



Oak News & Notes

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Participants at Yorkshire Arboretum with John Grimshaw and Jonathan Burton at the close of the European OOD event © Shaun Haddock

European Oak Open Days 2019

by Shaun Haddock

Fourteen participants mustered in Yorkshire, UK, on June 17th to commence the 2019 European Oak Open Days, having found their way from Czech Republic, Belgium, France, Germany, the Netherlands, and even the UK. We had planned to be 20 (the suggested size limit for a group), but attrition of one sort or another reduced our numbers: finally, and surprisingly, there were only two hardy UK members. It would appear that nothing changes: John Grimshaw, polymath director of the Yorkshire Arboretum, overhearing me muttering about soft southerners confirmed in a belief that the Yorkshire icecap remains until June, informed me that Caesar's Roman occupation troops referred similarly to their southern counterparts. But seriously, I would be grateful if our UK members could advise via tours@internationaloaksociety.org whether the lack of UK interest this year lay with distance, the month, the fact that the visits were during the week, that you were insufficiently notified, or of course any other reason. Next year we hope to visit Wales . . .

It is considered a truism that if one wishes to have an

Arboretum, one should inherit one. And yes, one would inherit impressive old trees, but as always in life there are possible downsides: they may be too close together; already in decline (and the dreaded honey fungus may be established); they may not be ideally placed in the landscape; and often there will be no record of their origin. On the other hand, a "clean sheet", if boldly seized, can present a priceless opportunity for original landscaping with a well-documented planting, allowing experiment and subsequent research, but (downside again) less to one's own advantage than that of one's successors. Our visits this year allowed us to ponder both sides of this question. Thorp Perrow is an arboretum which has remained in one family for several generations, giving it a unique and almost tangible "atmosphere"; the Yorkshire Arboretum, although on a long-established estate, has been planted since 1979 on what was originally medieval parkland. And the conclusion? For me at least, I wouldn't want to choose—both arboreta are necessary and complementary, both contributing greatly to the present and future arboreal richness of the British Isles.

The 100-acre Thorp Perrow Arboretum as we now see it was created by Colonel Sir Leonard Ropner, the grandfather of the present custodian, and contains five National Plant Collections in addition to 67 UK Champion Trees. However, the property can be traced back to the Domesday Book (the Norman property register completed in the year 1086). The 16th and 17th centuries saw the addition of many parkland trees (there is a “Catherine Parr” oak of 1535), and then fashionable plantings of North American imports were added in the mid-1800s to a section known as the Millbank Pinetum, and include a champion *Sequoia sempervirens*. Tree expert Alan Mitchell was excited by what he saw on a visit, and subsequently IOS member Lord Michael Heseltine encouraged the late Sir John Ropner to make additional plantings in the 1980s. So a rich history indeed, and the arboretum attracts 75,000 visitors a year. Upkeep depends largely on volunteers, guided by one full-time gardener.

Curator Faith Douglas was our expert guide for a morning tour of the arboretum, and in the afternoon we were free to explore. She first explained the system of labeling: the “disappearing label” syndrome compelled them to develop their own arrangement where each plant has a plastic cow’s ear-tag with first a letter denoting the zone of the arboretum and then a specific number which can be checked against a catalogue available at the welcome desk. The Arboretum can be subject to drought due to the uneven annual distribution of rainfall. Alkaline soil near the entrance and tearoom becomes heavy clay further out in the arboretum, and one area where 89 of a total of 90 poplars were removed was the next week full of water!

The cool summers do not favor North American white oaks (and the same applies at the Yorkshire Arboretum, with a July mean of only 15.6 °C), but some other oaks have become enormous, such as a *Q. rubra* and a Cerris-section *Q. libani* which cast shade over most of the oak planting. Other notable oaks include *Q. trojana*, *Q. macranthera*, *Q. canariensis*, and *Q. faginea*, some of which are now providing doughty competition for one

another. Interestingly *Q. kelloggii*, which can be difficult to establish in Europe, seems to find an amenable home in Yorkshire: there is a good specimen here, and we were also to see a healthy (albeit younger) specimen at the Yorkshire Arboretum. Mexican oaks include *Q. acherdophylla* and of course the redoubtable *Q. ryso-phylla*. Oaks are also commemorative: there is a 1935

Q. robur sown in situ for the jubilee of King George V, a Red Oak avenue, and finally, on a mound, a notable “acorn” (yet to sprout) in honor of Sir John Ropner’s 70th birthday (see photo).

The following day we reconvened at the Yorkshire Arboretum, around 40 miles east of Thorp Perrow, to be met by Director John Grimshaw and his Collections Manager Jonathan Burton. Over coffee, John first introduced us to the Arboretum, which is an enormous 124 acres, stretched in an east/west direction, and with wet clay to the south and a sandier soil to the north which includes a “Mediterranean” planting. It lies on the estate of Castle Howard (a 1699 renaming of an older medieval property).

Some old *Q. robur* survive from the mid-18th century, a veteran *Q. petraea* has a circumference of 4.89 meters, and there are clumps of oaks relating to the coronation of Queen Elizabeth II (1953), but the Arboretum plantings commenced in 1979 with 6,000 trees, mainly from the Hillier Nursery.

The oak list thus contains interesting named forms, in addition to the later wild-origin plantings of the 1980s. In contrast to the haphazard growth of many arboreta, planting was to a design by James Russell, and he remained involved during subsequent additions until the early 90s. The design includes wide open glades, and long vistas which cunningly curve at the end or disappear due to the terrain, often giving the visual impression that the Arboretum is limitless. The glades now include wildflower hay-meadows.

