



Oak News & Notes

The Newsletter of the International Oak Society, Volume 18, No. 1, 2014

Oak Creek Canyon, Arizona

Oak Creek Canyon is an extensive drainage basin on the southern edge of the Colorado Plateau in North Central Arizona. The canyon is located at the geological fault between the Basin and Range Province and the Colorado Plateau. The fault forms an extensive area of highlands known as the Mogollon Rim, and many large creeks drain the area. Oak Creek Canyon, in the Coconino National Forest, is one of the most beautiful of these creeks, and it is home to many different species of deciduous and evergreen oaks.

The mouth of Oak Creek Canyon starts near the red rocks of Sedona, and the canyon extends northward, narrowing as it goes. It cuts through the different strata of the Colorado Plateau, revealing first the beautiful red sandstones of the Sedona area at the mouth and then white sandstones farther north in the canyon. The rim of the canyon is made of black basalt. The stream that cuts down through the canyon is scattered with large boulders of these various rock types, which have been washed downstream in the periodic flash floods that occur during the monsoon and heavy winter rains. Oak Creek originates from a number of tributary springs that come down from the headwaters of the many side canyons that join Oak Creek, including West Fork canyon. Oak Creek Canyon drains the Colorado Plateau from north to south, while the side canyons enter from the east and west. The tributary springs well up at the transition between the white sandstone strata and the more impermeable basalt layer.



View of Oak Creek Canyon from a lookout point. Photo: Ryan Russell

The Mogollon Rim forms a floristic boundary between the colder Rocky Mountain flora, Great Basin flora and the warmer Madrean oak woodlands and Sonoran desert floras. Oak Creek Canyon encompasses many of these different types of terrestrial ecosystems, which occur in different locations depending on the slope, exposure, elevation, and soil type. Precipitation in the canyon is significantly higher than in the surrounding region, leading to a greater diversity of habitat types.

Starting at the Sedona area and travelling north, visitors to the lower canyon mouth first encounter areas of desert grasslands and patches of Great Basin pinyon-juniper woodlands. The desert grassland is characterized by summer bunchgrasses and ocotillo (*Fouquieria splendens* Engelm.), with scattered oaks and junipers where the grasslands mix with chaparral and pinyon-juniper woodlands. Soil type and slope are key factors for good grass stand development in this area. Juniper woodlands are also common at lower and middle elevations in the Oak Creek area. Dominant species are *Juniperus* mixed with *Quercus turbinella* Greene and, at higher elevations, shrubby *Q. gambelii* Nutt. Steeper slopes near the canyon mouth are covered with thick interior chaparral. Trees near the canyon mouth generally range from 5 to 30 ft/1.5 to 9 m tall.

North of the mouth the canyon narrows, and the terrain becomes dense interior chaparral and Madrean oak woodland. Interior chaparral is a shrub-dominated ecosystem made up of many species adapted to drought and fire. Oaks in this area are evergreen, not deciduous. The most important component of interior chaparral is *Q. turbinella*, which

