

JC Raulston Arboretum

Friends of the Arboretum Newsletter

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J. C. Raulston

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Greetings and a welcome to a very special and unique newsletter issue - not only chock full of goodies - but it is also my first time to make an announced publication date - truly remarkable! I'm changing the format a bit and putting the announcements here at the beginning as many have told me it takes so long to wade through all my verbose ramblings that half the events are over before they get to them! So - first a look ahead - and then a review of recent arboretum news. It's a long story this time - but then you've got until January to read it all.

Announcements and Coming Events

NIGHT COURSE - Once again this fall Bryce Lane will offer his excellent and popular course Plants for Home and Pleasure (a general home gardening course) on Wednesday nights 7:00-8:40 beginning August 31 and continuing 15 weeks into December. It will meet in Room 125 of Kilgore Hall. Enrollment may be handled through the Division of Continuing Education at the NCSU McKimmon Center on Western Boulevard.

SEPTEMBER 17 - AUTUMN ARBORETUM SOCIAL - On Saturday, September 17 at 4:00, we will have a tank of ice-cold watermelons at the Arboretum to cut and share. We'll also walk and look at the new garden additions - plants, facilities, programs. There will also be a swap and give-away table - bring extra plants, cuttings, divisions, from your garden to trade or give away; or plants you'd like for others to see. (Anyone game for a seed-spitting contest?)

SEPTEMBER 18 - PUBLIC LECTURE - On Sunday afternoon at 3:00 PM, I will be presenting a free lecture on Great Gardens of the East Coast at the N. C. Museum of Natural History. It will cover the features of many gardens from Fairchild Tropical Gardens in Miami to Asticou Gardens in Maine.

OCTOBER 1-2 And NOVEMBER 5-6 WEEKENDS - THE "MAMMOTH PERENNIALS RE-PLANTOUT" - The huge perennial border planted this spring will undergo a complete replanting to perfect the design for better color display, sequence of bloom, arrangement of heights and to incorporate new plants. It will take an enormous amount of help and we'll be having student workdays on those 4 days from 9:00-4:00, and anyone interested in perennials or in just helping would be most welcome. (P.S. - many of the perennials must be divided and thinned, and we'll need good homes to send the extra plants to.)

OCTOBER 8 - DWARF CONIFER DAY - This is a second scheduling of the program which was announced in the spring. It will be an all-day program consisting of a slide lecture on dwarf conifers and great collections of them in various arboreta around the world, followed by tours of 4 excellent dwarf conifer collections in the Triangle area. Registration for the day is \$10 which will include transportation and lunch. Please call my secretary, Emily Tate, (919-737-3132) to reserve your place and obtain information on where to meet - registration will be limited to not overcrowd the private gardens to be visited.

OCTOBER 13 - FRIENDS OF THE NCSU Arboretum (now the JC Raulston Arboretum) SLIDE SHOW - On Thursday evening at 8:00 PM in Room 159 Kilgore Hall, I'll present a slide show on plant and garden highlights of the spring and summer of 1983 including my early summer visits to PA, NJ, and CT gardens; summer tour of Minn, Wisc, and Chicago gardens and German gardens including the IGA show in Munich. We'll also have our fall plant distribution with several extra-special "goodies" this time.

NOVEMBER 5-6 - PERENNIALS WORKDAY - See October 1-2 announcement above.

NEXT NEWSLETTER in January. Enjoy the fall - visit the arboretum often - many plants have dazzling fall color which may individually last only a short time and repeat visits help catch the variety available - the Japanese maples (*Acer palmatum* cvs.), smoketrees (*Cotinus*), Chokeberry (*Aronia*), Sweet Gums (*Liquidambar*), Sumacs (*Rhus*), and Barberries (*Berberis*) are particularly nice. Also the autumn fruit and berries make their great show. Take someone who has never been there and share the many treats of the garden.

Observation and Arboretum Notes

On one hand the April-July period has been full and busy as usual, on the other hand, some expected activities were changed and less than hoped for was accomplished. My scheduled group tours to DC-NYC and Germany fell by the wayside as I got tangled up with some doctors for some unexpected throat surgery and spent a month resting a little more than I'm accustomed to. Thankfully, all went well, I recovered very rapidly and am back 100% now. Will Hooker took the fine group on the DC-NYC tour for me and they hit the best spring in decades at its very peak. Everyone enjoyed the trip so much and such camaraderie developed that the group had a "reunion" picnic at the arboretum in July to renew the acquaintances that developed during the trip.

I managed only one trip out to visit gardens and collect materials but it was a dandy. After driving through Richmond on the Interstate bypass for 20 years and never stopping for a visit - I finally learned what grand things I had been missing as B. Townes of Wilkes Community College gave me a royal tour. Most of my visit was to a variety of private gardens and estates. One was a 5 acre property developed roughly 50 years ago by a rhododendron hybridizer. To properly prepare for rhododendron culture he covered most of the property with imported German peatmoss to a depth of 1"! He built an incredible collection of rhododendrons through importation of species and exchange with the noted American hybridizers of that period. In addition - over 1,000 cultivars of azaleas were planted, dwarf conifers, Japanese maples and many other choice plants (e.g. - I saw the extremely rare *Elliottia* for only the second time in my life; and my first time to see *Stewartia malachodendron* in bloom - 5 plants 15' tall in full bloom covered by the spectacular large white flowers with snowy purple stamens). The estate went into decline but over the past few years it has been brought back to its former glory and the present owners are propagating and selling many cultivars of rhododendrons rarely in commercial trade (only at the house - no mail order). If you are seriously interested in rhodys and azaleas and are passing through Richmond, a stop is well worthwhile (Mr. & Mrs. Jack Wyatt, 6311 Three Chopt Road, Richmond - 804/282-3846).

(While I'm on rhodys, I must digress for 3 notes.) (A) In visiting a fine collection in N.C. this spring I finally saw a cultivar in bloom I had long heard of - and am delighted to report it is as superb as reported. "Trudy Webster" is truly magnificent with excellent foliage, enormous trusses a good 10-14" in diameter of pale pink flowers 4-5" across. Well adapted to N.C. use. (B) After driving by within 200 yards of it for 7 years, I finally stopped to see the beautiful Vanlandingham Glen of rhododendrons on the campus of UNCC in Charlotte - well worth a stop in May to see acres of 8-15' tall rhododendrons in a woodland setting. (C) A secondhand (and unverified by me) story on rhodys came from a man who had spent years living and working in Nepal and was very familiar with the plants there. He said that he discovered a spot in N.C. comparable in "feel" to the rhododendron forests of the Himalayas and as spectacular as most in the British Isles. The place is the Knapdale Nursery near Parkton, N.C. which was apparently planted with over 60 acres of rhododendrons many decades ago and though many have been sold and the acreage has decreased, there are still some 20 acres of rhodys now up to 20' in height t }{\f13\fs20\ulw Attention Conifer Crazyes!}{\f13\fs20 Two notes of interest for you. (A) In the fall a gathering of 32 conifer specialists was held at the home of Joel Spingarn in NY and from this meeting a new plant Society has developed - The American Conifer Society - with a goal to popularize dwarf conifers. To become a charter member one can send a check forrested in record sized trees - a National Register of Champion Trees of the U.S. is available for \$3.00 from National Registry of Bil've ever seen; enormous old magnolias, many others. There is also a rather fine example of classic Italian Renaissance hillside garden with stone terraces and a water cascade. A Japanese garden has been added in recent years but sadly lacks in finish detail work and much vandalism even though it does contain some fine individual specimen plants.

Then on northeast for 3 intense days of plants and touring with Steve Wheaton of Swarthmore and Tom Dilatush of Dilatush Nursery as my guides. Far too much to cover adequately but just a few highlights. I've been pushing *Cornus controversa* as a potential new N.C. nursery crop based on literature and performance of plants in our collection - finally saw numerous old specimens in full bloom in the Philadelphia area - more convinced than ever of its desirability - truly spectacular. A wonderful private small backyard garden containing over 1,000 different perennials (walking drenched in a solid downpour of rain for an hour and a half - but such plants that who cares about rain!) - including an interesting bigeneric hybrid - *Heucherella* from a *Heuchera* x *Tiarella* cross. The finest Chinese Fringetree (*Chimonanthus retusa*) I've seen - in full bloom at Barnes Foundation - magnificent (and again, well adapted to N.C.). At the Henry Foundation a brilliant red clone of the N.C. Cross Vine, native S.E. azaleas in full bloom, Amsonias, honeysuckles, lupines, and magnolias. At the Morris Arboretum an excellent tour by Paul Meyer to see all the recent changes, restorations, and additions to the arboretum - superb garden sculpture, the beautifully restored rock cascade area, magnificent old specimen trees everywhere. On to New Jersey and the delight of Mr. & Mrs. Dilatush and their beautiful nursery and superb dwarf conifer collection. Tom is one of the most consummate plantmen I've ever met - incredible knowledge of physiology, taxonomy, technical scientific literature - a day with him is like a semester immersion in technical training - made me aware of so much about plants and a wonderful person. The fine Rutgers University arboretum, then to the Bammbrook and Willowood collections (the largest *Metasequoia* I've seen - 80'; my first awareness of the delicate and beautiful blue-flowered shrub *Sophora davidi* - which should do well in N.C. and we now have; an incredibly fine fastigate *Juniperus virginiana* seedling perhaps 35' tall and 3' in diameter); to Skyland - "New Jersey's finest garden" - excellent wisteria, conifers and heathers. The tour concluded with a day in Connecticut visiting the research plots of Dr. Sidney Waxman of U. Conn. His research involves dwarf conifers - the genetics of the inheritance of dwarf characteristics, propagation and cultural techniques. It was truly exciting to tour his acres of plantings and thousands of different conifer seedlings. Most of the work involves white pine and Canadian hemlock but many other species are also represented. I was able to obtain a 4' diameter dwarf pine of our arboretum (which completely fills the back of a VW!) and 2 specimen paperbark maples (*Acer griseum*) about 9' tall and 4" caliper which we'll get this winter and plant on either side of the entrance to the lath house. I was particularly overwhelmed by his block of dozens of 6-14' specimen Japanese Umbrella Pines (*Sciadopitys verticillata*) which he sells to nurserymen at \$500-\$1,000 apiece to pay for his