Development continues unabated—a Woodland Garden has been established since John’s tenure, and the hum of machinery during our visit announced that some of the main paths are being given a hard surface, which can make a positive difference to visitor numbers in a some-



The yet-to-sprout acorn planted to mark Sir John Ropner's 70th birthday, with Cécile Souquet-Basiège for scale
© Shaun Haddock



Some participants with *Quercus Pondalim* Group at the Yorkshire Arboretum © Shaun Haddock

what soggy climate (31,000 visitors last year).

A fuller coverage of both arboreta will appear in the next edition of the IOS journal, *International Oaks*.

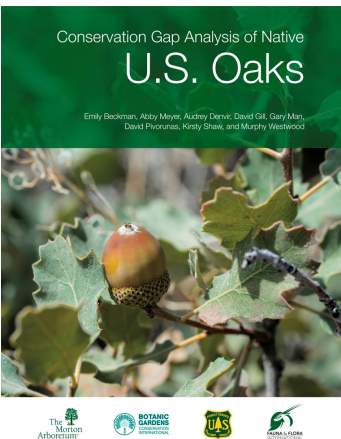
A large proportion of our group headed east to the port of Hull to catch ferries back to the Netherlands, but some whose route home took them via Manchester airport were able to take advantage of Lloyd and Sally Kenyon's generous offer to open their oak collection on the following day. 🌱

Conservation Gap Analysis of Native U.S. Oaks

by Emily Beckman

The Morton Arboretum is pleased to announce the release of the [Conservation Gap Analysis of Native U.S. Oaks](#). They would like to thank everyone who participated in this endeavor, which they hope will drive future partnerships, collaborations, and, ultimately, the successful preservation of our diverse native U.S. oaks, both in situ and ex situ.

With funding from the USDA Forest Service, and in collaboration with Botanic Gardens Conservation International U.S., The Morton Arboretum assessed the con-



servation status and needs of native U.S. oaks, to inform a broad audience of stakeholders. Of the 91 native U.S. oak species, their study identified 28 as species of conservation concern, based on factors such as habitat destruction, susceptibility to climate change, and lack of representation in ex situ collections. Each of these at-risk species is analyzed in a detailed species profile, providing specific recommendations for in situ and ex situ conservation actions. By providing actionable recommendations and a list of stakeholders currently engaged in conservation efforts for the 28 U.S. oak species of conservation concern, this report aims to catalyze efforts to preserve our native oaks for generations to come.

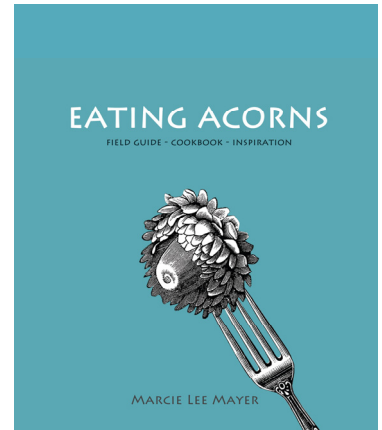
Read more about the major findings of this report on The Morton Arboretum website (www.morton.org). Please email Amy Byrne (abyrne@mortonarb.org), Global Tree Conservation Assistant or Murphy Westwood, Director of Global Tree Conservation (mwestwood@mortonarb.org), with questions. 🌱

BOOK REVIEW

Eating Acorns to Save the World

by Roderick Cameron

Marcie Mayer's new book, *Eating Acorns*, has soft "wipeable" covers that seem resistant to kitchen stains and acorn-flour fingerprints, ideal for a recipe book. But don't be deceived, it is much more than that: recipes for cooking with acorns are part of a message that could help change humanity's relationship with the environment and bring back a diet that was once the basis of civilization. The book is structured like a meal: an introductory amuse-bouche puts on the table the idea of rediscovering acorns as a 21st century food; an appetizer discusses the acorn itself, leading to an antipasto that describes the process of preparing acorns for human consumption; the main course lays out a smorgasbord of recipes using acorns and acorn-flour, while a dessert section sweetens the palate with an account of current and future projects, and useful advice on that other thing you can do with acorns (plant them to grow trees).



Eating Acorns: Field Guide—Cookbook—Inspiration. Marcie Lee Mayer, Oakmeal, Kea, 2019. 266 pages.

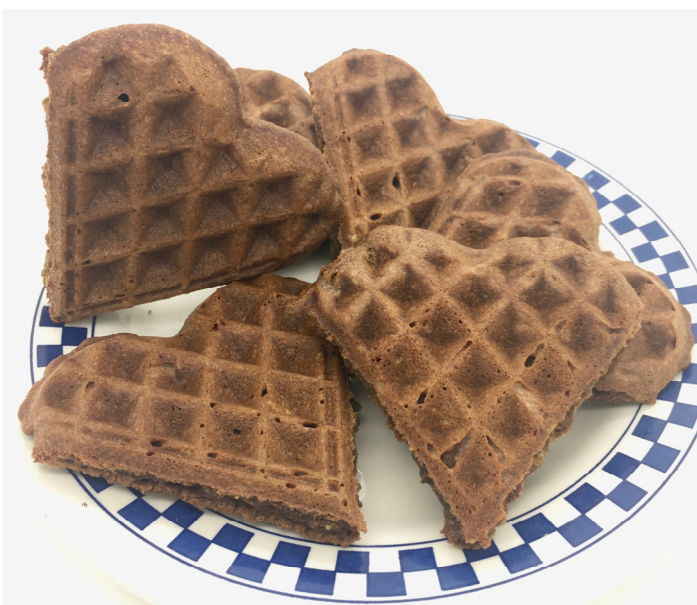
As acorn-flour and chips are not yet to be found on every supermarket shelf or convenience store, the book begins with detailed instructions on how to make your own from scratch—or rather, from whack: the best way to harvest acorns is while still green and infestation-free, by whacking the branches of your oak trees with sticks. Only wood or bamboo should be used, to avoid damaging the tree; traditional "whacking sticks" on Kea are made from willow, cut during winter and cured by the fireplace. Marcie's tips are immensely practical: aprons can be made into convenient pouches by sewing front and back sides together, and a heavy-duty zipper at the bottom saves time and effort when unloading. Whacking has even had a beneficial effect on trees in Kea, providing natural pruning, and trees that are whacked biennially are observed to be more healthy and vibrant than unwhacked ones: spare the rod, spoil the oak!

