

NURSERYMEN'S PANEL

Chairman: William Collins, American Garden Cole, Circleville, Ohio

The nurserymen here are real happy to be involved as participants in this program. Some of us that have been involved with METRIA from its beginning recognized that one of the goals of the group was to promote a better understanding of the problems and interests and desires of the multiple interests that this group represents.

The subject little-known and little-used species which are most likely to succeed in metropolitan areas is a paradox. It is a most valuable one but at the same time a difficult one. We are working with a mix of predictions, guesses, and judgments involving some trees we may know little about. How will they perform in the future under numerous and varying stress conditions?

A special burden and opportunity may be placed on the nurseryman to propagate, grow and offer for sale some of these trees. We must remember that it is the trees the nurserymen are now selling that provide the dollars to venture into the growing of new kinds. For some of these untried kinds, the cost of production and the future sales demand are not presently known--and in today's economy that constitutes a real gamble.

METRIA, as organized, is doing much to bring together an understanding of the problems involved for the major interest groups concerned.

First there is that large and diverse group who are involved in breeding, selecting, recommending, as well as specifying and even wishing that certain kinds of trees were more available--especially those for planting in the more diverse sites and situations.

At the other end of the process is another group: the buyers, users, and planters which include arborists, foresters, landscape architects and contractors and the agencies they represent.

In between these two groups is the third group, the funnel section of the hourglass, the nurserymen. For the most part they are attempting to keep in economic balance the wishes and desires of the first group with the demands and needs of the third group. Frequently, the time involved in the production cycle for trees is not realized by portions of the membership of the other groups.

For the little-known and little-used species, there is likely to be an additional length of time that needs to be tacked onto the production cycle which we can call "start-up time." When you start from scratch, you may have to build from a near zero inventory of propagation material to one large enough to sustain the desired annual production.

The major problem I had in selecting these trees was not that I lacked conviction for their potential uses and attributes but rather how could I most effectively present them to you.

After much consideration, I decided that each species should first be judged by the degree to which each possesses aesthetic, intrinsic, and utilitarian worth. I then evaluated the trees with three criteria in mind: the inherent growth characteristics, cultural requirements, and environmental tolerances of the species.

At this point, I want to read a quote from a recent issue of Newsweek:¹ "It is unarguable that everyone has a right to his or her own opinion. But the right to express it does not make that opinion as good as anyone else's. It may be wrong or ignorant or both. Besides, some place along the line we all should be taught the necessity and value of seeking out facts that are "inconvenient" for our own opinions and ideas."

Acer saccharinum (silver maple). -- Explaining why a tree with a bad reputation is selected for a particular plantingsite will frequently bring agreement where divergence existed before. For example, if you feel kindly toward this tree you may speak of it as the silver maple; if otherwise, as the soft maple. If you live east of the Missouri River, you may never be very far from areas where this species is native or from what is or was good agricultural land. Silver maples are commonly found throughout this area because they always seem to be planted around homes and farms. Youthful owners of newly built homes frequently plant this maple for three good reasons: it is inexpensive, it grows fast to give early shade, and it can be successfully transplanted bare-root with a wide range of soil types and sites. Young people use it as a pioneer tree planted into a bulldozer soil mix. At the other end of our life cycle, we may find a repeat of the same needs. The burgeoning newly developed areas of mobile homes are

¹ John Bunzel. The Badge of 'Elitism'. Newsweek, October 1, 1979.

filled with a blend of retirees, newly-weds, and a transient labor force. They want, and they will have, a fast-growing, inexpensive, easy to transplant shade tree to enjoy as quickly as possible for a stay of unpredictable length.

If we will just recognize the obvious, doesn't it make sense for tree people like ourselves rather than to agreeably stand around patting each other on the back in mutual condemnation of the species, to select, to breed, or to find silver maple selections that are as free as possible of the tree's acknowledged faults.

FAST GROWTH is not in itself an undesirable characteristic, but some of the results may be; such as weak or brittle wood, poor crotch angles and the structural breakage of mature trees or the much more severe storm damage to them.