research program - they were magnificent! One last stop on the return at Oliver's Nursery in Fairfield, CN (a retail-only garden center on my speciality nurseries list at the arboretum) - my first visit and I was thoroughly impressed. It is relatively small but handles a wide range of superior plants - fine conifers, rhododendrons, deciduous azaleas, broadleafed evergreens, perennials, wild flowers, and others. Display gardens showed landscape groupings of specimen plants and demonstration plantings - a wonderful rock garden with old dwarf conifers, a perennials bed, etc. The most extraordinary feature was their alpine and rock garden plants section - a first for me in an American retail nursery. They sold not only individual alpines in pots - but also constructed and planted trough gardens for people to buy completed plantings. The troughs varied from 6"x6" to 2'x5' and varied from a few plants in gravel to entire miniature gardens with rock outcroppings and dozens of species. Prices for the completed troughs varied from \$50 to \$300. (For those unfamiliar - "troughs" were once just that - a trough chiseled from solid stone to hold water for animals. Gardeners made holes in the bottom for drainage and filled them with an extremely porous soil mix perfect for growing alpines. Genuine troughs are rare, very expensive and extremely heavy. Today they are made from various mixtures which provide boxes that look like stone as they age - but are lighter and affordable. One such formula is: 2 parts Portland cement, 1 part sand, 1 part moistened peat moss, 1 part fine perlite, 1/4 part vermiculite - mix dry ingredients together - add water until a ball can be formed when squeezed - spread mixture over a box shaped form of chicken wire molds about 2" thick and allow to dry. Troughs may be any shape or size - generally about 6-8" deep - and drainage holes must be left.) Of course, I had to pick up a few more plants (including a beautiful groundcover broom - *Cytisus*) to fill the remaining niches in my load of pots, ice chests with cuttings, divisions, etc.

Arboretum Notes

Fall - in dry climates palms can handle lower temperatures than in areas where rain may fall in crowns and freeze around the one growing point. This was beautifully shown by two Windmill palm (*Trachycarpus fortunei*) plants in the arboretum - one in the open and one in the visitor center (overhead cover but no temperature protection). It rained heavily all day and that night temperatures fell to 10 degrees Fahrenheit (coldest of winter) encasing everything in ice. The covered palm survived and the one with the wet crown died. We also had severe damage on the large Agave which in previous winters had tolerated 10 degrees and lower with no injury at all - likely for the same reason. Incidentally - the hardiest palms for use in N.C. are the Mediterranean Fan Palm - *Chamaerops humilis*, Needle Palm - *Rhapidophyllum hystrix* and Windmill Palm - *Trachycarpus fortunei*. For best results they should receive shade during winter months and a roof overhang may prevent crown freezing. West of Charlotte in the town of Shelby there is an old planting of Windmill palms now about 16' tall which certainly have endured 0 degrees or lower temperatures over the years.

01/15/83 - Of our 40+ species of ferns in the lath house, the following remained evergreen all winter (is that redundant?): Christmas fern - *Polystichum acrostichoides*; Ebony spleenwort - *Asplenium platyneuron*; Common polypody - *Polypodium vulgare*; Evergreen woodfern - *Dryopteris marginalis*; Toothed woodfern - *Dryopteris spinulosa*; also *Dryopteris atrata* hirtipes, *Dryopteris ludoviciana*, *Polystichum andersonii*, and the most attractive one of all for winter garden appearance - *Dryopteris erythrosora*, the Japanese Wood Fern.

Weather is never dull when one gardens - this year the latest major snowstorm in history here - about 8" when daffodils and redbuds in full bloom - bizarre!

With winter low of about 8-10 degrees, and that for only a brief period of time during the winter, and rarely down to 15 degrees - this was the mildest winter in decades and allowed many marginal materials to survive that normally would not be expected to overwinter. Perhaps most surprising were the very tender *Solanum jasminoides album*, *Eucryphia x nymansensis*, *Rhus interigifolia*, *Corokia cotoneaster*, *Berberis darwinii*, and *Edgeworthia papyrifera* which survived. Other plants which lived that were somewhat unknown but expected to be marginal included *Convolvulus cneorum*, *Rhododendron simsii variegata*, *Washingtonia filifera*, *Callistemon sieberi*, *Jasminum officinale*, *Myrica californica buxifolia*, *Podocarpus totara*, *Mahonia nevinii*, *Cornus capitata*, *Hebe cupressoides*, *Pachysandra stylosa*, and *Scirpus tabernaemontani zebrinus* Shima-Futo.

But there were losses (you've always got to try something so marginal you'll be truly excited if it beats all odds and survives). *Desfontainea spinosa* from Chile, *Damnacanthus indicus* from the Himalayas, and *Embothrium coccineum* from Chile as examples. My biggest worry of the winter concerned a flat of my choicest new plants which were in the lath house to be placed in an overwintering house when the 10 degrees and ice period mentioned above unexpectedly hit. I didn't realize it was getting so cold until I heard the temperature on a weather report late at night. I raced to the farm and the pots and root balls were solidly frozen and I was certain I had lost all the best items of a year of collecting (roots are damaged with much less temperature drop than needed to damage tops - the reason container growers have to take extra overwintering precautions) - which depressed and nagged at me all winter. But they were moved to appropriate storage for the rest of the winter - and I was delighted when the *Cornus kousa variegata*, *Magnolia macrophylla* Whopper, and *Cornus controversa variegata* finally leafed out and began to grow. Too close for comfort!

04/03/83 (Easter) - Magnificent flower displays - 96 different things in bloom. Some unusual ones for this area - *Neviusia alabamensis*, *Prunus Hally Jollivet* (a superb plant - long flowering period, blooms when quite small, roots very easily from summer cuttings), Paw Paw - *Asimina triloba*, *Rhododendron Chapmanii x mucronulatum* (first evergreen rhododendron to bloom - excellent), *Trailing arbutus* *Epigea repens*, *Fothergilla gardenii*, *Enkianthus perulatus*, *Corylopsis pauciflora*, *Stachyurus praecox*, *Pachysandra stylosa*. Two plants which were particularly outstanding for continuous bloom over a 4 month period were the heather - *Erica Arthur Johnson* and the tiny but wonderful *Houstonia caerulea alba* - no plant could produce more flowers longer in relation to plant size. New to me this year and now one of my favorite must plants.

A near disaster with a very late freeze like last year - predicted to hit 24 degrees with most plants in full leaf and actively growing. Tracy Segner drew on her girl scout training and with the assistance of the farm crew a irrigation pipe teepee covered with black plastic was built big enough to completely enclose the big cutleaf Japanese maple and a heating element was placed inside to raise the

temperature - a mammoth task. On really rare plants - particularly some Magnolias - we mounded soil around plant bases so if the top was killed we might regenerate the plant by basal sprouts. Many areas were devastated that night - luckily we went only to 28 degrees and survived with no serious injury - but way too close for comfort.

Big spring accomplishments - (1) digging, dividing (both major difficult tasks) and moving the grasses collection to new location; (2) creation of the "Secret Garden" by clearing an area under the large Japanese evergreen oak, planting hosta and liriopse and installing seats; (3) tearing out the entire groundcovers plots area, putting in wooden dividers to keep plants from growing into other plots, and replanting; (4) building planting beds in front of lath house for Ericaceous plants; (5) installation of the bronze memorial marker in the Southall Garden; (6) movement of the entire rose planting (for the second time in two years!) from the north side of the annual beds to the south side (my hindsight is far superior to my foresight). Many thanks go to the dozens of people who helped on these projects.

04/23/83 - Clematis montana rubens in bloom; another learning experience as 90% of visitors strongly dislike the bed of red and yellow Texas tulips at the visitor center (after we've done all the things to ensure they rebloom at least 3 more years - sigh!); incredible bloom on hollies this year - full of bees; Prunus glandulosa and Stranvaesia davidiana dead of fireblight; peak of Viburnum bloom; Daphne Ruby Glow beautiful in flower; excitement to see the rare and difficult Kalmiopsis full of flowers.

05/03/83 - Exciting day - first flower bud opens on our Laburnocytisus adamii and it is the true chimera form with yellowish-pink flowers. Grafted wood can yield the Laburnum reversion so we're lucky. A very rare and remarkable plant and I bubble with excitement for days. First bloom on our 3 year old Cornus controversa - flowers cover plant - but no seed set later. Rhod. Holden impresses me as much as last year - beautiful. Iris tectorum album - like white orchids - exquisite.

