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## OBOVATA - ALBA

Chris Laning

The most highly prized things often are enhanced by scarcity. This may be true of obovata alba since it is not often available. Add to this the unwelcome trait of difficult propagation and one realizes the reason for its being only a collector’s treasure. In the early time of Professor Saunders' hybridizing endeavor, P. obovata alba was identified as P. obovata var. Willmottiae -- later known as P. obovata and/or P. obovata alba.

When crossed with P. macrophylla, '**Silver Dawn**' resulted. Since P. obovata tends to languish in our cold winter climate, it is not surprising that '**Silver Dawn**' is now lost! The seedlings resulting from its use are very early blooming -with, a "something extra" in their makeup.

Be assured that P. obovata var. Willmottiae is par excellent as a parent in any hybridising program, but you must find it first!

P.S. England (G.B.) has a mild climate (about like Virginia); therefore a plant that is hardy there may not survive a Michigan winter.

TRY SOMETHING NEW FOR ITOHS

Chris Laning

Tetraploid - syn-tets - amphidiploid: these may, when pollinated with '**Alice Harding**' lutea hybrid, give triploid or maybe tetraploid Itohs with a possibility of some fertility. **'Thunderbolt'** and **'Age of Gold'** should also be tried as pollen parents!!

What I like about Itohs is the great substance of leaves and flowers, ease of dividing and good resistance to diseases. Also the blooming season covers many days and each bloom holds up very well! Now if some person that has ability of a lab technician will try Dr. Peter Hughes' approach, fertility in some small measure may be gotten.

Another variation is worth repeating: Roy Pehrson thought he had succeeded in getting seedlings from crosses of (1) P. lutea, (2) P. delavayi, (3) P. potaninii, and (4) various suffruticosa plants. He had sent me several plants of **'Nippon Gold'** x T.P. mix. These all have incomplete flowers, but why? And what would one expect if instead of lactiflora pod parents, tetraploids should be used? — I'll try some of these crosses.

Jackie Janson, if you use Reath's P. lutea #14 as pollen parent on lactifloras more than likely incomplete flowers will result. I cannot understand why only the lutea hybrids (and maybe delavayi) offer complete flowers of excellent quality!

One puzzle that puzzles me as it must puzzle many other puzzled people is the existence of **'Pink Harmony'** and **'Pink Symphony'**. These two plants were reported to exist and their parentage is herbaceous peony with Japanese tree peony. Now if these two hybrids no longer exist (Smirnow says they were inadvertently destroyed by developers), what plants were involved in their development? What the pod parent and what the pollen parent?? Surely I'd like to try to duplicate these remarkable crosses!!!

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NOTE TO: HERMAN KRUPKE, SWEDEN

Seedlings growing from the seeds you sent some time ago are finally doing nicely. The P. officinalis Monte Baldo is quite different from our old officinalis, at least as it appears in this seedling group. Please tell me more about this species — height, flower color, date of bloom, and anything else you can think of in describing it.

Anomala Intermedia is also doing well! One thing that is a bother is that these species seeds take two years for germination. This factor is most disconcerting since it is easy to lose them by not remembering their planted location. But now I have about 20 plants of anomala and 20 plants of Monte Baldo! Thanks!

-- Chris

# SOME IDEAS ON TETRAPLOID PEONIES

Dr. Peter Hughes
70 Studley Park Road
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Australia

Over the years my work has been mainly bio-chemical in the field of cancer research and I have also done some work with roses. In many respects the present position with regard to hybrids of Paeonia is at a stage that the hybridists had reached with Rosa at the end of the last century. The roses of Victorian times were essentially once flowering and did not repeat in the autumn. The forms of Rosa galica and the moss roses were tetraploid. With the introduction of Rosa chinensis the genes of recurrent flowering were introduced. This gene is recessive and Rosa chinensis is itself diploid, so that on crossing Rosa chinensis with the then garden roses, triploids such as the first hybrid tea La France introduced in 1867 were triploids and proved to be very low fertility. Subsequently with repeated crossing tetraploid forms arose and then round about the turn of the century, Pernet-Ducher crossed the tetraploid Persian yellow rose with the then tetraploid hybrid teas to produce the Pernetiana roses. With this all the wonderful range of colours of the present day roses was introduced, but along with this came disease and thorniness and numerous other problems. Subsequently this has been bred out and we now have roses of a very high standard.