SHORT LIFE (comparatively speaking) in itself is not an undesirable trait. If the species hurries into an acceptable degree of beauty and function for the site on which it is planted, then Amen. Who knows, municipally speaking--the garden of today may soon be the concrete-asphalt desert of tomorrow--and quite realistically, the reverse can be just as true.

Photographs of trees having improved form that are currently being evaluated were shown and described.

Acer saccharum var. nigrum [black (sugar) maple]. -I was not aware that **the black maple, a form or type or sugar maple**, had such **distinct characteristics** until I moved to south central Ohio about 13 years ago. It was during several plant hunting trips with the late D. B. Cole that I learned the characteristics he used to distinguish black maple, or the black sugar maple as it is sometimes called, from the regular sugar maple.

At least in this part of Ohio the black maple is singled out by a number of characteristics. First, as seen from a distance, on open-grown trees such as are planted along small town streets or edging country lanes, the head is often as broad as tall, occasionally broader than tall. They produce a fall color in shades of yellow. From our observations, the foliage appears to be more scorch resistant than that of sugar maple.

The leaves are boldly 3-lobed with the lobe tips curving downward. Stipules at the base of the leaf petiole may vary from scarcely noticeable to quite long and

pronounced. On vigorous growth they may become almost like miniature leaflets.

We feel the black sugar maple is a tougher tree, more tolerant of the stress of a lower soil moisture content than the common sugar maple. It appears to grow better on poor sites than sugar maple.

From large seedling populations of sugar maples, we find varying percentages from year to year of the black maples. There is a much larger percentage of intermediate types. On two separate occasions, we have tagged for further observation superior black maple seedlings.

When their foliage and form are good, they are the equal or perhaps better than similarly selected sugar maples within that same lot of seedlings.

For additional comments on this variety, see pages 10, 18, and 25.

Alnus glutinosa (European alder). -- What is the present attitude towards a comparison of two fast growing trees--the well-known silver maple and the European (black or common) alder, which is just beginning to become fairly well known in this country? Right now the potential of European alder seems boundless in both horticultural and forestry circles. We Americans are intrigued with the new--is that why we are expecting such promising performance from this plant?

A few northern Ohio nurserymen have been growing and using the European alder. They are usually planting this tree in some of the places ordinarily planted to silver maple. However, because of the alder's very dark leaf; its interesting small, blackish, egg-shaped seed cone; its very fast growth and comparatively narrow head; we now find it being placed in more favored landscape situations.

What are some of the characteristics that make this plant desirable? It is credited with growing forty feet in twenty years. It is tolerant of poor soil conditions including wet, boggy lands, and it has been recommended for use in land reclamation projects. Its wood is useful for furniture making, fiber production, and wood fuel. It has the ability to fix nitrogen similar to legumes and its leaves have the potential to serve as a protein. Finally, it is adapted to container production. Trees 5 feet tall have been grown in one-gallon containers.

I have almost the same feeling that Hugh Johnson

expressed in his splended reference, The International Book of Trees, "Alders must be the easiest trees to overlook or simply to accept as part of the scenery. I lived for 36 years before I became aware of them. Perhaps that is why they give me so much quiet pleasure now."

The natural range of the Italian alder, *Alnus cordata*, is smaller but the tree is considered generally more attractive. A street in Cleveland was planted to it by the late Ed Scanlon. At the time I saw it, the planting was impressive. We should probably be evaluating both trees at the same time. (editor's note: The planting in Cleveland was visited by the group and was still "impressive." The 4 or 5 trees remaining from the original planting have survived two of the most severe winters this part of the country has ever had.)

Prunus padus (mayday tree). -- Was I at an impressionable age or just happily drinking up the first sign of spring after a long dark Iowa winter? Driving down one of Des Moines' impressive, wide streets, I caught the sight of a specimen tree just leafing out--it seemed weeks ahead of anything else. The lower branches were sweeping the ground and the tree form and structure were worthy of a Beech. I learned it was *Prunus padus* known at that time in the mid-west as the mayday tree, in Europe as the bird cherry.