The process of making acorns palatable is quite complex and involves drying, hulling, and repeated leaching, but as Marcie points out, it is no less complex than harvesting and processing wheat or collecting and soaking ol-

ives in brine to remove their bitterness. Instructions are provided for both small-scale and large-scale processing. On Kea, thanks to a crowdfunded project that Marcie set up in 2011, locals can have their oaks hulled in a machine imported from Turkey. One of the reasons that acorns have a bad rap is that their shells make them toxic for most domestic animals, except pigs, which have evolved the ability to spit out the shells without swallowing them. Farmers on Kea can now have their acorns hulled in large quantities, and the shelled acorns can then be safely fed to their livestock.

Leaching in water is required to remove the tannins from acorns. Tannins are good in small quantities (as in wine), but make unleached acorns disagreeable. However, we should be thankful for tannins because they also serve as a natural preservative, and dried acorns can be easily stored for several years without losing their culinary and nutritional value. Processed acorns can be milled to make mash or flour, and different milling methods are described in the book, together with storage methods and other uses for the various byproducts of the acorn process.

The core of the book, the list of recipes, opens with an account of acorns' high nutritional value: they are an excellent source of potassium, iron, magnesium, calcium, and vitamin B-6, they are gluten-free and high in fiber, and also contain free radical scavengers: antioxidants that help protect cells from free radicals that may cause damage and increase the risk of cancer and other diseases. But acorns are also tasty and their nutty flavor is said to be characterized by umami, the indescribable fifth basic taste (after sweet, sour, bitter, and salty) that is the Holy Grail of foodies the world over. One imagines that it is acorns that are responsible for the umami found in the highest quality Iberian ham, *jamón ibérico de bellota*, which according to regulations can only come from pigs raised on 7 kg of acorns a day during feeding season.



Acorn chewy cocoa waffles

Seventy recipes cover the gamut from breakfast to dessert. In many cases Marcie has adapted recipes by replacing wheat-flour with acorn-flour, resulting in nutty pancakes, waffles, muffins, crepes, tortillas, pastas, pizzas, breads, brownies, and cookies. Other recipes use acorns as a substitute for meat, as in a vegan Bolognese sauce for pasta. Some are borrowed from history (acorn savoury biscuits are adapted from a 12th century recipe attributed to Hildegard of Bingen) and some from contemporary sources (acorn pumpkin bread from Julianne Skai Arbor, aka Treegirl and familiar to those who attended the Lightning Talks at the 9th IOS Conference in Davis, California). Then there are recipes drawn from cultures that still incorporate acorns in their daily diet, such as dotorimuk, an acorn jelly popular in Korea that can be served in salads, and a hot acorn drink adapted from Racahout des Arabes, a beverage of Arab origin popular in 19th century France. Many of the dishes and concoctions may strike the uninitiated reader as unusual, but surely none more than the snack “Grub Popcorn”, made by sautéing—in garlic-scented olive oil—live weevil larvae (yes, those you find in the bag you’ve stored your acorns in). Apparently they pop just like corn and are tasty and nutritious, having grown plump on a diet of nothing but acorn. Don’t worry if you think they might make you feel squeamish: you can wash them down with a glass of acorn-infused vodka, the recipe for which is helpfully placed on the same page.

The final section of the book describes other oak initiatives Marcie Mayer has undertaken: exporting acorn caps for tanneries to create sustainable income for Kean farmers, developing new applications for acorn extract, community activities such as an Acorn Festival that includes a hotly-contested competition for the heaviest acorn (past contenders have been disqualified for freezing their competing acorn in an attempt to maintain maximum weight, a practice known on Kea as “acorn doping”).

You can purchase *Eating Acorns* conveniently on Amazon or on Marcie Mayer’s website: www.oakmeal.com. While you are waiting for it to arrive, learn more about her remarkable story by perusing the Article Archive section of her website. Marcie received an International Oak Society Special Service Award in 2015 for her initiative on Kea to rehabilitate the age-old industry of processing acorns of native oaks; you can read a full account of her work in her article in *International Oaks* No. 25, pp. 13–22. You should also view Marcie’s [latest presentation](#) at TEDxThessaloniki. Marcie’s message is irresistible: humans may have forgotten their quercivorous roots, when we survived on acorns, but perhaps now we can return to where we started and know the place for the first time. In Marcie’s words: “The simple act of eating acorns allows every one of us to participate in the creation of a green new world with a braver new humanity.”



SPECIES SPOTLIGHT:

***Quercus look* Kotschy**

by Ori Fragman-Sapir

In honor of Dr. Michael Avishai

Quercus look is one of the least-known oaks of the arid mountains of the Middle East. It grows on Mount Hermon and in the Anti-Lebanon Mountains and Lebanon Mountains. It is a typical tree of the montane vegetation belt at altitudes of 1500–1800 m. In this belt, the dominant tree is *Q. boissieri*¹, and *Q. look* becomes dominant only in the higher parts. All other trees and shrubs of this vegetation are deciduous and include some Rosaceae (*Prunus ursina*, *Amygdalus communis* subsp. *microphylla*², *Rosa canina*). *Phlomis chrysophylla* is a dominant shrublet. They form an open, sunny woodland that includes a huge variety of perennials, bulbs, and annuals. It is a dry and harsh habitat: winter is cold and snowy, the soil is very stony—thus drains quickly—and there are no summer rains.