It is to be noted that rose seedlings flower the first year, whereas in breeding peonies we have to wait seven or eight years for seedlings to flower, so that generation time is much greater in the peonies. Hence progress is much slower.

Another important event in rose breeding was the introduction of the genes of Rosa rugosa and Rosa wichuraiana into the rose gene pool. Both these species are diploid and in 1919 Bowdich introduced a ground cover variety called Max Graf, which had small single white-pink flowers and was itself absolutely sterile. Subsequently in Kordes nursery this plant produced seed and in 1941 Kordes had produced Rosa koresii which was a spontaneous tetraploid and was highly fertile. As a result of this the hardy genes of rugosa and wichuraiana have been introduced into the rose pool. So it can be seen that acquisition of tetraploidy into the gene pool is very advantageous to breeding and peony breeders should aspire to this level.

In Iran, Afghanistan and parts of southern Russia there occurs a unique little plant which at one stage was classed as a rose under the name of Rosa simplicifolia. Subsequently the plant has been placed in a monotypic genus of Hulthema the sole species being Hulthema persica. This is a little plant which has entire and not pinnate leaves. It has a very bright buttercup yellow flower which is an unfading yellow. At the base of each petal is a bright red blotch. It has been the aim of rose breeders for the past two hundred years to introduce the genes of this into Rosa, but to date efforts have been to no avail.

An interesting hybrid was introduced before 1836 by Hardy. This was obtained from seed gathered in the Garden of Luxembourg in Paris by Hardy from a plant of Hulthemia persica, which was growing near to a plant of Rosa clinaphylla, assumed to be a hybrid between these two species. This plant is diploid and has been to date totally sterile and has so far defeated all attempts to breed from it. It is a delightful little plant with a very fine pinnate foliage, bright yellow flowers with the bright red eye of the Hulthemia parent. It is however prone to mildew. I have made numerous attempts to produce a tetraploid form of this to hybridise with Rosa and have used several chemicals. I have had a singular lack of success. However, I have had some success in producing good pollen grains by a technique using colchicine and I think such a technique could be applied to peonies, particularly very sterile very valuable hybrids, such as the Itoh hybrids. I will give details of the method as some readers may find it interesting to apply it to their peony breeding.

In a sterile hybrid such as Hulthemosa persica which is diploid and the Itoh hybrids which are diploid, mitosis occurs at division of chromosomes and pairing. However, when meiosis occurs this is impossible as the chromosomes are too dissimilar to pair. In pollen formation a stem cell undergoes successive mitotic division and then a meiotic division which results in a haploid pollen grain in the case of diploid plants. In the sterile plants this is impossible as the chromosomes are to dissimilar to pair. It was thought that by injecting a dilute solution of colchicine into the bud prior to meiosis metaphase arrest could occur in one of the mitotic divisions proceeding meiosis giving rise to a tetraploid precursor cell to pollen grains which then would be capable of meiosis to produce a diploid pollen grain. Some studies were done on Rosa and it was found that meiosis occurred quite early when the bud was smaller than about half the size of a grain of wheat. It was then extrapolated to Hulthemosa and if meiosis was possible it could occur at a similar stage. Because of this the dilute solution of colchicine was injected into all the buds of ten plants of Hulthemosa persica at this stage, and 0.1% aqueous solution of colchicine was used containing two drops of 10% santomerse SX per ten millilitres. After the treatment most of the buds aborted, however several flowers were produced and on these flowers a small percentage yielded viable pollen grains. These were used to hybridise roses such as Orangeade which seed freely here and ten seeds were produced. These were sowed and produced five seedlings which had unusual looking foliage, somewhat resembling Hulthemosa. Unfortunately the seedlings were lost in our severe drought during the very hot summer of two years ago, when watering was prohibited. The same technique could well be applicable to plants like the Itoh hybrids producing diploid pollen grains and could then be crossed with tetraploid plants of the better hybrids to produce presumably tetraploid seedlings.