We plant all kinds of bulbs and perennials that announce colorfully spring is here--why not plant trees that do? If this tree is not the prime candidate for this use in these latitudes, then it is very close to the top. True, mayday tree may not look a great deal different than our native wild cherry species, but it is apparently more genetically diverse. Europeans have already selected and propagated at least five kinds, differing in size, growth habit, flowers and foliage color. Will it have some of the same pests our wild cherries do? It may but let's find out!

Ulmus parvifolia (Chinese elm). -- Reputation by association has had a double-barreled adverse affect in delaying the use and acceptance of this species. The first is the confusion caused by its common name, the Chinese elm, which has been matched with earlier references to *Ulmus pumila* the Siberian elm. Second, is the unfounded fear that this species is subject to most of the same pests that trouble our native elm species. If we can get some agency with binding authority to accept one or the other of the two names now occasionally used, the lace bark elm or the little leaf elm, we may be well on our way to overcoming this handicap.

Although there is living evidence in eastern mid-continent locations that this species can become a very large tree, it is quite unlikely such size will be reached in typical municipal planting sites: streets, mini-parks, and the large planter boxes edging inner city buildings.

The "pluses" of this species are the enduring small, heavy-textured leaves, many with fall coloring capability. The degree to which individual trees exhibit pronounced bark flaking is variable and affords the opportunity to make improved selections. Similarly, it is possible to select trees with better structure and form. Sturdiness of limbs is apparently an almost universal characteristic of the species. I recall a tractor driver remarking as he emerged from between two 8 foot fully planted rows, "If you aren't careful, the branches will pull you right off the tractor seat."

Like the seedlings of golden-rain tree, Japanese zelkova and Kentucky coffee tree, the form of most seedling lace bark elms won't exactly have customers fighting to get to the cash register, but nearly all of them become more beautiful and impressive each additional year they are in place in the landscape.

We have grown enough of them to learn that some of the selections can be asexually propagated on their own roots, the method that by-passes the problem of stock-scion incompatibility.

Growth in the nursery is likely to be slower than that of the northern native elm species and certainly much slower than Siberian elm or many of the European and American hybrids.

It is definitely a species for which we should take the "wraps off."

William Flemer III, Princeton Nurseries, Princeton,
New Jersey

The original objective of this conference was to discuss new and different trees. This was then changed to a discussion of "super" trees. I would like to say that these I am going to discuss, and many of those that have already been mentioned, are not super trees. They are interesting trees that deserve further trial.

I would say that there are super trees already in production. They have proven over many, many years to be those

which are generally best adapted to producing shade and beauty in the very hostile environments found on our city streets.

So these are interesting new thoughts but are by no means super trees. For example, there are serious problems involved in making a block of 3 inch Parrotia limbed up to 7 feet. This is a primary reason we are not using Parrotia right now.

Corylus colurna (Turkish filbert). -- Most of the hazlenut family is made up of shrubs of moderate height with many stems arising from a common crown. This very interesting tree is unique in the genus because it grows with a single trunk and reaches 75 feet in height in its native forests.

It is not a showy tree, but it is beautifully shaped with an upright oval that is ideal for street tree planting. No corrective pruning is necessary other than limbing it up to provide pedestrian clearance. The fall color is an unexceptional yellow, but the foliage is a fine dark green color even in years of severe drought when other trees suffer much leaf damage. It comes from a very dry climatic area in the Middle East which makes it well able to thrive on city streets where water stress and reflected heat are intense during the summer months. The male catkins are very pretty in the early spring and the nuts are edible.

There are some impressive streets lined with Turkish filberts in Angers and other cities in southern France.

Maackia amurensis (amur maackia). -- This small summer flowering tree resembles a low, spreading Sophora in general appearance. Coming from the harsh climate of Manchuria, it is adapted to bitter cold winter weather and dry heat in summer. It will grow well in the dry impoverished soil along inner city streets and has the added advantage of freedom from insect pests.

The compound foliage is leathery and a shiny green color, turning yellow briefly in the fall. The white pea-shaped flowers are borne in showy 6 to 8 inch panicles at the ends of the branchlets in late summer, a time when very few other trees in the temperate areas bloom.

