

# JC Raulston Arboretum

## Friends of the Arboretum Newsletter

### Number 14

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## J. C. Raulston

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### ANNOUNCEMENTS AND COMING EVENTS:

For once I'm actually much ahead of my intended publication schedule for this issue, but fate has plotted against me to keep the pressure on last-minute completion. An unexpected public lecture came up that I want to announce, so here I am racing the clock one more time to get this in the mail. Luckily the computer is behaving more and more cooperatively, has already printed out the mailing addresses, and has allowed complete preparation of this issue from scratch in just three days (so much for the 4th of July weekend!). I think an issue with a fine diversity of items included. Happy Summertime.

**JULY 15 (TUESDAY) SPECIAL GUEST LECTURER AND SLIDE SHOWS.** Through the sponsorship of the Men's Garden Club of Wake County, Mr. Albert Wilson from the California Bay Area, will present a lecture and slide show on gardening and landscaping for the homeowner. Mr. Wilson has been involved in horticultural education on public television for over 30 years, has written a number of books, lectures widely to gardening audiences, and does landscape consulting specializing in renovating older overgrown properties. Tony Avent has heard him speak at a national convention and tells me he gives an incredible presentation that will delight everyone in the audience. The Men's Garden Club has also asked that I present a brief program on new plants of interest in the arboretum that local people might enjoy learning to use. The program will be held in 3712 Bostian Hall at 7:30 PM. This is the large lecture hall where Mr. Lloyd lectured and where we had the Korean Night. Go through the parking lot behind Kilgore Hall, east toward the library, down the brick walk lined with magnolias. Bostian Hall is built over the walkway just before the brickyard. Go up the stairs, the lecture hall is on the Hillsborough Street side of the walk. Bring everyone you know who enjoys gardening.

**JULY 30 (WEDNESDAY) NCSU BEDDING PLANT FIELD DAY.** Each year professional greenhouse growers, nurserymen, and garden center operators are invited to the NCSU Unit 4 Farm (where the arboretum is located) to observe the bedding plant trials which Dr. Joe Love coordinates. The event will take place from 9-12 AM and I would like to extend an invitation to Friends who would like to attend to join the activities. Various speakers will also present programs during the afternoon at the NCSU Faculty Club. I haven't seen the full program yet, but I understand Mr. John Elsley of Wayside Gardens will talk about production of perennials at 1:00 PM - many of you know him and have seen him on other programs. Always worth hearing his latest views on this popular group of plants. The farm will be groomed to receive visitors, the bedding plants will be at their peak, and it is good chance to see horticultural friends from across the state.

**AUGUST 7-9 (THURSDAY THROUGH SATURDAY) CONFERENCE ON LANDSCAPING WITH NATIVE PLANTS - WESTERN CAROLINA UNIVERSITY, CULLOWHEE, N.C.** This conference is bringing together an outstanding assemblage of top speakers from across the country to discuss all aspects of the selection, production, and use of native plants in the nursery/landscape industry. Housing will be provided in dorms on the campus at a very reasonable cost, and the conference registration is also quite modest. Attendance will be limited to the first 400 registrants. To obtain registration information call Dr. Jim Horton (704-227-7244). I highly recommend this very special meeting and will see all of you there.

**AUGUST 10-12 (SUNDAY - TUESDAY) N C ASSOCIATION OF NURSERYMEN SHORT COURSE AND TRADE SHOW.** To be held at the Inn-on-the-Plaza hotel in downtown Asheville, with registration on Sunday: presentations and trade show on Monday and Tuesday. For a full program and registration information contact: Mr. Bill Wilder, NCAN Executive Director, Wilder's Nursery, Knightdale, N. C.

AUGUST 14 (THURSDAY) SLIDE SHOW, PLANT DISTRIBUTION, AND POT-LUCK GARDEN DINNER. This spring and early summer has lead me to quite a varied series of landscapes and gardens all across the country. Unlike most shows I've presented, which at least aim to have some sort of coherent theme this one will be a total mish-mash of everything from a home landscape created totally from animal bones, to a new Chinese garden, to the Vancouver World's Fair, to Texas wildflowers. After the talk we will have a mini-plant distribution of things propagated from The NCSU Arboretum (now the JC Raulston Arboretum) collections, along with some materials from the Korean expedition. Later in the fall we will have another, probably larger distribution. People have enjoyed our past pot-luck picnic dinners in the arboretum so we will have another one this summer. Bring a big dish of food to share: we'll provide tables, paper plates, utensils, and drinks. (If you should bring your own beverages, remember University regulations prohibit any alcoholic beverages on the property - thanks.) We'll plan to eat at 7:30 and it should be dark enough by about 8:30-45 to start the slide show. In case of obviously inclement weather - we'll forget the dinner and meet at 8:00 for the slide show in room 159 Kilgore Hall.

SEPTEMBER 12 (FRIDAY) - SPECIAL GUEST LECTURE. We are very fortunate to be able to welcome our highlight speaker of the fall to this area. I've been trying to get Mr. Gary Koller, managing horticulturist of the Arnold Arboretum in Boston here for several years; but a difficult thing to do with his many professional activities. He has been in charge of the living collections at the world renowned Arnold Arboretum for the last ten years, is a lecturer in the Harvard graduate program in landscape architecture; is a horticultural consultant for such "clients" as Central Park, NYC, Dumbarton Oaks, DC, the Brooklyn Botanical Gardens, etc.; and is involved in a wide range of public service activities in the world of public gardens and plant collections. He has specifically asked to not do a typical "three hundred wonderful unknown plants in 45 minutes" lecture, but wants to focus on "Creating Spaces for Living". He will show how to maximize the potential uses of a piece of land - using plants as spatial organizers, redeveloping older properties, how to affect circulation patterns and extend living activities into the outdoor areas. We want to publicize this talk widely and have the largest attendance possible to hear this excellent speaker. It will also be held in 3712 Bostian Hall at 8:00 PM.

The next newsletter will be out in September and will feature a lengthy discussion of activities which have been happening in the arboretum during the past year since returning from the Korean Expedition - something I had hoped could be ready for this issue but just didn't work out. In so many respects it has been a wonderful year - we have so many people giving us such good volunteer support, we've accomplished so much, the place looks so good and people are commenting so favorably on it, and our outreach is stronger and more extensive than ever. But major problems are also developing and we are at a point that we must evaluate the entire program and see where to go from here. As in every public garden across the country, finances are always of concern (as well as in every business and private household budget), and our status has reached close to a crisis level. I will lay out the situation, and present some concepts for ways we may have to go - partially based on a series of meetings and group discussions which will occur between now and that time. Several people have been concerned about being overdue on their membership payments - but they have not been sent out yet. You will get your statement in September (how's that for an incentive for me to write and mail an issue on time!!) - so please wait until then before sending any dues to keep our bookkeeping simple.

We can certainly use more Friends - and to that direction I am sending with this newsletter a copy of our new arboretum brochure which just recently came back from the printer. It's been a long process to get it done - four individuals have started and dropped the project over the last four years - but finally our student, Julia McIver, tackled and completed the project after nine months of red tape and agony, and great dedication. We're very proud to at long last "look" somewhat official and legitimate. How about helping us and pass your copy to someone who has been meaning to become a member for years and just never quite gets around to it - and urge them to make the big plunge. We very much need the support. Thanks.

## IN MEMORIAM - JEAN ISELI

On June 9 I received a stunning phone call and was told that Jean Iseli, the owner-manager of Iseli Nursery in Oregon that I have written about so many times, had suddenly died the night before of a heart attack. He was one of the greatest creative geniuses of the American plant world; a person who reached so many people all across the country with a uniquely personal touch of magic and friendship. I think I have never met a person with such exuberant spirit, such joy of life, such excitement in all the things that could be done if one only charged after the challenge of the concept. In my mind he was always a pixie - his eyes gleaming with mischief, bubbling with excitement, ready to play and make the workplace fun and exciting. It always astounded me to walk into his Oregon office totally unexpected - this man who controlled an enormous business with hundreds of workers - and have him drop everything immediately, grab his keys and head out to his jeep (always in his thongs or sandals no matter what time of year or how wet or cold the weather) to go look at the most exciting three thousand things happening that day and marvelous new plants that he was experimenting with. Two or five or eight hours later we might get back to the office after running around over the entire northwest corner of the state looking at a witch's broom in this tree in a front yard, checking out a particularly good neighborhood deli there, driving through muddy roads in small nurseries of friends he admired and supported, fantasizing about creating this wonderful collection of fine conifers for the public in such and such a way.

He had the magic of a Walt Disney - to assemble talented people, encourage their own creative genius and let them accomplish wonderful things. Young people working for him were encouraged to start their own nurseries on the side if they wanted to try that for eventual independence - and he would supply them with plants, and market them when grown if necessary to help the beginners. He challenged countless old concepts and broke through to new forms of plants, new ways to produce them (what - root thousands of *Sciadopitys* and *Picea*??? Never! - can't be done. But he did - again and again and again on impossible concepts), new ways to market them. During our last phone call I asked him how he made so many revolutionary breakthroughs - and his answer is in a file in my office

on a sheet of paper where I wrote it as he talked - "it's important to have a healthy disrespect for acquired knowledge". Just because others say something doesn't work, or this is how things should be - why not try it slightly different or from a reverse direction - at least try.

In this age of the gigantic corporate nursery - the larger the business today, the less likely the owner will be a plantsman or look for the specialty rare plant with the eye of an enthusiastic amateur hobbyist. Jean had the revolutionary idea of taking rare choice collector materials and making them available in a quantity and scale for popular use by the general public. People couldn't believe his first field of a half million dwarf Alberta spruce - where will you sell them?? He did. So many plantsmen who love fine plants want to hoard them for themselves - Jean wanted everyone to have access to them. Obviously on the marketplace; but less obvious though equally important in his tireless efforts to support public gardens with collections - he gave so many plants to so many people. When our graduate student, Larry Hatch, wanted specimens of a new juniper Iseli had just originated - potentially the most valuable new commercial plant he had at the time - he sent half his total stock for Larry to use with no questions. When I admired a rare blue form of a spruce recently discovered, I was sent back to N. C. with one of the eight plants then in existence. In our last conversations he was talking about supporting university research on a host of revolutionary projects he could see in his experimental nursery - things no academic person in the U. S. would even be aware of - to fund graduate students and bring them to work there with all the resources at his command. What an incredible experience that would have been for such youths. His "playhouse", the experimental nursery was full of the most incredible new plants imaginable. He was one of the founding fathers of the American Conifer Society and supported it heavily (mostly quietly in the background - but very effectively) - and he was looking forward with such great excitement for the national convention to be at his nursery in August of this year - just nine weeks after his untimely death.

He was magnificent, he was unique, he was irreplaceable, he was a special friend whom I will long remember and I will miss him very much. He is survived by his wife, two daughters, a brother and thousands of friends around the world to whom he gave so much joy and inspiration.

## **PLANTS IN THE NCSU Arboretum (now the JC Raulston Arboretum) - CERCIS (REDBUDS)**

As I face the deadline of publication of another newsletter coming up without as much written for it as I would like, various topics I've had in mind for some time to write about come to mind. The redbud was finally chosen as it is: one of the finest native woody plant species of N. C.; one of the most popular cultivated ornamentals grown in the nursery industry here; a plant that has been a part of my environment everywhere I've ever lived - from Oklahoma, through Maryland, Florida, Texas, and N. C.; a group of plants that have become a significant collection in The NCSU Arboretum (now the JC Raulston Arboretum); and a group of plants that still have much potential for greater awareness and expansion in commercial production and use. The following article is a "one-day wonder" ("I wonder what on earth else I can say to fill another page?") with the limited resources readily available on my shelves (cited at the end) and various observations from experience and contacts over the years. As usual it leaves me wishing for more time to work original journal sources, more technical literature review, to conduct extensive correspondence to clarify and verify things I think I remember, etc. - but in my crazy life such thorough completion of anything is unlikely. But even with its limitations, I think it will prove to be an interesting, and hopefully useful compilation.