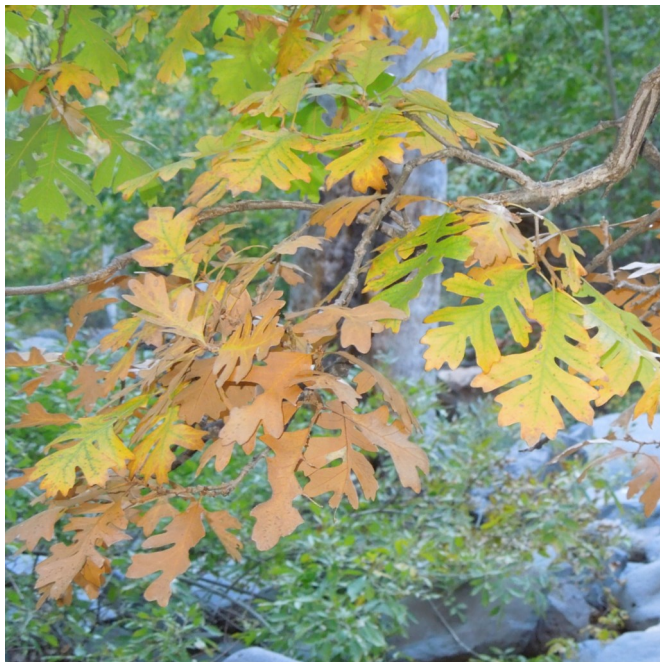


Meeting of two species: *Quercus gambelii* and *Q. turbinella*.
Photo: Ryan Russell

forms extensive stands in Central Arizona. Turbinella oak is often a shrub (5 x 5 ft/1.5 x 1.5 m), but can be a small tree up to 15 ft/4.6 m tall. It has small thick leathery leaves with an extensive underground root system to gather moisture. Bearberry (*Arctostaphylos pungens* Kunth), a large shrub with bright red bark and small, pointy, glossy leaves, dominates higher-elevation south slopes and forms pure stands in the Oak Creek area. *Rhus ovata* S. Watson, known locally as Sugarberry, is a shrub with large oblong leaves found in lower elevation chaparral. *Q. palmeri* Engelm. is a large shrub oak that is abundant in the Oak Creek area. Palmer oak often hybridizes with *Q. chrysolepis* Liebm. in middle elevations of the canyon. Madrean oak woodlands are at their northern limit on the Mogollon Rim and are mostly composed of several evergreen oak species, specifically *Q. emoryi* Torr., *Q. grisea* Liebm., and *Q. arizonica* Sarg. *Q. grisea* is often found mixed with junipers, and turbinella oak grows on dry south slopes. *Q. grisea* is often a small tree or shrub and hybridizes with turbinella oak. *Q. arizonica* is a large tree that grows on north slopes and in riparian areas. It often hybridizes with *Q. grisea*, forming hy-

brid swarms in intermediate habitats. *Q. emoryi* is a large to small tree common in middle elevation areas. *Q. emoryi* attains its greatest size on the banks of Oak Creek next to giant *Q. arizonica*.

Cool north slopes at the middle elevations of the canyon bear forests of ponderosa pine and Gambel oak that resemble those found in the Rocky Mountains. This forest also dominates higher elevation south slopes and the forested Colorado Plateau above the canyon. Important species are *Pinus ponderosa* Douglas ex C. Lawson, *Q. gambelii*, *Juniperus* spp., and *Q. turbinella*. Ponderosa pine, the most common and important tree of this habitat,



Gambel oak along one of the streams running through the Canyon.
Photo: Darin Jenke

grows very large, often over 100 ft/30 m tall. Rocky Mountain juniper (*Juniperus scopulorum* Sarg.) is found along the canyon rim and scattered in middle elevations of the canyon. Forests of white fir and Douglas fir (*Abies concolor* Lindl. and *Pseudotsuga menziesii* (Mirb.) Franco) sprout at the higher elevations of the canyon, particularly at the head of the canyon, and

on lower north and east slopes, along with shrubs of snowberries (*Symphoricarpos longiflorus* A. Gray).

Oak Creek itself and its contributing springs are lined with rich riparian deciduous forest. Many of the riparian trees reach 50 ft/15 m or taller, and some may grow as tall as 90 ft/27 m. Arizona sycamore (*Platanus wrightii* S. Watson), a large tree with striking white bark, is the most prominent riparian inhabitant of the lower and middle reaches of the canyon. Arizona walnut (*Juglans major* (Torr.) A. Heller), oak (*Q. arizonica*), ash (*Fraxinus velutina* Torr.), and alder (*Alnus oblongifolia* Torr.) mix with the sycamore. In the cool, moist side canyons, many moisture-loving trees like maples, cottonwoods, and willows occur. Narrow-leaf cottonwood (*Populus angustifolia*

