PAEONIA

Volume 6, No. 2 June, 1975

REQUIRED READING –
1. "The Peonies" by John C. Wister, $3.50 from American Peony Society.
2. The Bulletins of the American Peony Society.

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The PAEONIA is authorized by Miss Silvia Saunders.

Our leader and teacher in hybridizing is Roy Pehrson.

Editors are Chris and Lois Laning,
553 West F Avenue, Kalamazoo, MI 49007.

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NOTICE: Due to poor health, Roy Pehrson has been unable to contribute articles for this issue of Paeonia. He will be undergoing surgery in the near future to correct a genito-urinary problem and is not expecting to attend the Peony Convention in Mansfield. We wish to congratulate him on his recent 70th birthday and hope for improvement in his health so he may continue his peony hybridizing.

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Dear Chris, March 21, 1975

Here are my $2.00 dues. I still haven't had time to do any peony hybridizing as I am already very active in both iris and daylily hybridizing, but I find PAEONIA stimulating and enjoy the articles. One suggestion— when you list contributors to the articles could you also include their addresses? Then when we read their articles or letters and have questions we could correspond directly with them. I would like to write to Peggy Goldsmith about 'Red Lacquer' and how it differs from 'Alexander Woollcott', and 'Scarlet Tanager', both of which I obtained from Sylvia Saunders many years ago. I have found that peonies, hybrids and herbaceous, do well in the Denver area of Colorado, and the late tree peonies (mostly lutea hybrids) also perform when established. The buds of the Japanese tree peonies, however, are generally caught in late April frosts which can be quite severe. I moved to Colorado from Long Island in the summer of 1971. I moved most of my peonies in the summer of 1972 so only have 1973 and 1974 bloom seasons behind me. Out of a dozen Japanese tree peonies such as Ren Kaku, Gessekai, Hana Kisoi, Tama Fuyo, etc., only 'Black Sea', a Louis Smirnow introduction has bloomed.

Best wishes for your continued success. Henry B. Kuesel, 10 S. Franklin Circle, Littleton, Colorado

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NOTE FROM - Martin M. Meyer, Jr., Associate Professor, Nursery Management
University of Illinois, Urbana, HI. 61801

I thought I would write and tell you I am planning to attend the meetings of the American Peony Society in Mansfield, Ohio. I am looking forward to seeing the many beautiful peony flowers. I do have considerable peony callus growing. I have not yet been able to get any plants from it, but the production of proliferative growth as callus looks interesting. I want to thank you for the visit and encouragement. Hope to see you in Ohio.

EMODI

Seeds from India, 100 grams (or about 375 seeds), arrived November 15, 1974. What can you do with dormant seeds at this time of year? This you should do? Wait 'til late spring to plant them. This means losing a whole year which doesn't suit me at all! If only a few would germinate and start growing, this spring., I would be happy.

All seeds were wrinkled, about the size of large peas, shiny black with a metallic appearance, and surely dormant. Can anything be done to provide at least two or three plants for '75? Well, when not following conventional ways, conventional results are not produced. Judging from the problems Professor Saunders had with this kind of seed (as recorded in "The Peony" by Dr. John Wister), a different method would be of some possible value. So I doo-ed it.

All seeds were given the flotation test, placing all the seeds in a pail of water, some of them sinking to the bottom immediately. These were left in the water overnight, This was a mistake for in the morning all the soaking seeds had imbibed so much water that none was any longer wrinkled. A goodly number of these heavy seeds had split their seed coats. DON'T FOLLOW MY EXAMPLE — soaking is no good!! Once removed from water, they were dried with a towel and air-dried for a few hours, then placed in moist vermiculite in a plastic bag. They never did completely recover though a few finally did start growing, finally.

