



## **Zavitz Pines: One Hundred Years of Growth**

by Professor Alan Watson, Director

The first tree planting in The Arboretum took place in fields on May 1971, just 5 months after The Arboretum Master Plan was approved by the Board of Governors in November 1970. As one walks through The Arboretum, almost 38 years later, it is inspiring to think of the transformation from extensive fields with scattered remnant forests in the early 1970's to the treed landscape we enjoy today.

A large percentage of The Arboretum site was fields, cleared of the original forests after John Galt and "his boys" cut the first tree on the banks of the Speed River in April 1827. A map drawn in 1873 of the soon to be Ontario Agricultural College (OAC) shows the area of The Arboretum north of Stone Road. It is remarkable that in the 46 years between 1827 and 1873 most of the forest had been cleared and crops were being grown to feed the growing population of Europeans settling in the area.

The clearing of the land to plant crops was a pattern that was repeated throughout southern Ontario during the 19<sup>th</sup> century. While today some of us may lament the lack of planning behind the clearing, it was certainly the "thing to do." To not have cleared the land and planted a crop as soon after arriving as possible would have meant that one's family would surely starve or, at least, not have been able to remain on the land.

This unbridled clearing of the forest in eastern North America came back to haunt later generations. For example the rich topsoil was formed by the decomposition of thousands of years of tree trunks, branches and leaves. The soil was held in place by the forest canopy and the extensive intertwined roots of the trees. However, once the land was cleared of its arboreal protection, the soil was often washed or blown away. This was especially true in the area of Ontario's Norfolk County where the material underlying the rich forest topsoil was sand. By the end of the 19<sup>th</sup> century and beginning of the 20<sup>th</sup> century, large areas of Norfolk County were barren; the land consisting of blowing sands.

In Guelph, at the Ontario Agricultural College, E.J. Zavitz was studying the use of pines as way of reducing the loss of soil in the "blow sands" of Norfolk County. In 1907, as part of his study, Zavitz planted rows of White Pine (*Pinus strobus*) in a sandy area of the OAC at the southwest corner of College Avenue and Victoria Road. That plantation is the first documented plantation of White Pine in Ontario. Zavitz didn't get a chance to see his pine plantation grow because he left the OAC

(continued on page 4)



Planting White Pines (Pinus strobus) at the corner of College Avenue and Victoria Road in 1907. Looking east with Victoria Road visible at the far left. The deciduous trees of Victoria Woods are visible behind the planters.

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		CHANGING LIVES



## **AUXILIARY ACTIVITIES: New Volunteer Coordinator at Work**

## by Barbara Parke

I'm busy at work as the new Volunteer Coordinator at The Arboretum. I've got big shoes to fill, replacing this portion of Rob Guthrie's old job... but I'll do my best. You can find me in the Arboretum Centre one day a week... my voicemail will indicate when I'm in the office.

The Arboretum Auxiliary is a great group of energetic individuals who volunteer their time to assist The Arboretum staff in various functions throughout The Arboretum. The various volunteers group include the following:

**Grounds:** Sean Fox supervises this group of volunteers who assist with the maintenance of The Arboretum grounds and formal woody areas. This group prunes and weeds, but also tackles some of the bigger projects like brush removal, digging, edging and chipping of beds.

**Gardening:** Under the supervision of The Arboretum's Horticultural Technician, Lig Taurins, this group of volunteers focuses on the maintenance (weeding, transplanting, general maintenance/clean-up) of the formal gardens within The Arboretum.

**Mailing Assisting:** Or as some like to call it... our "Stuffing" sessions. Auxiliary members meet to label and stuff information packages for distribution to Friends of The Arboretum, Auxiliary members and the public.

**Foyer Reception Desk:** Volunteers welcome visitors and provide information about The Arboretum. These Auxiliary members answer telephone calls, and assist with office support.