The genus *Cercis* is a member of the Leguminosae family and comes from the Greek word "kerkis" which originally meant "some kind of plant" (original specific plant designation now unknown). The woody plants, ranging from 3' shrubs to 50' trees, are commonly called redbud for the obvious most striking ornamental characteristic of the showy buds and flowers - though there is not a true "red" flowered one in existence. They are also often called the Judas tree, usually incorrectly as we shall see later. Depending on which source of splitter or lumpers taxonomy one uses there are about 7-10 species in existence, native from the mideastern region of Afghanistan-Israel, across southern Europe, across North America from New Jersey to California and down into Mexico (where things get terribly complicated), and in the Orient through Korea and China. I'll go through them species by species with various observations and indicate those that are presently in cultivation in The NCSU Arboretum with an \*.

*Cercis canadensis* L.\* is one of the first two species of redbuds described by Linnaeus in the 1753 first edition of *Species Plantarum*. The name is a bit of a mystery as the plant is not native anywhere in current day Canada (though boundary lines were different at that time), and in the Linnaeus description was listed as from Virginia. It is surprising he did not list it as *C. virginiana*, as so many other new plants in varied genera of that time were. It was recorded in cultivation in 1641 and had been introduced to Europe by 1730. It has been described as the largest, fastest growing, hardiest, and most tree-like of the redbud species. It has 3-6" light green leaves which are pointed at the tips, and will reach 25-40' in height.

It is native on a northern border from New Jersey across to Nebraska, extending into Michigan; south to about Orlando, Florida; west to far-west Texas in isolated populations and down through the mountains of central Mexico to below Mexico City. In N.C. it is found from the coast to the mountains, but is most prevalent in the Piedmont areas. Although it is found in both north and south coastal areas, there are 25 Coastal Plain counties not showing any native populations in the Flora of the Carolinas. As would be expected from such a wide geographic range there are considerable ecotypic variations - particularly in winter hardiness. Dirr lists it hardy in zones 4-9 (with selected populations into Z3), Krussmann says Z5, and in the Sunset Magazine zone system (of 24 zones) 1-3, and 7-20. As we'll see a number of times later, environmental factors can also affect degree of hardiness in different climates. Like so many other southeastern

U. S. (and Chinese) plants, the lack of summer heat to "ripen" wood in England (and the Pacific NW) makes our eastern redbud much less hardy there - injured at temperatures which would not begin to bother it here. Bean states it is much less satisfactory in England than *C. siliquastrum* (which ironically also comes from regions with very hot summers) and is more sparse flowering.

The Texas-Mexico populations give the most confusion and almost every reference consulted gives different terms for the plants there. Authorities don't know whether to consider the gradations of the eastern species into different morphological types to be new species, forms, or varieties. In general the leaves become smaller, more waxy and glossy surfaced, and more pubescent to conserve moisture as the species moves into hotter and drier climates. Some of the possible choices one can make are:

*C. canadensis* forma *glabrifolia* Fern. - with glabrous leaves.

*C. canadensis* var. *pubescens* Pursh. - more or less pubescent leaves.

*C. canadensis* var. *texensis* (Wats.) Hopkins - more glabrous than the following.

*C. canadensis* var. *mexicana* (Rose) Hopkins - more pubescent than the above.

(Vines states the Texas and Mexican redbud differ from the eastern redbud by having conspicuously shiny and stiff leaves, whereas the eastern form is dull green and flexible)

*C. canadensis* 'reniformis' is used by the NY Botanic Garden.

*C. texensis* is used by Krussmann.

In talking with Dr. Shannon Smith of Lone Star Nursery when there this spring, he indicated as they look at the native wild redbuds for possible commercial production, there is enormous variation in the plants in various populations as one goes across Texas - in glossiness, undulation of the leaf margin, size of leaf - with no clear cut differences in species range of the Texas and Mexican redbuds. Obviously there needs to be a great amount of population sampling and study of this group - and obviously there are probably some outstanding ornamental types yet to be found as well. I'm going cover them here - probably incorrectly, as three species: the Eastern Redbud, the Texas Redbud, and the Mexican Redbud - but they are more likely simply climatic ecotypes of one species.

As in any woody plant, there is an enormous amount of genetic variation among seedlings within the species to select for horticultural types to name as cultivars. We've likely been spared from the huge number of cultivars present in another fine native flowering tree, the flowering dogwood - *Cornus florida* (which has an almost identical native habitat) - only by the fact that the redbud has been much more difficult to propagate by vegetative means. The following forms are found in the literature I have listed:

'Alba' \* - a white flowered form sometimes listed as a variety (forma *alba* Rehd.), but most likely an occasional seedling variant in the wild that has been found several times in different individual seedlings. Likely the most widely produced cultivar(s) in the U. S.

'Applachia' - no information given on either characteristics or origin.

'Flame' - more narrowly upright in habit, flowers larger than the species, up to 20 petals with extra pistils and stamens - a semidouble form. Was found in the wild in 1905 in Illinois, and named and introduced in 1965 by Louis Geraldi Nursery, O'Fallon, Ill.

'Forest Pansy' \* - a selection with purple foliage, and next to the white flowered form - probably the most widely produced cultivar in the U.S. today. Quite surprisingly, in all the references checked no information is given as to when or where it originated. The color is a direct reflection of temperatures encountered. In the spring when night temperatures are low, the foliage color is almost purple-black. In areas such as the west, Pacific northwest, England, etc. where high night temperatures do not occur during the summer - the color remains intense all summer. As soon as temperatures rise, the color begins to fade and in Raleigh by late June the color is normally almost green again. New growth produced in the fall will also be dark in color. It has recently become extremely popular on the entire west coast and growers cannot begin to produce enough to meet the market demand - and thus little stock is available to ship east. Some production is occurring in Tennessee.

'Pinkbud' - a bright pure pink flowered selection with the original plant on an estate near Kansas City.

'Pink Charm' - synonymous with 'Wither's Pink Charm'.

'Plena' - listed as a "somewhat double" and "semi-double" pink-flowered form. Has been listed as being identical to 'Flame', but other sources consider it a separate cultivar.

'pubescens' - downy underside of leaves - no other information on origin.

'Rosea' - listed in Hortus Third with no information.

'Royal' - a selection with outstanding and abundant white flowers found in the wild at Parent Bluffs, Ill. - selected by Prof. J. C. McDaniel of the U. of Ill.

'Royal White' - listed by Krussmann as larger, whiter, and earlier flowering than 'Alba', with more compact growth. Introduced by the Louis Gerardi Nursery, O'Fallon, Ill. I would assume this and 'Royal' above are the same form - unlikely for two whites from the same area with such similar names to not be.

'Rubye Atkinson' - a pure pink-flowered form. Produced mainly in California commercially now. No information on origin.

'Wither's Pink Charm' - a pink-flowered form found by

D. Withers in the Virginia mountains around 1930.

'Silver Cloud' - a form with silver-white variegated leaves producing few flowers and seen at its best color in partial shade. Introduced by Theodore R. Klein, Yellow-Dell Nursery, Crestwood, KY in 1964. When we first began the arboretum I corresponded with someone (likely Klein) in Kentucky that had grown this form but had retired and was no longer propagating it. He sent color prints showing the beautiful foliage clearly and indicated that there were a few older plants still in the field that I could have if I would come there and dig them. Money and time seemed too limited to do it then - and I have regretted my action (or the lack thereof) ever since. I'd do it in a minute now if given the chance to obtain this one.

As most authors agree - this species is an excellent ornamental - doing well in a wide variety of soils, but best in deep loams with good drainage and good moisture. The plant will take partial shade, but has the best shape and also flowers best in full sun. Plants are best transplanted when young. As a sideline use, Vines states that the flowers are pickled for use in salads and in Mexico they are fried and eaten.

*C. chinensis* Bunge \* (also listed as *C. japonica* Planch. - though in checking Ohwi's Flora of Japan it is not listed as being native to Japan, while it is listed in the Flora of Korea, though I'm not sure if that is as a native or cultivation escape) - the Chinese redbud. It is native to central China (through Korea?) and was in cultivation before 1850. The NY Botanical

Garden states it is the tallest *Cercis* species at 50' and the Royal Horticultural Society Dictionary of Gardening cites plants 40-50' with 3-4' diameter trunks, yet in cultivation it is almost universally a small multiple-trunked shrub or tree to 10-15' in size. The plant is rigidly upright in growth habit with glossier and darker green leaves than the eastern redbud. The flower buds are much more densely arranged on the stems and makes a more solid color display also. A possible objection is the extremely heavy seed set with solid masses of fruit on the plants in the winter. Dirr and Krussmann both list it as Z6 for hardiness (Sunset Z4-20), yet again because of the summer heat need, it is listed in Hillier as not being hardy for England except in special localities espaliered against a south brick wall.

It is not that commonly seen in the landscape as one travels the eastern U.S., yet someone locally in the Raleigh area must have produced quite a quantity of the plant on a one-time basis about 25 years ago as there are more plants within a mile of the NCSU campus than I've seen anywhere else - all about the same age. It is rarely produced in the nursery industry of the state today. It is highly ornamental and deserves greater use - and is more in scale with residential properties than the larger eastern redbud with more flowers produced in the same area. It flowers slightly earlier than the native species.

'Arborea' - listed in Hortus Third with no information.

'Avondale' \* - Selected and produced by Duncan & Davies Nursery, New Plymouth, New Zealand. Described in their catalog as "fantastic deep purple flowers on plants in early spring, plants will flower at a young age." We obtained our plants last summer and in the cross-equator acclimatization we should have our first flowers next spring to see how they compare to the species presently being grown. Vegetatively we can see no difference.

'Nana' - listed in Hortus Third with no information.

*Cercis chingii* \* - the most exciting and rarest plant in our collection. Grown from an accession of seed received from China in 1984, planted out to the arboretum bed in the spring of 1985, and our first few flowers were produced this spring. As far as I can determine it is not in cultivation in either Europe or the U.S. at this point. We grew 4 seedlings and sent one each to the Arnold Arboretum and the U. S. National Arboretum, and planted two in the arboretum. Both our plants flowered about 7-10 days before the eastern redbud and seemed pinker in color - but that needs another look next spring when we should have excellent flowering on much larger plants. At first I thought it might be simply another Chinese name applied to *C. chinensis* (as often happens with a variety of material I've received from there - e.g. *Cryptomeria japonica* is usually cited in Chinese seed lists as *C. fortunei*) but the plant is quite distinctly different with much more vigorous growth (some 4-5' whips last year, and that much more growth this year looks likely) and already a more treelike form. An unusual feature I've never noted on any of our other redbud species are large stipule-like growths at the base of leaves about 1/4 - 3/4" in diameter (very prominent on one plant, much less so on the other). I will be very anxious to see the flowering next spring, and particularly anxious to have seed produced so we can begin to distribute the plant elsewhere to test potential adaptability and use. What a thrill it was to daily watch the flower buds expand and realize it was possibly the first time for this species to flower in the western world!

*Cercis griffithii* Boiss - listed in Krussmann as the only cited description. It is the only species of redbud we do not presently have in our collection. Described as being very similar to *C. siliquastrum*, differing mainly in the fruit and again likely a locational ecotype. Native to Afghanistan and not the easiest source of plants to work with these days - but after considerable hunting, I think I may have a source

lined up to obtain it this winter. I have seen a growing plant only one time - in the Kew collections - sadly no seed on it when I was there (often the case on these plants from warmer climates which do not set seed well in England - e.g. *Magnolia grandiflora*). It should be hardy and do well in this area.