The good light ones which had been in the water only one-half hour were to be planted in the garden in late spring. So to hold them until that time in good conditions, the experiment was to place them in slightly moist vermiculite. Let me say that when placed in bags, these seeds were wrinkled and dormant looking. But some of them showed signs of rooting in just 30 days. Now what? On January 1, the sprouted seeds were placed in the plastic A-frame tent with one inch thick styro-foam (2 ft. x 4 ft.) covering them. From this planting 54 plants are now growing.

BATCH #l: Heavy seeds held in water 12 hours became water soaked, bloated, many with split seed coats. A few plants finally resulted from this group,

BATCH #2: Lighter seeds placed in moist vermiculite the middle of November. By December 15 a few seeds showed signs of germinating. These were planted in plastic A-frame tent on January 1 or 2.

BATCH #3: Seeds rooting after Jan. 1 but before March 1 were divided. Half of these rooted seeds were planted in a V-shaped box containing damp vermiculite, and placed in the potting shed to be held in cool condition with temperatures fluctuating between 32 and 50F. These were placed in A-frame about April 15. A few (5 or 6) are just now coming up. The other half of the seeds of this batch became batch #4.

BATCH #4: These seeds were potted and held in the basement at higher temperatures (60 to 70F) until warm weather had arrived. They still (as of May 28) show no signs of top growth. Can these be held until next spring not forgetting to give them cold treatment during next winter? Maybe!

BATCH #5: All unsprouted seeds planted in garden May 15 or 16, It will be interesting to see if any from this batch and/or batch #4 produce plants next year.

NOTE: Throughout this project, during each inspection, the moldy seeds were removed periodically and discarded (probably 25% of the original total of seeds were no good).

This was not intended to be a scientific experiment so was not conducted in an exacting fashion. What was wanted was a few *P. emodi* plants which I now have got, and the experience is a fringe benefit. - Chris Laning

LETTER TO ROY PEHRSON FROM DON HOLLINGSWORTH

Dear Roy: March 3, 1975

I, too, am skeptical that there is any widespread deficiency of boron affecting peony breeding. However, I am interested in what are the causes of young plants, perhaps old ones too, failing to produce pollen, when under other conditions the same variety gives at least some pollen. It is the hybrids, especially the lutea hybrids, in which I find this a problem. If boron metabolism is somehow involved, I suppose it might be due to some peculiar combination of controlling genes in which the parent species differ widely, resulting in "missing links" and the erratic pollen development in the hybrids. That's just a "for example" of how it might work. Anyhow we know boron metabolism is involved in pollen development as well as in fertilization in some species, that some species provide boron in the stigmatic fluids and tissues, others apparently put it into the pollen grain thereby having it available. We know also that it is simple to add, therefore we can test easily whether adding will help. Seems like "a stone worth turning", on that basis.

Upon reading Reath's plan for developing vigorous scion wood in tree peonies (March APS bulletin) whereby he foliage sprays weekly with Miracle Gro (it contains boron and other trace minerals), I am enthused about trying this instead of boric acid alone (which I have suggested in what I sent to Chris). Reath's approach gives a shot-gun treatment with almost everything known to benefit the plant if added. I do know that at the Minnesota National Exhibition his flowers of '**Mystery**' and '**High Noon**' had plenty of pollen. At home, I've had only young plants of Lutea hybrids to flower and only '**Alice Harding**' has regularly given some pollen though the quantity is low, for there are few anthers. The others have so far given none.

SUGGESTION TO CHRIS LANING FROM ROBERT J. GELLER

March 13, 1975

Dear Sir:

The enclosed photocopy came from the 1st quarter issue of the American Daffodil Journal. Please note the last item on page 34 of the sheet.

I am not familiar with "Axion" except that it was once advertised as a super duper ingredient in washing machine soap powder. I do not remember of any previous journals telling of how or what method was used. Evidently it was given orally at the meeting mentioned.

Thought perhaps one of our scientists could experiment with the product. Maybe they have something.