**Docents (Tour Guides):** Auxiliary members work under the supervision of Chris Earley, our Interpretive Biologist/ Education Coordinator. These volunteers conduct organized tours of The Arboretum grounds. Extensive interpretive training is provided to these group tour leaders.

**Plant Sale:** Auxiliary members work under the direction of both Sean Fox and Lig Taurins. This group grows, pots, cares for, labels and organizes the many trees, shrubs, vines, herbaceous perennials and limited edition plants which are sold at The Arboretum Auxiliary's Annual Plant Sale, held the 2<sup>nd</sup> Saturday of September each year. Many volunteers from the other groups assist with various functions on the actual day of the sale to make this annual event such a resounding success.

Information for Auxiliary members is provided through a newsletter, *Arb Aux*, which has recently been revamped and reissued. This new issue was fabulous with many interesting, informative articles and pictures... there were a few chuckles too. Thanks to all the contributors, both staff and Auxiliary members. A special thanks to our publisher, Alvin Gillies, an Auxiliary member. The *Arb Aux* can now be seen on The Arboretum's web site at www.uoguelph.ca/arboretum/arb Overview/Volunteer.

Volunteering is fun... a great way to stay active and allow individuals to give back to their community.

If you'd like to consider joining The Arboretum Auxiliary, please give me a call at 519-824-4120 ext. 53615 or send me an e-mail, <u>bparke@uoguelph.ca</u>.



## The Arboretum offers the public a wide range of educational workshops.

- trees
- shrubs
- wildflowers
- gardening
- watercolours
- birds
- photography
- mushrooms
- ponds
- pilates
- ferns
  - astronomy
  - dragonflies
  - butterflies
  - owl prowls
- pruning
- story-telling
- tours
  - growing plants from seed



## **TREE TO SEE:** Big Shellbark Hickory (*Carya laciniosa*)

by Sean Fox

he University of Guelph Arboretum is internationally recognized as having one of the most diverse collections of woody plants in all of Canada. What makes our collection particularly valuable is the presence of plants of known provenance, or origin. We propagate the majority of the plants here in our Arboretum nursery, and we make special efforts to obtain seed from plants growing naturally in their place of origin. For example, if a particular species of tree is native to China, then we attempt to obtain seed of this species from a wild population that is actually growing in China. In our plant records database we keep specific records with origin and cultivation details for all of the woody plants growing on our grounds.

Historically, botanical gardens and arboreta have focused on collecting and displaying an array of unique and exotic plants, sometimes with disregard to the native plants that were growing in their respective regions. In many cases, some of this native flora was being threatened with extinction while no efforts to conserve these plants were taking place. The need for botanical institutions to begin to work closely with their own native flora became more evident and Botanical Gardens Conservation International (BGCI) was formed in 1987 to help collaborate these efforts.

Prior to this time, The Arboretum was already doing important educational work with Ontario's native flora in addition to establishing a very complete collection of the woody flora native to the province. In 1979 these steps were taken even further with the introduction of our Rare Woody Plants of Ontario Program. At the time, curator Dr. John Ambrose called this program "Picking Up The Paw Paws" and the goal was to establish a Gene Bank to act as a repository for the rare and endangered woody plants of Ontario. Specimens representing nearly every natural Ontarian population of these rare species were propagated for cultivation in our Gene Bank seed orchards. The objectives of the Gene Bank were to provide an ex situ conservation site as a back-up to *in situ* conservation efforts, and to act as a seed resource to reduce collection pressures on wild populations. Unique species within the Gene Bank include Paw Paw (Asimina triloba), Cucumber tree (Magnolia acuminata) and this "Tree to See", Big Shellbark Hickory (Carva laciniosa).

There are approximately 20 species of hickories found in the world with four of these being found in Canada. Big Shellbark Hickory is very rare in this country, with scattered specimens being found only in southwestern Ontario.



The range of Carya laciniosa in Canada as shown in this University of Guelph, Arboretum, Ontario Tree Atlas Project map.