05/27/83 - Bloom on: Erica tetralix Pink Star, Kalmia latifolia (peak), Genista pedunculata diffusa, Potentilla nepalensis Miss Wilmont, Jasminum parkeri, Gypsophila cerastroides, several Amaryllis, Bletilla stricta alba, Azalea Chinsayi, Siberian iris, Coreopsis Sunray at peak and a sheet of yellow 15' x 25' - wonderful, Cotinus spectacular this time of year for first time, Itea oldhamia, miniature roses at peak.

06/03/83 - Bloom on: Clinopodium coccineum, all deciduous hollies, Rosa gallica officinalis, Jasmine humile revolutum, Potentilla tridentata, Cornus kousa Summer Stars, Nandina Moyers Red - distinctly pink flowers - all others are white; Sapindus drummondii and Hovenia dulcis - first time to flower for both - 5 years from seed, Lilium Connecticut King - finest of lilies in collection - superb.

06/26/83 - Bloom on: Cyrilla parviflora, Clethra acuminata, Gordonia lasianthus, Agapanthus Peter Pan (about 2-3 weeks earlier than the species), Vitex at peak, Magnolias Royal Crown and Susan in rebloom, Erica ciliaris Maweanana and Stoborough.

07/05/83 - Very excited with seedlings emerging from plantings of seed from Chinese botanical gardens - several extremely rare or not even listed in the limited literature I have - Cercis chingi, Chimonanthus nitens, Phellodendron chinensis, Keteleeria evelyniana and Arisaema jacquemonti.

After the much-extended cool, moist period of spring and early summer the great heat wave of '83 finally hit July 10-23 with 13-days above 90° and a peak of 100°. Plants from cooler climates such as Chile, New Zealand, the Himalayas and the Pacific N.W. were badly stressed and many died. Losses included Torreya californica, Abies concolor 'Candicans', Abies lasiocarpa, Cornus florida - 'Junior Miss', 'Cherokee Chief', and 'Purple Glory', Idesia polycarpa, Parrotiopsis jacquemonti, Nothofagus antarctica, Rhododendron macrophyllum, Tanaka radicans, Vancouveria planipetala, Garrya elliptica 'James Roof', Prunus lusitanica (borers), Cassiope lycopoides. Many plants responded to the drought by dropping leaves to reduce water stress and protect themselves - major defoliation occurred on Corylus avellana, Salix matsudana 'Torulosa', Salix babylonica 'Crispa', Taxodium mucronatum, Platanus, several deciduous Magnolias (in first year and not yet established, older plants seemed remarkably drought resistant), and Populus hybrids.

07/22/83 - First concrete poured for the footing of the wall to surround the Japanese Zen garden. Over the next 2 weeks all the base will be poured and the wall will be constructed in August.

07/23/83 - The big lightning-killed white oak in the northwest corner of the arboretum was cut down and removed. It had a trunk diameter of 48" and a ring count proved it to be about 75-80 years old. We will keep a trunk cross-section showing the annual rings for an educational display in the visitor center.

On our summer tour guide sheet we drew attention to our young Paw-Paw tree (Asimina triloba) which is tucked back behind other trees where it is rarely seen by the average visitor. Thinking of its rapid growth, attractive foliage, and the first fruit it set this year - I felt the following note in the July '83 NCSU Forest Resources Letter (Vol. 12, No. 7) worth sharing.

"The American paw paw, a horticultural orphan, may emerge as one of our most valuable fruit trees" according to U.S.D.A. research scientists, John P. Cherry and R. Neal Peterson. Why a fruit that has a fragrant aroma, the custard-like texture of a banana and the rich sweet taste of a peach has been neglected is a mystery. Pawpaw, a member of the apple-custard family, is "potentially the most important wild fruit in the United States," state the scientists. A nutritional analysis found it to be high in unsaturated fats, proteins, carbohydrates, and an excellent source of vitamin A and C. It contains higher amounts of potassium, phosphorous, magnesium, sulfur, iron and six times the amount of essential amino acids than found in apples, peaches or grapes. In colonial (and possibly current times), a "spirituous liquor" was made from pawpaw fruit. The fibrous inner bark makes an excellent fish stringer. Pawpaw patches may be found in North Carolina along deep, rich, moist coastal river bank soils and in mountain coves. It is a hardy tree 25 to 35 feet tall, with few insect and disease problems. Propagation is from seed, layering or root cuttings."

A real pity such a beautiful foliaged native plant has never made it into the nursery/landscape industry.

Interesting plant combination/landscape ideas seen or heard.

1. Interplant lily-of-valley and bleeding heart. Lily-of-valley will emerge early and flower, bleeding heart grows up over lily-of-valley and flowers - then dies back in summer leaving lily-of-valley foliage instead of bare bed. (Heard about - wonder if vigor of lily-of-valley would eventually crowd out bleeding heart unless periodically thinned and replanted).
2. Interplant English ivy and Virginia creeper (*Parthenocissus quinquefolia*) as a groundcover in large areas of light shade. In summer, foliage of the Virginia creeper will grow above the English ivy without damaging it giving a different summer/winter effect plus the addition of fall color as the Virginia creeper turns red and yellow. (Swarthmore)
3. Interplant 'Peter Pan' agapanthus and the red surprise lily *Lycoris radiata*). In the N.C. piedmont agapanthus foliage emerges in spring as the ~ foliage dies down, blue flowers of the agapanthus appear in June, then red flowers of the lycoris in fall. The lycoris foliage emerges about the time agapanthus dies back (NCSU Arboretum)
4. 'Blue Ridge' rhododendron has one of the most striking colors in the garden - an intense electric blue flower that caught the attention of all arboretum visitors. A good combination for color and bloom time would be B., 'Blue Ridge', ajuga and candytuft (*Iberis*) planted together. (NCSU Arboretum)

PEOPLE NEWS

During the summer we've accomplished a great amount in the garden and many visitors have commented about how good everything looks and how fine the maintenance has been this year. In addition to our normal outstanding help from our permanent people - John Scott, farm director; Clifton Ryan, farm technician; and Newell Hancock, the arboretum technician; we've had invaluable help from a wonderful group of people with special individual talents.

WILL, HOOKER, who teaches landscape design in our horticultural science department and practices commercial landscape architecture work, has given us countless hours of labor this summer and the leadership needed in developing the long-delayed Japanese garden. The garden was designed by undergraduate David Ostrich in a landscape class under the direction of Tracy Segner. But the step from paper plans to reality is a long, complex and most difficult one. Will involved his class in the early stages of construction, but the end of school (and his desire to build authentically with respect for the wood in the true spirit of a Zen Garden, using only hand-crafted construction without power tools) led to rapid disappearance of his student helpers. He has continued building (mostly alone or with his daughter Suzanne and her teddy bear) in the garden all summer, completing the viewing deck, and laying the foundation and building the wall surrounding the Zen garden. It has been an enormous gift of time and talent, without which we most certainly would still be looking at a bare expanse of soil on the site. Will and his classes also designed and built the visitors center and the paving materials display area in 1979. I can't thank this grand man enough for all he has contributed to the arboretum over the years, his beautiful spirit and great friendship.

To TED BILDERBACK and BRYCE LANE, also faculty in the horticultural science department, we thank for involvement of their classes in digging and moving the rose plants (again) to their new (and permanent!) area. Ted's arboriculture class also moved the large Japanese maple to the Japanese garden and prepared several large camellias for movement there this coming winter.

LARRY HATCH has worked in the arboretum this summer as a part of his graduate program research funding. Larry is from Syracuse, NY (really loved the July heat wave!) and received his BS in ornamental horticulture from Cornell University. He's been an avid gardener since childhood and still maintains a large collection of plants at his family home specializing particularly in junipers, sedums and sempervivums, and variegated plants. His MS research project under the direction of Dr. Paul Fantz is about as difficult a subject as I could possibly imagine. Trying to develop a taxonomic key to sort out the over 100 different named cultivars of *Juniperus horizontalis* that exist. One of his special projects for the arboretum has been working on preparation of label formats for plants. We've long been faced with the need for better and more permanent labels and have finally bitten the bullet on the great expense involved (\$5 per label) and will begin to order several hundred permanent labels each year and gradually label the collection. Labels will include the scientific name, common name, family, and country of origin. With his superb taxonomic knowledge, Larry has been a tremendous help in this project. Hopefully, you'll begin to see the new labels appearing this fall in the garden.

EDITH EDDLEMAN is serving as our curator of the new perennial border this year. Edith comes from Charlotte and is studying landscaping in our horticulture program. She has long grown perennials as a hobby and spent last summer studying design at a school in England where she had the opportunity to study in detail the magnificent perennial borders that exist in so many places there. She does custom landscape work for gardens and perennial borders in the Triangle area (919-286-7691 - if you need to hire some professional help) and designed the layout and planting plan for our border in the arboretum. This spring in our madhouse "plantout" rush to get it all planted in one day - most plants ended up in the wrong places - and we lacked many things her beautiful design called for. She went into complete shock the next week when she saw how badly we had butchered her design in our planting. But luckily we were able to talk her into continuing the project - this summer she's locating and propagating missing needed plants, maintaining the existing border, recording bloom dates, colors and heights on the existing plants, and planning for the "Great Perennials Replant of '83" this fall in which we'll dig, move, add to, and change to have the correct Gertrude Jekyll color scheme, heights, etc. It will be a mammoth task but the border next year will be (even more) magnificent thanks to Edith's dedication.