> "Bill Bender, I have been using the Axion treatment of many different kinds of seeds since hearing your presentation at the convention in Portland and although I have not kept scientific records, my belief is that the Axion soaking really does work. I certainly seem to get quicker, fuller germination from Axion-treated seeds of many different kinds. - Jack S. Romine"

ADDENDUM TO FATHER SYROVY'S ARTICLE IN THE MARCH "PAEONIA."

Dear Chris: Vining, Iowa., March 7, 1975

I'm writing this while I'm holed up like a rabbit in my house; for the past three weeks now. Two weeks ago on a Monday we had snow, winds and drifts. Then a week ago Monday — same thing. Now starting last night we are again snowbound! So I can't even get out of my garage to go to the Post Office! So I thought I'd write to you again to let you know how my experiment turned out.
First of all, I can't forgive you for "pushing me" to send it in. I really wasn't finished with it and I hesitated to send it in until I would see the final results -- if it was successful or not. Perhaps the title of this ought to be, "Fools rush in where angels fear to tread!" However, again, "Nothing ventured, nothing gained!"

As I wrote in my letter to you and the title "Stem or Meristem," my original intention in this experiment was to try to root the cutting, as I thought as long as coconut milk induces all cell growth rapidly, the hidden potential cells for roots would also cone forth. However, I did not succeed in doing this, I think partly because there was no "callus" started from which they have an opportunity to grow. Secondly, Dr. Steward was working with a piece of carrot root. Perhaps one would succeed with this if he would work with pieces of peony roots, especially the valuable herbaceous and hybrid types. But let us remember we were working with a semi-herbaceous and woody type -- the Itohs. I wrote what a time I had when the herbaceous part especially between the buds began to deteriorate, and also began to slough off. It contaminated my solution constantly and I had to change it, and also dip it into the disinfectant to prevent mold growth. It was difficult to keep an aseptic or sterile solution!

The temperature too is a problem and I added in a special letter after I sent in my experiment how I began the whole thing at a higher temperature (48 to 50°F) at first and when I saw the rapid disintegration of the herbaceous stem (which I also thought that perhaps was due to the last heavy frost and low temperature before I cut if off), I immediately switched to cold — in the upper part of the refrigerator, about 40° or a little over. I also wanted to keep the stems somewhat dormant to induce root growth, as the roots would be important to sustain the buds if they began to grow. The last couple of weeks I began to take my Itoh stems in the wide-mouthed jar in the agar and coconut solution for a couple of hours each day under fluorescent lights, and then return them to refrigeration. I also removed with the forceps some of the outer covering of the buds, as they showed some darkening or disintegration. I was hopeful as the bud section began to grow and the tiny part was fresh and alive. This persisted fresh and living for about a week. Then something happened and the section below them began to disintegrate and the disintegration became more rapid. Too high a temperature, for too long? What's the right temperature to work with?? I have only one stem left and that one has a bud on top with over an inch of stem — and it is under refrigeration — will it produce anything?

I have a lot of old Peony Bulletins and there are a lot of fine articles which have much valuable advice and ought to be reprinted, also experiments conducted along this rooting attempt. There is one I found for December, 1951 - Bulletin No. 123 -under the heading "Plant Metabolism", Roy G. Gayle, page 143 which describes the makeup especially of the root system and how the different cells of the roots work where they are located and how they grow; how a plant breathes, eats or digests, elimination, etc. I figured that in "Meristem Culture" you would have to have almost a complete laboratory expertly set up, a system of circulating chemicals to feed the cells, to draw away what the plant eliminates, etc. That convinced me "Meristem Culture" is for the experts!

I, however, am not giving up on the rooting business; I'm going to try again this fall, first of all by inducing a callus on the stem about July, cutting into the stem — and using the old adage, "If you at first do not succeed, try, try again!"

Got another idea!! I have proven by my experiment that the area around the bud retains the Tree Peony characteristics. It still persists after the herbaceous part above it disintegrates, We wonder if this section could be cut out and bud grafted on peony roots or Tree Peony roots? I have a bud grafting machine for bud grafting grapes, imported from France. I had two but gave one to Leo Armatys and he was experimenting with bud grafting on Tree Peonies. I wrote to him the other day, asking him again what success he had along this line. So will let you know when I get an answer.