It is of interest that the above procedure was also used on a triploid Tea rose called Lady Hillington which has always been regarded as completely sterile and the pollen so produced was used to fertilise flowers of a popular winter flowering diploid Rosa gigantia hybrid called Lorraine Lee. This is winter tender in most parts of the

United States but here is almost evergreen and has a profusion of sweetly scented flowers in winter. The resulting seedlings grew and yielded plants which were fertile, thus we produced a diploid pollen grain from Lady Hillington which was previously sterile and used this on a diploid Tea rose derivative producing a tetraploid fertile hybrid. The above procedure offers no end of possibilities in using sterile diploid triploid hybrids to raise the ploidy to a level which would greatly benefit peony breeders. All my other attempts using colchicine to produce tetraploid roses have been doomed to failure. The above procedure is quite simple to carry out and could be, I think, quite applicable to peony breeders.

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Letter from: Roger Anderson January 27, 1984
Fort Atkinson, WI 53538

Dear Chris:

Here it is almost February and I haven't sent my money for Paeonia. I'm also enclosing extra to pay postage on those back publications you sent last year.

Had another good year in hybridizing once again being very successful in my Ito crosses.

Since you didn't make it to the show in Milwaukee this past year, I am enclosing these two pictures of an unbloomed Ito that Roy sent me back in 1980. Last year was the first year it bloomed and I think it is probably one of the better Itos I've seen to date. Roy sent me others, but none can compare to this. I wish Roy could see this one, he might say it's his best.

Will close for now!

Best regards,

Roger

ED: Paeonians, the two pictures show this Roy Pehrson Itoh to be very good. I, too, have a nice one from Roy and am beginning to believe that Thunderbolt should be used in the Itoh crosses.

Chris

# SOME EXPERIENCES GROWING AND HYBRIDIZING TREE PEONIES, ESP. LUTEA HYBRID TP'S

Bill Seidl, Manitowoc, WI

Some time back, Chris asked about the performance of the various Daphnis hybrids sent out by Gary Seaman in the early 70's, so that will be my starting point. When I received these plants, about ten in number, I planted four at my home lot and the others at my acre lot. Those on the acre lot all died because of poor drainage. The area in which they were planted never had standing water during wet periods but the ground apparently was saturated for long periods of time. Even after this experience I lost more tree peonies transplanted to what I thought were adequately drained areas. Although no peony thrives in poorly drained soil, it seems in my experiences that the intolerance varies beginning with the most intolerant, suffruticosa and lutea species, then lutea hybrids, Ito hybrids, herbaceous hybrids, and lactifloras. I once had lutea, lutea #14, and three potaninii Tall Yellow plants growing and established, (except L14) on the well-drained sandy soil of a rented lot and all died after an early winter. Rain was closely followed by subzero weather. Other peonies (incl. Itos and other lutea hybrids) survived OK. Although all were lightly mulched, perhaps a heavier mulch would have allowed the excess water to drain away before freezing around the roots. (Perhaps growing on a mountainside would have helped.)

The four planted at home all grew and still survive. They are D222, D223, D324, and Gauguin II. D222 is a small light yellow, nearly white, not very vigorous, and probably somewhat fertile but I have no seedlings from it.