CURTIS BROOKS is our full-time summer worker in the arboretum this year. Coming from a Florida background, he went through the July heat wave without even realizing it had gotten warm. He has a degree in Botany from Duke, an MS in Plant Breeding from the University of Georgia, and has worked in a wide array of fascinating jobs ranging from being an interpretative ranger at the Corkscrew Swamp sanctuary in Florida to supervisor of the Duke Phytotron. He is now taking landscape courses in horticulture at NCSU. He's a man of many talents and superb plant knowledge we are most fortunate to have. He is making quite a personal sacrifice financially (we pay him a third of what he makes landscaping) to give up much of his personal design/build practice this summer to satisfy his desire to learn

more about the plants and programs of the arboretum. (He's looking for work this fall if anyone has landscaping needs - 919-929-9416 - hint, hint). We deeply appreciate his help and dedication. At home he's managed to develop his perennial border in a yellow/orange-free color scheme of all pink/ blue pastels (difficult with N. C.'s summers).

Another invaluable contribution to the arboretum to fill a longstanding need has come from DOUG BETHUNE. He is a craftsman (with an intense interest in wood construction techniques and furniture design) completing a MLA degree in landscape architecture at NCSU. He has chosen as his final degree project the development of landscape structures and artifacts - and as one part of his work he custom designed and constructed 8 different garden benches to be located in various areas of the arboretum. The benches are mostly completed and will be installed in August-September. They represent a wide variety of styles, woods, and construction techniques and their elegant beauty will add much to the visitor enjoyment of the garden. He will finish his degree in September and begin a business of custom wood-work construction (interior and exterior furniture, tools, cabinetry, sculpture, structures, etc.) - anyone interested in commissioning specialty high-quality custom woodwork may contact Doug at 919-781-0630.

We have long needed an Arboretum sign on Beryl Road as so few people know the arboretum is there, and so many people hunting it have difficulty in finding it. This spring the student Horticulture Club and Pi Alpha Xi voted funds to have a sign professionally constructed. This project has been taken on by CHERYL DORNEY, another MLA degree student in the NCSU landscape architecture program. She's doing the sign design and working with finding the right firm and following through on all the numerous time-consuming details involved in getting it finally installed. It will be exciting to see a fine sign finally in place this fall.

With our vast unlimited budget, we also hired 2 fulltime biological control specialists this summer to help with our rapidly growing mouse, rat and rabbit populations. The 2 beautiful, coal black young ladies joined us when about 6 weeks old and in their first month of work they have grown rapidly, gotten very proficient in their work (occasionally making a faux pas as when one killed and ate a baby rabbit in full view of a visiting group - horrifying everyone), and have become great favorites of our visitors. In addition to their official duties, they act as unofficial tour guides - generally greeting visitors and escorting them through the garden and back to their cars, patiently waiting for the next guest. Their early names of "Arbor" and "Return" didn't stick and they just go by the collective name of "KITTY". Any name suggestions?

GUIDELINES FOR YOUR FALL TULIP PLANTING

With bulb planting time in the near future, I would like to share recent research findings by Dr. Paul Nelson and Dr. Gus DeHertogh of our department on perennialization of tulips in the N. C. landscape. Unlike daffodils which readily come back year after year, tulips rarely perform well more than one or two years here and gradually decline. A major difference in the two plants is that the daffodil bulb remains and grows larger each year (if adequate foliage is left and it has adequate sunlight), whereas a tulip bulb disintegrates after flowering and a completely new bulb must be regrown for the next year's flowering. It was long felt that it was just "too hot" in the South and that increased respiration prevented enough carbohydrate accumulation to produce the new bulb. But research over the past 5 years by Nelson and DeHertogh has completely changed our knowledge of tulip culture in the south - through variety trials to select the best adapted varieties, and cultural trials to learn the best handling methods. To greatly simplify a great amount of work, the following recommendations will give you the best performance from tulips.

1. Use adapted cultivars. The following tulips are the most dependable for rebloom in the south:

- Ballade
- Beauty of Apeldoorn
- Bellona
- Carlton
- Charles
- China Pink
- Clara Butt
- Cordell Hull
- Demeter
- Diplomate
- Don Quichotte
- Elizabeth Arden
- Golden Apeldoorn
- Golden Oxford
- Golden Parade
- Gordon Cooper
- Gudoshnik
- Jewel of Spring
- Jimmy
- Lucky Strike
- Merry Widow
- Monte Carlo
- Oxford
- Parade
- Paul Richter
- Red Matador

- Spring Song
- Striped Apeldoorn
- White Triumphator
- Yellow Dover

2. Allow good root growth. Roots emerge from the base of bulbs, usually about 6" deep where our clay soils are tight and have little oxygen. Work soils 12" deep and add quantities of pinebark to loosen and aerate the soil.

3. Lime soil heavily to provide adequate calcium and correct pH. Our soils are very acid and the pine bark recommended above is also. Add agricultural limestone and thoroughly incorporate to the bottom of the root zone to obtain a desirable pH of 5.4-7.0. since amount of lime needed to change pH varies so greatly from one soil to another (a 4-fold range just in different Raleigh areas alone) it is best to have a soil test made and use that information.

4. Provide adequate phosphorus during bed preparation. Our acid soils strongly "fix" applied phosphorous and make it unavailable for uptake by plants. Surface applications will not move through the soil to where roots are located. So at the time of bed preparation incorporate 3 lbs of treble superphosphate per 100 sq-ft of bed area through the full 12" root zone depth of the soil. One finding of the research was that the long-held standard recommendation of using bone-meal for bulbs provides no benefits over other fertilizer sources.

5. Provide nitrogen and potassium through the winter and spring: Although bulb foliage is not visible in winter, roots are active and nutrients are needed all winter and until foliage dies down in early summer. One can apply 2.5 lbs of 10-10-10 (3 lbs of 8-8-8)/100 sq-ft once in the fall and again in the spring when plants emerge from the soil; or use a slow-release fertilizer such as StaGreen Bulb Booster 9-9-6 applied at 4 lbs/100 sq ft (or other available slow-release materials applied at equivalent rates will work equally well.

6. Maximize food production and storage in the bulb. Plant tulips in full sun and allow at least 24 sq-in of space (4"x6" planting) per bulb so leaves do not overlap and shade each other. Mulch the beds before foliage emergence so soil (and bulbs) will stay cooler as hot weather develops. Water plants if a drought occurs and do not remove foliage until it yellows.

Using the methods described above, trials at the Unit 4 Farm have shown that 3 years after an initial planting of 12 bulbs, over 35 flowers were being produced in plots with bulb increase apparently still continuing.

A SYNOPSIS OF CONIFER INFORMATION AND THEIR GENERAL N. C. AVAILABILITY

The conifers, or cone bearing plants of the botanical order Coniferae, comprise about 50 genera containing over 400 species. Although conifers constitute less than one-quarter of one percent of all plant species, they have great importance in forestry and as ornamental plants. Although a few genera such as *Abies*, *Cedrus*, *Chamaecyparis*, *Cryptomeria*, *Juniperus*, *Picea*, *Pinus*, *Thuja* and *Tsuga* are commonly grown in North Carolina others are unknown, unavailable because of rarity or untested for adaptability to conditions of the southeastern U.S. As a guide for use by the nursery/landscape industry and interested serious plantmen in North Carolina, the compilation to follow has been developed from available literature, experience in the NCSU Arboretum, observation in various public and private gardens in many areas, and in numerous cases, intuitive hunches. Hopefully, it will give assistance to those contemplating trial of unusual materials.

The chart on pages 58-59 gives general information on 54 genera of conifers including common names, winter hardiness, general adaptability to the three North Carolina climatic zones, the number of species in each genera, areas of native origin, general availability of the U.S. and the normal commercial propagation method. A few notes of explanation are in order on several of these factors. Winter hardiness is a complex matter with data coming from a variety of different systems and from different countries. The basic system used here comes from Harrison's evaluation under New Zealand conditions, but I have modified a number of ratings from observations by Dirr, notes in *Hortus Third* and the *Sunset Western Garden Book* and experience at NCSU. Though most books evaluate plants only on winter hardiness, in reality the ability to tolerate maximum summer temperatures, elevated night temperatures, humidity, our soils and drought are often more limiting in North Carolina than winter lows; particularly on plants from the mild, cool climates of Chile, New Zealand, and the Himalayas. The "General Adaptability" column attempts to encompass the sum of all collective climatic factors for each of the three major areas of North Carolina. If a genera is comprised of many species, the rating indicates the best that some species can do in that region, not the adaptability of all. For example, there are 75 *Podocarpus* species and an excellent rating is given for coastal N. C. adaptability, but only 3-4 species are indeed adapted there. Most species are true tropicals and would freeze there, but several are well adapted.

Availability is a relative term. If one wants any plant bad enough essentially all species are available with enough effort. My system means roughly: Very common - probably present any 10 home landscapes; Common - available in 50% of retail garden centers; Uncommon - not a difficult or rare item but found in commercial nurseries selling unusual or specialized crops - 1 in 20 garden centers or by mail-order; Rare - grown commercially by only a few nurseries in the U. S. V. Rare - probably not available commercially but in a number of botanic gardens or arboreta; Extremely rare - only one or two collections in U. S. probably not over 10-30 plants in U. S.