I also wrote to Cornell University to see if Dr. Steward is still with them and if I can correspond with him. So if he answers, I will try to get more information on the use of coconut milk for growth. Perhaps from the coconut milk certain chemicals have been extracted and other simpler methods of meristem culture are available. I will also question him and seek his advice, especially in regard to rooting.

Thought you'd like to know what my thoughts have been along this line — and a bit of advice about meristem culture. Don't be in too big of a hurry to try it, and don't get too excited about it! Finally; "Be not the first by whom the new is tried, nor not the last to lay the old aside."

> ED: Fear not. Father Syrovy -- angels have done nothing to further the production of, nor the performance of peonies. This job has been relegated to man.

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TO: The Lanings FROM: Wyla Tompkins, 139 Parsons, Webster Groves, MO 63119
DATE: March 26, 1975

Dear Lanings,

Receiving the latest Paeonia (and seeing my peonies up about 2-3") reminded me that dues for it were one of the things I put off when we weren't sure now long my husband's job would last. As it looks like that worry is postponed until next year, my check is enclosed, with my thanks for the great job all of you who contribute to Paeonia do.

Have a question — is there any semi-complete listing of chromosome counts for the current cultivars not in Wister's book? It would certainly help us tentative hybridists to know which plants are absolutely incompatible — even if it is fun to just "take a flier on it" occasionally. If this sort of compilation is available from the American Peony Society (or elsewhere), how about publishing that information?

I'm hoping the weather permits us to accomplish more hybridizing this year. The last two years we've had spring early, lured everything out, and zapped it with a late reversion to winter. In spite of covering up the peonies for late-freeze scares for some time, we lost most of the buds and flowers with the last freeze both years, when they were too tall to cover. But the weather can't consistently be that weird! The first daffodils and forsythia are blooming now, so we're about on schedule so far ..., and it's snowing today.

> ED: I don't know the answer to her question, so any reader of Paeonia who can help out on answering her question, please send me the information as soon as possible! We ALL can use information of this sort.

EARLY FLOWERING PEONY HYBRIDS: THE SEARCH FOR GREATER RESISTANCE TO LATE FREEZE DAMAGE

by Don Hollingsworth

Unusual weather patterns which occurred in Missouri early during the 1973 and 1974 growing seasons resulted in the destruction of the flowers, foliage and even the stems of some peonies. Prolonged mild temperatures in late winter of those years had promoted an uncommon advancement of new growth, some of which was subsequently injured by hard freezes. Most severely affected were some of the early hybrid strains produced by A.P. Saunders by mating early flowering peony species or hybrids of such species on the one hand and the later flowering P. lactiflora cultivars on the other. Groups represented in my planting which suffered as a whole were the Macro, Triple, and Quad Hybrids. The early hybrids are especially interesting and, although the loss of flowering was disappointing, the information gained may prove to be of great benefit to future hybridizing work.

Previous to having experienced these difficult seasons, I had given no thought to the question of how peonies may be adapted physically to withstand hard freezing temperatures after growth commences. Now, I not only recognize that this is a matter of concern, but have an information base from which to formulate some tentative criteria for selecting against the problem. Coming consecutively as they did, the 1973 and 1974 harsh springs have provided a valuable screening test for cold resistance in the kinds which I had growing. Chris Laning has reported that similar losses were experienced in Michigan and perhaps the problem has been of concern in other areas, as well.

Of the hybrid groups already mentioned, individual cultivars were less severely injured than their mates. These included '**Chalice**', '**Roselette**', '**May Music**' (Saunders 16209) and '**Winged Victory**'. '**Herald**', acquired because it is red pigmented and descends from Macro, was severely injured. Some cultivars of P. suffruticosa and P. lactiflora were injured while others were not. Halcyon was only partly resistant.

