink [C28] (10)
 311 polyanthus "Super Giant" lemon yellow [C28] (10)
 312 polyanthus "Super Giant" mixed [C28] (10)
 313 polyanthus "Pacific Giant" white [C28] (10)
 314 polyanthus "Pacific Giant" bicolor [C28] (10)
 315 polyanthus "Pacific Giant" scarlet [C28] (10)
 316 polyanthus "Pacific Giant" rose shades [C28] (10)
 317 polyanthus "Pacific Giant" blue shades [C28] (10)
 318 polyanthus "Pacific Giant" yellow shades [C28] (10)
 319 vulgaris "Ernest Benary Show mix" [C25] (10)

SECTION PROLIFERAE HYBRIDS

- 320 candeleva semi-doubles light pink [D13] (10)
 321 cockburniana "Dwarf" [D46] (5)
 322 japonica "Inshriach Hybrids" [D16] (10)
 323 japonica hybrids [D36] (10)
 324 Lissadel "pulverulenta x cockburniana"-shocking pink hybrid [D22] (5)
 325 pulverulenta white-yellow [D18] (10)

SECTION PRIMULACEAE

- 326 cortusa matthioli [D26] [D41] (10)
 327 cortusa matthioli var allaica [D39] (10)
 328 cortusa matthioli var pekinensis [D39] (10)
 329 dodecathion [D18] (5)

UNKNOWN

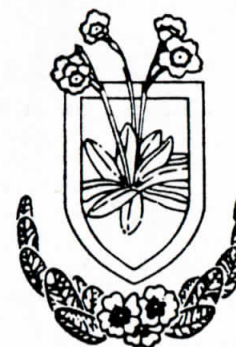
- 330 samonimontana [D48] (5)
 331 Pot-Luck - mixture of all auriculas (25)
 332 Gamblers choice - mixture of all primula seeds (50)

COMPANION PLANTS

- 333 Aquilegia bertolonii [D26] (10)
 334 Calceolaria falklandica [D26] (10)
 335 Campanula Sotundifolia [D39] (10)
 336 Clematis - blue lagoon [D44] (10)
 337 Clematis lanquetica - golden [D32] (10)
 338 Cniclis casabonoe blue thistle [D13] (10)
 339 Cyclamen [D44] (10)
 340 Cyclamen [D3] (10)
 341 Dianthus humilas [D38] (10)
 342 Dianthus fischeri [D38] (10)
 343 Dictamnus burning bush white flowers [D37] (10)
 344 Gentiana asclepisdea - willow gentian [D6] (10)
 345 Helleborus orientalis - yellow [D37] (10)
 346 Laprerousia Loia 8" garden iris [D11] (10)
 347 Lewisii cotyledon pink [D16] (10)
 348 Lewisii cotyledon red [D16] (10)
 349 Lewisii cotyledon red & white [D16] (10)
 350 Lewisii cotyledon pink [D13] [D16] (10)
 351 Lewisii cotyledon hybrids [D3] (10)
 352 Lilum pumilum-dwarf [D42] (10)
 353 meconopsis Himalayen Blue Poppy [D24] (10)
 354 meconopsis [D45] (10)
 355 meconopsis [D18] (10)
 356 Rhododendron glaucophyllum x luteum [D32] (10)
 357 Rhododendron atlanticum [D32] (10)

- 358 Rhododendron lutescens [D32] (10)
 359 Rhododendron impeditum dwarf [D32] (10)
 360 Rhododendron macrophyllum [D32] (10)

- 361 Rhododendron oreotrephes [D32] (10)
 362 Rhododendron concinnum [D32] (10)
 363 Rhododendron minus x carolinianum [D32] (10)
 364 Tulipa Tarda deep orange [D42] (10)



1992 International Primula Symposium

April 10 - 11 - 12
 Beaverton, Oregon

AMERICAN PRIMROSE
 PRIMULA AND AURICULA SOCIETY
 50th Anniversary

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