E. James) is common in the upper reaches of the canyon, and Fremont cottonwood (*Populus fremontii* S. Watson) in lower elevations. Willow species grow throughout the canyon. Maples such as ash-leaf (*Acer negundo* L.), bigtooth (*Acer grandidentatum* Nutt.), and Rocky Mountain (*Acer glabrum* Torr.) are generally found along Oak Creek, near springs, and on north slopes. A rare species, Knowlton hophornbeam (*Ostrya knowltonii* Coville), grows near the confluence of the west fork of Oak Creek. This species occurs in small colonies throughout the Western United States, but is never a common species. Grasses are quite common even in the riparian and woodland

areas, and the transitions between habitats may be gradual. A number of nonnative trees also grow along the creek. Early homesteaders planted orchards of apples, plums, apricots, peaches, pears, and pecans. Many of the orchards survive and have spread across the canyon. Apples have recruited and are found along Oak Creek. Peaches and apricots have less success



Knowlton hophornbeam. Photo: Darin Jenke

in reproducing, but scattered trees are found in the area.

Oak Creek Canyon suffered a couple of severe wildfires in 2006. The fires burnt the chaparral and ponderosa pines on the west side of the canyon. Though the fire benefited the chaparral habitat, traces of those fires can be seen today in the dead ponderosa and



Arizona sycamore bark detail. Photo: Ryan Russell

burnt logs that still cover the region. However, Oak Creek Canyon remains a popular spot for recreation and nature walks. It also contains Slide Rock State Park, where slippery red sandstone has formed natural waterslides that are very popular with locals during

the hot summers. The creek is a beautiful, gentle stream that descends gradually through the canyon, forming still little pools interrupted by occasional stretches of rippling water. It isn't the place to visit if you're looking for rapids, but it's a peaceful place for a walk and hosts a healthy fishing community, who come to catch introduced rainbow trout from its cold waters. The trout species native to Oak Creek Can-

yon, the gila trout unfortunately was long ago extirpated. Other native species survive, including desert sucker and a variety of chubs, and they feed on the abundant arthropods that thrive in the creek, including crayfish, mayflies, dragonflies, and aquatic insects.

The canyon varies seasonally in appearance. In the spring, the mouth of the canyon has abundant wildflowers. The forests open their flowers during the monsoon summer. The monsoon can cause huge thunderstorms that spark wildfires and cause flash floods, but these storms are also very beautiful. After a big storm, the normally sunny and dry canyon becomes cool, cloudy, and misty. In the autumn, the deciduous trees turn lovely colors, and some flower species are still in bloom, particularly *Asteraceae*. The maples become vibrant red and orange, and the cot-

tonwood and willows go bright yellow, with orange and red at the edges. The one deciduous oak in the canyon, Gambel oak, turns a muted red. The sycamores become a russet brown, but they keep their leaves for most of the winter. In the winter, the higher moun-

tains become tipped with snow. The canyon is cold in the winter, but it's worth a visit year round.

Darin Jenke and Stephanie Bittner

Species Spotlight

An endangered oak: *Quercus austrocochinchinensis*

Quercus austrocochinchinensis Hickel & A. Camus is a Critically Endangered species. It has a scattered distribution in ravines of Hainan and southwest Yunnan provinces of China and northern Indo-China and is one of the dominant tree species in these regions. Based on herbarium records, it was once the dominant tree of the seasonal tropical forest of these regions, but due to the development of the economy and agriculture, its habitats have been taken over by rubber tree and banana farms. As a result of this, the populations of *Q. austrocochinchinensis* have decreased dra-



Quercus austrocochinchinensis acorns. Photo: Min Deng

matically and currently this species can only be found in nature reserves. It was included in the book *China Species Red List*.