Like many low growing trees, it requires special care to provide standard street tree form and clearance, but it is a tough, hard wooded species which will not grow out of scale where a small tree is desired. Barret Cole made a

determined and unsuccessful effort to popularize Maackia many years ago. They deserve a second look for planting in adverse situations where few other trees will thrive.

Quercus acutissima (sawtooth oak). -- This handsome oak was introduced by the U. S. Department of Agriculture from its native China, Korea and Japan. The original introduction, from which all American trees are descended is said to have been from a warm area. Future introductions from the coldest northern limits of its native range would undoubtedly greatly extend its winter hardiness in the United States.

It is particularly useful for city and parking lot planting because it is very drought resistant and withstands pavement glare as well. The bark thickens and becomes corky at a very early age and thus resists the peeling and vandalism to which thin barked trees like young pin and willow oaks often suffer. Unlike the turkey oak (which it resembles) it is exceptionally easy to transplant and is readily reestablished after planting. The growth rate of young trees is rapid. Narrowly pyramidal as a young tree, it broadens to a rounded head at maturity, though rarely so broad as the tree at Glenn Dale, Maryland so often used to illustrate the shape of the species.

The fall color is unfortunately a mediocre yellow. If it were as brilliant as some of our native American oaks, it would be hard to beat as a street tree. However, the luster and dark green color of the foliage in summer are very handsome.

Sassafras albidum (sassafras). -- The sassafras is one of our unique native trees noted for its aromatic foliage, picturesque branching habit, and marvelous fall color. Except for Japanese beetle feeding on the leaves, it is quite pest and disease free. It is also a tree which thrives in poor, sterile soil, from porous to stiff clay textures.

It has the reputation of being coarse rooted and difficult to move. However, by growing them in containers this problem can be eliminated. In earlier days when all trees were moved bare root, sassafras was especially difficult to transplant. Now even "easy" trees like nor-way maples and honey locusts are routinely moved with a ball of earth, so sassafras presents no exceptional problems in the larger sizes, so long as it is moved in the spring. Sassafras should be grown from seed because seedlings develop better root systems than plants grown from cuttings, even though it is easily propagated by root cuttings.

This tree, like red maple, has an exceptionally broad range from Maine south to Florida and Texas. Therefore there are many geographical races which vary exceedingly in winter hardiness. Much of the troubles growers have experienced with the species have resulted from planting southern seedlings in the nursery. Like so many other trees which are remnants of the great tertiary flora, there remain only two species, ours and the very similar *S. tzumu* in China.

While sassafras is intolerant of inner city conditions it is a neglected but really beautiful addition to the list of trees for suburban use.

Sorbus alnifolia (Korean mountainash). -- This is a splendid small tree which has been growing in this country for a great many years but which has never caught the public fancy. For conditions in the eastern United States it is the best and most long lived of the mountain ashes because it does not succumb to borer attacks as do the better known European species and clones. As in other species, fire blight can be a problem during wet, humid summers. No *Sorbus* species thrive from zone 7 south, and they seem to grow better the farther north they are planted--very important because they make a fine show where dogwoods, cherries and others of our choicest flowering trees will not survive.

As its name indicates, *Sorbus alnifolia* has oval toothed leaves like an alder, whereas most other species have compound leaves. The foliage is retained perfectly throughout the summer and turns bright shades of orange and scarlet in the fall. The individual flowers are pure white, and are much larger than those of other *Sorbus*. The large clusters in full bloom in late May are as showy as any hawthorn. These are followed by colorful clusters of red and scarlet fruits which remain on the tree for some time after the leaves have fallen.

Where grown from seed *S. alnifolia* exhibits considerable variation in form, ranging from trees with somewhat drooping branches to trees with regular upright crowns. Obviously selection and vegetative reproduction are necessary if the best street tree forms are required. Our new clone 'Redbird' is the best of many thousands of seedlings we have grown. It combines a splendid upright branching habit with large, dark green leaves and excellent red fruits in the fall.

William R. Heard, Heard Gardens, Des Moines, Iowa

Introduction. -- The location of our nursery is halfway between the Missouri and Mississippi Rivers--about 350 miles west of Chicago. We grow most of the trees grown on the Atlantic seaboard, but some are marginal and require special microclimates in our area.