*Cercis mexicana* \* - the Mexican redbud, which should no doubt be listed under the Texas redbud - but I've chosen to list it separately as the few plants I've encountered are visibly different than the Texas redbuds I've seen. Lone Star Nursery in Texas is the first to look at commercial production of this plant, and evaluation has been going on with it at the Renner Experiment Station near Dallas by Benny Simpson for a number of years. It has nearly the same glossy surface described for the Texas redbud, but the leaves are generally much smaller, and they have an undulate leaf margin which in my opinion gives them the most beautiful foliage of any redbud in cultivation. They will be smaller in stature than most redbuds with a finer texture in the landscape. Our largest plant in the arboretum has leaves about 1-1.5" in diameter, is densely branched and very handsome. Again, next year should be our first flowering and I'm anxious to harvest seed from it. It could be an excellent miniature redbud for our smaller urban spaces around homes and townhouses. One wonders what special forms of this species might exist in the high mountains far down in central Mexico? - certainly one of the great untapped plant treasure houses for potential plants for American gardens.

*Cercis occidentalis* Torrey \* -(discovered by Torrey in the U. S. Exploration Expedition 1838-42). Listed by Krussmann as Z8 but northern seed sources will be hardier than that; Sunset Z2-24. Several English sources indicate it is tender and must be grown in a greenhouse to survive there. Native in Arizona, Utah, Nevada, California, and Oregon (though not shown existing in Oregon in the Atlas of U. S. Trees distribution map). Vines indicates it is native in New Mexico but the Atlas also shows no populations in that area. We also get into another classification problem here with listings of:

*C. occidentalis* var. *texensis* Wats. - smaller and more reniform leaves than the species.

*C. occidentalis* var. *orbiculata* (Greene) Tidestrom (Vines feels a dubious name).

*C. californica* Torrey - another non-valid name.

A shrubby plant reaching tree size and form in some localities - in some native areas it is 3-4' at maturity and others up to 10-18'. Usually a dense clump with many stems. The foliage is blue-green in color and is notched or rounded at the tips, and is listed as having good yellow-red foliage color in fall. It produces masses of pink or magenta (depending on literature source) flowers over a 3 week period. Likely an extremely variable species in the wild looking at the variations in its native habitats, and surprising that no cultivars have yet been selected. This spring Dr. Gerald Straley of the University of British Columbia looked at flowering populations in the Siskiyou Mountains of Oregon and feels there are likely much better types for ornamental use - particularly for superior foliage and freedom from seed pods in winter. I had suspected it would not grow for us - either not hardy enough, or like most of the Pacific coast woody species have problems here with summer root rots, or lack of calcium and magnesium in our very low pH soils. But our plant has grown well and suffered no injury last winter at about 5-8F. We should have our first good flowering next spring.

*Cercis racemosa* Oliver. \* A plant first described by Henry in 1886, and collected by Wilson in 1907 at 6000' in Hupeh province, also found in Szechwan. It received an A.M. award by the Royal Horticultural Society in 1927. A shrub to small tree (though Bean lists a 36' tree in Sussex). Every reference describes it as the most beautiful redbud in existence with pendulous 3-5" chains of 10-30 pink flowers hanging in the tree. It has been grown so rarely that little information exists on adaptability - Krussmann says Z7, Hortus Z8, NY Bot (in its usual frustrating vague way) says "not hardy in the north", while Bailey in the old Standard Cyclopaedia of Horticulture says it is not hardy at the Arnold Arboretum but "is perfectly hardy in southern England". My first plant was put out the winter of our record -7F so I started the wrong year to get useful information. It should be adaptable at least in Z8 of the U.S. and possibly Z7. It is a reflection on the almost total lack of woody plant testing in the southeastern U.S. that this plant raved about for its great beauty by so many plant authorities over the last 70 years still has not been evaluated in the one area of the U.S. where it will likely be the most adapted for use. The last two plants I obtained are being grown in containers and moved into our cool greenhouse each winter to get them large enough to see bloom (and collect seed hopefully) - and when larger, and with backup plants, we will go to the field with them here and in Wilmington. I've never seen it in flower in my travels (not being able to get to England early enough because of classes) or even a photograph. High on my "desired plant experience" list.

*Cercis reniformis* Engelm. \* A small tree reported to 40' but more likely 15- 20'. Various described as being related to *C. canadensis* or *C. occidentalis* (as described earlier). The leaves are 2-3" wide, with rounded or notched tips and a glossy, dark green upper surface. Listed by Krussmann as Z8, in Sunset as Z2-9, and 14-24; and I would say Z6 where it gets summer heat (showed no injury here at -7F). Again in England it is listed as requiring greenhouse culture to overwinter. Listed variously as native to Texas, Oklahoma, New Mexico and Mexico. Two cultivars are listed:

'Oklahoma' \* - A plant discovered in the wild in the Arbuckle Mountains of Oklahoma in 1964, named and released by Warren & Son Nursery of Oklahoma City in 1965. It has been listed variously as:

*C. X 'Oklahoma'*

(*C. canadensis* X *C. canadensis* v. *texensis*)

*C. canadensis* 'Oklahoma'

C. reniformis 'Oklahoma'

C. texensis 'Oklahoma'

The two most distinctive features are the highly glossy leaves which are extremely attractive all summer, very leathery in texture; and the dark reddish-purple flowers which are considered the "reddest" of all redbuds. So far above the normal eastern redbud in beauty and ornamental qualities it is hard to imagine why anyone who ever sees 'Oklahoma' would even consider growing any other redbud (the "why" is the special propagation requirements of course). (In my last conversation with Jean Iseli just a week before he died of a heart attack so unexpectedly - we were discussing this plant and I was begging him to get it into mass production somehow. He said if he could get some plants he had no doubt he could learn to root it from cuttings - and after his amazing breakthroughs with *Sciadopitys*, *Picea*, and many other "non-rootable" plants - I have no doubt he would have learned how to do it).

'Texas White' - A similar foliage type with masses of pure white flowers - stunning in bloom. I believe this one is often misnamed in commercial channels. Sunset lists this as a *canadensis* cultivar, and in talking to friends in California they say 'Texas White' does not have the glossy leaves I've described; so what is sold there is most likely the 'Alba' or white eastern redbud. 'Texas White' should be reserved for the white form of the true Texas redbud with glossy leaves. A number of plants were apparently brought to Raleigh from Tennessee several years ago by a local retail outlet for sale and are stunning in landscapes where they were planted - but the plant is no longer available at retail outlets as far as I can determine. After a long hunt I've found a plant to add to our collection this winter.

In 1985 in a population of seedlings from our 'Oklahoma' tree, I found an extreme dwarf seedling - after 6 months of growth when its siblings were two feet tall, it was racing also at nearly an inch in height with tiny leaves on diminutive branches. Sadly, somehow we lost it during the winter - I think probably tossed by mistake when dormant as the branches would have been almost unnoticeable in the large gallon can. I really hate the loss - it would have made a fascinating and unique plant as it grew.

*Cercis siliquastrum* L. \* - the Judas tree, so named as it is supposedly the tree that Judas hanged himself from after betraying Christ. It is native to Israel, so that is a possibility. Other redbud species are also often called Judas trees, but their various geographic origins make that term an incorrect one. This plant has been in cultivation since early Middle Eastern civilizations have existed and accurate written records describe it before 1600. It is native from Spain across southern Europe into Israel. It was the other species of *Cercis* described by Linnaeus in *Species Plantarum* - listed from Spain and Italy. It is more tree form than most species - reaching 40' but more commonly 15-20' in cultivation. It has 3-5" leaves, heart shaped at the base, and with a rounded or notched tip. The flowers are purplish rose (and are eaten in salads). The seed pods are described as being purple-tinted and a conspicuous and ornamental feature of the plant. Krussmann and Dirr list it as Z6, NY Bot as Z7; Sunset as 2-19; several references indicate it is more tender when young and can take more cold as it ages. It seems to be growing well in our planting so far and should flower well next spring. Several cultivars are listed:

var. or f. *alba* (West.) Rehd. - a form with white flowers and lighter green leaves. Received the A.M. award from the Royal Horticultural Society in 1972

'Albino' - synonymous with f. *alba*.

'Bodnant' - a form with deep purple flowers; the original plant was planted in 1876 and is recorded as being 30' tall; listed by Hillier 1975.

'carnea' - flower softer light pink.

'floro-plena' - flowers semi-double to double

'fructu rubra' - fruit reddened when mature.

'penduliflora' - pedicels longer, flowers drooping.

'Sinense' - plant more vigorous.

'Sterilis' - does not produce fruit.

'Variegated' - a form with white and green variegated leaves.

This completes the list of various redbud species and cultivars that I've been able to come up with in a short search. As in the commercial nursery industry - The NCSU Arboretum (now the JC Raulston Arboretum) collections are much better in species work than with cultivars. At this point we likely have the best collection of *Cercis* species (8) of any garden in the world; but very weak on cultivars (which I intend to work on next year from European sources). 'Oklahoma' is planted in the parking lot near the fastigate English oak; 'Forest Pansy' south of the parking lot beside the farm work road which runs through the arboretum; and the species collection is in the west arboretum area at the north side of the circle of Leyland cypress.

In THE ROYAL HORTICULTURAL SOCIETY DICTIONARY OF GARDENING - VOL I; I found the following key for sorting out the most commonly encountered species. (And have added another characteristic noted by Dr. Paul Fantz)

1. Lvs. rounded or notched at apex 2

1. Lvs. shortly pointed 4

2. Lvs. 2.5 - 4" wide *C. siliquastrum*

2. Lvs. 1.5 - 3" wide 3

3. Pods 2-4" lng, 0.5" wide *C. reniformis*

3. Pods 2-3" lng, 0.75" wide *C. occidentalis*

4. Fl. in racemes *C. racemosa*

4. Fl. in clusters 5

5. Lvs. dull beneath at first, margin not translucent;

fl. about 0.5" long

(7 palmate veins in lf. - Fantz) *C. canadensis*

5. Lvs. glossy beneath, margin translucent;

fl. over 0.5" long

(5 palmate veins in lf. - Fantz) *C. chinensis*

Unlike many genera of woody plants (e.g. *Quercus*, *Pinus*, *Betula*, etc.), there is no hybridization between *Cercis* species in collections so any seed collected will produce the true species. Of course, cultivars do not come true from seed.

The species are all easy to grow from seed (once one finds commercial sources of seed) with the primary requirements to scarify the seed to break the hard seed coat (by sulfuric acid or mechanical means), and to stratify (cold treat) them to break the dormancy requirement. The cultivars are rare in commercial commerce as stated because of difficulties in propagation. In general they have been budded or grafted - and with considerably more difficulty than such other common nursery crops as maples, crabapples, pears, etc. Generally T- or chip-budding in July-August on *C. canadensis* seedling understock will work. Some research has been done with cuttings (Dirr reports a surprising 75-90% rooting in early summer) - but likely much greater advances could be made with further work. (A likely approach - as with the breakthrough in maples, would be to use extremely young succulent tissue under mist, with bottom heat, and with extended photoperiod lighting to keep growth active). With the strong market demand for 'Forest Pansy' several companies are working heavily with tissue culture techniques and breakthroughs are likely in that area in the near future. At this point - among the estimated 1,200 nurseries in N. C. I would guess that perhaps 300-400 or so produce seedling eastern redbuds either in field or container production. I'm probably wrong but at this time I don't know of a single producer in N.C propagating (several buy in liners from elsewhere) any of the cultivar redbuds. It would take time, money and much effort to master the techniques obviously, but somewhere there must be a place for someone to carve out a specialty niche and produce 'Forest Pansy', 'Oklahoma', 'Texas White', and possibly the Mexican redbud for east coast markets. And for the longer future - there is great need for adaptation research to explore the potential uses of *C. racemosa* for the southeastern U.S.

Reference Sources Consulted:

Atlas of United States Trees Vol. 3 & 4 - USDA Forest Service

Encyclopedia of Horticulture Vol. 2 - Everett - NY Botanical Garden

Flora of Japan - Ohwi

Flora of Korea - Lee

Hilliers' Manual of Trees & Shrubs - Hillier.