Q. austrocochinchinensis was placed in section *Helferiana* by Menitsky, while Camus grouped it under subdivi-

sion *Breviglans*, which is characterized by flat acorns. The trees can grow to 50 m/164 ft tall. The leaves are oblong-elliptic to lanceolate, 10-20 x 3-5 cm/ 4-8 x 1-2 in, and slightly leathery with a sharply toothed margin. They are yellow to brown and covered by dense fasciculate hairs when young, becoming glabrous when mature.

The cupule can be likened to a Chinese chess piece, covering most of the nut except for the top and is usually covered in dense, short gray hairs.

The acorn has a flat top with 4-5 styles. It is typically recalcitrant (cannot be stored for long periods) and will germinate as soon as it is ripe. In some extreme cases, it will even germinate while still on the branch. Acorns can germinate in 1 month when stored at 4 °C/39 °F in a refrigerator. Germination is unusual in that the radicle emerges from the seed scar instead of the style base.

duce another young shoot and may do so several times, but without enough



Radicle emergence from cup scar. Photo: Min Deng

humidity, the shoot dies quickly. The young seedlings grow fast in a humid greenhouse and a one-year-old seedling can reach a height of 0.8 m/2.6 ft. They produce abundant lateral branches. We were able to asexually propagate some seedlings via micropropagation and cuttings by using these young lateral shoots. Hopefully, by continuing this work in the future we can conserve, propagate and reintroduce this endangered oak.

Qian-sheng Li and Min Deng

Oak Open Day – Belgium: Clonal Propagation of Oaks

On Sunday, September 22, 2013 about 30 oak enthusiasts gathered at Pavia Nurseries in Deerlijk, Belgium for an Oak Open Day that was to be devoted to clonal propagation of oaks. Our hosts were Dirk and Katrien Benoit-Vercruysse, owners of the nursery. Dirk was a member of the Board of the IOS until 2012 and is a longtime member of the Society.

We had a diverse group of attendees coming from six different countries of the European Union: France, Germany, Italy, Luxemburg, the Netherlands, and of course Belgium. Quite a few were nurserymen or garden designers. All were oak enthusiasts.

Grafting: extending the plantsman's palette

The morning of our Oak Open Day was devoted to a presentation by Dirk

Benoit about propagating oaks by grafting. This propagation technique has been criticized by many in recent years, actually ever since wild-collected plants have become the craze. Yet, there are many excellent reasons to graft oaks.

The first reason (for the 'serious' oak collector) is when you find an oak in the wild that you would like to collect and there are no acorns. That is what Dirk did in Mexico in 2009 when we saw *Quercus urbanii* Trel. in its natural habitat.

Further, with natural hybridization, one can never be sure that trees grown from acorns will result in a specimen typical of the species collected.

Other reasons were cited and discussed. Rootstock choice might improve the adaptability of an otherwise tender species or allow planting in unfavorable soil conditions.

There are simple horticultural reasons for grafting oaks, such as selections for:



New flush of growth showing orange-colored tomentum. Photo: Min Deng

Despite the fact that acorns germinate readily, successful seedling establishment is very difficult. We have never found any young seedlings in the field. Conditions of high humidity are essential for germinated seeds to grow into seedlings. In drier air, the emerged young shoot will dry out. Sometimes, the seed will keep struggling to pro-



Young *Quercus robur* 'Concordia' graft. Photo: Charles Snyers

Habit - *Q. robur* L. Fastigiata Group comes more or less true from seed, but try seedlings of this oak in street plantings: a disappointment. In some cases, uniformity is needed.

Leaf Color - the old Belgian cultivar, *Q. robur* L. 'Concordia' was mentioned and shown in the presentation.



Dirk Benoit leading a tour. Photo: Charles Snyers

Autumn Color - *Q. coccinea* Münchh. 'Splendens' was selected in Europe for its autumn colors because that species does not color well in Western Europe contrary to its usual performance in its natural range.

Finally, we discussed the propagation of F₁ hybrids, natural hybrids in many cases, or trees used for mast production.