When I think of the subject of street trees,.. I think of the frustrations involved in trying to get a tree to survive and grow under the adverse urban conditions with which we are all familiar. I believe we should prepare a "Bill of Rights" for trees that could be distributed to those people responsible for urban tree planting and care. It would consist of a set of guidelines they should follow to insure the best possible survival and growth of the trees under their care.

Acer saccharum var.,. nigrum [black (sugar) maple]. -- This is the only hard maple native to my area. Many of the old street trees found in Iowa were dug in the country and moved into the city.

The leaves of black maple are thicker than those of sugar maple and are more resistant to scorch. The bark is warty and resists sunscald in the winter.

In our area black maple occurs in pure stands. But wherever black and sugar maple grow together there is much crossing and the seedlings that result have some characteristics of each.

Celtis occidentalis (common hackberry). -- This is a tree that I don't especially care for. but it does thrive even when neglected.- There are places in cities where anything that reaches the second or third story of a building and provides some shade for people waiting for a bus is acceptable.

George Ware commented that there is a broad band of transition from *C. laevigata* (sugar hackberry) to *C. occidentalis* (common hackberry). Sugar hackberry is resistant to the witches broom disease that disfigures many of the common hackberry, but is less hardy. Some very attractive hackberries that appeared to be hybrids of the two species were seen on the tour of Cleveland's streets.

Gleditsia triacanthos, thornless and podless cultivars (thornless, podless honeylocust cultivars). -- Everyone knows there are a lot of problems with honeylocust, but it is a great "workhorse" tree. In urban areas it is one of the most resilient of all the trees we have because it will stand all kinds of abuse and still survive.

Ostrya virginiana (American hophornbeam; ironwood). -- This is not a glamour tree, it has no characteristics that are very exciting. It is a tough disease and pollution resistant tree. If our goal is to get something green growing in the city, then this tree is one we should consider planting there.

Because of their slow growth rate it is questionable whether or not it is profitable for nurseries to grow them.

Quercus bicolor (swamp white oak). -- This oak has an attractive exfoliating bark and thick leaves that resist scorch. It has good fall color and the leaves persist into the winter, retaining a rosy bronze tint. It tolerates salt and moist soils and has a moderate growth rate.

Other selections. -- Mr. Heard was unable to limit his selections to 5, and briefly mentioned the following trees as being potentially useful as street trees.

Acer ginnala (amur maple).

Crataegus crusgalli (cockspur hawthorn).

Malus spp. (crabapple). -- He mentioned 4 relatively new cultivars that are scab resistant and have small fruits-- Ormiston Roy, David, Mary Potter, and White Candle.

Prunus virginiana (Canada red cherry; common chokecherry)

William Hendricks, Lake County Nursery Exchange, Perry, Ohio

After being asked to participate on this panel, I wrote down about a dozen plants I thought should be mentioned. Many of the trees I eliminated have already been discussed and several of the 5 I chose have also been previously mentioned. The 5 I've chosen were selected for their durability and practicality. All have had some use and are available in the trade.

Acer campestre (hedge maple). -- Hedge maple is one of the smaller maples that is just starting to get known and has a tremendous future. The foliage is dark green in summer and changes to yellow and sometimes orange and red in the fall. The bark is corky and more resistant to frost cracking than many of the other maples. It has a round, dense growth habit and will branch to the ground, but can be limbed up for street use.

It is easily transplanted, tolerates air pollution, and

will grow well in full sun or light shade.

We grow hedge maple from seed and have seen a lot of variation in form and color. In the future, we should be able to develop some good cultivars from this species.

Ostrya virginiana (American hophornbeam; ironwood). -- This native tree has very attractive dark reddish-brown branches and interesting leaves and fruit;. It has a pyramidal growth habit that becomes round with age. The branching is horizontal to drooping.

It grows well in sun or partial shade and does well under city conditions. A problem is that there are reports that it can be difficult to transplant. We have moved them successfully in the fall, but spring is probably the best time to move them. They should be moved balled in burlap.