Hortus Third - Bailey Hortorum

Manual of Cultivated Broadleaved Trees & Shrubs Vol. 1. - Krussmann

Manual of the Vascular Flora of the Carolinas - Radford, Ohles, and Bell

Manual of Woody Landscape Plants - Dirr.

NCAN Nursery Notes 16(6)Nov-Dec.'82 p.9,11 - Fantz.

Reference Guide to Ornamental Plant Cultivars - Hatch

Species Plantarum (1753 Facsimile Edition) - Linnaeus.

Sunset New Western Garden Book - Williamson (Ed.).

The Royal Horticulture Society Dictionary of Gardening. Vol. I.-Chittenden (Ed.).

The Standard Cyclopedia of Horticulture Vol. 1. - Bailey

Trees & Shrubs Hardy in the British Isles. Vol. 1. - Bean.

Trees, Shrubs and Woody Vines of the Southwest - Vines.

Useful reference (not seen) *Arnoldia* 36(1976): Cercis - The Redbuds. Robertson.

## BOOK NEWS:

My biggest reading project of the year has been a month of bedtime reading in one of the most varied and comprehensive books I've ever encountered - *THE DISCOVERERS - A HISTORY OF MAN'S SEARCH TO KNOW HIS WORLD AND HIMSELF* by Daniel J. Boorstin (Vintage Books, ISBN 0-394-72625-1, copyright 1983, paperback edition 1985 - 745 pages, \$9.95). Although only a small portion is related to plants I still must recommend it for consideration. The range of people, events, concepts covered is really quite incredible - he has given 29 pages at the back just to list the books used as sources for the publication. Dr. Boorstin has degrees from Harvard, Yale, and Cambridge (not a bad start on a career) - has taught at Harvard, Swarthmore, U. of Chicago, U. of Rome, Kyoto U., U. of Puerto Rico, U. of Geneva, and the Sorbonne; was director of the Nat. Museum of History & Technology in Washington, D. C. and Librarian of Congress since 1975. I have a great love of history and archaeology and pride myself with having a fair knowledge of the history of the world and its development - but every page just bubbled with all kinds of new people and concepts I had no awareness of. I'm fighting the mad desire to include my favorite 500 quotes from pages I've tabbed. It astounds me how many of our everyday life concepts have such ancient origins - our concept of a 365 day calendar is over 6,000 years old, our use of a 60 minute hour and 360 degrees in a circle goes back to a base 60 number system from Babylon; how complex it was to get to a 24 hour day concept (and why 24??); how travel developed to change awareness of the earth (with a wonderful story of how the famous botanist Banks after his notable first trip with Cook to Australia raised his demands for a second exploration voyage from 8 to 15 servants to include a portrait painter, draftsmen, and a horn player. Somehow Korea last year wasn't quite like that!); the rise of science in the areas of astronomy, biology, archaeology, economics, statistics, etc. - all very readable and enjoyable. His world-wide range goes far beyond the European heritage usually emphasized in our U.S. schooling. We hear about Gutenberg's press in 1456, but how many hear of the Chinese publishing a 5,000 volume, 130,000 page set of books on one subject in 983 AD? A wonderful story of the German, Heinrich Schliemann, who pioneered in the field of archeology - he developed a way of studying to learn new languages without formal school training - it took 6 months to master his first new language - English, and then 6 weeks each to speak and write fluently French, Dutch, Spanish, Italian, Portuguese, Arabic and Greek. At age 47 he married a 17 year old Greek girl, taught her 4 languages in 2 years and together they made incredible discoveries - Troy, the Treasure of Agamemnon, etc. Word origins are often given, e.g. "overland travel was a laborious, individual trek. From that age came our English word "travel" - originally the same as "travail", meaning labor, especially of a painful or oppressive nature - an accurate description of what it meant to go long distances." Many still feel that way about travel today! I could go on and on (and want to) - but read it yourself - find out about the significance of sauerkraut to world exploration, where the word "bedlam" originated, how the invention of writing destroyed fantastic ancient memory techniques used to preserve knowledge, how the word Bible developed from a plant name - and thousands more. I want to make the book required reading in my graduate research methods course this fall - somehow I can see student reluctance to have a one week, 700 page assignment.

The April '86 issue of *American Forests* magazine had an interesting summary of the recently updated National Register of Big Trees - a 32 page listing of the national champion specimens of various tree species in the U.S. I was interested in seeing how many such trees we had in N. C. and went through the list to come up with the above summary.

It is a fascinating list to look through - to see how large and where the biggest specimens of such familiar plants as dogwood, American elm, etc. are located. As would be expected from their widely varying climates and large number of endemic species - Florida, Texas and California are the state champions with large numbers of species listed. Local libraries often have copies of the magazine (I saw the issue in the excellent public library downtown in Asheville - my favorite library in N.C.) or one could possibly buy a back issue from the publisher. A year's subscription is \$24 from: American Forestry Association, 1319 Eighteenth St., N. W., Washington, D. C. 20036 (202-467-5810). The issues are always colorful, with enjoyable articles of all sorts about trees.

A favorite quote: "Where is human nature so weak as in the book-store? - Henry Ward Beecher. Preacher Beecher knew his human nature. Few literate people are impervious to the siren call of a fresh new book - its look, its smell, its heft in the hand, the palpable miracle of the word made flesh (or, at the very least, paper, ink, and glue). Those suffering from acute cases of bibliophilia must sometimes be lashed to the mast before sailing through a bookstore, their senses ravished, but their hands unable to reach cash, checkbook, or charge card. A pathetic figure. Others indulge their passion at seasonal intervals, allowing themselves to browse, pluck, handle, sample, and finally buy, to the bookseller's delight." From an article on bookstores by Michael McRee in *The Spectator*.

Speaking of buying books, with my compulsive habit in this area my name must now be on every mailing list sold to book companies and promoters and I receive an endless flow of catalogs it seems. A selection of some of these follow for those who want more temptations. *THE SCHOLAR'S BOOKSHELF*, 51 Everett Drive, Princeton Jct., NJ 08550 - 250 publishers, 1300 books at savings to 75%. The beautiful *VERSAILLES: A GARDEN IN FOUR SEASONS* normally sold for \$85 is offered at \$49.95. *EARTHLY PARADISE: GARDEN AND COURTYARD IN ISLAM* listed at \$55 is \$34.50. *BARNES & NOBLES*, 126 Fifth Ave., NY, NY 10011. 55 pages of books. *VITA on Vita Sackville-West* is \$6.95 in hardback. *HACKER ART BOOKS*, 54 West 57th St., NY, NY 10019. Has such things as *THE ALHAMBRA*,

PARADISE AS A GARDEN, VERSAILLES, etc. at sale prices. BALUSTER BOOKS INC, P. O. Box 10500 Fort Dearborn Station, Chicago, IL 60610 (312-664-5660) Catalog \$1. (Get the Architecture & Urbanism catalog). It lists perhaps 70 excellent books on gardens, design, landscape techniques, parks, etc. at reduced rates.

Another book service I've not recommended before in the newsletter is THE GARDEN BOOK CLUB, 50 West 57th Street, NY, NY 10107. You can get excellent gift incentives for joining, books are offered at good discount rates, and there are bonus books given for every four purchased from the many offerings. The only requirement is that one purchase at least 3 books per year after joining. (If a club member gets a new member to join, the existing club member is entitled to a free book of value up to \$50 value for encouraging the signup. I'm a member now - hint, hint, hint!) Seriously, for anyone purchasing many books this club is a definite plus to consider.

A new reference guide to landscape services in the Triangle area has just been published by The Triangle Association of Landscape Professionals (TALP). It features the name, address, phone, professional expertise, and scope of services for a wide variety of landscape architects, landscape contractors, nurserymen, landscape designers and other related professionals in Orange, Wake, and Durham counties. Copies may be obtained for \$7.00 (which includes shipping and handling) from: TALP, P. O. Box 1045, Durham, N. C. 27702-1045.

In recent years we have sent information to a number of authors of proposed new travel guide books for visiting gardens. The first of these with The NCSU Arboretum (now the JC Raulston Arboretum) in it has just been published: GARDENS OF NORTH AMERICA AND HAWAII: TRAVELER'S GUIDE by Irene & Walter Jacob. (Timber Press, 9999 SW Wilshire, Portland, OR 97225, 368 p., \$24.95 - ISBN 0-88192-017-7). The book is organized on a state-by-state basis, with location, description of the garden and special collections or features, visiting hours and admission charges - 1,400 gardens are listed and rated on a 4-star system. It is a most useful guide that I would recommend to travelers, though it does have some limitations. The title is a bit in error as apparently North America does not include anything south of the Rio Grande River. There are 39 locations given for North Carolina. The authors of course could not possibly visit all gardens and were dependent upon the information sent to them with some interesting results. The information we sent on our perennial border was deleted, and somewhere a quote of "a good collection of herbs of the southeastern states is found here" was added!?? The rating system is sometimes strange also - The Biltmore Estate - one of America's greatest gardens gets two stars, while the Tyron (sic) Palace garden and Duke Gardens get four stars (the only 2 four-star features in N. C. - and both ranked above the incredible 300 acre, \$40 million Chicago Botanic Garden). We received two stars which is about right (the same ranking as Disneyland!!). The Bartlett Arboretum in Charlotte, the Mordecai Gardens in Raleigh, and the fine garden and arboretum at Sandhills Community College were left out, and one feature in Virginia was listed in N.C. (Picky, picky, picky - I'd hate for anyone to scrutinize my information as closely as this).

I received a brochure in the mail for an unusual garden and related books that would be of interest to many of our members and yet information likely not readily available to most. It describes Neot Kedumim - a Biblical landscape reserve in Israel. It is a living 500 acre museum of the wild and cultivated landscapes of biblical Israel with the flowers, trees, fruits, grains, nuts, and spices mentioned in the Bible and Talmud - grown and interpreted for visitors from around the world. Two books on these plants and this garden have recently been published: TREES AND SHRUBS IN OUR BIBLICAL HERITAGE and NATURE IN OUR BIBLICAL HERITAGE by Nogah Hareuveni and translated by Helen Frenkley. The books are \$19 apiece (or both for \$36) plus \$1.50 for handling and shipping from: American Friends of Neot Kedumim, Paul Steinfeld, Secretary, Halcott Center, NY 12437 (Or a complimentary copy for a contribution of \$100 to support the garden; both for \$150 contribution.) All proceeds are used to support the development and maintenance of the garden. Any visitors going to Israel and interested in seeing the garden can write for information to: Neot Kedumim, P. O. Box 299, Kiryat Ono 55 102, Israel (Telephone: (08) 233-840 or 245-881).

In relation to the above announcement, this seems an appropriate place to put a story submitted by Vivian Finkelstein (who is a tour guide at the arboretum and does so many fine things to support our activities). "Have you heard about the British vicar who was such a garden enthusiast that he installed spotlights on his perennial border so he could keep watch over his phlox by night?" (Groan)

Another contributed story (true this time) comes from Tony Avent who related among other employee problems - an employee of his put Roundup herbicide in the gas tank of his Weedeater seriously thinking it was an appropriate fuel for killing weeds. It does not work, Tony assures me.

I've never known where to put this item I've had for a year - but while on reader contributions I'll clear it out of my file. Last year when we had our most enjoyable garden pot-luck dinner and lecture by Barry Yinger in the white garden - everyone raved over the dish of baked beans brought by Mr. Heidler. He later shared this recipe used for many years - truly a superb dish.

1. Wipe pot with bacon fat, 2. Add layer of pork and beans (use #10 can), 3. layer of catsup, 4. layer of brown sugar, 5. layer of onion salt (sprinkle on), 6. 2 tbsp. Worcestershire sauce,

7. layer of bacon, 8. repeat above layering and cover, 9. cook

2 hours at 325-350° F, 10. uncover and brown bacon, recover and serve. Yum!!