D223,* light yellow, single flowers, about 10 petals, almost no flares. Low to medium height, tends to bloom only from terminal buds but these usually winterkill, so usually only 2-5 blossoms are produced annually. Fertile both ways, once yielded eight firm seeds in one carpelhead. Leaves are unique, taking on reddish fall tones very early. Once they took on red colorations in June, then became overall bronze-green, then back to the usual fall colors in early September. If this had appeared among my own seedlings I probably would have ignored it for hybridizing. But as I had few lutea hybrids to work with, I did use it in several crosses. So far it has produced two unique seedlings (AL1 and AL13) that one would never have suspected it capable of producing.

D324, similar in flower to D223 but on a tall-growing, vigorous floriferous plant, quite hardy, terminals not usually freezing out. Fertile both ways.

Gauguin II, similar to GAUGUIN in flower color but smaller with 2-4 laterals. Rather weak growing, so-so hardiness, rarely produces a seed. No seedlings from it.

* Probably not-true-to number as the description here does not match that of 223 on David Reath's descriptive list of Daphnis numbered seedlings.

The original plants of D223 and Gauguin II are still in place at my home lot. D222 was transplanted to the acre lot where it merely survives. D324 was split three ways, one division transplanted to the acre lot died (poor drainage again) and the other two are thriving on the rented lot. In a similar experience I divided a very large plant of A197 growing at home into nine divisions; two transplanted to the acre lot died, the other seven to the rented lot all grew OK. I've also dug up four well established suffruticosas growing at home, splitting each 3-4 ways, and planted on the acre lot. About half died and the other half are just clinging to life. Lesson: Believe the textbooks, TP's are best propagated by grafting; lutea hybrids (some of them) can tolerate root division a little better.

An unrelated experience: mice once girdled every stem of t.p. Shujakumon one winter but, surprising to me for a pure suffruticosa, it grew strongly from underground eyes and in the second year bloomed normally. This probably is to be expected when the t.p.'s are deeply planted as is the usual recommendation.

I've planted little TP seed and have only two seedlings, both from Rock's Variety x an unknown single purple sent to me as Hana Daijin, a double purple. One is labeled TP#1, basically a lavender with darker flares, vigorous and very hardy. The second is a nondescript white, weak growing. A third, more vigorous than, otherwise similar to #1, died from an accidental dose of Round-up herbicide spray. Rock's Var. is self infertile when grown by itself with no other TP's nearby, absolutely no firm seed has been produced.

In the lutea hybrid crosses, the seedling plants were numbered individually AL1, AL2, etc. (AL = Advanced Lutea) as they neared blooming size and so far I've not gone beyond 14. Lutea hybrids used have been Reath's A197, A198, and A199. The latter two are fertile both ways; A197 is pod fertile only. Also used: '**Age of Gold**', '**Alice Harding**', '**Chinese Dragon**', D223, and D324. The first to bloom was . . .

AL1: '**Age of Gold**' x D223. This had sickly lighter-than-normal green foliage beginning as a one-year seedling, with even lighter chartreuse veins. In later years, creamy-white patches appeared, more prominent on some stalks than others. These leaves would burn somewhat at the edges in a hot June sun, although they toughened up later in the season. The variegation never fades and, in the fall, combinations of light green, red, creamy-white, and pink-on-cream make some individual leaves quite beautiful but never widespread enough to be showy from any distance. It has produced light yellow semi-double flowers, usually hidden in the foliage, and somewhat fertile.

AL13: A197 x D223. Bloomed first time in 1983, six blossoms, 10-12 petals, a lavender-blue-rose blend with darker flares, no pollen; it produced three firm (still ungerminated) seeds by '**Chinese Dragon**' pollen. Vigorous and hardy, it is the ONLY plant from this cross of two light yellow parents. I know of no other lutea hybrid like it in color, the closest being '**Mystery**', whose pollen should be tried on it.

Other numbered seedlings are not especially noteworthy or unique. I figured it would be difficult to breed a yellow better than the many yellow cultivars already available, so concentrated more on '**Chinese Dragon**' crosses because of its attractive more-finely divided foliage.