The Propagation column lists the most common method normally used. Obviously in nature all grow from seeds (S), but in certain cases they may be unavailable (the main reason the magnificent *Pseudolarix* is not more widely grown or plants grow easily from cuttings (C) that though seed is available, it is rarely used (e.g. *Chamaecyparis*, *Thuja*). Plants in certain genera can occasionally, or with difficulty, or in certain species, be rooted from cuttings; but generally are propagated by other means (e.g. *Calocedrus*, *Pinus*). In certain groups where selected superior cultivars exist (e.g., *Ginkgo*, *Picea*, *Abies*, *Pinus*) and cuttings will not root easily or dependably, it is

necessary to graft (G) these on understocks to reproduce the plants. Though an effective technique for many conifers, layering is normally too expensive for commercial use. Also, the newer technique of tissue culture has been successfully used with some conifers in experimental research, but no conifers are being propagated this way commercially at present.

Sources Utilized for List Compilation

1. Bailey Hortorium Staff. 1976. Hortus Third. MacMillan Publishing Co., Inc. 1290 p.
2. Bean, W. J. 1970-80. Trees and Shrubs Hardy in the British Isles. Butler and Tanner Ltd. (vol. 1-1970-845 p., Vol. 2_1973-784 p., Vol. 3-1976-973 p., Vol. 4- 1980-824 p.)
3. Den Ouden, P. and B. K. Boom. 1965. Manual of Cultivated Conifers. Martinus Nighoff. 535 p.
4. Dirr, M.A. 1983. Manual of Woody Landscape Plants. Stipes Publishing Co. 826 p.
5. Harnson, C. R. 1975. Ornamental Conifers. Kyodo Printing Co., Ltd. 224 p.
6. Hillier & Sons, Ltd. 1973. Hilliers Manual of Trees & Shrubs. A. S. Barnes and Company. 575 p.
7. Raulston, J. C. 1983 Personal observation and NCSU Arboretum experience
8. Sunset Books, 1979. Sunset New Western Garden Book. Lane Publishing Co. 512 p.
9. Welch, H. J. 1979. Manual of Loving Conifers. Theophrastis. 493 p.

A SYNOPSIS OF CONIFER INFORMATION – DR. J. C. RAULSTON - AUGUST 1983

GENERAL N.C. ADAPTABILITY IN COASTAL, PIEDMONT, MOUNTAINS

GENUS	COMMON NAME	ZONE*	COASTAL	PIEDMONT	MOUNTAINS	# SPECIES	AREA OF ORIGIN	U.S. OCCURRENCE	PROPAGATION
Abies	Fir	3-7	Poor	Some	Excel.	ca. 50	N.A., Europe, Asia, Japan	Common in cooler areas	S
Acmopyle	none	9	none	none	none	3	New Caledonia, Fiji	Extremely rare	S
Actinostrobus	none	8	slight	none	none	2	Australia	Extremely rare	S
Agathis	Kauri pine	8	Slight	none	none	~20	Phillipines, N.Z., Australia	V. rare-not heat or cold tol.	S
Araucaria	Monkey puzzle tree	7-9	Fair	Fair	none	~15	S.A., Pacific to Australia	CA, FL, Pacific N.W.	S
Arthrotaxis	Tasmanian cedar	6-8	Slight	Slight	none	3	Tasmania	Rare - needs cool moist	C
Austrocedrus	Chilean cedar	7	Slight	Slight	none	1	Chile, Argentina	V. Rare - needs cool moist	C
Callitris	Cypress pine	8-9	Slight	none	none	~15	Australia, Tasmania	V. rare - needs hot dry	S
Calocedrus	Incense cedar	5	Good	Good	Excel.	3	western U.S., Taiwan, China	Uncommon	S
Cedrus	True cedar	5-7	Good	Excel.	Excel.	4	N. Africa, Asia minor, Himalayas	Common	S,G
Cephalotaxus	Plum yew	5-7	Excel.	Excel.	Excel.	2	China, Korea, Japan	Uncommon	C

Chamaecyparis	False cypress	3-6	Excel.	Excel.	Excel.	7	S.E. and N.W. U.S., Taiwan, Japan	V. Common - many cultivars	C
Cryptomeria	Japanese cedar	5-6	Excel.	Excel.	Excel.	1	Japan, China	Common - many cultivars	C
Cunninghamia	China fir	6-7	Excel.	Excel.	Good	2	China, Taiwan	Common	S,C
Cupressocyparis	Leyland cypress	5	Excel.	Excel.	Excel.	3	hybrid	Common	C
Cupressus	True cypress	6-8	Good	Good	Few Sp.	~20	West. N.A., Medit., Himalyas, China	Common	S,C
Dacrydium	Rimu	5-6	Slight	Slight	none	~20	Australia, N.Z>, Chile	Rare - not heat tol.	C
Diselma	Diselma	6	Slight	Slight	none	1	Tasmania	Extremely rare	C
Fitzroya	Fitzroya	6	Slight	Slight	none	1	Chile	Rare - not heat or cold tol.	C
Fokienia	Fokienia	8	Slight	none	none	1	China	Extremely rare	C
Ginkgo	Maidenhair tree	4	Excel.	Excel.	Excel.	1	China. Grow only males	Common	S,G
Glyptodtrobus	Canton water pine	6	Excel.	Excel.	Fair	1	China	Rare	C
Juniperus	Juniper	2-7	Excel.	Excel.	Excel.	~70	N. hemisphere	V. Common - many cultivars	S,C,G
Keteleeria	Keteleeria	3-5	Excel.	Excel.	Excel.	4	China, Taiwan	Very rare	S,C
Larix	Larch	2-5	Poor	Fair	Excel.	~10	N.A., Europe, Asia	Common, not drought-tol.	S
Libocedrus	Kawaka	6-8	Slight	Slight	none	5	N.Z.	Rare - not heat or cold tol.	S
Metasequoia	Dawn redwood	8	Excel.	Excel.	Excel.	1	China	common	C
Microbiota	Russian cypress	3	Poor	Good	Excel.	1	U.S.S.R.	Available	C
Microcachyra	none	6	Slight	Slight	none	1	China	Extremely rare	C
Microstrobis	Microstrobis	7	none	Slight	none	2	New South Wales, Tasmania	Extremely rare	C

Neocallitropsis	none	8	Slight	none	none	1	New Caledonia	Extremely rare	S
Papuacedrus	none	8-10	none	none	none	3	New Guinea	Extremely rare	C
Phyllocladus	Celery pine	7-9	Slight	none	none	5	New Zealand - not hot or cold tol.	Extremely rare	C
Picea	Spruce	2-6	Few	Some	Excel.	~40	N.A., Europe, Asia	Common, few heat tol.	S
Pilgerodendron	Alerce	6	Slight	Slight	none	1	Chile - not heat or cold tol.	Extremely rare	C
Pinus	Pine	3-8	Excel.	Excel.	Excel.	~90	N.A., Europe, Asia - diverse	Common	S
Platycladus	Oriental arborvitae	5-6	Excel.	Excel.	Excel.	1	China	Common	C
Podocarpus	Podocarpus	6-8	Excel.	Good	none	~75	S. Afr., Chile, N.Z., Australia, Japan	Common	C
Pseudolarix	Golden larch	5	Excel.	Excel.	Excel.	1	China (Superb plant)	Rare	S
Pseudotsuga	Douglas fir	6	Slight	Fair	Good	5	N.W. U.S., China, Japan	Common, not drought tol	S
Saxegothaea	Prince Albert's yew	6	Slight	Slight	none	1	Chile (Unlikely heat tol.)	Very rare	C
Sciadopitys	Umbrella pine	5	Excel.	Excel.	Excel.	1	Japan	Available (Slow!)	S
Sequoia	Coastal redwood	7	Fair	Fair	Slight	1	California	Available	S,C
Sequoiadendron	Giant redwood	6	Slight	Fair	Good	1	California	Available	S
Taiwania	Coffin tree	7	Good	Fair	none	2	Taiwan	Rare	C
Taxodium	Bald cypress	4-7	Excel.	Excel.	Excel.	3	S.E. U.S., Mexico	Common	S,C
Taxus	Yew	4-6	Slight	Good	Excel.	~8	Europe, China, Japan, Canada, Florida	Common	C

Tetraclinus	none	8	Slight	none	none	1	Morocco (heat and drought tol.)	Very Rare	S
Thuja	Arborvitae	4-6	Excel.	Excel.	Excel.	6	China, Japan, Korea, N.A.	V Common (many cultivars)	C
Thujopsis	False arborvitae	6	Excel.	Excel.	Good	1	Japan	Uncommon	C
Torreya	Torreya	5-6	Excel.	Excel.	Excel.	6	N.A., Japan	Uncommon	S,C
Tsuga	Hemlock	4-6	Poor	Fair	Excel.	~9	N.A., Japan, Himalayas	Common	S
Widdringtonia	Willowmore pine	7	Slight	Slight	none	5	South Africa	Rare	S

BOOK NEWS

A relatively new (5 years) publication from England may be of interest to serious woody plant enthusiasts. I know quite a number of "Friends" are members of the Royal Horticultural Society and receive *The Garden* with their membership. It mainly covers various British gardens with mentions of plants growing in them and rarely gives much detailed horticultural or botanical information about individual plants. The same publishing company now produces a journal called *The Plantsman* which attempts to "bridge the often difficult gap between botanists and gardeners". I'm finding it one of the most readable, informative and enjoyable of plant journals I receive and highly recommend it. Articles are devoted to fairly detailed coverage of a given genus, cultural technique, or topic - and written in easily understandable layman's language. Annual subscription, (4 issues) is ten pounds (about \$15-18 depending on fluctuation of exchange rates which you can check at your local bank) and normal U.S. bank checks are acceptable payment: Mail to: *The Plantsman*, New Perspectives Publishing Ltd., Artists House, 14-15 Manette Street, London W1V 5LB England.