One of my favorite quotes of this year - from a News & Observer article in the business section on economic predictions. Don Conlan, president of Los Angeles based Capital Strategy Research, Inc. offers his forecast for 1986. "Things are either going to be a lot better - or a lot worse," Conlan says. But he adds, "There's a 10% chance I don't know what I'm talking about." Please - don't bother to send me a company prospectus.

We know so very little about the adaptability and requirements of most woody plants and so little research is conducted in this area that it is always exciting to find good information. While in Vancouver I discovered a book entitled; DISTRIBUTION AND ECOLOGICAL CHARACTERISTICS OF TREES AND SHRUBS OF BRITISH COLUMBIA - by Krajina, Klinka and Worrall, faculty of botany and forestry at the University of British Columbia. (1982, 131 p., published by J & M Publishing, Vancouver, B. C. - possibly available by mail from the senior author - Dept. of Botany, 2075 Wesbrook Mall, UBC, Vancouver, B.C. V6T 1W5; or from the campus bookstore). To quote from the abstract: "The distribution and ecological characteristics of 35 tree species and 11 shrub species native to B.C. are presented. Each species is characterized by its geographic distribution, climatic requirements, orographic position, physiognomic type, edatopic requirements, and nutritional type. The biogeographical units in which a species occurs are listed. Species tolerance to frost, shading, and flooding are discussed. For each species, the above information is integrated in a short discussion regarding ecological requirements." For example - under Western White Pine (WWP) - *Pinus monticola* - Nutrient requirements of WWP are high for Ca and Mg. WWP is first affected strongly by Ca dieback on its root system . . . when young root hairs are destroyed by Ca deficiency . . WWP does not readily develop new roots when older ones are killed . . . therefore, Ca deficiency becomes a strong factor in the survival of WWP. . . many are eliminated by Ca deficiency in coastal soils there Ca is removed from upper soil layers by podzolization (or our very low pH here in N. C.)

. . when trees are already affected by Ca deficiency they may be readily killed by drought because the damaged roots cannot even absorb water . . . collapse of plants looks like drought wilting even when plenty of water is available." Or with Sitka Spruce (SS), *Picea sitchensis* - "SS requires considerable amounts of available Ca and Mg in its environment. Where these elements are in short supply the tree cannot thrive. This is why it benefits from brackish water or even from ocean spray where both these elements are readily available. . . in addition SS is tolerant to the large Na content of ocean spray . . . therefore, where ocean spray has a strong influence upon the vegetation, pure stands of SS may develop because the other trees do not tolerate that strong effect of ocean spray. Or the Western Redcedar (WR), *Thuja plicata* (which does very well in the NCSU Arboretum (now the JC Raulston Arboretum)) "WR requires nitrates for its growth and cannot tolerate complete replacement of nitrates by ammonium compounds . . . a well- balanced supply of both Ca and Mg in a nutrient rich soil is required for productive growth of WR . . . however, this species is able to survive and grow, though with less productivity, on soils with a low moisture and nutrient content . . . flood resistance is very high (i.e. poorly aerated soils) (all emphasis mine - data in their paper which would lead one to predict it might do well here). An enormous amount of data and maps are provided - one could study this book productively for a long time. I feel much could be deduced about potential use of various species in our area from data presented here - and looking through a source of such information makes me wish such information were available on a much wider array of plants - particularly exotic ornamentals where we often know little of the soil chemistry and environmental parameters existing where such species are native.

We have often discussed Elizabeth Lawrence and her outstanding books in this newsletter. It is a pleasure to announce that Duke University Press in March reissued her 1957 book THE LITTLE BULBS; A TALE OF TWO GARDENS in a 249 page paperback form at \$10.95. So it should be in local bookstores again. Superb!

Many of you heard Dr. Alex Shigo at the Sandhills Community College Symposium this spring. He is the world authority on tree structure and behavior, and his practical applied work of the last 20 years has completely changed our understanding of trees. He recently sent us pre-publication information on two books which will be available this fall summarizing his many years of work. They are A NEW TREE BIOLOGY, hardcover, 592 pages, (\$39.00 before November), 633 B&W photos, facts, and philosophies on trees and their problems and proper care; and A NEW TREE BIOLOGY DICTIONARY, softcover, 176 pages, (\$10.50 before November), terms, topics, and treatments for trees and their problems. To order, send check or money order for the appropriate amount plus \$2 for postage and handling to: Shigo and Trees Associates, 4 Denbow Road, Durham, NH 03824 (603-868-7459).

In response to many inquiries from various individuals attending AHS, ASHS, and ISHS meetings in California in August, and those going to the World's Fair in Vancouver - I've prepared a brief travelers guide to gardens and nurseries in central California, and a sheet of a personal view of the fair and how to see it. If interested in either, drop me a request note and I'll send a copy.

## **NEW CATALOGS AND PLANT SOURCES OF INTEREST:**

In the last issue of the newsletter I had only one listing for new sources of plants - Maver Rare Perennial Nursery. As luck would have it - by the time my information went out - it was incorrect; however that turned out to be a form of good luck in itself as I was unaware the nursery was in the process of being moved from Seattle, WA to Asheville, N. C. which gives us easier access to a fine range of unusual plants. So I want to relist the nursery with updated information and extend a warm N. C. welcome to

M. Majella Laroche and MAVER NURSERY - RARE PERENNIALS, RR 2 Box 265B, Price Road, Asheville, NC 28805 (704-298-4751) Plant and Seed lists \$3.00. In the letter I received he stated: "our major move has set us back, temporarily . . . but we are catching up rapidly. We now offer 140 kinds of plants and 2,700 kinds of seed. By June 1986 we should have propagated over 1,000 kinds of plants, many to be offered between June-September 1986." It's been a fascinating thing to see so many exceptional small scale nursery specialists dealing in uncommon or rare plants move to N. C. from other states in recent years - it's very exciting to have all of them here.

During my years of teaching at Texas A&M University in Texas ('82-'85) and since, I've heard repeatedly of the legendary Lynn Lowry as one of the two most knowledgeable southwest native plant specialists in existence (along with Benny Simpson of Dallas) - but unfortunately have never had the opportunity to meet him. These two fabled men have walked every square foot of Texas (and Mexico) it sometimes seems and their knowledge of rare plants and occurrences of unusual plant populations where one would never expect them will likely never again be equaled. In May a friend in Texas sent me a price list of a new nursery which Mr. Lowry recently began,

specializing in unusual natives of the southwest (nursery propagated and grown I might add, not collected plants from the wild). I was most interested in several plants listed and called to get further information. To my surprise and delight - the phone was answered by one of my former Aggie students, Erio Lautzenheiser, who now works there as the nursery manager - and we had a chance to catch up with each other on happenings of the last 12 years. Though not set up originally as a mail order firm, in our discussions they indicated that they would handle material of appropriate size by mail for those interested in the listings. A price list may be obtained from ECOTONES - RARE AND NATIVE PLANTS, P. O. Box L, Kirbyville, TX 75956 (409-423-4995). Many of the plants listed are also native to N.C. where our populations of these materials extend into the Big Thicket area of eastern Texas - like *Chionanthus virginiana*, the fringe tree; *Cotinus obovatus*, the American smoke tree; *Cyrilla racemiflora*, titi; *Halesia diptera*, two-wing silverbell; *Magnolia pyramidata*, pyramid magnolia; many fine oak and pine species rarely seen for sale; and various vines, ferns, and perennials. There are many interesting Texas and Mexico plants which have shown to have considerable promise for use in N. C. in our arboretum trials - like *Cornus mexicana*, *Diospyros texana*, *Mahonia trifoliolata*, *Nolina nelsonii*, and *Ungnadia speciosa*; as well as a fair number of choice Asian species. I was most excited to see a listing of the dwarf loblolly pines which everyone admires in our arboretum and which have never been available commercially before. They have a source of seed from trees with witches brooms and are growing them from that source. Supplies are limited and I suspect this newsletter listing will clean them out in a matter of days as so many arboretum visitors have asked for them for so long. Check out this list of over 150 choice unusual plants.

I want to offer my readers an advance notice of an opportunity to obtain an exceptionally rare plant which will likely become a major nursery crop during the next decade as stocks of it are built up and become available. In 1981 seed of an extremely rare Chinese plant, *Heptacodium jasminoides* was obtained by Dr. Dudley on the Sino-American Botanical Expedition and plants were established at the U. S. National Arboretum and the Arnold Arboretum. These were the first plants to exist outside of China. It has proved to be very promising for commercial landscape use with ease in propagation, rapid growth to a 20' multiple stem small tree with handsome flaking bark, white fragrant flowers which appear in September, followed by reddish-purple bracts which remain until frost. It will be hardy anywhere in N.C. This fall the Arnold Arboretum is going to offer the first rooted cuttings available anywhere to members of the Friends of the Arnold Arboretum for \$30 for 2 plants. Membership is \$15 per year which includes subscription to the excellent *Arnoldia* publication. If you would like to be one of the first in the U.S. to have this plant - send \$45 (if not presently a member) for membership and two plants to: Heptacodium Distribution, The Arnold Arboretum, Jamaica Plain, MA 02130

I was given a catalog for hardy cacti and succulents for landscaping use - truly hardy materials which tolerate the -15F temperatures in the area of the Denver nursery. Write Rod Haenni, WINTER COUNTRY CACTI, 5405 Mohawk Road, Littleton CO 80123 (303-795-1083) and enclose fifty cents for the catalog. There are 136 different plants for sale and 54 different seeds. Our limited trials in the arboretum indicate many more of these materials can be grown here than most people are aware of, as long as drainage to prevent summer root rotting is provided. It is interesting to note he carries a native N. C. coastal species of cactus, *Opuntia pusilla*. He has the hardy iceplant, *Delosperma nubigenum* which grows in front of the lathhouse and has done so well for us. I'm also excited to see seed and plants of a wide array of hardy *Agave*, *Dasylyrion*, *Hesperaloe*, and *Yucca* that I want to order and try. Most plants are \$1-3 with a few to \$5-6.

From a newspaper story on use of wildflowers across the U. S. I obtained information on a firm with a beautiful catalog and information and seed for creating wildflower meadows. For a free catalog call 802-425-3500 or write to THE VERMONT WILDFLOWER FARM, Box N, Charlotte, VT 05445.

They have special seed mixes formulated for various areas of the U. S.

One of the most beautiful of garden perennials (where they can be grown properly) are the peonies - both herbaceous and woody shrub types. Two large listings came in the mail from REATH'S NURSERY HYBRID PEONIES, P. O. Box 521, 100 Central Blvd., Vulcan, MI 49892; and KLEHM NURSERY, Rt. 5, Box 197, South Barrington, IL (312-551-3715) which also includes *hemerocallis*, *hosta*, and *iris*. In N. C. peonies are at their best in the mountains and as one heads toward the coast they become more and more difficult to succeed with due to the heat. Variety selection and correct siting becomes more and more important. I've seen many tree peonies fail in the Triangle area, yet an inexpensive chain store plant we planted at the Horticulture Department building on campus with no care at all has gotten more spectacular each year and this spring had 7 magnificent blooms on it. So much more experimentation is needed to master this plant in a marginal area - but worth the effort for the spectacular reward when success is achieved. If our arboretum were in Winston-Salem or further west I'd probably have 300 varieties of this plant I love so much.

Several years ago in the newsletter I wrote about (and included in our sources list) a nursery called Colvos Creek Farm - experimenting with unusual plants and handling some mail order business on special requests. The nursery has apparently changed somewhat and they have now published their first mail order catalog under a different nursery name PUGET GARDEN RESOURCES, Peter Ray, Rt. 5 Box 51, Vashon Island WA 98070 (206-567-4542). Some of the interesting plants available which are hard to find in N. C. would include: *Agapanthus* 'Headbourne Hybrids', *Araucaria araucana* - the Monkeypuzzle tree, several species of *Eucalyptus* (*gunnii* and *niphophila* are the hardiest for us to use), *Leycesteria formosa*, and *Umbellaria californica*.