Hybrids of P. tenuifolia, such as '**Laddie**' and '**Early Scout**', seemed entirely tolerant. The Saunders Lobata of Perry Hybrids showed marked resistance, although '**Red Red Rose**' and '**Lustrous**' (full siblings) were substantially damaged. No important damage was sustained by the Little Reds, Otto Froebel and other plants of similar habit which were received as P. peregrina and P. lobata,, respectively. This was also generally the case with P. officinalis cultivars and their hybrids with P. lactiflora. '**Nova**' (Mloko x Macro) F2, '**Belinda**' (Otto Froebel x Mloko) F2, and the Windflowers were resistant. '**Claire de Lune**' flowered both years at a nearby but more protected site.

A thoughtful comparison of shoot emergence habit in both resistant and vulnerable kinds suggests five characteristics which are possibly significant adaptations for survival against freeze damage and which are probably heritable. It seems likely that most of these adaptations are present to a marked degree in all of the early flowering cultivars which proved to be fully flower bud hardy for me in 1973 and 1974. These possibly significant adaptations are:

1. Leaflets remain clasped around the flower bud until relatively later during shoot growth. Some P. suffruticosa cultivars show this to a marked degree.
2. There is a relatively greater luxuriance of early leaflet development; in herbaceous kinds the shoots are sometimes quite bulky as they emerge from the soil.

3. Delayed shoot emergence as in P. tenuifolia, one of the earliest to flower. Even a few days delay may decrease the odds of being advanced to a vulnerable point upon the date when the last hard freeze occurs.
4. Flower bud remains surrounded by or immersed in a "pillow" of foliage until fairly late in the development process, as seen in the Little Reds and species of similar habit.
5. Internal physiological mechanisms which resist freeze damage, perhaps most evident in the early emerging kinds, some of which seem to remain unfazed by very low temperatures. Some degree (or types) of these mechanisms are no doubt present during earliest growth stages in all seed grown peonies which survive to maturity, while some may possess these mechanisms to a much more marked degree as in P. tenuifolia and P. suffruticosa.

In the P. lactiflora cultivars which flower later, it is late emergence of the shoots which seems to provide the predominant adaptation against late freeze damage. Moreover, these kinds frequently show possibly adverse adaptations in the form of rapid early extension of shoot length and late development of growth in the leaf segments. Perhaps stem height has been gained at the expense of leaflet growth, at least in the early stages. However, the late freeze of 1973 caught most P. lactiflora several inches high and there was considerable variation in the amount of freeze resistance shown. This suggests that some are potentially better parents for producing early hybrids.

The cultivars which I have of the Macro, Triple, and Quad groups have largely inherited the desired earliness, but predominantly show the adverse adaptations of stem and foliage development of their Lacti parents. On the other hand, P. tenuifolia and the Lobata of Perry seem to have largely dominated the shoot growth patterns of hybrids made between them and the Lacti cultivars. Mloko may also impart some important dominance in the transmission cold resistant adaptations.

What are the logical applications of the foregoing in a breeding program which has the goals of transferring Lacti ornamental qualities into early flowering peonies? Among the varieties I have observed, three or four avenues of approach seem attractive at this time. One involves working among the early hybrid cultivars that have shown some resistances using as pollinators Clair de Lune, Lobata of Perry Hybrids and Lacti-Tenui Hybrids. My present preferences for seed parents among the F1 triploids are Chalice, Roselette, May Music and Winged Victory. These are known to give a few seeds, are only one generation from Lacti double flowered (or Japanese flowered) parents, and have shown at least minimal resistance to freeze damage.

A second, longer range approach is to breed a strain of hybrids using Laddie pollen on Lacti double flowered cultivars and select for freeze resistances, earliness and fertility to use in future work. Nancy may provide a useful alternative to Laddie in this effort.