It is a great pleasure to recommend a superb "new" book (new edition) on woody plants that I could write on and on about (and probably will) but can best be summarized by saying that if a person is going to have one book on trees and shrubs (in the eastern U.S.) - this is the one to have. It is "Manual of Woody Landscape Plants - Their Identification, Ornamental Characteristics, Culture, Propagation and Uses" by Dr. Michael A. Dirr of the University of Georgia (Revised 1983, 826 p., available in either soft or hard cover published by Stipes Publishing Company, 10-12 Chester Street, Champaign IL 61820~. Dirr is the contemporary landscape plant materials authority of the eastern U.S. in the 1980's and this new edition of his already-excellent manual is greatly expanded with more southern plants reflecting his move from Illinois to Massachusetts to Georgia. It is packed full of useful information, presented in easily readable form with his thoroughly enjoyable personal observations (e.g. "Japanese flowering quince; a ratty shrub, whose use should be tempered by astute judgement. *Nevusia* - a novelty item for the plantsman who wants something different ... a great plant with which to stump your plant material friends"). It is now the text for our plant material courses at NCSU and is available in the campus bookstore. Very highly recommended.

The Holly Society of America has an excellent pamphlet for landscapers, filled with information on hollies. The title is "Hollies: Versatile Beauty for the Intimate Landscape" and it recommends holly cultivars in easy-to-read chart form sorted by species, hardiness (for most), and height. For each cultivar, coded information gives growth habit, foliage color and brightness, leaf size and serration, branching habit, and berry color.

Also included are a page on hollies as landscape plants; another on holly culture detailing planting, fertilizing, spraying, pruning, and care of young hollies; suggestions on choosing cultivars, and a host of official holly display and test centers. Individual copies cost 50 cents. Bulk orders for 50 or more copies are 25 cents per copy plus postage. Publication No. 18, "Hollies: Versatile Beauty for Intimate Landscapes," may be ordered from the Holly Society of America, 304 North Wind Road, Baltimore, MD 21204.

I've lost the source of the following quote that several years ago I clipped out of a newspaper article about a noted black woman author, but it has remained a favorite I'd like to share. "My parents were my source of inspiration," she says. "They taught us that goals in life were attainable. Their attitude through all the years is what Napoleon said to his troops when fighting Hannibal. He said, 'There are no Alps.' Don't you see? If you think of all the obstacles and the barriers, then you'll never do it. Never. Remember that. There are no Alps."

For those seriously interested in rose culture, a major new reference book has just been published to diagnose all the disease problems (fungal, bacterial, viral, nematodes physiological: environmental, nutritional, pesticide toxicities, and air pollution) of this most popular plant. It is published by the top scientific organization involved with plant diseases and has contributions from rose authorities around the world. It contains 83 color and 18 black and white illustrations to aid in problem diagnosis - the ultimate rose problem reference. It may be ordered for \$15.00 (includes postage and handling) from: The American Phytopathological Society, APS Books, 3340 Pilot Knob Road, St. Paul, MN 55121. Its title: *The Compendium of Rose Diseases*.

During my Swarthmore visit I saw a book new to me that seemed a quite worthwhile reference. *Plants for the South: A Guide for Landscape Design* (1980-564 P.) by Neil G. Odenwald and James R. Turner and published by Claitor's Publishing Division 3165 South Acadian at I-10, P. O. Box 3333, Baton Rouge, LA 70821. Each plant is covered in one page of text with drawings and a map of areas of adaptability. Quite a range of southern plants is covered including not only trees and shrubs, but also grasses, vines, etc.

A bit of perhaps widely-applicable advice recently discovered in *Alice in Wonderland* by Lewis Carroll: "Cheshire Puss" she began ... "would you tell me, please, which way I ought to go from here?" "That depends a good deal on where you want to get to, said the cat."

For those interested in residential garden design, it is a treat to share the news of a superb new book about the foremost private garden designer in U.S. history - Thomas D. Church (1902- 1978). The book is *Gardens Are For People* by Thomas Church Grace Hall and Michael Laurie (1983, 288 p., McGraw-Hill Book Company - available from Capabilities Books for Gardeners, Box 114, Hwy 46, Deer Park, WI 54007 for \$34.95 + \$1.25 for shipping). One could write on and on about Church he was considered a genius in landscape design; he received almost every award possible from national architecture landscape architecture, arts and horticultural organizations· unlike most "famous" designers he focused on residences rather than large public projects (though those were done also) and during his career he did over 2,000 private gardens. The book is greatly expanded beyond the 1955 first edition with far more photos of recent gardens, contains his writings on design concepts and a wealth of B+W and color photographs illustrating everything from plants to gazebos. A wonderful MUST book for anyone interested in garden design.

Every garden has its own special and separate character, which arises partly from the tastes of the owner or his garden, but still more from the situation, aspect, and soil of the garden. It is this that saves our gardens from monotony; if the conditions of every garden were the same, it is to be feared that the love of following the fashion of the day would make our gardens painfully alike. But this is prevented by the happy law that before success can be reached the nature of the garden must be studied, and this study soon leads to the conviction that we cannot take our neighbor's garden as the exact model for our own, but must be content to learn a little from one and a little from another, and then to adapt the lessons to our own garden in the way that our own experience (often very dearly bought) tells us is the best. And because of this special character in each separate garden, it follows that each garden has something to teach, which cannot be taught so well elsewhere; and the happy result is that no one with a love for gardening who visits other gardens can ever go into a garden without learning something." Canon Ellacombe

for those heading to the northeast for vacations, a useful horticultural guide to the area is *New England Gardens Open to the Public*. It is available from David R. Godme, Publisher, 306 Dartmouth Street, Boston, MA 02116 for \$8.50 (paperback) or \$17.50 hardcover) plus \$1.50 for postage and handling.

Sir Kenneth Clark who wrote and narrated the noted TV series "Civilisation" recently died at the age of 79. The producers of the 13 part series asked him to summarize his beliefs about man and life at the end of the last lecture. He felt it an impossible task - but gave the following statement as "the creed of a civilized man" - and it remains as his epitaph.

"I believe that order is better than chaos, creation better than destruction. I prefer gentleness to violence, forgiveness to vendetta. On the whole, I think that knowledge is preferable to ignorance, and I am sure that human sympathy is more valuable than ideology. I believe that in spite of the recent triumphs of science, men haven't changed much in the last 2,000 years, and in consequence we must still try to learn from history. History is ourselves. I believe in courtesy, the ritual by which we avoid hurting other people's feelings by satisfying our own egos. And ... that we are part of a great whole, which for convenience we call nature. All living things are our brothers and sisters. Above all, I believe in the God-given genius of certain individuals, and I value a society that makes their existence possible."

A follow-up story to my discussion of the book - *The Secret Garden* by Frances Hodgson Burnett, in the December '82 issue of the newsletter. I mentioned its significance both as a popular and classic children's book and its great impact on me as a child. Many people have responded and told me of their similar experience in enjoying the book both as children and as adults. In June I was thumbing through a newspaper, looking at the Raleigh movies and activities listing and for some reason happened to look at the children's section (which I never do). I noted a special children's morning matinee the next day with a movie entitled "The Secret Garden". I had no idea if it related to the book at all - but in hope that it would be, I took off work and at 10 AM a group of eight hundred 3- to 7-year-old children and I all trooped into the movie theatre. It opened with Mary playing with her dolls in an Indian palace - and I knew I had accidentally stumbled into a most wonderful event. I would gather the movie was probably made in the late 30's or 40's, by MGM in the lavish production and superb actors typical of those times - and totally faithful to the book. It was WONDERFUL, probably my best experience of the summer - the kids and I booed and screamed and laughed and cried at all the appropriate parts. (You should see the old abandoned garden in bloom after they bring it back to its full glory - some Hollywood set designer went totally wild!). So if you should ever see it listed again - sneak off with all the kids for a treat or I still recommend re-reading the book - so full of magic.

Most horticultural book sources I list are mail-order but often it is nice to browse through books before making the decision to purchase them (particularly in these days of \$20-75 books) - or to decide this versus that one. Marion Redd of Greenway Nursery, Inc., 6307 Reddman Road (704-537-2386) in Charlotte has over the last 2 years been actively searching through book trade fairs for desirable books not commonly handled by the bookstore chains in most shopping malls, and is even importing a number of titles directly from Europe that are not available in the U. S. They currently have over 250 horticulture titles in stock (likely the best selection in N. C.) and the shop is definitely worth a stop if you are in or visit the Charlotte area. In the near future they will also have a list available for mail-order.