Two new price lists from N. C. growers of herbaceous materials were received from WILDWOOD HERBAL, P. O. BOX 746, Albemarle, N. C. 28002 (704-983-3586) featuring a variety of herbs and flowering perennials (with wholesale quantities available for landscape contractors and garden centers); and JERNIGAN GARDENS, Route #6, Box 593, Dunn, N. C. 28334 (919-567-2135) for *hemerocallis*, *iris*, and *hostas* by mail or other perennials at the nursery only.

A remarkable young individual plantsman with a private botanic garden who collects and distributes documented source seed of perennial, shrub and tree species of the midwest is Stan Tyson, RIVENDELL BOTANIC GARDEN, P. O. Box 17, Beardstown, IL 62618. All his seed are collected from native stands in IL, MO, and IN and some 140 very fine plants are included. Write for a copy of his Index Seminum to order seeds. He has no formal charge for this service (the last time I checked) but I would suggest that anyone requesting seed should send a donation (at least \$1 or more per type requested) to help finance his personal collecting trips to obtain these materials. No garden, much less private ones, ever has the money really needed to operate.

Seed may be the only way to obtain plants of many uncommon plants, and a superb new commercial source of woody plant seed recently came my way from Frank T. Callahan, CALLAHAN SEEDS, 6045 Foley Lane, Central Point, OR 97502 (503-855-1164). This huge list of over 500 species of shrubs and trees has many exceptionally fine and rare materials priced at \$2-10 per lot. He also does custom collecting throughout the western U.S. if a "want list" of requested items is provided. Examples of virtually unobtainable seeds from any other source include such conifers as Athrotaxis, Callitris, Dacrydium, Glyptostrobus, and Keteleeria; and other items like many Cypresses, Mahonias, Pines (86 species! - where else will you find *P. oocarpa*? I've never heard of it but I love the species name), oaks and many, many other plants.

During my travels this spring I discovered (through Dr. Mike Dirr) a superb young perennials operation in Georgia run by Marc Richardson and Richard Berry - GOODNESS GROWS, P. O. Box 576, 156 South Woodlawn Drive, Crawford, GA 30630-0576 (404-743-5055). They do not mail-order plants but anyone heading to Atlanta should try to stop to see the operation (south of Athens, GA). Their business is one badly needed in N. C, in specializing in larger size perennials and native wildflowers in quantity for use by landscape contractors - primarily in the Atlanta market where these plants are red hot in the commercial landscape trade. We have numerous N. C. producers either doing the cell-pack size materials for garden centers in spring, or hobbyist growers producing small quantities of larger size or more unusual perennials for retail homeowner or catalog sales. We badly need someone in this state producing gallon containers by the multiple thousands of perennials or wildflowers so they could be used by landscapers. Goodness Grows does have a retail outlet (with nice display beds showing the various plants in garden settings) for visitors. My congratulations to them on a first-rate business.

One of our former NCSU graduates with a Master's of Landscape Architecture degree is trying to bring some unusual woody materials into the state nursery industry. After trying unsuccessfully to find uncommon plants to use in his own landscape practice, he has finally decided the only way to get such items is to become a nurseryman and grow them himself - and in the process has learned just how laborious that is - just to find sources of seed and propagation materials. But Jones Abernathy of J. ABERNATHY LANDSCAPE COMPANY, 2596 Landmark Drive, Winston-Salem, N. C. 27103 (919-765-0000) has persisted - talking frequently to plant authorities such as Mike Dirr and getting materials from him; traveling to various arboreta as far away as the Arnold Arboretum in Boston to gather cuttings and seed. Though basically wholesale at this point, he is such a fine plantsman that one seeking special plants could probably wheedle a few out of him with the proper reverence for the value of his fine plants. All materials are field grown and only available in winter months as B&B specimens. But where else can one find *Cercidiphyllum*, *Parrotia*, *Stewartia*, and other such fine plants locally?? My compliments to Jones for the exceptional efforts he is making to bring new plants to our state industry.

Another former student (from Duke, but with wisdom enough to come to NCSU and take the nursery production course!) who has formed an exceptionally fine young nursery is David Johnson of JOHNSON NURSERY CORPORATION, Route 2, Box 12 1/2, Willard, N. C. 28478 (919-285-7861). He is strictly wholesale; but I mention his operation in relation to a rare new plant from the arboretum we've been trying to promote to the nursery industry unsuccessfully for a number of years now, and which he is now growing as the only commercial source in the U. S. at this point. The plant is *Vitex rotundifolia*, a groundcover, round-leaved plant for use in beachfront plantings as a very handsome blue-grey foliated plant with typical vitex blue flowers during the summer; extremely tolerant of salt, sun and wind of beach areas. On beaches it will be about 1' in height (2' here away from the wind) with spreading runners to 15' in length. We saw it in Korea last year where it is native - there it is the last plant to survive farthest out in the sand dunes toward the water. It has great potential for the entire coastal area of the S. E. U. S. from Maryland to Texas. So if you have a beachfront property and would like to try it - ask where his plants are going to retail outlets so you can find it to purchase. New plants are often difficult for retailers to sell - and we want to encourage use of this fine plant as much as possible in its difficult introduction phase.

#### PROPAGATED PLANT AND SEED SOURCES FOR SOUTHEASTERN NATIVE PLANTS - 1986

We hope the following information will be helpful to wild flower gardeners interested in propagating their own plants. By purchasing propagated native plants and by raising wild flowers from seed, we accomplish two things. First, we are tapping into a plentiful natural resource that allows us to furnish our gardens with new and attractive native plants. Second, we relieve the pressures of over-collection of native species from our natural areas by commercial nursery concerns. By producing plants ourselves, we are demonstrating practical alternative to the purchase of collected native plants.

Many of the plants offered in these catalogs are native to the southeastern United States and appropriate for use in the home garden. Listed below are nurseries that offer propagated plants native to the southeastern United States. Also listed are seed sources for many native southeastern wildflowers.

#### PROPAGATED NATIVE PLANT SOURCES

Tom Dodd Nurseries Inc

Semmes. Alabama 36575 (native shrubs)

We-Du Nurseries

Route 5, Box 724

Marion, N. C. 28752

Passiflora

Route 1, Box 190-A

Germanton, N. C. 27019 (\$1.00 for catalog)

Transplant Nursery

Parkertown Road

Lavonia, Georgia 30553 (native azaleas)

World Insectivorous Plants

1347 17th Street

Los Osos, California 93402 (carnivorous plants)

Sunlight Gardens, Inc.

Route 3, Box 286-B

Loudon, Tennessee 37774 (\$1 for catalog, refundable w/order)

Orgel's Orchids

18950 S.W. 136th Street

Miami, Florida 33187 (carnivorous plants)

Woodlanders, Inc.

1128 Colleton Avenue

Aiken, S. C. 29801

Oak Hill Farm

204 Pressly Street

Clover, S. C. 29710 (native azaleas)

Montrose Nursery

P.O. Box 957

Hillsborough, N. C. 27278 (\$1.00 for catalog)

Native Gardens, Columbine Farm

Route 1, Box 494

Greenback, Tennessee 37742

Natural Gardens

113 Jasper Lane

Oak Ridge, TN 37830

SEED SOURCES

Applewood Seed Co.

P.O. Box 10761, Edgemont Station

Golden, Colorado 80401

Environmental Seed Producers, Inc.

P.O. Box 5904

El Monte, California 91734-1904

Far North Gardens

16785 Harrison

Livonia, Michigan 48154

Green Horizons

500 Thompson Drive

Kerrville, Texas 78028

Herbst Seedsman, Inc.

1000 N. Main Street

Brewster, New York 10509

Horizon Seeds, Inc.

P.O. Box 81823

1600 Cornhusker Hwy.

Lincoln, Nebraska 68501

Manglesdorf Seed Co.

P.O. Box 327 (4500 Swan Ave.)

St. Louis, Missouri 63166

Midwest Wildflowers

Box 64

Rockton, Illinois 61072

Natural Habitat Nursery

4818 Terminal Road

McFarland, Wisconsin 53558 North Plain

P.O. Box 9107

Moscow, Idaho 83843

Passiflora

Route 1, Box 190-A

Germanton, North Carolina 27019 (\$1.00 for catalog)

Prairie Associates, David M. Peterson

6328 Piping Rock Road

Madison, Wisconsin 53711

Prairie Moon Nursery

Route 3, Box 163

Winona, Minnesota 55987 (also plants)

Prairie Nursery

P.O. Box 116, Route 1

Westfield, Wisconsin 53964

Prairie Seed Source of Iowa, Inc.

P.O. Box 1131

Des Moines, Iowa 50311

Stock Seed Farms, Inc.

R.R. 1, Box 112

Mudock, Nebraska 68407

Theodore Payne Foundation for Wild Flowers

and Native Plants, Inc.

10459 Tuxford Street

Sun Valley, California 91352

Wild Ginger Woodlands, Phyllis Parkas

1297 Mill Creek Run

Webster, New York 14580

Windrift Prairie Shop

R.D. 2

Oregon, Illinois 61061

## **NEW PLANTS RECEIVED IN THE NCSU Arboretum (now the JC Raulston Arboretum) - MARCH - JUNE 1986**

*Ilex dimorphophylla* 'Chollipo Clone' - Chollipo Arb, Korea (cuttings potted) 3/5

*Hedera rhombea* (Possible dwarf collected from wild) Korea (cuttings potted) 3/5

*Vitex cannibifolia* - Chollipo Arb, Korea (cuttings potted) 3/5

*Euonymus japonica* (white variegated clone) - Chollipo Arb. Korea (cuttings potted) 3/5

*Prunus laurocerasus* 'variegata' - Chollipo Arb, Korea (cuttings potted) 3/5

*Weigela coreana* (?) Chollipo Arb, Korea (cuttings potted) 3/5

*Podocarpus macrophylla* (White-tipped new shoots clone) - Chollipo Arb. Korea (cuttings potted) 3/5

*Illicium religiosum* - Nat. Arb (cuttings potted) 3/5

*Ligustrum henryi* - UBC Bot Garden (cuttings potted) 3/5

*Chamaecyparis nootkatensis* 'pendula variegata' - UBC Bot Garden (cuttings potted) 3/5

*Juniperus horizontalis* 'UBC Clone #1' - UBC Bot Garden (cuttings potted) 3/5

*Juniperus horizontalis* 'UBC Clone #2' - UBC Bot Garden (cuttings potted) 3/5

*Juniperus cedrus* - UBC Bot Garden (cuttings potted) 3/5

*Arcterica nana* (syn. *Pieris nana*) - UBC Bot Garden (cuttings potted) 3/5

*Parrotia persica* 'pendula' - UBC Bot Garden (cuttings potted) 3/5

*Lindera melissifolia* - NC Dept. of Natural Resources - Steve Leonard - Endangered species from Berkeley Co. SC, Francis Marion Nat'l Forest. (Bareroot Seedling 1') 3/7

*Rhododendron* X 'Lem's Cameo' - Greer Gardens, OR (4" rooted cutting) 3/9

*Ledudendron* 'Brilliant' - Greer Gardens, OR (Qt - 8") 3/9

*Prunus serrula* - Greer Gardens, OR (Bare-root 8') 3/9

Wisteria 'Purple Patches' - Greer Gardens, OR (1 gal vine) 3/9

Pseudotsuga menziesii 'Roger's Weeping' - Greer Gardens, OR (1 gal - 5") 3/9

Azalea X 'Pryored' (NA 36544) - Nat. Arb. (Qt - 10") 3/9

Magnolia X 'Spectrum' (NA 28352) - Nat. Arb. (Qt - 10") 3/9

Platanus X 'Columbia' (NA 36539) - Nat. Arb. (Qt- 15") 3/9

Platanus X 'Liberty' (NA 36537) - Nat. Arb. (Qt - 15") 3/9

Ulmus parvifolia 'Dynasty' (NA 36533) - Nat. Arb. (Qt - 12") 3/9

Raphiolepis delacouri (R. indica X R. umbellata) - Don Rose, CA (Gal.-cut down) 3/9