We grow Americanhophornbeam from seed we collect ourselves. Again, there appears to be enough variety from which superior strains could be selected.

Populus hybrids (hybrid poplars). -- Hardiness and size variable. Work on hybrid poplars was begun in 1924 at the New York Botanical Garden by Dr. Ernst Schreiner. He moved his project to the Northeastern Forest Experiment Station, Durham, New Hampshire in 1936. Thirty-four native and introduced varieties were used as parents. Selection of varieties for future evaluations were based on beauty, form, durability, and longevity.

These are rapid-growing trees that will achieve in 8-10 years the same dimensions most trees attain in 20-30 years. Where quick shade is the objective, nothing can surpass the 5-8 feet of growth attained each of the first 5 years they are planted. They are the best fast growing deciduous screen trees on the market today. Though they are not recommended for street tree use, they can be used along highways, in parks, on schoolgrounds and golf courses.

There are 4 varieties I would like to emphasize. Androscoggin (*P. maximowiczii* x *P. trichocarpa*) is a male green-barked clone with dark green leaves and a wide form. It has bright yellow fall color. Kingston is a female with the same parents as Androscoggin. It is slightly less spreading than Androscoggin, has long, thick, very dark leaves that turn bright yellow in the fall. Red caudina (*P. deltoides* x *P. caudina*) is a male (a cottonless cottonwood) clone that has red petioles, red veins in its leaves, and auburn new growth. The limbs on trees of this variety are closely spaced and rather short, giving it a shape that

can best be described as narrow pyramidal. Robusta (P. angulata x P. nigra 'Robusta') is a male clone introduced at the University of Minnesota. It has a broad oval form and is well suited to arid conditions.

Prunus virginiana var. 'Schubert' (Shubert Canada red cherry; Schubert common chokecherry). -- The new foliage on this tree is green, then turns purplish red. In early summer, this tree has a reddish cast on its older growth and green tips. Only later in the season does it turn totally red.

The tree is pyramidal **in** form and produces racemes of white flowers in mid-May. It is one of the hardiest of the red foliaged trees and can be used where not even Crimson King Norway maple will survive. The extreme hardiness of this tree suggests it warrants a closer look by municipalities and further testing under city conditions.

Sorbus meinichii (Meinichi mountain ash). -- The tree originated as a naturally occurring hybrid of S. aucuparia x S. rupicola and grows wild in Norway. Its foliage is green above, grey tomentose below, and is more coarse than that of S. aucuparia. Its erect form and compact head make this tree well suited for use in urban areas. During several years of observation in our nursery, we have not seen any problem with fireblight or borers, but a thorough test should be performed to confirm this.

Questions for the Nurserymen's Panel

Peter Bristol: We've noticed that several native plantings of sassafras on the arboretum grounds are declining. It is random now and we believe it is caused by a root fungus. I would like to know if anybody else in the audience has noticed this kind of decline. It appears to be similar to ash decline, but because it spreads among the colonies we believe it is caused by a root fungus. I am wondering what is going to happen to them when they are placed in a hostile environment along city streets. I know the ones in Madison have not declined as yet.

Bill Flemer: I have not noticed this in the New Jersey area. Do you think it is caused by Armellaria?

Peter Bristol: We have not had a plant pathologist check it out yet, so the fungus has not been isolated.

Alan Bunker: I saw it in a wooded suburban area and it affected all age and size classes. It affected not only the large ones, but it seemed to radiate out in a concentric

fashion to affect all of them. There was no positive proof, but we thought it might have been a root disease that affected them. This was in the area of southwest Ohio, near Hamilton.

Anonymous: Another problem with sassafras is they are severely damaged by Japanese beetles where they are a problem.

Davis Sydnor: I think you can say the same thing about Turkish hazel. Its a favorite of Japanese beetles. As a matter of fact, they like it more than lindens.

Larry Kuhns: I'm not sure I understand the relationship between black maple and sugar maple. I thought black maple was a distinct species, and yet you are talking about selecting them out of sugar maple seedlings. What was the seed source of the seedlings from which you were selecting?