Seedlings AL9, 10 and 11 are from D223 x '**Chinese Dragon**'. Two are purple in color and one of these, AL11, backcrossed to '**Chinese Dragon**' has produced two young plants. Other crosses with '**Chinese Dragon**' are:

A198 x '**Chinese Dragon**', six 3-yr plants.
'**Chinese Dragon**' X A199, four 3-yr plants.
A197 x '**Chinese Dragon**', three 1-yr plants.
Also twelve 2-yr plants, label lost, but I think all 'Chinese **Dragon**' seedlings.

In all of these, few have foliage as finely-divided as '**Chinese Dragon**', the broader foliage of the yellow parent seeming to dominate.

To obtain superior yellows with only a small population of seedlings it seemed best to use '**Alice Harding**', thus . . .

A199 x '**Alice Harding**'. Two 2-yr plants.

There were many more than two firm seeds from various crosses with '**Alice Harding**' so I blame poor seed-germinating techniques for having only two seedlings. However, even this limited success was enough to inspire an even more promising cross last season:

'**Age of Gold**' x '**Alice Harding**', One firm seed; ungerminated.

Two arguments came to mind for NOT trying the cross: (1) the impossibility or high, improbability of success, and (2) the likelihood that the resulting seedlings would inherit '**Alice Harding**' flowers-hidden-in-the-foliage habit.

'**Age of Gold**' can set seed and '**Alice Harding**' can produce viable pollen; so much for impossibility. As for improbability, '**Age of Gold**' and '**Alice Harding**' are more closely related than LACTI and '**Alice Harding**', parents of Ito's famous cross, so chances of success should be considerably better. As far as the hidden-flower argument, crosses entirely within the lutea species produced the upright-flowering Lutea 14 clone, so crosses between two parents each having only 50% lutea ancestry should improve the odds for flowers held above the foliage. The micro-climates of my parent plants are such that '**Age of Gold**' was well past its peak when '**Alice Harding**' pollen became available, so only 3-4 fresh flowers were pollinated and left unlabeled and unmarked. They were completely forgotten about until late November when, while grooming the plant of dead foliage and stems, I discovered a dried, unopened carpel with a firm seed inside. This cross bears repeating and I hope to encourage a plant of '**Alice Harding**' to bloom earlier by weighting down some black plastic mulch around it to warm up the soil earlier.

## WIND DAMAGE — Don Hollingsworth

A strong east wind, during the night of April 20, 1984, in the Kansas City area had muscle enough to cause new shoots of peonies to break. The shoots were perhaps 8-12 inches on the herbaceous types and maybe 6 inches on tree peonies. About 40 varieties and seedlings were affected of hundreds of different clones exposed.

Because of differences in degree of exposure, due to variation in density of shoots and plants, distance from other objects which may have given some differences in shelter and whatever else may have contributed variation in actual degree of pressure experienced by different stems, I will not go into detail on all of the varieties affected. I feel it not justified to unconditionally consign every plant so affected to the trash heap. However, it is entirely legitimate to favor those not hurt over their injured row mates.

As a group, the early hybrids were hardest hit. This was probably due in part to their stage of growth--perhaps a higher percent of them were tall enough to receive the critical level of torque, or leverage. Among the early hybrids, however, there were distinct differences in susceptibility. We must take such factors into account in choosing parents to favor in making future crosses.

Vulnerability to spring weather hazards must be an important factor of selection in any varieties which are chosen for introduction. This could be particularly damaging to the acceptance of early flowering peonies by the general gardening public.

One of the surprises to me was the number of established lactiflora varieties which showed vulnerability. '**Le Cygne**', '**Arcturus**' and '**Mikado**' are notable examples. These were thin clumps from recent divisions—thinly spaced stems—and the stage of growth, height was probably a factor in the first two, which come out of the ground early for the type. I would like to have the comments of others on these varieties. In the tree peonies, the introduced Japanese varieties had very little breakage. The worst damage was among seedlings and the most plants affected were seedlings, although my plants are predominantly introduced varieties. This suggests that wind exposure is a factor Influencing selection in Japan.