Raphiolepis umbellata - Don Rose, CA (Gal.-cut down) 3/9

Raphiolepis indica X 'Ballerina' - Don Rose, CA (Bordiers) (Gal.-cut down) 3/9

Raphiolepis indica X 'Clara' - Don Rose, CA (Hines) (Gal.-cut down) 3/9

Raphiolepis indica X 'Coates Crimson' - Don Rose CA (Leonard Coates Nursery) (Gal.-cut down) 3/9

Raphiolepis indica X 'Enchantress' - Don Rose, CA (Cal.-cut down) 3/9

Raphiolepis indica X 'Jack Evans' - Don Rose, CA (Gal.-cut down) 3/9

Raphiolepis indica X 'Pink Lady' - Don Rose, CA (Gal.-cut down) 3/9

Raphiolepis indica X 'Pinkie' - Don Rose, CA (Gal.-cut down) 3/9

Raphiolepis indica X 'Rosea' - Don Rose, CA (Gal.-cut down) 3/9

Raphiolepis indica X 'Snow White' - Don Rose, CA (Christensen Nursery) (Gal.-cut down) 3/9

Raphiolepis indica X 'Springtime' - Don Rose, CA (Christensen Nursery) (Gal.-cut down) 3/9

Raphiolepis indica X 'Summertime' - Don Rose, CA (Gal.-cut down) 3/9

Raphiolepis indica X 'Pink Beauty' - Don Rose, CA (Gal.-cut down) 3/9

Raphiolepis indica X 'Harbinger of Spring' - Don Rose, CA (Hines) (Gal.-cut down) 3/9

Gentiana szecheyi - We-Du Nurseries, NC (3" pot) 3/12

Baptisia alba - We-Du Nurseries, NC (3" pot) 3/12

Baptisia australis - We-Du Nurseries, NC (3" pot) 3/12

Helianthus atrorubens - We-Du Nurseries, NC (3" pot) 3/12

Pleea tenuifolia - We-Du Nurseries, NC (3" pot) 3/12

Viburnum boninsimense (NA 3553) - National Arb. 3/16

Ligustrum japonicum (dwarf clone NA 3632) - National Arb. 3/16

Iris tectorum (NA 3215) - National Arb. 3/16

Ophiopogon jaburan 'variegated' (NA 3004) - National Arb. 3/16

Hemerocallis sp. (NA 3574) - National Arb. 3/16

Elaeagnus glabra (NA 3609) - National Arb. 3/16

Aspidistra elatior 'Akebonoe' (NA 3005) - National Arb. 3/16

Lycoris albiflora (NA 3296) - National Arb. 3/16

Fern (Unk.) (NA 3545) - National Arb. 3/16

Fern (Unk.) (NA 3568) - National Arb. 3/16

Fern (Unk.) (NA 3549) - National Arb. 3/16

Fern (Unk.) (NA 3577) - National Arb. 3/16

Fern (Unk.) (NA 3580) - National Arb. 3/16

Fern (Unk.) (NA 3554) - National Arb. 3/16

Fern (Unk.) (NA 3580) - National Arb. 3/16

Pteris multifida (NA 3553) - National Arb. 3/16

Sedum (Unk. sp.) (NA 3103) - National Arb. 3/16

Sedum spectabile (NA 3567) - National Arb. 3/16

Ligustrum quihoui (NA 3667) - National Arb. 3/16

Lilium sp. (NA 3691) - National Arb. 3/16

Hepatica asiatica (NA 3744) - National Arb. 3/16

Lilium sp. (NA 3690) - National Arb. 3/16

Asarum sp. (NA 3128) - National Arb. 3/16

Codonopsis lanceolata (NA 3006) - National Arb. 3/16

Ilex cornuta (NA 3702) - National Arb. 3/16

Actinodaphne lancifolia (NA 3841) - National Arb. 3/16

Polygonatum involucreatum (NA 3229) - National Arb. 3/16

Allium sp. (NA 3572) - National Arb. 3/16

Aconitum puchellum (NA 3714) - National Arb. 3/16

Magnolia acuminata 'variegata' - Kew Gardens, England (Scions - successfully grafted) 4/1

Sibiraea laevigata (MA 275-83) - Morton Arb. (1 gal - 1') 4/1

Ilex X 'Rock Garden' - Holly Society of America (3" rooted cutting) 4/1

Liriope 'Hawk's Feather' - Curtis Lantis, FL (Division) 4/3

Liriope 'Border Gem' - Curtis Lantis, FL (Division) 4/3

Liriope 'Curly Twist' - Curtis Lantis, FL (Division) 4/3

Hymenocallis liriosome (?) - Dug from wild near El Campo, TX 4/3

Quercus texana - Glen Flora Nursery, TX (1 gal- 8") 4/3

Ulmus crassifolia - Greenleaf Nursery, TX (1 gal. - 18") 4/4

Raphiolepis X 'Jack Evans' - Greenleaf Nursery, TX (1 gal. - 6") 4/4

Lagerstroemia indica 'Christiana' - Greenleaf Nursery, TX (1 gal - 10") 4/4

Lagerstroemia indica 'Firebird' - Greenleaf Nursery, TX (1 gal - 10") 4/4

Lagerstroemia indica 'Candycane' - Greenleaf Nursery, Tx (1 gal - 10") 4/4

Phlox (Unk. cv.) - Greenleaf Nursery, TX (Gal - 6") 4/4

Eriobotrya japonica - Greenleaf Nursery, TX (Liner - 6") 4/4

Koelreuteria bipinnata formosa - Greenleaf Nursery, TX (Liner - 6") 4/4

Chrysactinia mexicana - Lone Star Growers, TX 4/5

Vitex trifolia variegata - Lone Star Growers TX (1 gal -1') 4/5

Pistachia texana 'Pecos Dwarf' - Lone Star Growers, TX (1 gal - 6") 4/5

Mahonia gracilis - Lone Star Growers, TX (Seedling - 6") 4/5

'Coppertone' - Claimed bigeneric hybrid of Eriobotrya X Photinia (likely Raphiolepis) - Lone Star Growers, TX (Qt - 6") 4/5

Rhus virens - Lone Star Growers TX (Seedling - 6") 4/5

Bauhinia lunarioides - Lone Star Growers, TX (1 gal - 1') 4/5

Styrax americana - Lone Star Growers, TX (1 gal - 2') 4/5

Cercis mexicana - Lone Star Growers, TX (Qt - 8") 4/5

Aesculus mexicana - Lone Star Growers, TX (Qt - 8") 4/5

Rhamnus sp. - Lone Star Growers, TX (Qt - 8") 4/5

Fern (Unk. Mexican sp. - grey foliage) - Lone Star Growers, TX (Qt - 8") 4/5

Euphorbia antisyphilitica (Candelilla) - Lone Star Growers. TX (Qt - 8") 4/5

Calyophus hybrid - Lone Star Growers, TX (Qt - 4") 4/5

Cercocarpus montanus - Lone Star Growers, TX (Qt - 6") 4/5

Yucca arkansana - Lone Star Growers, TX (Seedling - 3") 4/5

Echinops setifera - Korean Seed NA 3900 - Potted 4/6

Scilla scilloides - Korean Seed NA 3683 - Potted 4/6

Tricyrtis dilatata - Korean Seed NA 3763 - Potted 4/6

Leibnitzia anandria - Korean Seed NA 3899 - Potted 4/6

Hemerocallis sp. - Korean Seed NA 3574 - Potted 4/6

Dianthus sinensis - Korean Seed NA 3250 - Potted 4/6

Hosta sp - Korean Seed NA 3610, 3616, 3566 - Potted 4/6

Viburnum rufidulum - TAMU Renner Station, TX (Unrooted cuttings - potted 6/15) 4/7

Styrax texana - TAMU Renner Station, TX (Unrooted cuttings - potted 6/15) 4/7

Styrax platanifolia - TAMU Renner Station, TX (Unrooted cuttings - potted 6/15) 4/7

Styrax youngae - TAMU Renner Station TX (Unrooted cuttings - potted 6/15) 4/7

Cornus florida (Monterrey, Mexico ecotype) - TAMU Renner Station TX (1 gal - 10") 4/7

Weigela florida 'Eva Supreme' - ? (Bareroot 3') 4/10

Iris kaempferi 'Kagori Ri' - Powell's Gardens, NC (Gal.) 4/10

Nandina domestica 'Royal Princess' - Rushings Nursery, AL (Qt - 6") 4/15

Cryptomeria japonica f. radicans (BS 260) - Brookside Gardens 4/15

Euonymus sieboldiana 'Issai' (BS 581) - Brookside Gardens 4/15

Ilex integra 'Green Shadow' (BS 712) - Brookside Gardens 4/15

Osmanthus heterophyllus 'Sasaba' (BS 715) - Brookside Gardens 4/15

Carex phyllocephala 'Sparkler' (BS 1403) - Brookside Gardens 4/15

Miscanthus sinensis (BS 1451) - Brookside Gardens 4/15

Ilex X wandoensis (BS 1708) - Brookside Gardens 4/15

Trachelospernum sp. (BS 1776) - Brookside Gardens 4/15

X Cupressocyparis leylandii 'Green Spire' (questionable) (BS 1839) - Brookside Gardens 4/15

Cotoneaster salicifolius (BS 1916) - Brookside Gardens 4/15

Juniperus conferta 'Akebono' (BS 1925) - Brookside Gardens 4/15

*Cornus officinalis* 'Issai Minari' (BS 1929) - Brookside Gardens 4/15

*Juniperus conferta* (BS 1932) - Brookside Gardens 4/15

*Fokienia hodginsii* - National Arb. (5 gal - 5') 4/15

*Abies mariesii* (NA 51364) - National Arb. 4/15

*Albizia coreana* (NA 53290) - National Arb. 4/15

*Alnus japonica* (NA 55039) - National Arb. 4/15

*Alnus mayri* (NA 55223) - National Arb. 4/15

*Arisaema heterophyllum* (NA 55113) - National Arb. 4/15

*Aster hispidus* (NA 55067 and 55189) - National Arb. 4/15

*Aster spathulifolius* (NA 55237) - National Arb. 4/15

*Belamcanda chinensis* (NA 55138) - National Arb. 4/15

*Broussonetia kazinoki* (NA 55101) - National Arb. 4/15

*Callicarpa dichotoma* (NA 55250) - National Arb. 4/15

*Callicarpa japonica* (NA 55088 and 55108) - National Arb. 4/15

*Carpinus coreana* (NA 55061) - National Arb. 4/15

*Carpinus laxiflora* (NA 55056) - National Arb. 4/15

*Celtis choseniana* (NA 55159) - National Arb. 4/15

*Celtis sinensis* (NA 55093) - National Arb. 4/15

*Chrysanthemum indicum* (NA 55236) - National Arb. 4/15

*Clematis heracleifolia* (NA 55177) - National Arb. 4/15

*Clematis heracleifolia* var. *dauidiana* (NA 55120 and 55231) - National Arb. 4/15