The morning was concluded by a quick visit to the greenhouse where the "Master" demonstrated his grafting skills. Dirk also showed us his hot-pipe callusing unit. Pavia produces 20,000 grafted oaks annually.

Before lunch, we visited another greenhouse with a wonderful display of a diverse assortment of oaks, all grafted. Several selections illustrated



View inside Pavia's greenhouse. Photo: Charles Snyers

all the reasons given for grafting oaks: A *Q. tomentella* Engelm. selected for its improved hardiness, and a *Q. ×bebbiana* C.K. Schneid. grafted to preserve the character of the F₁ hybrid.

In front of (and around) the greenhouse, we saw *Q. 'Chimney Fire'* (autumn color and habit), a seedling of the Riverbank Lodge *Q. ×warei* T. L. Green & W. J. Hess in Petersburg, IL selected by Guy Sternberg, *Q. ×bimundorum* E. J. Palmer 'Crimschmidt' an excellent columnar selection of *Q. alba* L. × *Q. robur* L. Fastigiata Group, and another hybrid named *Q. ×schuettei* Trel., a hybrid between *Q. bicolor* Willd. and *Q. macrocarpa* Michx., which strangely has some similarities with *Q. pyrenaica* Willd.

We then had lunch in the garden of our hosts. Some had brought acorns, chestnuts, and samaras and a seed giveaway booth was dressed during lunch.

Nursery fields

After lunch, we were off to the fields. We walked through rows of well-maintained nursery plants. We came across this interesting columnar tree, *Q. ×bimundorum* 'Crimschmidt', that I would like to see in the streets of Brussels.

The day closed in the nursery with the display of young grafted plants. Some stayed late to choose plants to take home (although not all plants displayed are for sale due to very limited quantities). I know which one I would choose if I still had a garden to plant it in and that is a nice velvety specimen

of *Q. dentata* subsp. *yunnanensis* Franch.

Pavia has about 160 oaks and oak cultivars for sale, but many more in its collection of "mother plants."

I met Dirk for the first time during a trip in the Fall of 1997 in New England. I had never visited his nursery in Belgium until this 22nd of September,



Pavia OOD attendees. Photo: Charles Snyers

2013. For some reason, it was never the right time. I am glad I did now. This is a great place to find interesting oaks and Dirk is a great and keen plantsman.

Charles Snyers

Did you know?

There are more than 15 accounts of oaks in the Jewish Tanakh or the Biblical Old Testament. These trees were used as landmarks (Genesis 13, 14, 18, and Deuteronomy 11) and as a metaphor for strength and longevity (Amos 2 and Zechariah 11). According to Isaiah and Hosea, oaks were also used as a place for idolatry (Isaiah 1, 2, 57 and Hosea 4) These accounts are most likely referring to either *Quercus coccifera* L. or *Quercus coccifera* subsp. *calliprinos* (Webb) Holmboe.



From the Board

This issue of *Oak News & Notes* is the second one produced in-house (thus representing significant savings to our Society) thanks to newsletter Editors, Ryan Russell and Roderick Cameron, with help from our very active Editorial Committee. For those of you who have not yet chosen to receive *Oak News & Notes* electronically – in full color – you can nonetheless access it on the website.

There you will also find additional articles, more photos, and a more in-depth treatment of some of the subjects presented here. You must register on the website to access *Oak News & Notes*. Registering on the website will also enable you to explore the many other resources available there. If you need any assistance to register, our Website Administrator, Charles Snyers, and Website Editor, Roderick Cameron, would be happy to give you a hand.

The Editors of *International Oaks* and *Oak News & Notes* have received a great many laudatory reactions from members concerning the quality of both the content and new presentation of our publications, remarking often on the evident enthusiasm of those individuals responsible for producing them. Perhaps it is this enthusiasm that has in turn prompted membership to share opinions and reactions? Involvement from the membership is always welcome and to encourage this the Editorial Committee has agreed to create forums on the website for members.