We have investigated *Q. look* on Mount Hermon during the past 40 years. It was hard to evaluate it in the beginning, since the area was overgrazed and most trees were reduced to shrubs, many looking like bonsai plants. In the past 30 years, the southern part of Mount Hermon became a proposed nature reserve and sheep and goat grazing were reduced dramatically. Trees grew and, starting in the late 1980s, bloomed

and produced acorns. It was then that [the late Dr. Michael Avishai](#) could see clearly that these trees are [indeed distinct](#) and fit the characters of *Q. look*, a species described in 1860 by [Karl Kotschy](#), who climbed Mount Hermon himself.

Quercus look is the southernmost representative of mountainous deciduous oaks in the Middle East. Only recently,



Quercus look on Mount Hermon © Ori Fragman-Sapir

[molecular work confirmed the uniqueness of *Q. look*](#) and placed it next to *Q. cerris* (and not *Q. libani*, as had been postulated in the past). Indeed, some trees on Mount Hermon show intermediate characteristics between *Q. look* and *Q. cerris*.

Description: a winter deciduous tree, 4–10 m tall. If not cut back, the tree has one trunk, but obviously many trees have several erect trunks, evidence of them being cut in the past. The leaves are variable: elongated, shiny, roughly toothed, 5–11 cm long, often wavy. The leaf teeth are triangular, regular or irregular, and larger and fewer than in *Q. libani*. Blooming takes place in spring and the acorns develop during summer, ripening in September. By October the acorns are gone, dispersed by European jays (*Garrulus glandarius*) and rodents. The acorn is large; the upper cupule scales are erect, while the rest spread outwards or bend downwards. The nut is unique: it is slightly exserted or not exserted, dark brown, and flat or even slightly concave at the tip.

Cultivation: In the Jerusalem Botanical Gardens we grow several trees, which grow slowly like most oaks in Mediterranean climate. I believe that they would grow faster in colder areas. Since the tree grows at high altitudes, it is believed to be hardy enough for Europe and parts of North America. The key would probably be well-drained soil. We also believe that this oak would be a good candidate for water-saving gardening in semi-arid cold regions.

Although there are now tall healthy trees in the southern parts of Mount Hermon, increasing cattle grazing is threatening the woodlands. Hundreds of cows are released in summer in the area. They do not allow tree seedlings to establish and they graze the smaller trees that become dense and shrubby. 🌿🌿



Quercus look on Mount Hermon, note the concave acorn tip © Ori Fragman-Sapir

¹ For some authors a synonym of *Q. infectoria* subsp. *veneris* (See [International Oaks No. 28](#), p. 75, footnote 2)

² For some authors, a synonym of *Prunus korshinskyi*

CULTIVAR CLOSE-UP:

Mighty Miniatures

by Ryan Russell

Quercus palustris 'Swamp Pygmy'

This selection of pin oak was found growing in a swampy area of Meeuwissen Nursery, Zundert, Netherlands. It was cultivated and sold by Bömer Nurseries,



Quercus palustris 'Swamp Pygmy' © Milan Havlis (www.havlis.cz)

also of Zundert, Netherlands, and has since made its way to nurseries in the U.S. It is different from many other pin oak cultivars because of its small stature. An apparent genetic dwarf, 'Swamp Pygmy' remains a shrubby tree around 5 × 3 m (likely a little larger with age). Its foliage is typical for the species and can achieve nice fall color. No doubt a plant for the collector, this cultivar could fit well in small gardens a larger tree would outgrow. There are a few other diminutive pin oak cultivars such as 'Isabel' and 'Döring's Kompakt'.

Quercus robur 'Tromp Dwarf'

This selection of English oak (or common oak) was first raised at the Arboretum Trompenburg, Rotterdam, Netherlands in 1979. It is a seedling of *Q. robur* 'Cristata'

and was cultivated by the late Dick van Hoey Smith. 'Tromp Dwarf' is a very dense, slow growing, multi-stemmed plant eventually reaching 1.5 × 1 m. The leaves show an affinity to its 'Cristata' parentage, being somewhat twisted and congested on the stems.

Even smaller in size than the above selection, 'Tromp Dwarf' could fit into nearly any size garden. There

are a few newer selections of dwarf *Q. robur* such as 'Blue Gnome' and 'Kobold'. These selections can occasionally be found in specialty nurseries.



Quercus robur 'Tromp Dwarf' in Arboretum Trompenburg © Arboretum Trompenburg

Quercus ilex 'Ditha Jung'

Keeping with the "mini-oak" theme, this cultivar of holm oak (holm oak) is by most accounts a miniature. In 1989, Gerhard Dönig made a collection of seed from a small evergreen shrub of *Q. ilex* near Lake Garda in north-central Italy. Originally two small-statured seedlings arose from that collection,

but one ultimately survived and was named 'Ditha Jung'. It was selected for its dwarf, pyramidal habit and tiny evergreen foliage (30 × 5 mm). At the time it was registered in 2011 (23 years of age), it had managed a size of only 85 cm tall × 25 cm



Quercus ilex 'Ditha Jung' © Gerhard Dönig

wide. This selection is rare in the nursery trade but has been offered at a German nursery. Mr. Dönig named this selection after his mother-in-law, and the original plant is still growing at the Arboretum Altdorf, Germany. This is the only registered dwarf cultivar of *Q. ilex*, but another form is known to exist. 🌱

HISTORIC OAK:

Sutter's Fort's Sessile Oak

by Roderick Cameron

An oak planted to commemorate the foundation of the city of Sacramento turned 80 this year, and the IOS has helped set the record straight on what sort of oak it is. Sutter's Fort in Sacramento, California, was established in 1839 by John Augustus Sutter, a German-born Swiss pioneer. Sutter earned renown when workmen building a sawmill for him discovered gold, setting in motion the California Gold Rush. Sacramento was subsequently founded in the same area and the Fort has been preserved as part of Sutter's Fort State Historic Park.