*Clerodendrum trichotomum* (NA 55140) - National Arb. 4/15

*Cornus kousa* (NA 55043 and 55081) - National Arb. 4/15

*Dianthus superbus* (NA 55175) - National Arb. 4/15

*Diospyros lotus* (NA 55059, 55092, 55100, and 55279) - National Arb. 4/15

*Gleditsia japonica* (NA 55224) - National Arb. 4/15

*Grewia biloba* (NA 55085, 55188, and 55126) - National Arb. 4/15

*Gypsophila oldhamiana* (NA 55195 and 55130) - National Arb. 4/15

*Ledum palustre* (NA 51188) - National Arb. 4/15

*Lindera erythrocarpa* (NA 55038) - National Arb. 4/15

*Lindera obtusiloba* (NA 55079 and 55203) - National Arb. 4/15

*Euonymus sieboldiana* (NA 55282) - National Arb. 4/15

*Euscaphis japonica* (NA 55192) - National Arb. 4/15

*Iris laevigata* (NA 55176) - National Arb. 4/15

*Magnolia officinalis* (NA 55243) - National Arb. 4/15

*Pardanthopsis dichotoma* (NA 55136) - National Arb. 4/15

*Paulownia tomentosa* (NA 55218) - National Arb. 4/15

*Peucedanum japonicum* (NA 54879) - National Arb. 4/15

Photinia villosa (NA 55206 and 55224) - National Arb. 4/15

Picea glehnii (NA 51232) - National Arb. 4/15

Pinus densiflora (NA 55207 and 55235) - National Arb. 4/15

Pinus thunbergii (NA 55119, 55171, 55182 and 55220) - National Arb. 4/15

Platycarya strobilacea (NA 55247) - National Arb. 4/15

Pyrus ussuriensis (NA 55217) - National Arb. 4/15

Quercus myrsinifolia (NA 55249) - National Arb. 4/15

Quercus serrata (NA 55107) - National Arb. 4/15

Quercus variabilis (NA 55040) National Arb. 4/15

Rhus chinensis (NA 55205) - National Arb. 4/15

Rhynchosia acuminatifolia (NA 55097) - National Arb. 4/15

Sapium japonicum (NA 55170 and 55185) - National Arb. 4/15

Senecio nemorensis (NA 55112) - National Arb. 4/15

Sorbus alnifolia (NA 55173) - National Arb. 4/15

Styrax obassia (NA 55073) - National Arb. 4/15

Ulmus parvifolia var. coreana (NA 55242) - National Arb. 4/15

Viburnum dilatatum (NA 51291) - National Arb. 4/15

Viburnum sargentii f. calvescens (NA 51200) - National Arb. 4/15

Vitex rotundifolia (NA 55280) - National Arb. 4/15

Weigela praecox (NA 55193) - National Arb. 4/15

Weigela subsessilis (NA 55111) - National Arb. 4/15

Zelkova serrata (NA 55179) - National Arb. 4/15

Ilex X (dimorphophylla X cornuta) - National Arb. (4" pot - 15") 4/18

Magnolia zenii - National Arb. (4" pot - 6") 4/18

Bamboo (Unk. clone with variegated stems) - Private garden Glendale, MD (Division) 4/18

Viburnum plicatum plicatum (Pink Clone) - Shadow Nursery, TN (unrooted cuttings - potted 6/15) 4/30

Acer palmatum 'Tattoo' - Shadow Nursery, TN (1 gal graft - 8") 4/30

Magnolia grandiflora 'D. D. Blanchard' - Shadow Nursery, TN (Qt. liners -10") 4/30

Opuntia (Unk. upright sp.) (unrooted pad - direct rooted in 1 gal - 8") 5/2

Kalmiopsis leachiana - ? (3" pot - 4") 5/5

Abies pinsapo var. marocana - Arnold Arb. (Seedling from Native N. Africa collected seed - 6") 5/8

Abies pinsapo var. tazaotano Arnold Arb. (Seedling from Native N. Africa collected seed - 6") 5/8

Acer palmatum 'Waterfall' - McDonald Nursery, NC (1 gal - 2') 5/10

Acer palmatum 'Red Select' - McDonald Nursery, NC (1 gal - 3') 5/10

Acer palmatum 'Brocade' - McDonald Nursery, NC (1 gal 3') 5/10

Acer palmatum 'Butterfly' - McDonald Nursery, NC (1 gal - 2') 5/10

Acer palmatum 'Red Filigree Lace' - McDonald Nursery, NC (1 gal - 3') 5/10

Cotinus coggygia 'Velvet Cloak' - McDonald Nursery, NC (5 gal - 2') 5/10

Nerium oleander 'Avent Hardy' - Tony Avent, NC (Gal -1') 5/10

Pyracantha coccinea 'Lalandei' - Don Rose, CA (Gal.-cut down) 5/12

Pyracantha fortuneana 'Cherri Berri' - Don Rose, CA (Hines) (Gal.-cut down) 5/12

Pyracantha fortuneana 'Graberi' - Don Rose, CA (Gal.-cut down) 5/12

Pyracantha koidzumii 'Red Elf' - Don Rose, CA (Gal.-cut down) 5/12

Pyracantha koidzumii 'Santa Cruz' - Don Rose, CA (Leonard Coates Nursery) (Gal.- cut down) 5/12

Pyracantha 'Leprechaun' - Don Rose (Gal.-cut down) 5/12

Davidia involucrata (Sonoma Hort. Clone) - Sonoma Hort. Nursery, CA (1 gal - 6") 5/12

Thuja koreana - Tom Dilatush Nursery, NJ (1 gal - 6") 5/15

Alnus mayri (Morris Arb. #411) - Seedlings potted 5/15

Celtis sinensis (Morris Arb. #240) - Seedlings potted 5/15

Celtis bungeana (Morris Arb. #288) - Seedlings potted 5/15

Celtis choseniana (Morris Arb. #346) Seedlings potted 5/15

Carpinus coreana (Morris Arb. #259) - Seedlings potted 5/15

Callicarpa dichotoma (Morris Arb. #439) - Seedlings potted 5/15

Callicarpa japonica (Morris Arb. #285) - Seedlings potted 5/15

Koelreuteria paniculata (Morris Arb. #471) - Seedlings potted 5/15

Weigela praecox (Morris Arb. #381) Seedlings potted 5/15

Iris laevigata (Morris Arb. #364) - Seedlings potted 5/15

Viburnum bitchiuense (Morris Arb. #319) - Seedlings potted 5/15

Pinus tabuliformis (Hoyt '84) - Seedlings potted 5/15

Maackia amurensis (Hoyt '84) - Seedlings potted 5/15

Pinus lambertiana (Hoyt '82) - Seedlings potted 5/15

Pinus pinaster (Hoyt '81) Seedlings potted 5/15

Pterocarya rhoifolia (Hoyt '85) - Seedlings potted 5/15

Abies nordmanniana - Greenfingers Tree Seeds, England - Seedlings potted 5/15

Abies homolepis - Greenfingers Tree Seeds, England - Seedlings potted 5/15

Abies firma - Greenfingers Tree Seeds, England - Seedlings potted 5/15

Cupressus bakeri - Greenfingers Tree Seeds, England - Seedlings potted 5/15

Fuchsia magellanica 'Double Otto' - Molbak's Nursery, WA (1 gal - 8") 6/3

Fuchsia magellanica 'Santa Claus' - Molbak's Nursery, WA (1 gal - 8") 6/3

Fuchsia magellanica 'alba' - Molbak's Nursery, WA (1 gal - 8") 6/3

Fuchsia magellanica 'Papoose' - Molbak's Nursery, WA (1 gal - 8") 6/3

Ilex aquifolium (Unk. cv. - sold as Osmanthus heterophylla 'variegata) Molbak's Nursery, (1 gal) 6/3

Thujopsis dolobrata 'nana' - Molbak's Nursery, WA (l gal -1') 6/3

Potentilla 'Smith's Gold' (horizontal spreading cv.) Molbak's Nursery, WA (l gal - 4") 6/3

Quercus ilex - Molbak's Nursery, WA (5 gal - 2.5') 6/3

Spirea X bumalda 'Limemound' - Molbak's Nursery, WA (1 gal - 8") 6/3

*Wisteria floribunda* 'Honey Bee Pink' - Molbak's Nursery, WA (1 gal - staked vine) 6/3

*Picea pungens* 'prostrata' - Molbak's Nursery, WA (3 gal - 6" T X 1.5' W) 6/3

*Tsuga diversifolia* - Wells-Medina Nursery, WA (1 gal - 1.5') 6/4

*Spartium junceum* - Wells-Medina Nursery, WA (1 gal - 2.5') 6/4

*Escallonia X exoniensis* 'Fradesii' - Wells-Medina Nursery, WA (1 gal - 1') 6/4

*Sequoia sempervirens* 'nana pendula' - Wells-Medina Nursery, WA (2 gal - 4" T X 1' W) 6/4

*Kalmia latifolia* 'Elf' - Wells-Medina Nursery, WA (1 gal - 10") 6/4

*Hypericum reptans* - Wells-Medina Nursery, WA (1 gal - 6") 6/4

*Hoheria populnea* - Western Hills Nursery, WA (Rooted cutting - 3") 6/10

*Magnolia liliiflora* (Red-Flowered Clone - Seoul, Korea) UBC Bot Garden KE3523 (Rooted Cutting - 8") 6/10

*Chamaecyparis nootkatensis* 'aurea' - Coenosium Gardens, PA (Graft) 6/12

*Chamaecyparis nootkatensis* 'compacta glauca' - Coenosium Gardens, PA (Graft) 6/12

*Chamaecyparis nootkatensis* 'variegata' - Coenosium Gardens, PA (Graft) 6/12

*Chamaecyparis pisifera* 'filifera variegata' - Coenosium Gardens, PA (Graft) 6/12

*Juniperus virginiana* 'filifera' - Coenosium Gardens, PA (Graft) 6/12

*Pinus virginiana* 'Pocono' - Coenosium Gardens, PA (Graft) 6/12

*Pinus virginiana* 'Wate's Golden' - Coenosium Gardens, PA (Graft) 6/12

*Quercus robur* 'argenteo-marginata' - Coenosium Gardens, PA (Graft) 6/1

*Thuja plicata* 'Gollyer's Gold' - Coenosium Gardens, PA (Graft) 6/12

*Juniperus sabina* 'variegata' - Coenosium Gardens, PA (Graft) 6/12

*Chamaecyparis thyoides* 'Heatherbun' - Coenosium Gardens, PA (Graft) 6/12

*Acer platanoides* 'Drummonidi' - Coenosium Gardens, PA (Graft) 6/12

*Parthenocissus virginiana* 'variegata' - Coenosium Gardens, PA (rooted cutting) 6/12

*Ficus nipponica* - Korean Seed NA 3532 - Potted 6/15

*Patrinia scabiosaefolia* - Korean Seed NA 3842 - Potted 6/15

*Potentilla dickinsii* - Korean Seed NA 3342 - Potted 6/1

*Paeonia suffruticosa* 'White Cv' - Viette's Nursery, VA (Gal) 6/19

*Iris kaempferi* 'White Cv' - Viette's Nursery, VA (Gal) 6/19

*Peltiphyllum peltatum* - Viette's Nursery, VA (Qt) 6/19

*Franklinia alatamaha* - Hoyt Arb. '84 Seed - Potted 6/20

*Cornus occidentalis* - Hoyt Arb. '82 Seed - Potted 6/20

*Mahonia nervosa* - Hoyt Arb. '82 Seed - Potted 6/20

*Viburnum erosum* - Morris Arb. #402 Seed (Korea) - Potted 6/20

*Caragana pekinensis* - U. of Wash. Seed #124 - Potted 6/20

*Caragana brevispina* - U. of Wash. Seed #123 - Potted 6/20

*Quercus lobata* - U. of Wash. Seed #12 - Potted 6/20

*Euonymus europea* - Hoyt Arb. '84 Seed - Potted 6/20

*Trochodendron aralioides* - U. of Wash. Seed #200 - Potted 6/20

Rhododendron schlippenbachii - Korean Seed NA 3888 - Potted 6/20

Rhododendron mucronulatum var. maritimum - Korean Seed NA 3626 - Potted 6/20

Actinidia arguta - Korean Seed NA 3711 - Potted 6/20

Pollia japonica - Korean Seed NA 3530 - Potted 6/20

Sanguisorba tenuifolia - Korean Seed NA 3624 - Potted 6/20

Hosta montana 'aureo marginata' - Mobjack Nursery, VA (gal) - 6/29

Hosta 'Saishu Jima' - Mobjack Nursery, VA (gal) - 6/29

Hosta 'Ginko Craig' - Mobjack Nursery, VA (gal) - 6/29