Bill Collins: That's the catch.' I was hoping Mr. Ware, with his knowledge of leaf patterns, could say where they might have come from. This is a problem that occurs when buying seeds. We presume they are collected from pure sugar maples, and then when they come up in the nursery a percentage are clearly black and a larger percentage are intermediate. The way we handle this situation is if the leaves do not look enough like sugars to not be challenged, then we sell them as black maple. We can't discard a third of a row because it isn't clearly sugar or clearly black. We are able to collect black maple seed from colonies of black maple and please be sure that is what they are. We have rows of them and they all come up black maple. Mr. Ware, would you make a guess as to where those on the slide came from?

George Ware: My map showed the concept that these are not distinct species. In Illinois we have a problem positively identifying specimens people bring in because we are in the transition area. Most of the Illinois sugar maples are intermediate between black and sugar, and the farther you go west the more black maple characteristics you find in the sugar maples. Finally, in Iowa its about 95 percent black maple and 5 percent of what you might call true sugar maple. But black maple genes also filter east and black maples may be found on bluffs and limestone outcrops. The black maples in these areas are pollinated by the sugar maples around them and a lot of their seedlings will be intermediate forms. So black maple genes may be expressed in trees with glossy leaves on dry spots, high hills, or shallow soil in West Virginia and on into New England. It is a complex species with no clear line between the true species and the intermediate forms.

Davis Sydnor: Did I understand you to say that there is a gradation right on into grandidentatum in the Rocky Mountain region.

George Ware: There are some interesting islands. There ~~is one island~~ in Oklahoma in which a maple they call Cato maple grows. It grows as far north as Kansas City and is a very striking maple. But it is not especially hardy. There are other islands in Texas and then a great discontinuity across to Denver. We have ordered grandidentatum seedlings from a nursery in Golden, Colorado, and sure enough, when they came in it was obvious there had been sugar maple pollen around--they were intermediates between sugar and grandidentatum. In nature there is a great break between Iowa and the Rocky Mountains. Across the plains there is no sugar maple or black maple or grandidentatum country so there are not any intermediates like you find with black maple towards the east.

Bill Heard: I would just like to add a little bit to that. Where we are there are native strains of what we call black maple growing on north slopes, and without exception every leaf that I have found is very pubescent. I have seen them under the scanning electron microscope and seen the same thing. One of the ways we use to measure the amounts of interbreeding is to inspect the leaves with a hand lens. In Kansas the leaves will be mildly pubescent, maybe just on the veins or margins. Others will be completely pubescent on the underside. These are found in areas where the eastern forms of sugar maple have never been introduced. In our area, the strains of black maple have remained fairly pure because there are not many sugar maples around to cross with.

Kim Steiner: I believe the degree of pubescence is a characteristic used to distinguish black maple from sugar, but the seedlings you were calling black maple, Bill, appeared to be glabrous. Is that true?

Bill Collins: The upper sides were glabrous but the under sides are very pubescent.

Kim Steiner: The petioles looked glabrous to me.

Bill Collins: Of course, by that time of the year we had in excess of 12 inches of rain and the pubescence could have weathered off some. One other thing I didn't mention. The trees I showed have outstanding scorch resistance, which was one of the characteristics others here have attributed to black maple. We wondered if it might have something to do with the stomata of the leaves. We sent a collection of leaves up to the University of Wisconsin and asked them to

examine the stomata and determine if there was anything peculiar about them that would make the tree scorch resistant. They did not think this was the case.

Kim Steiner: Back to Larry Kuhns' original question about the taxonomy of the two species. I talked to Albert Little a few weeks ago and he told me that in his new checklist of forest trees in the United States he distinguishes *Acer nigrum* and *Acer saccharum* as separate species. But I agree with George Ware that wherever the two occur together, they almost invariably hybridize. It is pretty difficult to call them different species.

Henry Gerhold: I would like to further comment on the same subject. There has been a series of very good studies on introgression between the two species. This was done about 30 years ago by Desmarais and Dansereau. They have several publications in the literature that provide some very good information that would be helpful to people who want to get into this more deeply.