The largest number of seedlings which I grow, that are of mature sizes, are of the lacti-Little Reds group. There seemed to be very little susceptibility in the group as a whole. These come out of the ground early and spread their leaflets early, but attain height more slowly. This might be viewed as an adaptation to wind resistance, as might the spreading leaflets which tend to bring the foliage of the different stems in contact quite early in development. There seemed to be a definite advantage in resistance in favor of larger clumps, presumably giving a shock absorber effect. In contrast, the habit of the lactiflora group is that the leaflets remain clasped to the stem until considerable height is attained.

It seems likely that there can be resistance to breakage in the internal anatomy, inasmuch as all external factors being equal in a close set seedling row, breakage of early hybrids types was conspicuous, even seen with one or two plants having Little Reds types on each side, all stems in the crowded row lapping onto each other and the wind direction being lengthwise of the row.

From this experience, I feel it is the early hybrids types which must be culled most rigorously for wind resistance. This is such an important group for the potential expansion of acceptance of the new peonies in general gardening circles. Let's not retard this prospect by ignoring a potentially damaging flaw, which is now occurring only in a minor percentage of the plants.

## SYSTEMATIC CODIFICATION FOR CONVENIENCE OF THE HYBRIDIZERS?

Don Hollingsworth

Your words, Chris, help me take off on an issue which I feel we must deal with in a larger context than that of hybridist convenience.

As hybridists and connoisseurs of the rare and unusual peonies, we have recently been through a period during which we have been very much inner-directed, maybe introverted, in our perspective. Just getting things together to preserve the heritage of the Peony Society and to preserve the breeding materials which had been previously created has demanded a great part of our attention.

There is a larger gardening public for peony matters, however. This is a public which has had only a few glimpses of what we see with respect to the new hybrid variations, as well as the expanding availability of familiar forms (tree peonies, for example). This is a general gardening public having its own ongoing communications network, which functions quite apart from our own. Just as we communicate with one another about peonies through the print media and activities of the American Peony Society, the general gardening public communicates by way of print media and activities, which include marketing activities and various levels of organized gardening activities.

What this has to do with our efforts to standardize nomenclature of the new peonies is, I believe, that the time is coming when continued growth in the health of peony interests will depend in part upon how effective we become in communicating about the new peonies through the general gardening network.

Up to now we have been mostly concerned with talking among ourselves about the new possibilities for peonies in ornamental horticulture, ourselves being an "insiders" group represented by the Peony Society membership, and, even more narrowly, the readers of PAEONIA. I find that we are a lot farther along toward having a readily understood terminology for talking among ourselves than for talking to the uninitiated gardening public.

Our "insiders" needs are best satisfied with terminology which reflects species and pedigree—the genetic perspective. As Chris has pointed out, genotypic information is largely meaningless to any but the most specialized interests. On the other hand, the general gardening network will be better served by terminology which invokes ideas about usefulness in ornamental situations—color, season, form, for example. This terminology must find a place in the larger vocabulary of gardening if it is to serve our larger needs.

Roy Klehm recently related an example of one of the problems we face in presenting the new kinds of peonies to the larger gardening public. A major nursery, which produces a colorful, slick paper catalog, raised the question of why should they include more than one yellow flowered tree peony variety. From the standpoint of business and economy the nursery wants to concentrate only a few varieties. While this reflects a much narrower view than the general gardening network may require, it is indicative of the problem we face in presenting new forms of peonies. The general gardening public is going to be able to incorporate a few designations which will convey important differences about the new peonies much more readily than it will a complexity of terminology such as we use in talking about hybridists interests.

As we face the problem of what nomenclature (classifications, if you prefer) we might choose to promote peonies with the general gardening communications network, it may be instructive to examine what has evolved in other plant societies. Groups such as the iris and daffodil societies have classifications based on form and they have a fairly wide range of classifications, although in each case the number of classifications used by the marketers tends to be reduced. The rose industry has reduced their number to three of more or less narrowly defined sections and a fourth which is a catchall in which the varied interest groups that are not much in the market are lumped together as one—loosely referred to as "old fashioned" roses.