This tree is also referred to as Kingnut Hickory, and if you were to see the size of the nuts, you would understand why. In the branches you will find the largest nuts of any hickory in the world. These nuts, including the husk, are sometimes over 5 cm in diameter. In addition, this species also has the largest buds and leaves of any hickory tree. These large features are all very useful for identification.

Another unique feature is the persistence of the petioles (leaf stalks) on the twigs well into winter. The leaflets fall off the tree in autumn, but the remaining, curved petioles give this hickory a very unique look in the winter.

Several of the species within our Gene Bank seed orchards have begun to produce seed crops in the past few years. With Big Shellbark Hickory being a large, long-lived tree, I had low expectations to find seeds on these trees in the near future. So you can imagine my surprise to find one solitary tree producing nuts in the autumn of 2006. None of this tree's nearby kin have yet followed suit, but it is at times like these where I'm able to directly see the "fruits of their labour" of those before me (and the pun certainly was intended).

In addition to our Gene Bank, you can also find Big Shellbark Hickory growing in the World of Trees Collection next to the three other Canadian hickory species. Hopefully within the next few years we (and the squirrels) will be able to enjoy a crop of nuts on these trees as well!



The first crop of Carya laciniosa nuts in our Gene Bank seed orchard. The other "tree nut" in this photo is Sean Fox.



The Arboretum is the study site of many research projects being done by professors, graduate and undergraduate students, and Arboretum staff.

John Klironomos, Arboretum Research Coordinator, is developing research strategies and promoting the resources available for research at The Arboretum. He recently developed The Arboretum Research Associates (ARA), a group that he chairs and that is responsible for promoting and stimulating research in The Arboretum. Members of the ARA include Karen Landman (Department of Landscape Architecture), Andrew Gordon (Department of Integrative Biology), Ze'ev Gedalof (Department of Geography), David Galbraith (Royal Botanical Gardens), and Alan Watson (Arboretum).

(*Zavitz Pines continued from page 1*) that year and started the St. Williams Forestry Station in Norfolk County for the Department of Lands and Forests. While Zavitz may not have had a chance to see his pines grow they continued to thrive. I suspect he did return to the OAC on occasion and I like to think that he would hike over to the corner of College Avenue and Victoria Road and have a loving look at his trees.

How fortuitous that the area E.J. Zavitz planted Ontario's first plantation of White Pines was destined, 63 years later, to become part of the University of Guelph's Arboretum! As a result, Ontario's first White Pine plantation is protected and will be so for centuries to come.

That being said, a lot can happen during a tree's long life. In May 1983 many of the "Zavitz Pines" were levelled by a tornado. Fortunately a number of the pines survived and 25 years later they continue to grow. The importance of the



Two of the White Pines (Pinus strobus) in 2007.

"Zavitz Pines" to The Arboretum goes beyond the opportunity we have to protect part of Ontario's arboreal heritage. The Arboretum is a remarkable demonstration of a continuing vision at the University of Guelph; a vision related to trees and conservation demonstrated by Zavitz 100 years ago.

The Arboretum's century White Pines are easy to see. Following on the recommendation in the 2004 Arboretum Master Plan, the entrance to The Arboretum has been relocated to College Avenue, just west of Victoria Road. Now, as Arboretum visitors come to The Arboretum they will pass by the "Zavitz Pines". The century pines also provide a wonderful visual anchor at the southwest corner of College Avenue and Victoria Road. The visitor or passerby can contemplate that while The Arboretum is relatively young, its tree planting "roots" go far back to 1907, the beginning of the 20<sup>th</sup> century.



The Arboretum welcomes you to a variety of special events. <u>Theatre in the Trees</u> - An entertaining evening of dinner theatre. Nov. to May <u>Children's Theatre</u> - Interactive performances for kids ages 3 - 11. Feb. and Nov. <u>Auxiliary Plant Sale</u> - Many perennials and native woody plants. Saturday, Sept. 13. <u>Wall-Custance Memorial Forest Annual Dedication Service</u> - Sunday, Sept. 21.