A third approach is to secure Japanese and double flowered hybrids already produced, screen them for cold resistance and fertility, then work between the survivors and the F1 cultivars listed in the first mentioned approach.

A possible fourth approach is to screen Lacti cultivars for earliness and cold resistance to be used in back crossing with the more satisfactory early hybrids previously identified. This should get fine flowers in fewest generations, but may not attain the earliness of the present early hybrids very soon.

Would other PAEONIA readers who have had problems with freeze damage please relate what they have found on resistance and vulnerability shown by various varieties? This might be of special benefit to all of us who are working with early hybrids. While none of the foregoing promises rapid results, a logical approach seems more worthy of making the effort and the devoting of scarce space to the seedlings. As new results come to light we may then find more expeditious approaches.

> ED: P. macrophylla is a bad one, all right! It behaves as poorly in Kalamazoo as it does in Kansas City. If I could get along without Archangel in my hybridizing program, I'd probably be quick in saying — don't use it! Now you may ask, just what ails the thing. For me it is too tender — subject to frost damage; however, the earliness it lends to its hybrid offspring is desirable. -Chris

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TRUE SALMON

Roy's "True Salmon" is a treasured gift that came to my garden last fall. Its mother is Shaylor's Sunburst and its father is Little Red. The three blooms riding high on the little plant are darlings! The color is exquisite — true salmon, the blooms are of medium size singles, altogether lovely!

PHONY ITO

I suppose I'll never really understand the exact mechanics of developing an Ito hybrid notwithstanding having successfully developed five or six of them. So when asking for more information, to stress his point of leaf patterns to look for, along with the appearance and shape of the root structures Roy Pehrson sent a "Phony Ito." The leaf shape of this plant could easily be mistaken for an Ito. But the roots are very typically lobata — long carrot shaped and connected to the crown by slender strings. No one would mistake this root for an Ito, so, dear readers, use this as an added bit of evidence of a successful cross. Visitors seem to be drawn to the blooms of the plant, hardly noticing Laura Magnuson, Ludovica, and Paula Fay until later when satisfied with their inspection of this one. Blooms are luscious peach pink dainty singles with golden yellow stamens. I like it too!

YELLOW – BEST

Roy Pehrson's Best Yellow has performed beautifully for me this year. When comparing it with such other cultivars as Prairie Moon, Starlight, Moonlight, and Northern Lights, its yellow flowers are superior to all of them! The blooms are semi-double, large and of very good substance. Also, side blooms open later and while smaller than the main blooms, have the same very beautiful color.

As if this wasn't enough to put "Roy's Best Yellow" in the elite class, it affords a bonus that must be the delight of hybridizers; it sets seed very willingly.

The plant is very similar to Archangel in form and size. The sturdy stems are a delight to the hybridizer but even so, can scarcely hold erect the very heavy load of blooms. I love this plant!

- Chris

CALIFORNICA

The Californica peony is native only to California. Even then the plants are very local in their dispersal and are rather difficult to locate. Areas containing the plants are quite densely settled once the patch is begun.

During the past year, my wife and I had lived in Southern California; Redlands, to be exact. We asked different people about their knowledge or awareness of the presence of this little known wild flower. No one we talked to was familiar with the flower we named. When we described the plant and its rather plain flowers, someone asked if we could be talking about what they called "bachelor buttons". This proved to be what we were looking for.

Arrangements were also made to meet with Dr. Dara Emery of the Santa Barbara Botanical Gardens. Growing inside the boundaries of the garden he pointed out to us a small patch of lush green plants with tall, slender stems bearing the small brownish-red flowers. Mr. Emery gave us directions to another area he was familiar with which also contained Californica. There, too, we found the plants to be well developed. Individual clumps sometimes reached an approximate height of three feet. Santa Barbara's mild moist climate was evidently just what the plants liked. The thickest concentration of plants was always to be found in the shade of the chaparral bushes growing on the side of the mountain.