Several things concerning The NCSU Arboretum are now available for those interested. After working a year on mapping and inventorying our collections we finally have a first draft of a listing of the plants we have. It is probably 70% complete and accurate at this point as losses and additions continually occur, but the 25 page listing presents the names of ca. 2,500 plants in our collection. Copies are available for \$2.00. Also, many arboretum members have become Friends in the last year and some of you may be interested

in obtaining back issues of the newsletters issued before you joined. We have recently reprinted all of them and they are available for \$1 apiece. (#1-Jan '81 #2- Mar '81: #3-Dec '81; #4-Feb '82; #5-May '82; #6-Dec '82; #7- Apr '83). Send a list of the items desired and a check for the correct amount (payable to N. C. Agricultural Foundation) to: Reprints, The NCSU Arboretum, Dept. of Hort. Sci., NCSU, Raleigh, NC 27650.

Of many names in the field of ornamentals and landscaping, perhaps one of the least known by the public is that of William Robinson (1838-1935). Yet in many ways he had perhaps the greatest influence of anyone on English and American gardens of the past century. During my "rest" this summer I had a chance to read his old and most influential book - *The English Flower Garden* ("the most widely-read gardening book ever written"), and a new (1982) book on his life *William Robinson. Father of the English Flower Garden* by Mea Allen (Faber & Faber Press, 255 p.). In a period of 9 years he went from a gardener progressing through several positions, quit to become a horticultural correspondent to cover the Paris International Exhibition of 1867, traveled widely on the continent to become familiar with plants, gardens and techniques there, returned to England and wrote 5 books on horticulture to become a much respected authority. He then traveled to the U. S. and toured widely, returned to England and founded *The Garden* - the influential garden publication he edited for the next 29 years and which made him a wealthy man. He was to be responsible for the disappearance of carpet bedding, the craze for tropical plants, and the ornate Victorian garden. He emphasized hardy adaptable plants and the selection of the best species and cultivars available. He greatly influenced Gertrude Jekyll in her early career and advocated natural rock gardens decades before Farrer. When 47 he bought a 1,000 acre property named Gravetye Manor and spent the rest of his life developing it as his ideal model garden to demonstrate his ideas. Sadly, it was perhaps the best example of how fragile gardens are and how few outlive their founders. When he died in 1935 it was one of the finest gardens in England and he left a large bequest for its maintenance; yet 3 years later it was a ruined neglected shamble.

"William Robinson was a man of fiery temper and fixed ideas. When he approved, he eulogized. When he disapproved, he damned. He had no use for half-measures." A classic example follows with this quote from *The English Flower Garden* on his views of conifer cultivars. "UGLY EVERGREEN TREES - One of the most baneful things in our gardens has been the introduction of distorted and ugly Conifers which often disfigure the foregrounds of beautiful houses. These are often sports and variations raised in modern days, a mass of distorted, unnatural, and ugly forms, the names of which disfigure even the best catalogues. In one foreign catalogue there are no less than twenty-eight varieties of the Norway Spruce, in all sorts of dwarf and monstrous shapes - some of them, indeed, dignified with the name *monstrosa* not one of which should ever be seen in a garden. It is not in distortion or in little green pincushions we must look for the charm of the Pine, but rather in storm-tossed head and often naked stems; and hence all these ridiculous forms should be excluded from gardens of any pretence to beauty. There are plenty of beautiful things, new and old, without filling our gardens with such monstrosities, many of which are variegated. Of all ugly things, nothing is worse than the variegated Conifer; it usually perishes as soon as its variegated parts die and the half-dead tree often presents the appearance of a bush full of wisps of hay." (How's that for impartial objective writing?!)

Both books make fascinating reading and not only offer many still-useful ideas (but certainly not on conifer use!) but a view of the world of ornamental horticulture possibly at its peak of power and magnificence. Changing salaries, patterns of wealth, and social fashions ended the era of great individual gardens. Today's zillionaire will buy jets and football teams - in the 1800's, to be cultured and fashionable would have demanded a personal arboretum, conservatory, fruit orchards, etc. and a staff of dozens of gardeners. But one still still read and dream of the golden days.

NEW CATALOGS AND PLANT SOURCES OF INTEREST

As I lead into this regular feature of trying to promote and support firms dealing in out-of-the-ordinary plants - the following recent quote from England is most appropriate: "There was a very worldly-wise, superficially knowing (and suitably snobby) article about gardening in the *Tatler* which contained one remark that rang regrettably true. Really 'in' gardeners, it said, never buy plants- they are always given them, or seed or cuttings, by friends. Obviously it is not wholly true, as many a busy nursery can witness. Unfortunately there seems to be actual pride attached to not buying plants - especially among people who can best afford them. I am echoing the plaintive notes of one nurseryman with an amazing list of varieties gathered as seeds all over the world. Rare plant nurseries can't survive, he says, unless keen gardeners will buy plants from them. A vigorous commercial trade in rare plants is essential to their survival in cultivation. We should have learned the lesson when Hilliers guillotined three-fifths of their list (my note - in 1981, Hilliers dropped 6,000 different plants from their remarkable list because of poor sales of them). If we hope to be able to find rare plants when we want them, we must support the nurseries that grow them - and not just with words." *The Garden* 108(6):219 June '83.

At a recent lecture I was (yet again) asked by an elegant, and obviously wealthy woman, why plants are so expensive. My reply was lengthy and indignant but in part included such comments as "people readily buy \$5 drinks, \$20 dinners, \$30- 45 Broadway play tickets, \$75 motel rooms that are used and forgotten in hours and completely balk at a \$10 magnolia with 50 years of beauty and enjoyment of thousands of flowers." The nursery/landscape/maintenance industry professionals in general receive far less than they should for their efforts - they deserve support for their public service - and satisfactory income for a decent standard of living. (Enough of the soap box - sorry - but it is a serious problem that even avid plant lovers tend to overlook).

As each issue of the newsletter is issued I keep wondering how I will possibly have a continuing list of new sources of unusual quality plants - but somehow the firms keep appearing. One of my happiest discoveries of the summer has been Russell Graham Purveyor of Plants, 4030 Eagle Crest Rd, N.W., Salem, OR 97304 (503-362-1135) with a wonderful 32 page catalog of garden perennials, lilies, cyclamen, specialty bulbs, ferns, etc. The catalog is \$2 and comes with a \$2 refund coupon for use with your first order. Most plants range \$1-3 with a few rarities up to \$5-8. There are many outstanding finds in this listing but several of particular interest to me since

I've spent so much time hunting them were: 6 Asarums (wild gingers - excellent shade groundcovers), *Cardiocrinum giganteum* (a 6-8' tall lily relative I want to try in the lathhouse), 20 species of hardy cyclamen - several very rare ones, *Eremurus* - the foxtail lily growing 3-6' tall (has anyone seen or grown it successfully in N. C.??), 55 ferns, 28 lily species, ginseng, and many others.

Seed of woody plants is much less readily available than that of annuals and perennials because of the collecting difficulties. A source new to me is: Wild~ 2021 South Forest Avenue, Tempe, Arizona 85282 (602-967-82630 owner Gary Maskarines). Although much of his list is S. W. desert materials and western mountain plants, he also carries some eastern and northern species. It's the first list I've ever seen with seed of the little northern groundcover, *Cornus canadensis* (and at \$160/lb!). In addition, his catalog has many wildflower seeds and seed mixes. Lastly - the inclusion of writings by Thoreau and Robert Frost add the final delight to this fine small catalog.

It is a pleasure to note that another fine speciality plant nursery has "seen the light" and moved to N. C. to produce their plants here. Washington Evergreens (formerly at South Salem, NY) is now in Leicester, NC. Their 50 page catalog (Box 388, Leicester, NC 28748 - \$1 refundable with an order) offers a wide array of dwarf conifers, and evergreen companion plants with a particularly good range of *Pieris* cultivars.

A most unusual catalog and periodic newsletters are available for \$4 per year from Endangered Species Nursery. 12571 Red Hill, Tustin, CA 92680 (714-730-6323). They offer a wide array of unusual tropical species and succulents suitable for houseplants in N. C. with particularly good selections of *Hoya*, *Sansevieria*, Cycads, Palms, and Bamboos. They carry the black bamboo that many have admired in the NCSU Arboretum, *Phyllostachys nigra*; virtually unavailable in N. C. - priced at \$15. Also included is a selection of about 200 hardy woody plants mainly *Aeg palmatum* and *Eag_ys* cultivars and an assortment of conifers. An unusual area of emphasis is their special catalog of variegated plants. Many are quite rare and are custom ordered from Japan and Europe as they receive requests (and therefore quite expensive). They also are the only place I've seen that has for sale the book on variegated plants published in Japan in 1978 that contains nearly a thousand color photos of various variegated plants. The text is in Japanese only (with an index to photos of Latin names) and the price is \$35 - but it is a fine photographic guide to a very specialized world that the Japanese excel in. In general, all of Endangered Species plants are rather expensive - but many are not available anywhere else - and rarity determines the value of virtually any commodity.

For a superb listing of tropicals and unusual houseplants, send \$1 to IM. Plant Shop's Botanical Gardens, 18007 Topham street, Reseda, CA 91335 (213-881-4831). The 26 page listing contains about 4,000 different kinds of plants of incredible diversity and rarity, e.g. about 120 Euphorbias, 400 cacti, 70 Agaves, 100 carnivorous plants, 180 ferns, probably over 500 Begonias, and many, many more. Although one can find occasional items which would be hardy in the N. C. landscape (e.g., the very difficult-to-find black mondo grass), 99% of the list is only for indoor culture - but what a list! Prices range from \$0.75 (begonia leaf cuttings) to \$200 (*Dyckia lapostole* - marnier - with a 3 year wait list!) with most at \$2-4.