In 1939, in honor of the Golden Empire Centennial, as the centenary celebration of the founding of Sacramento was styled, the city of Kandern in Baden-Württemberg, Germany, Sutter's birthplace, presented the Fort with an oak. It was ceremoniously planted and has grown well and become a center-piece of the park. According to Nancy Jenner, Curator of Sutter's Fort State Historic Park, "it is the first thing visitors see when they walk in, and many of the park's programs take place around it, in the shade it provides."

As the oak's 80th birthday approached, Nancy became troubled by the question of the oak's identity. According to the Park's records, the oak had been presented as a *Quercus cerris*, but visitors had commented that it did not look like that species, and some quick research revealed that the species was not native to southern Germany.

Fortunately she contacted the IOS via our website and we were able to forward her photographs and description to Eike Jablonski, a member of the Taxonomy Committee. Eike pronounced it to be "very clearly

a *Quercus petraea* (sessile oak), with very good features: a yellow petiole, symmetric leaf shape. If it is 80 years old, it shows good growth and that it is happy in its location." One characteristic was not easily explained: it has not been known to bear acorns. Perhaps it is due to California's climate, which it would not be accustomed to?

In addition to this oak in the Fort yard, the park surrounding Sutter's Fort was planted heavily with oaks in the period from 1904-1920. According to Nancy, it was originally intended as an arboretum for native California trees, but this plan was not fully adhered to. Nevertheless, it still gives the effect of a planting of native oaks. It is a pity Nancy did not contact us a year ago: Sutter's Fort is a stone's throw away from Sacramento Library, where the Gala Dinner for the Davis Conference took place last year. Perhaps we might have convened for cocktails under the shade of this impressive sessile oak.



Oaks in Two Parks of the Northern Great Plains

by Dirk Giseburt

Fans of oaks are impelled to seek out the local *Quercus* representatives wherever their travels may lead, serendipitous though the destinations may be. This report highlights two sites near the limits of the footprint of *Quercus macrocarpa* in north central North America: the Prairie Arboretum in Freeman, in southeast South Dakota, and the Assiniboine Forest, in Winnipeg, Manitoba. In both places, *Q. macrocarpa* is the only native oak.

Yours truly has had the pleasure of visiting Freeman—my wife's hometown and home of her parents—for many years. A small town of some 1,300 people set in a rather flat, agricultural landscape, since 1999 Freeman has been the site of the Prairie Arboretum—a community effort to provide an educational and recreation resource for the region focused on trees. The arboretum was developed by volunteers from 40 acres of former pasture and dedicated in 2002.

This year, for the first time, I also visited Manitoba in July for a conference on reconciliation between indigenous peoples and descendants of European settlers. I was fortunate to find a time to visit the Assiniboine Forest on the west side of Winnipeg, about 450 miles due north of Freeman. Also a flat place—even more so!



The sessile oak in Sutter's Fort State Historic Park (photo courtesy California State Parks)



Young *Quercus macrocarpa* cultivars at the Prairie Arboretum, Freeman, South Dakota © Dirk Giseburt

The Prairie Arboretum

The oak collection at the Prairie Arboretum focuses, one might say, on cultivars of *Q. macrocarpa*. The labeling includes ‘Ashworth’, ‘Corki’, ‘Kreider’, and ‘Simoni’. The collection also features species from the nearer parts of the American Midwest—*Q. alba*, *Q. coccinea*, *Q. ellipsoidalis*, *Q. muehlenbergii*, and *Q. rubra*—plus the East Asian species *Q. acutissima* and a delightful hybrid otherwise unknown to your reporter, the “bur live oak”, *Q. ×burnetensis* (*Q. macrocarpa* × *virginiana*).

What strikes the visitor from a milder climate is the impact of the wind on these young trees! The prevailing wind in summer, when the trees are in leaf, is from the south. Most of the trees in the open area of the *Quercus* collection, all planted within the last 20 years, have grown up bending with this wind. They have the sculpted look of conifers in the high mountains or at the coast. The specimens of *Acer*, *Fraxinus*, and *Tilia* in the arboretum do not have such a marked northerly lean.

The bur oak does not grow randomly or naturally along the borders of farmland in the Freeman region, at least in these days, and, for reasons unknown, oaks do not often appear in the shelterbelts planted at farmsteads. The arboretum did install an experimental shelterbelt of *Q. rubra* set to the north and west of a line of *Acer ginnala*, some of which in turn lies behind a row of *Picea*. The northern red oaks are healthy and produce good crops of acorns. Where their tops reach above the neighboring maples, they splay out in a broad crown.

In the greater shelter of the town, residents have planted a few isolated *Q. macrocarpa* and *Q. rubra*, and these individuals grow with the typical symmetry of park and urban plantings. Also, in a somewhat more sheltered location in the arboretum, three specimens of *Q. ×bimundorum* ‘Crimschmidt’ (trade name CRIMSON SPIRE™) grow in a nicely erect and healthy form.