The Arboretum showcases a series of beautiful gardens that demonstrate topics such as wildlife habitat, water conservation and cultural influences.

Yes, Cacti Do Grow in Ontario!

## FROM THE GARDEN:

## by Lig Taurins

pril showers bring May flowers and Athe rejuvenation of native cacti. Laying dormant and shrivelled under a blanket of snow over the winter, the cacti begin to take on moisture as the soil warms their roots. There are four species of cacti indigenous to Canada. Two species, the Eastern Prickly Pear Cactus (Opuntia humifusa) and the Brittle Prickly Pear Cactus (Opuntia fragilis) are native to Ontario. The Eastern Prickly Pear can tolerate a minimum temperature of -25°C, and the Brittle Prickly Pear can withstand a minimum of -48°C. Part of a small group of cacti adapted to surviving long periods of freezing temperatures, they truly are one of nature's anomalies.

The Eastern Prickly Pear Cactus is a low growing, clump-forming plant. The branching, green flattened stems are formed of jointed, fleshy stem segments or pads which are up to 12 cm long, 10 cm wide and less than 1 cm thick. The stem segments are most often spineless but occasionally there are a few scattered, single, needle-shaped spines up to 2 cm long at the top margins. The segments are covered in numerous tufts of tiny (3 mm) barbed bristles or glochids which easily detach from the cactus when touched and become lodged in the skin.

The Eastern Prickly Pearisoutstanding in bloom! Bright yellow, waxy flowers often with a red centre are produced from the top margins of the stem segments from June to July, although each flower lasts only for a day. The showy flowers, broadly cupped with a central cluster of numerous stamens with yellow anthers, are cross-pollinated mainly by bees. The fruit is fleshy and edible. Eastern Prickly Pear reproduces both sexually through seeds which are dispersed by small mammals, especially rabbits, that feed on the fruit and vegetatively by detached

#### pads which take root in the soil.

In Canada, the natural population of the Eastern Prickly Pear Cactus is limited to two small locations at the extreme southwestern tip of Ontario: in Point Pelee National Park and at the most southern tip of Pelee Island in Fish Point Provincial Nature Reserve. The population at Point Pelee is the largest and the healthiest. The red cedar savannah is preferred by the cactus which thrives in dry, sandy, open habitats in early stages of succession including raised beach ridges and sand dunes along the shoreline.

The population on Pelee Island is very small and vulnerable, nearing extirpation. At both sites, the main natural threat to the Eastern Prickly Pear is the loss of habitat due to severe winter storms resulting in shoreline erosion and by natural succession of woody vegetation which shades all the cactus. Human factors such as trampling, recreational activity in its sandy open habitat, and collection of stem segments and whole plants by people for transplant to their own gardens also puts the original colonies at risk. The Eastern Prickly Pear Cactus is listed as an endangered species both federally and provincially. To enhance the species chance of survival in its natural habitat, the cactus is protected under federal law by the Species at Risk Act and under provincial legislation by Ontario's Endangered Species Act.

The Brittle Prickly Pear Cactus is a low, mat-forming plant only 5 to 10 cm tall. The small stem segments (pads), less than 5 cm long and 2.5 cm wide, are somewhat rounded to ovoid and typically armed with very sharp, straight, barbed spines (1-3 cm long) in groups of one to six on each segment. As its name suggests, the cactus is quite fragile. The small pads break off at the joints very easily, even in heavy rains. The Brittle Prickly Pear blooms only on rare occasion. The flowers are greenish to yellow and similar in appearance to those of the Eastern Prickly Pear. The fruit is dry and inedible. The cactus primarily reproduces vegetatively by detached pads which are disbursed by attaching to the fur of animals.

The Brittle Prickly Pear is found further north than any other cactus species in the world. In Canada, its natural range is quite widespread, however, individual populations are widely scattered and the cactus is actually quite uncommon. In Ontario, the Brittle Prickly Pear occurs at a small number of locations in western Ontario and at one isolated location in eastern Ontario, near Kaladar, which marks the most easterly natural occurrence of cacti in Canada. The cactus is found in barren areas and grows on dry rocky outcrops where it roots in tiny cracks amongst lichens and mosses.