If you have received a membership renewal letter in the last quarter of 2013, I cannot urge you enough to renew in a timely fashion! Late renewals – sometimes as late as the last quarter of the following year – represent numerous time-consuming and often costly tasks for the volunteers responsible. Membership is the lifeblood of any Society such as ours. It was once pointed out to me that if every existing member recruited only just one other person... the math is not difficult!

Who have you recruited this year?!

As we enter the year 2014 planning is well underway for the 8th International Oak Society Conference (2015), under the auspices of the grand old Morton Arboretum, to be chaired by Andrew Hipp and Kunso Kim (with help from Guy Sternberg, who, though retired from his lifelong service to the IOS, I am happy to write, is not really!).

And, of course, 2015, a conference year, is also one for which we must recruit new candidates for the Board, as well as candidates for our different committees (for which it is not necessary to be a Board member). Finally, you do not have to be a Board or committee member to contribute to *Oak News & Notes* and *International Oaks*, or to organize an Oak Open Day or other oak-related event.

Béatrice Chassé

Oak Open Days – Aiken, South Carolina

Oak enthusiasts from nine US states and two foreign countries descended upon the town of Aiken during the first week of November. It was the site of the Oak Open Days organized by IOS member, Bob McCartney of Woodlanders Inc., a rare plant nursery. The tours included four separate locations and were guided by Bob and several other experts in the area. The Citywide Arboretum was on full display and featured two mile-long (1.6 km) oak collections, a longleaf pine preserve, a public display garden, and a rare tree and plant collection along one of Aiken's main

streets. Aiken's Arboretum is unique in the fact that it is not a designated parcel, but includes all public and private property, including Hitchcock Woods located in the center of the city.

The eager tourists were greeted with a welcome reception on the first evening in the city's reconstructed train depot, which now serves as a visitor center. A fine meal was accompanied by rekindled friendships and bluegrass music. The Aiken City Manager welcomed the visitors to town and presented a brief history of Aiken. The following morning the attendees were divided into two groups and each went to tour a separate part of the city.

One of the mile-long oak collections was planted along a median parallel with the train tracks that run through the heart of Aiken. We stopped at the Aiken County Agricultural Services Center where several rare species of trees and shrubs have been planted over the years. A subspecies of sugar maple (*Acer saccharum* sbsp. *leucoderme* Small) was beginning its showy fall color display and a putative hybrid of *Quercus rysophylla* Weath. × *canbyi* Trel. planted by Bob were among the first trees encountered here. A beautiful *Q. salicina* Blume with limbs practically lying on the ground met us as we rounded the corner of the building. Just beyond this were two *Lithocarpus* species (*L. edulis* (Makino) Nakai and *L. glaber*



Aiken OOD attendees. Photo: Guy Sternberg

(Thunb.) Nakai) with a few scattered blooms and a few remaining acorns, which were scooped up in a hurry. As we started on the oak trail along Park Avenue, the first oak encountered was the incredibly rare *Q. boyntonii* Beadle. This oak is listed as endangered on the IUCN Red List of threatened species (www.iucnredlist.org). As we continued down Park Avenue, we saw one excellent specimen after another. The second tree we visited was a small, nice *Q. germana* Schltdl. & Cham., complete with one acorn. We saw many more beautiful species such as *Q. rysophylla*, *Q. polymorpha* Schltdl. & Cham., *Q. marilandica* var. *ashei* Sudw., *Q. sartorii* Liebm., *Q. affinis* Scheidw., and a very unusual hybrid of *Q. nigra* L. \times *myrtifolia* Willd. Most of these specimens had plenty of acorns and they were quickly collected by the happy tourists. Another mile-long collection of oaks has been planted along Beaufort Street, and the array of oak species is just as outstanding.