Frank Santamour: I believe we have all been unduly swayed by Desmarais and Dansereau into thinking that all the maples like *leucoderme*, *barbatum*, the western species, as well as *nigrum* and *saccharum*, are all *Acer saccharum* in the broad sense. I think that's a lot of bologna. The last two monographs I have seen on the maples have said *Acer saccharum* in the broad sense encompasses four or five species. *Nigrum* and *saccharum* I'll buy as being one mega species, but the western and southern ends are another story. We are finding with enzyme studies that we can't distinguish *nigrum* and *saccharum*, but we can distinguish them from the western and southern forms.

Jim Evans: Is there any reason to believe that the heavier and thicker leaves of black maple make it more salt tolerant than the regular sugar maple.

Bill Flemer: Since the leaves are gone during the salt season the sugar maple problems come from salt accumulating around the roots, not on the leaves. Where you have a road going through an area that has sugar maples on a high side and a low side, it is the trees on the low side that show tremendous maple decline. There is also a relationship between scorching and the use of salts. I would imagine a thick-leaved variety would be much better as a seashore tree than a regular sugar maple. The big curse of black maple to me is the poor fall color--a little bit of yellow, then brown, and that's it.

Peter Bristol: My experience with *Prunus padus* has not been very positive. I will agree that it is a lovely tree, but I have found it to be short lived; 40 years maximum. I have noticed on several strains at the Morton Arboretum a severe problem with black knot disease. The trees also tend to split because it is usually poorly crotched at the base and the whole system just opens up under a good snow or ice load. The leaves come out in early spring and are very susceptible to being injured by late frosts. Sometimes you lose them all and you must rely on latent buds to break. At the Holden Arboretum, we have had problems on it with borers and it grew poorly on the heavy clay soil. It is a beautiful tree, but should have some better form and disease resistance bred into it.

Bill Collins: I think most of what you say is true, but I think the situation here is a little bit like what was said about Russian olive. The further west and the further north you go, the better it is. It's not possible to select trees that will thrive from north to south and coast to coast. I think we all recognize that there are areas within which each kind does well. When you go from central Iowa west and north, and your choice of trees becomes less all the time, *Prunus padus* becomes progressively more important and valuable. We all have to recognize that there are limitations within which and outside of which these trees do not fit--every one we talk about.

Ture Johnson: Someone in this room must know that the hophornbeam has some hazards. Here in Cleveland there is an entire street that has been planted with *Ostrya*. They are anywhere from 2-4 inches in diameter and they are all dying. At first, I thought it might be due to a gas leak, but that is unlikely because they are dying on both sides of the street.

Bill Flemer: I thought about *Ostrya* and didn't put it on my list for that reason. Where they have been used in cities in New Jersey they get terrible leaf scorch in the summer. In a park where there is grass and a lower night temperature, they do fine, but not under city conditions.

McCoy: I think that some trees are misused. After observing *Ostrya* in Buffalo, where it has been used extensively, I noticed that it did fine when planted in a suitable location. At one time it was thought to be a small tree that could be used in very narrow locations. This places a lot of stress on trees and results in the scorching. Where they are planted in broader tree lawns scorching is not a problem.

Alex Apanius: Mr. Heard, which varieties of lilac were you talking about?

Bill Heard: They are a late group of hybrids that bloom 10-14 days after the vulgaris types. Among them would be Evangeline, Royalty, the Skinner types, and a number of other rangy growing crosses, some of which are pretty spectacular. It's just a matter of someone growing them tree-form. I believe it could be done economically because I know one grower that has been dabbling with these and he is always sold out of them.

Bill Collins: Mr. McCoy, are you growing Ivory Silk? Can you tell us a little bit about that plant?

McCoy: That is Syringa amurensis japonica--Japanese tree lilac. We have Japanese tree lilac in the Buffalo area that are 50 to 75 years old. It is hardy and it has no problem with borers. I understand in Cleveland they believe it is subject to chlorosis, but I don't know how true that is. We had a chlorosis problem with it one time, but we traced that back to the use of simazine around it. We have found it to be a very good tree--hardy, creamy white flowers in the end of June or beginning of July, and no borer. We have a couple of introductions of Japanese tree lilac that we are working with. All are brought up tree form.