To find *Q. macrocarpa* growing naturally in the vicinity

of Freeman, you can go about six miles west to the banks of the James River and tributaries like Wolf Creek, where some inhabitants refer to the trees as “scrub oaks.” Or you can go about 10 miles south to an upland called Turkey Ridge, where the prairie gives way on the north-facing slopes to steep ravines known locally as “the Gulches.” From the moist soil of these ravines, the *Q. macrocarpa* grow big and very broad, creating a mutually reinforcing shelter zone. May the young trees of the Prairie Arboretum one day have this majesty too!

Freeman is in hardiness zone 4b, at about 1500 feet, with 26 inches (660 mm) of annual precipitation on average.

The Assiniboine Forest

The Assiniboine Forest lies almost due north of Freeman, at W 97.25 ° per Google, versus the Prairie Arboretum’s location at W 97.44 °. The Assiniboine Forest is 700 acres of semi-undisturbed native habitat within the City of Winnipeg, saved from urban development by the Crash of 1929. It is now bordered by residential areas on the west and institutional grounds (such as Canadian Mennonite University) on the east. It is primarily an aspen-oak woodland, with a large wetland in the center.

Outside the marsh area, it appears moisture in the soil allows almost complete forest cover, though the trees are not large. *Q. macrocarpa* grows here primarily with *Populus tremuloides* and *P. balsamifera*, along with six species of native *Salix*. Other native trees include *Acer negundo*, *Fraxinus pennsylvanica*, and *Ulmus americana*. While your reporter was not visiting to explore the understory, the *Cornus sericea*, *Corylus americana*, and *Prunus* spp. could not escape notice. The park’s plant list identifies four *Prunus* in the mix: *P. americana*, *P. nigra*, *P. pensylvanica*, and *P. virginiana*.

It was a marvel to walk in a mixed woodland and suddenly cross through an almost pure stand of *Quercus* and then a little further on a similarly pure stand of *Pop-*



Mixed *Quercus macrocarpa* and *Populus* woodland at a meadow’s edge, Assiniboine Forest © Dirk Giseburt

ulus. Although I have no experience with what a healthy recruitment regime would look like, it did appear to me that young plants were plentiful, even if the oaks are heavily browsed by deer.

Winnipeg is in hardiness zone 3b, elevation 800 feet, with about 20 inches (505 mm) of annual precipitation on average. 🌿

Potential Applications of Acorns in the Food, Pharmaceutical, and Cosmetic Industries

by Paweł Górnaś

Acorns can be a source of cheap plant material, in part due to underutilization, so from an economical perspective they have a high potential for the processing industry. Scientists have proposed the following applications for acorns: production of L(+)-lactic acid, bioethanol, biobutanol from acorn starch; biodiesel from acorn oil; fuel briquettes from acorn shells and cups; adsorbent for hexavalent chromium removal from acorn peel; natural coagulants for water turbidity removal from whole acorns; activated carbon from acorn shells; and extraction of bioactive compounds such as carotenoids, tocopherols, phytosterols, and phenolic compounds from acorn kernels. Out of all the proposed applications, the extraction of oil from acorns seems to have the highest potential of practical use on a small and medium scale, due to the popularization of the cold-pressed method for oil extraction from plant materials.

Unfortunately, not all acorns are a good source of oil. The oil yield in acorns can range from about 1% to over 30% depending on the oak species. For plant material to be considered a viable source of oil, a yield of at least 10% is required. For instance, oil yields from *Quercus rubra* and *Q. robur* acorns ranged from 3.1–6.3% and 20.1–24.0%, respectively, so the acorns of *Q. robur* can be considered a good source of oil, while *Q. rubra* apparently are not.

The acorns of some oak species have not yet been tested for oil content, or the data is outdated (mid-20th century), so it is worth testing as many different oak species as possible in order to find their potential utility value as a source of oil. Different concentrations of oil in acorns of the same oak species have been reported by different authors, mainly due to abiotic factors and oil extraction technique and its parameters (e.g., acorn moisture and fragmentation). The final expression of quantity also affects the oil yield, i.e., whether it is from acorn kernels or from whole acorns including the shell. The oak species with reported acorn oil yields of around 10% and



Quercus incana acorns reportedly have a high oil content
© Ron Lance

higher are: *Q. agrifolia* (18.4–22.4%); *Q. brantii* (13.42–15.11%); *Q. chrysolepis* (9.5%); *Q. douglasii* (8.1–8.9%); *Q. falcata* (15.6–36.9%); *Q. ilex* (7.6–20.1%); *Q. ilicifolia* (19.4%); *Q. incana* (36.6%); *Q. kelloggii* (17.7–19.8%); *Q. marilandica* (10.7–18.2%); *Q. nigra* (20.9–31.8%); *Q. texana* (syn. *Q. nuttallii*) (15.0%); *Q. palustris* (17.4–17.8%); *Q. phellos* (18.5–29.5%); *Q. rotundifolia* (7.3–12.1%); *Q. montana* (3.3–14.0%); *Q. stellata* (9.6%); *Q. velutina* (18.1–23.0%); *Q. robur* (6.7–24.0%); *Q. wislizeni* (20.6%).

The oil is mainly a source of triacylglycerols, but also an important source of bioactive compounds such as carotenoids (provitamin A), tocopherols (vitamin E), and phytosterols. Phytosterols have been reported to reduce LDL cholesterol in some individuals, while carotenoids can inhibit the development of cardiovascular disease. The inclusion of tocopherols (vitamin E) in a daily diet is essential for the proper function of physiological human systems such as the reproductive, neural, vascular, and musculoskeletal systems. The composition and concentration of those bioactive compounds in acorn oil also depend on the oak species, but unfortunately only a few oak species have been investigated in this context. Over 90–95% of oak species with a high oil yield listed above were not analyzed for bioactive compounds such as carotenoids, tocopherols, and phytosterols.