If you are interested in including these exceptional native species in your garden, seeds and/or unrooted pads and potted plants, are available through seed catalogues and native plant nurseries.

Please visit the Gosling Wildlife Gardens or the World of Trees collection at the University of Guelph Arboretum this summer to admire these rare Ontario native treasures.



Eastern Prickly Pear (Opuntia humifusa)



The Arboretum has a wide variety of habitats that support a diverse assemblage of plants and animals. Bring your binoculars and camera!

## **CREATURE FEATURE:**

by Chris Earley

A lthough many of you have heard the term "invasive species" before, most may automatically think of plants. Purple Loosestrife, Garlic Mustard and European Buckthorn might have popped into your mind. But there are invasive animals as well. Norway Rats, Common Carp, Zebra Mussels and Multicolored Asian Lady Beetles are good examples. Invasive species tend to make themselves known by having large populations, at least initially, and doing some sort of environmental damage.

This featured creature is an invasive insect, the European Paper Wasp (EPW). Many people have noticed an increase in the yellow jacket population in the Guelph area in the last couple of summers. Well, many of the black-and-yellow wasps you are seeing are actually EPWs, not yellow jackets. This newcomer first arrived in North America in Massachusetts in the late 1970's and reached Ontario in

# **European Paper Wasp (***Polistes dominulus***)**

1997. By the early 2000's, it arrived in Guelph. It makes an open paper nest, unlike the yellow jackets and Bald-faced Hornets which make a nest covered in paper, looking like a big, grey ball. And, luckily for us, the European Paper Wasps are much less likely to sting than the other wasps are. But, keep in mind, they will defend themselves. Their nests are small enough to fit under garbage

can lids, in your boardand-batten wall, in your aluminum ladder rungs or in your plastic basketball backboard, so you could get stung with a misplaced hand or constant bothering (as happened to me last summer while doing layups on the backboard).

While more stinging insects are certainly a problem for those with allergies, an EPW sting is not the environmental damage aspect needed to be a true invasive species. Besides out-competing the native paper wasp in this area, the EPW may also be a problem for cavitynesting birds. This wasp likes to nest in bird boxes and this may spell trouble for bird species such as Eastern Bluebirds, Tree Swallows, House Wrens and Blackcapped Chickadees. Many cavity-nesting bird populations are controlled by the

Barrett

European Paper Wasp

pulations are controlled by the number of nesting cavities available in their range. These birds already compete with invasive European Starlings and House Sparrows for cavity nests, so another competitor may be a problem.

I am doing a part-time M.Sc. project focusing on the EPW's effects on cavity-nesting birds, using new bird boxes in The Arboretum and across Victoria Road in the Turf Grass Institute and agroforestry plots. Stay tuned for some answers



The Arboretum offers facilities for your conference or celebration.

- O.A.C. Centennial Arboretum Centre
- Auditorium seats 150 banquet-style or 250 lecture-style
- **Boardroom** seats 20 people
- Sun Room seats 14 people

Special pricing for university groups.

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- West Lawn comes with an Arboretum Centre booking (indoor or outdoor ceremony)
- Conifers for outdoor ceremonies

A unique place for your special day!

#### by Ric Jordan

A lthough the Arboretum Master Plan was accepted by the Board of Governors in December of 2004 it is the ensuing Operational Plan of September 2006 that defines our framework for the physical development and future operations of The Arboretum. The following are some of the actions which are moving us towards our objectives for education, research and community outreach.

- <u>Arboretum Road</u> is now closed to vehicles from the Information Kiosk to a point just short of The Arboretum Centre. We are upgrading the service road at College Ave to an entrance/ exit. The corollary of this change is the added safety and enjoyment of the pedestrian visitors from campus.
- <u>Canadian National Cross-Country</u> <u>Trials</u> were held here in December. Working closely with Athletics and

## Moving Along ...

the Cutten Club it may have been the best CNCC trials ever.