One might readily find a correlation between the financial success of the rose industry and the simplification of the terminology with which they communicate in the general gardening network. This is not to say that I believe that the financial success of the peony "industry" is tied only to simplification of our nomenclature, but simply to reinforce the idea that we are best off to avoid any unnecessary complication in our terminology. That is to say, best off with respect to the potential acceptance of new ideas about peonies on the part of the larger gardening public.

So, let's give some creative thought to the problem of how to organize the present proliferation of peony variations into a small number of new classifications. This is not as easy as one might think, at least for some of us who have had an assignment to work on it.

Any input of ideas or suggestions by readers of PAEONIA will be appreciated.

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## COMPARED: SILVER DAWN $F_3$ CLONES

Don Hollingsworth

Upon several occasions in these pages the '**Silver Dawn**' lineage has come up, for discussion. For very good reason -- at least one of them has figured significantly in some of the recent advancements in breeding early hybrids having pastel colors, notably some of Chris Laning's achievements.

'**Silver Dawn**', originated, by Professor A.P. Saunders, no longer exists as far as is being reported in peony breeding circles at this time. Its influence now exists only in two " $F_3$" clones known to me. ($F_3$ is given in quotes here because this status is in doubt by breeding science use of the term—it is believed that these plants descended from the original through open pollinations, therefore equally subject to having been from outcross pollinations or from selfing, which latter is signified by use of the F symbol.)

I now have both of these clones, through Chris Laning's generosity. '**Silver Dawn**' " $F_3$" clone #1 was acquired and used by Roy Pehrson, in whose hands it first became known as an effective parent. My plant is in its 6th year and is now an impressive clump among

its bed mates. The new stems have much color, the leaves are large, the stems reached 44" height during the cold, moist 1983 spring season. The flowers are large, single, ivory ground color with lavender points—stigma, filaments and faint flares. I believe the ivory effect results from a suffusion of lavender color uniformly through a yellow pigment, also the way I see other ivory colored esrly hybrids. This one is especially attractive and should, in my view, be named and increased for distribution. There has been no record here of susceptibility to severe weather of spring, a subject on which I have said more elsewhere.

#1 is, I understand, the clone which Chris has used with excellent results and which may be involved in the parentage of part of his double flowered, pastel colored early hybrids seedlings.

'Silver Dawn' "$F_3$" Clone 2 (#2) is only in its 3rd season here, which necessarily clouds my comparison. However, in this case I feel it doesn't make a significant difference. #2 is seriously flawed. From Chris I have heard that it freezes off nearly every year. Here it was taken by a late spring freeze in its first year, had no buds in the second and now has had two of three stems broken in a strong wind. It was notably susceptible to wind breakage compared to other plants in the vicinity. These two flaws of this plant make it a poor prospect for use in breeding, so long as we have so many attractive alternatives available. True, I haven't seen the flower yet. Maybe it will show something extra special. In that event I might be persuaded to cross it with the better clone —SD3#1— in an effort to preserve what there is that is good between them.

If I make the cross between the two, then I will want to use the better clone as pod parent. It is in the nature of plants that the pod parent contributes more inheritance to the progeny than does the pollen parent. This is because the non-chromosomal contents of the egg cell give rise to most of the non-chromosomal cell contents of the progeny. The male germ cell from the pollen parent is too small that it can contribute very little more than chromosomes to the progeny (so the logic goes). Accordingly, I want my seedlings of the cross to get such secondary sources of inheritance from the better parent, just in case these sources will prove important in connection with avoiding flaws of the #2 plant. This is not offered on the basis of knowing something specific, however, just a play on the perceived odds.

A possibly more attractive breeding logic is to self the two clones and look for the possibility of their better qualities being sorted out from the worst ones among one or more members of the progeny.