It has been shown that the composition and concentration of tocopherols in different species can be diametrically different. For instance, *Q. rubra* acorn oil is rich in β -tocopherol (93% of total tocopherols), while *Q. robur* is rich in γ -tocopherol (96% of total tocopherols). On the other hand, the total content of tocopherols is nearly six-fold higher in acorn oil from *Q. robur* relative to *Q. rubra*.

The high oil yield of some oak species and the low-cost availability of acorns make acorns an interesting source

of plant material for industrial applications. There is limited information regarding the composition and concentration of bioactive compounds in the acorns of different oak species, especially those with high oil content. It would therefore be important to investigate their chemical profile so as to enable a more targeted use of their biological potential in different industries. 🌿🌿

Acorn Request

As he writes in his article above, Dr. Paweł Górnaś is looking for acorns of different oak species for his scientific project. He has appealed to the IOS for help. "Unfortunately, I cannot offer financial compensation," he writes, "since this project does not have any financial support. However, I can offer co-authorship, including an institution's affiliation, and acknowledgments, if required, in future scientific articles reporting on the project. The species which are of most interest are those rich in oil (please see the name of species above). Nevertheless, I would like to test species from the different sections of the genus, therefore I am hoping to collect the acorns of as many species as possible since many of them have not been tested yet. I will be very grateful for any species which can be provided. Thank you."

Can you help? For more information email Dr. Górnaś: pawel.gornas@llu.lv

To read more about Dr. Górnaś's research, follow the links below:

<https://link.springer.com/article/10.1007/s00217-018-3150-0>

<https://www.sciencedirect.com/science/article/pii/S0957582019301156>



An autumnal bird's eye view of Keirunga Gardens © Tim Whittaker

out that the reasons cited did not justify the action. The decision had been taken without a professional, scientific investigation to determine whether the trees posed a threat to neighboring houses, as claimed in a draft proposal.

The Gardens were planted by George Nelson in the 1930s, an English engineer who had a fascination with Kew Gardens and had collected oaks from all over Hawke's Bay. He spent a great deal of time and expense landscaping his park, apparently employing five gardeners for the purpose. Nearing the end of his life he gifted the Gardens to the city of Hastings, of which Havelock North is a suburb, and since the 1960s the woodland has become a much-loved feature of the area, popular with families who have walked under its canopy over several generations.

When a few trees failed, due in part to poor management practice, and others were felled prematurely, councilors drafted a plan to remove around 90 mature trees, effectively destroying the woodland park. The decision hinged partly on the controversial notion that oaks in New Zealand grow fast and therefore must die fast, never surviving as long as in their natural habitat where they grow slower and can live for centuries.

The campaign to Save the Keirunga Oaks was started in February and encouraged residents to sign an online petition and submit proposals to the Hastings District Council. Australian IOS member Peter Marshall and I visited David Cranwell in April, and he took us to see Arthur's Path, as the woodland is known, and we were able to offer support and encouragement. Signs had been placed outside the gardens informing about the situation and the need to take action, and the group of activists was preparing for a key meeting with councilors.

A Facebook page helped spread the word and also raise funds to finance advertising and an independent arborist's report to assess the health of the trees and recommend the best way to manage the woodland.

By May the campaign had gathered 4,000 signatures and 210 submissions had been made to HDC—only five of which supported the felling of the trees. On May 31,

Saving the Keirunga Oaks

by Roderick Cameron

An admirable community effort in the town of Havelock North in New Zealand's Hawke's Bay has saved dozens of 80-year-old oaks that had been slated for removal by the local city council. The successful campaign was spearheaded by, amongst others, IOS member David Cranwell of the Himalayan Oak Trust (see *Oak News & Notes* Vol. 22, No. 2, p. 10). It serves as an example on what can be done when misguided decisions threaten trees whose benefits far outweigh the risks or inconveniences they may present.

When news got out late last year that chainsaws were at the ready to fell the beloved oaks and other large trees in Keirunga Gardens, a favorite walk in Havelock North, the community reacted fast. Articles were published in the local and national press, raising awareness of the council's plans to destroy the woodland, and pointing

the campaigners were able to announce that the Council had reconsidered and the trees had been saved. A committee drawn from the campaigners would be responsible for the management of the woodland and Richie Hill, the arborist commissioned to prepare the assessment report, would be engaged to advise the committee.

According to Johnno Ormond, who led the PR efforts for the campaign, the 210 submissions were of key importance. "The council officers produced a report for councilors based almost entirely on these submissions," he said. "The council decided the outcome on a quantitative analysis of that report." Direct lobbying of councilors also helped win the battle: the campaigners took a few councilors out individually—and then again collectively—for 45-minute walks around Keirunga, stopping at various occasions and taking turns to make speeches to them. "This was smart because it's so beautiful in the woodlands," said Johnno, "and because the off-the-record discussions were much more candid than in the formal hearing."

Visit the [Save the Keirunga Oaks](#) page on Facebook to read the whole story. Kudos to Pat Turley, Johnno Ormond, Jeff Whitaker, and David Cranwell (and many others) for their terrific work keeping their oaks safe. Oaks may indeed grow faster in the Southern Hemisphere, but it is still to be determined whether they are doomed to die faster too. It is more likely that judicious management and informed care will allow them to extend their lives to their full potential and continue to share their bounty for centuries to come. 🌿



IOS members Peter Marshall (left) and David Cranwell inspecting the section of Arthur's Walk where several oaks had been felled
© Roderick Cameron

Share Your Passion for Oaks!