Later comparisons made between the plants of Santa Barbara with those of the Redlands area showed the coastal peonies to be generally much larger with correspondingly larger flowers. The growing season was also earlier than we found in Redlands. Probably the milder temperatures and earlier rainfall were responsible for this.

Living so close to the wild peony area in Redlands as we did, it was only natural that we should attempt to make a photographic study of their growth and development. Beginning in the middle of December, we detected the very beginnings of the plants as they pushed their heads through the soil surface. With my wife, Sally, acting as photographer, we began shooting slides once a week for the next five to six months. At first growth rate was rapid. Within a few short weeks the plants developed into small leafy green bushes, very appealing against the somber gray brown color of the deadness of California's winter.

After such a beautiful beginning, the plants entered a stage where they appeared to be dormant. There was no further growth and no new plants emerging. For about a month everything was at a standstill. After a period of no progress, the weather warmed again and we had a few warm winter rains. From this point on there was no stopping them. The plants reached their full height, about 24 inches, and sent out loads of buds and blossoms.

During the flowering season, Sally took close-up shots of the flowers from all different angles. Another area where we were interested was in the number of blooms per stem. One slide shows five definite buds or blossoms on one stem. At the peak of the flowering season we collected blossoms and took them home. Each day we would collect the ripe pollen and save it until we had enough to send via air mail to my dad.

Since that time, Sally and I have returned to Michigan. Although the peonies of California are far behind us, their memory is not forgotten. The pollen collected is today being used to pollinate various flowers in the beds at my father's house.

- Mark Laning

PRESERVING CALIFORNICA FOR EXHIBIT

Most peony enthusiasts are unfamiliar with the color, size, and overall appearance of the only known wild American peony, Californica. Through encouragement from my father, my wife and I sought to find some means of capturing the natural beauty of this unique flower.

Exploring the different possibilities of preserving flowers, we remembered having seen various arrangements of flowers encased in plastic cubes. In our search we became acquainted with Jeanette Woodhead of J & J Plastics, Redlands, California. Through much trial and error, Jeanette discovered the combination and technique that produced positive results.

Jeanette explained to us that it was of utmost importance that the flower be brought in fresh. The flower had to have all its moisture removed before being encased. Failure to remove all excess moisture would produce loss of color pigment and the flower's natural shape. At this point we tried two separate drying techniques. Initially the flowers were covered with a fine white sand, silica sand (this does not sound like floral silica gel which would look similar, but is entirely a different substance). It took between four days and a week, depending upon weather conditions, especially humidity, for this drying process to be completed. We were not satisfied with the results because the flowers shriveled and lost some of their natural color. The second drying process we tried utilized a combination of chemicals added to di-butyl alcohol. According to the type of flower, degree of fragileness and color chemical components, different chemicals in differing ratios were tried. Some of these chemicals used in conjunction with the alcohol were sodium citrate, sodium sulphate, citric acids and theaore. The flowers were submerged in the solution for 24 hours. At last, success! Californica specimens were ready to be encased.

The material used in making plastic cubes is a liquid polyester resin. Catalysts are added to cause the resin to harden. To begin the cube a small amount of resin is poured into the desired size mold. This is allowed to begin to harden before adding the flowers. The flowers are then arranged as desired in the mold and partially covered with a second layer of resin. Successive layers are poured as each previous layer dries hard enough to support another layer. Care must be taken to not pour too much resin too quickly to prevent burning heat which would damage the flower. As the resin dries it gives off heat. Depending upon the thickness desired, between five and eight layers of resin are needed,

After the poured mold is allowed to cure for 24 to 48 hours, the cube is removed. At this stage the cube is cloudy and must undergo a series of three to four different sandings. After the finest sanding it is then buffed. The end result is a clear cues of plastic with Californica beautifully and naturally displayed.

- Mark Laning

ED: If you are interested in seeing the above described plastic cubes, see Chris at the Peony Show in Mansfield, Ohio, in June. He'll have them with him (if he doesn't forget them.) - Lois