An excellent selection of sempervivum and sedums (hens and chicks for use as groundcovers and accent plants is available from Paul Lyman, Alpine Gardens, P.O. Box 247, Dallas, OR 97338 (503-623-5050). Alpine Garden is actively involved with the Sempervivum Society and features new cultivars, special and hard-to-get types (about 350 different ones). Plants are very reasonably priced at \$0.85 - \$1.50, allowing one to try a wide selection with little investment. For those who seriously get into these plants - you may want to join the Sempervivum Fanciers Association, Dr. Wilham Nixon, 35 Oxbow Lane, Randolph, MA 02368 or the International Sempervivum Society, Peter Mitchell, 11 Wingle Tye Rd., Burgess Hill, Sussex England RH159HR. We've recently added a collection of these interesting plants in the groundcovers area (donated by Mr. J.C. Taylor, Mr. Larry Hatch and Alpine Gardens) - and although still small plants, they can give a hint of the variety and beauty available.

A beautifully produced seed catalog of unusual vegetables. and native plants (wildflowers, trees & shrubs, cactus) is available from Plants of the Southwest, 1570 Pacheso St., Santa Fe, NM 87501. Perhaps most unusual is their list of ancient Southwestern food crops used by Indians of that region for hundreds of years such as Amaranth, Tepary Beans, Devils Claw, Blue Corn, etc.

“The greatest service which can be rendered to any country is to add a useful plant to its culture.” Thomas Jefferson

A new edition of Sources of Native Seeds and Plants (\$3.00 - 36 p. - Soil Conservation Society of America, 7515 N.E. Ankeny Road, Ankeny, Iowa 50021-9764) is the best source of information on places to purchase native plants. This new listing has twice the listings of earlier editions - with 300 growers in 40 states and Canada. It includes grower's addresses and their speciality in native plant production.

I've written before about the serious problem of nurseries carrying rare native plants that are collected from the wild thus further endangering the wild populations. One of the most threatened groups of plants are the lilies with their visual appeal from showy blooms and susceptibility to collection for sale. A major breakthrough has just been made in propagation of these plants through tissue culture and a good range of various native species are now available (in quantities only though) from B&B Laboratories, Inc., 1600 D. Dunbar Road, Mount Vernon, WA 98273 (206-424-5647). Prices are about 30 /bulb with a minimum order of 500 bulbs. Though beyond the reach of most individual gardeners - the potential now exists for . . nurseries and garden centers to purchase propagated native lily plants to grow for sale to the public.

NEW PLANTS RECEIVED IN THE NCSU ARBORETUM - APRIL-JULY 1983

Ajuga - *genevensis*, X *Jungle Beauty*, *pyramidalis*.

Aster - Professor Kippenberg, *Royal Beauty*, *Chorister*, *Crimson Brocade*, *Eventide*, *Fellowship*.

Cupressus - *deculouxiana*, *funeris*, *macnabiana*, *macrocarpa*.

Eucalyptus - *archeri*, *camphora*, *gunii*, *neglecta*, *nicholii*, *niphophila*, *nova-anglica*, *perriniana*, *urnigera*.

Lamium - *Beacon Silver*, *maculatum* white *Nance*.

Ligularia - dentata Desedemona, hodgsonii.
Lilium - canadense, philadelphicum, superbum.
Monarda - Cambridge Scarlet, Croftway Pink, Mahogany, Violet Queen.
Papaver orientalis - Bonfire, Louise.
Phlox subulata - Bluets, Dirgo Arbutus, Intensity, Millstream Coral Eye, X Millstream Daphne, X Millstream Jupiter, Pink Stars, Precious Pink, Sneewitchen, Temiscaming.
Phlox subulata australis - Chalky, Maiden Blush, Ft. Hill.
Pinus - armandii, coulteri, johannis, koraiensis, montezumae, sabiniana.
Quercus - sadleriana, vaccinifolia.
Sisyrinchium augustifolium - campestre, douglassi.
Tradescantia - Iris Pritchard, J. C. Weguelm, Purpledome, Red Cloud.
Trillium - erectum, erectum alba, sessile luteum, stylosum, undulatum.
Veronica - alpina alba, spicata Red Fox.
Bergenia cordifolia
Bocconia Coral Plume
Delphinium King Arthur
Lathyrus latifolius
Lavandula Hidcote
Perovskia atriplicifolia
Sedum Ruby Glow
Salvia East Friesland
Gaillardia Giant English Hybrid
Chrysanthemum maximum Alaska
Arabis alpina Snow Cap
Achillea Parker's Variety
Dicentra cucullaria
Dodecatheon meadia
Gentiana andrewsi
Mertensia virginica
Smilacina racemosa
Epimedium grandiflorum niveum
Agapanthus umbellatus headbourne hybrid
Cytisus Lucky
Dictamnus albus
Dictamnus albus rubra
Filipendula venusta
Weigela middendorffiana
Magnolia acuminata var. cordata
Astilbe taquatti Superba
Echinops ritro Taplow Blue
Erigeron Foerster's Liebling
Eryngium planum
Trollius X cultorum Golden Queen
Abies coahuilensis
Acer grandidentatum
Amorpha canescens
Aralia californica
Aristolochia californica
Aronia melanocarpa
Caragana pygmaea
Castanopsis chrysophylla
Clematis tangutica
Cornus mas
Cotoneaster horizontalis variegata
Diospyros virginiana
Garrya fremontii
Halesia monticola
Indigofera gerardiana
Juniperus occidentalis
Ledum glandulosum
Osmaronia cerasiformis
Picea koyamai
Prunus maackii
Rhododendron macrophyllum
Styrax officinalis californicus

Alyssum saxatile - Double Apricot
Campanula carpatica
Coreopsis auriculata nana
Geranium grandiflorum alpinum
Gypsophila repens rosea
Heuchera Spitfire
Phlox borealis
Phlox kelseyi
Primulas - poissonii , durmanica, chionantha cortusoides denticulata, secuundiflora, bulleyana, beesiana, denticulata alba, modesta alba, walens1s, capitata mooreana cockfunmana, wilsoni, elatior, secundiflora, saxatili, anisodora, alpicola. alba, sieboldii, pulvurulenta, apicolor julian b1color, derrticulata rubin, candlabra hybrid
Sempervivum - Booth's Red, Lavender & Old Lace, Old Copper, Granat, Rhodanicum, Silver Spring Firebird 'Rita Jane, Commander May, RedMountain, Leucanthum, Crest #1, Purdy's 901, Coronet, El Toro, Raspberry Ice, Oddity, Packardian, Highlight, Heigham Red Elene
Emminent Ginnies Delight, Wierdo, Jungle Shadows, Olivette, Silverine, Spanish Dance, Silver Thaw, Cleveland Morgan, Rubicon improved, Flamingo
Sempervivum montanum - cvs. Bumatti, Stiriicum, Rubrum
Sempervivum calcareum and cv. monstrosus
Jovibarba heuffelii - cvs. Chocolate Xanthoheuff Torrid Zone Cameo
Jovibarba hirta
Osostachys lwarengi
Rosubaria platyphylla
Euonymus - hamiltonius, myriantha, sieboldiana
Pinus - coulten, jeffreyi, muricata, pinaster
Quercus - durata, sadleriana
Rhododendron - calophytum, mucronatum, mucronulatum
Erica - arborea, tetralix, Ken Underwood, vagans
Acer lobellii
Austrocedrus chilensis
Cytissus monspessaulanus
Camellia williamsii Mary Christian
Garrya fremontii
Ilex yunnanensis
Pieris formosa
Yucca whipplei
Jeffersonia dubia
Ilex sugeroki Nakkahari
Juniperus chinensis Saybrook Gold
J. chinensis Gold Star
J. chinensis Mint Julip
Sulhvantia sullivanti
Silene polypetala
Cercidium floridum
Colutea arborescens
Laburnum anagyroides
Laburnum alpinum
Quercus dentata
Arisaema jacquemontii
Koelreuteria integrifolia
Halesia diptera
Picea rubens
Phyllocladus alpinus
Juniperus scopulorum Sparkling Skyrocket
Kolkwitzia amabilis
Mahonia aquifolium Orange Flame
Ceratostigma plumbaginoides
Buddleia davidii White Bouquet
Juniperus formosana
Orixia japonica
Forsythia X intermedia Tetra Gold
Hydrangea aspera sargentiana
Adina rubella
Carex conica variegata
Quercus bicolor Itea virginiana Swarthmore
Iris cristata alba
Hosta Wagon Wheels

Senecio tyrolensis
Lysimachia clethroides
Artemisia Silver Laceleaf
Sedum Kamschaticum variegatum
Mentha suaveolens variegata
Sempervivum Oddity
Acer tegmentosum
Drimys lanceolata
Drimys winteri
Davidia involucrata - large flowered form
Phlox nivalis Tennessee Beauty
Valenana arizonica
Verbena canadensis
Iris cristata Abbey's Violet
Acaena microphylla
Jeffersonia diphylla
Primula japonica
Coreopsis verticillata
Coreopsis verticillata 'Zegreb'
Coreopsis verticillata 'Moon Beam'
Malva alcea 'Fastigata'
Astermoea mongolica
Artemisia ludoviciana v. albula
Artemisia schmidiana v. Silver Mound

The list totals roughly 280 new accessions of species or cultivars added to the arboretum collections from April through July 1983.