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membership@internationaloaksociety.org
for more information.

Hybrid Oaks Under Evaluation

by Editorial Staff

For nearly 15 years, Nina Bassuk and her grad students at the Cornell Urban Horticulture Institute (UHI) have been [developing hybrid oaks](#) for exceptional tolerance of urban conditions (drought, alkaline soil, etc.). About 250 hybrid oaks of 2–3 inch caliper have now been distributed to some 40 communities in New York State where they are being planted out so they can be evaluated over time.

Between 2004 and 2006 Nina received pollen from about 40 oak species in the White Oak group (section *Quercus*) from all around the country. She and her students used oaks from the Cornell Botanic Gardens and Arboretum as mother plants to create new hybrids for urban use. "The idea was to create cold-hardy oaks that were [tolerant of alkaline soils](#), drought, diseases such as powdery mildew, and that had good form," she says. "We also wanted to [propagate them clonally](#), on their own roots, to avoid graft incompatibility which is a problem for oaks in general."

The maternal species were located on the Cornell campus in Ithaca, New York and include several native and purported hybrid white oaks: *Quercus bicolor*, *Q. gambelii* × *macrocarpa*, *Q. macrocarpa*, *Q. macrocarpa* 'Ashworth', *Q. montana*, *Q. muehlenbergii*, and *Q. ×warei* 'Long' (Regal Prince®). Some of the paternal species include *Q. virginiana*, *Q. lyrata*, *Q. robur*, *Q. fusiformis*, and *Q. polymorpha*. Over 350 unique hybrid genotypes were developed and over the years these hybrids have been evaluated for tolerance to cold temperatures, drought, and high pH soils.

At the same time, Nina and her team have researched asexual propagation techniques that would allow for desirable characteristics to be passed on to large numbers of new trees for introduction to the nursery trade. Their approaches have included the use of modified stool beds and tissue culture.

Trees propagated from the oak hybrids have been evalu-



Quercus x warei x comptoniae
growing experimentally on Cornell campus © Nina Bassuk

ated in UHI research plots and many have also been planted out on the Cornell University campus in Ithaca, at the Geneva Experiment Station, at Schichtel's Nursery in Springville NY, and at Green-Wood Cemetery in Brooklyn.

The work has taken over 25 years and has allowed researchers to improve their understanding of these hybrid oaks. "We are confident," says Nina, "that we may have some superior urban-tolerant oaks to introduce in the near future." 🌿

From the Board

by Shaun Haddock

Finance was a major topic of the recent IOS Board meeting. Now that the figures for the 2018 Conference and subsequent publication of the Proceedings are finalized thanks to much hard work from our excellent new Treasurer Dirk Giseburt, the accounts for 2018 have been published on the IOS website (see "[Financial Reports](#)" in the "About" tab, Main Menu), and we have a projected budget for 2019. You will be pleased to learn that we are still solvent! Our triennial Conferences are budgeted separately, and benefit from generous donors to whom I express gratitude on behalf of us all, but by far our largest annual expense is our Journal, *International Oaks*, and the Proceedings of the 2018 Conference, which you should have received by now, is the most ambitious issue ever. Many of the costs of the Journal are fixed, so the more members we have the less the "price" of each copy, so please do your best to recruit new members in order that we can retain the superb quality of the Journal.

Whilst on the subject of finance, during the Meeting of Members at the California Conference the idea of a fund to aid conservation of oaks and associated research was raised, to general approval. I am delighted to say that the idea has gained momentum and has fleshed out into a Committee to set up and manage a Research and Conservation Fund with some oak big hitters aboard, chaired by Tim Boland. To set the ball rolling, Mark and Jolly Krautmann have very generously agreed to match members' donations up to a possible maximum of USD 20,000. In view of this, the Board has agreed to an internet survey of the opinion of our membership on how such funds could be best employed, followed by a

New Zealand Oak Open Days 2020

The second IOS event to take place in the Southern Hemisphere is planned for April 25-26, 2020 in New Zealand. Legendary Hackfalls Arboretum and Eastwoodhill Arboretum, the National Arboretum of New Zealand, are the protagonists of the two-day event, organized jointly by the IOS and the New Zealand Farm Forestry Association. Both these arboreta contain world-class oak collections, featuring Mexican oaks, and a day will be spent in each. Our focus on oaks will of course not blind us to the many other treasures these arboreta have to offer. Accommodation will be in the nearby town of Gisborne, so we'll spend most of the time looking at trees rather than traveling. While it is expected that most of the participants will be local IOS members and other tree enthusiasts from New Zealand, this is a rare and ideal opportunity for international visitors to make two days in outstanding oak collections part of a visit to New Zealand, one of the premier travel destinations.

More details will be provided in due course, but if you have questions or would like to register your interest, please write to

tours@internationaloaksociety.org

postal appeal for funds. Once underway, the Fund will be autonomous.

Other items discussed included the setting up of a Conference Committee for the 2021 IOS Conference in Taiwan, and also a new take on Conservation by IOS Board member Ryan Russell: oaks have many sterling qualities, but marital, or rather species, fidelity is not one of them. The very localized populations of the rare *Quercus acerifolia* often backcross with other species, so seed is not a reliable means of propagation. Ryan intends to graft scions from several selected "true" trees and disseminate them widely so that material is available ex situ should mishap befall at home. Just the sort of project for a Conservation Fund!

Finally, as always, should you have any questions or ideas, someone from the Board is always available via postmaster@internationaloaksociety.org 🌿

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