- Arboretum staff have been working closely with Plant Agriculture on an <u>Organic Agriculture</u> initiative where a pilot market garden site could give students hands-on experience.
- Another initiative with Athletics is the installation of a recreational <u>Disc</u> <u>Golf</u> course for a trial period. This course is open to the public and the University community.
- We have had discussions with city staff and the <u>Guelph Hiking Trail</u> <u>Club</u> regarding the possible link between Arboretum and city trails.
- All Grade 6 students within the two local Boards of Education have received a copy of an Arboretum publication, <u>Feeder Birds of The</u> <u>Arboretum</u> by Chris Earley, courtesy of The Gosling Foundation.
- A new high school link will be the <u>Da</u> <u>Vinci Program</u> spearheaded by staff

from John F. Ross Secondary School. This will see students receive four Grade 11 credits using The Arboretum grounds as their classroom.

- Carolinian woody plants established as part of the "<u>Picking up Pawpaws</u>" program in the early '80's are all producing seed. This material will be available to groups in southern Ontario as they undertake restoration or research programs.
- Testing in <u>The Elm Recovery Project</u> has identified a number of specimens that exhibit a high degree of resistance to Dutch Elm Disease. In 10 to 15 years, we will hopefully have open pollinated seed of resistant parentage available for the trade.

Where do we go next? Well, looking at the Operational Plan there are a number of exciting opportunities open to staff and others to become involved in. If you wish to be a part of it, drop us a line, or better yet, come out and visit The Arboretum.



The Arboretum needs to raise over \$400 000 each year. That's over a \$1000 a day! There are a number of opportunities to donate including dedications such as trees, benches, gardens, arbours and endowments as well as undesignated donations.

#### LIFE TIME FRIENDS

Life time FRIENDS will be listed in the next issue of the Green Web.

The following donations were made in the time period of November 1, 2007 - February 29, 2008

## ANNUAL FRIENDS

**Poplar** Dorothy Medhurst

#### Locust

Warren Beacham Mary Beverley-Burton Marjorie E. Durnford Eva Goodchild Roy & Brenda Hutchings Peter Loch Heather Lyons Dennis Manning Ken McBey Barry Newcombe E.M. Mae Potton Stephen & Patricia Salt Margaret E. Taylor

#### **DESIGNATED DONATIONS**

Arboretum Endowment Fund Joe Hruska Postmodern Productions Inc. Organizational Behaviour Class (HAFA) **David G. Porter Memorial Japanese Garden** Lifu Song

#### **Dedication Trees and Benches**

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# FREE DEPARTMENTAL TOURS

The Arboretum has something for all university departments: research sites, outdoor labs, meeting rooms and beautiful trails. The Arboretum is offering free lunch-time tours for University of Guelph departments in June. Please contact us at ext. 54110 to book a 1.5-hour walk with an interpreter for your department, research group or committee.

Justin Peter Heather Robinson Lenore Ross Stephen & Patricia Salt Laurie White Krassimir Yankulov

Henry Kock Tree Recovery Project R. Matthew Foster Helen McCrae Peacock Foundation Valerie Kirkwood

Edna & Frank C. Miller English Garden Nancy Caspers

#### 

Hospice Lilac Garden Hospice Wellington

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Thank you to all of our Wall-Custance Memorial Forest donors.

Every effort has been made to acknowledge each donation. If you find that your name is missing, kindly inform us and the oversight will be corrected in the next issue of *The Green Web*. Thank you for your support.

**PLANNED GIVING AND ESTATE PLANNING**: The Arboretum has received many important gifts through will bequests and insurance. We would be pleased to provide you with information about making a willed bequest or insurance gift to help build The Arboretum. Please call The Arboretum at 519-824-4120, ext 52356 to receive information on planned giving.