That afternoon included a visit to Hitchcock Woods, the aforementioned longleaf pine (*Pinus palustris* Mill.) preserve located essentially in the center of town. This area was owned by a wealthy couple in the late 19th to early 20th centuries and used as a place to ride their horses and hunt. In 1939, the Hitchcock family established a

trust and set aside more than 1,100 ac/445 ha as a place for others to enjoy as well. Today, Hitchcock Woods has grown to more than 2,100 ac/850 ha and is recognized as an important ecosystem. It is managed as a longleaf pine preserve and holds a variety of oak species such as *Q. laevis* Walter, *Q. margareta* (Ashe) Small, *Q. incana* Bartram, *Q. marilandica* Münchh., *Q. coccinea* Münchh., and *Q. nigra* L. We gathered on the edge of the preserve and were met by our guides Bennett Tucker, Superintendent, and Julie Moore, a botanist who has studied the ecology of Hitchcock Woods for decades. After standing amongst the tall loblolly pines (easily over 100 ft/30 m tall), we headed up the slope and found a changing palette of plants as we went. The loblolly pines, pignut hickories, black walnuts and water oaks at



Young longleaf pine. Photo: Ryan Russell

used for annual horse shows and hound hunts.

The second day of tours took us to Colleton Avenue, another mile-long collection of rare trees and shrubs which is located in a residential area of Aiken. Wide medians allow for excellent planting areas and this has wisely been taken advantage of. One unique aspect of this collection is the signage that the city installed with Bob's guidance. Designated trees are labeled with genus, species, and common name along with a phone number and an extension code. Visitors can dial (803) 295-5008 and the extension of the tree they wish and a short message about each tree follows. There are over 100 trees and shrubs labeled this way, allowing for self-guided tours through the collection. We concluded our journey at Hope-

lands Gardens and The Rye Patch where we saw many interesting species such as *Nyssa biflora* Walter and *Juniperus bermudiana* L. along with awe inspiring live oaks (*Q. virginiana* Mill.). This OOD was concluded by an oak seedling give away sponsored by Woodlanders and a small acorn swap. Attendees scooped up acorns, swapped trees, promised to keep in touch until the next time, and everyone headed back home.

A full account of all the tours will be found in the upcoming issue of *International Oaks* and those not present will get a better feeling for just how incredible the City of Aiken and its



Quercus salicina Blume. Photo: Ryan Russell

the bottom gave way to turkey oaks, bluejack oaks, and of course longleaf pines. A putative hybrid of *Q. laevis* \times *marilandica* was located along the edge of the trail about midway up and had several acorns. Other interesting plants included *Carya pallida* Engl. & Graebn., *Oxydendrum arborescens* (L.) DC., *Persea borbonia* (L.) Spreng., *Kalmia latifolia* L., *Magnolia virginiana* L., and *Pinus virginiana* Mill. Aiken has been a strong equine community for generations and portions of Hitchcock Woods are still



Looking over a *Quercus pumila* Walter. Photo: Roderick Cameron



Colleton Avenue Tree Trail plaque.
Photo: Guy Sternberg

horticultural treasures are. I would like to thank Bob McCartney and the City of Aiken for organizing this event and extending hospitality to all the attendees.

Ryan Russell

Mating in Single Oaks

Sometimes one encounters a single, isolated individual tree, thriving in a private collection as the only representative of its species. The proud owner admires and perhaps even pampers it. But little thought is given to it besides the esthetic, botanical or horticultural merit of such a plant.

It is this case of a single individual that I would like to consider here, specifically the isolation of the species and the significance and biological interest of the reproductive barriers that prevent it from crossing with other species.

Oaks are wind-pollinated trees with male and female flowers on the same tree. But in spite of this fact they set fruit usually only when another individual of the same species exists in the vicinity and can serve as a pollen donor. The phenomenon is known as self-incompatibility and the plants distinguished as such are defined by geneticists as outcrossers. However, in some rare cases this pattern is not true and according to a recent study* a few cases (3.5%) of self-pollination give rise to viable acorns.

Outcrossing is a well-known phenomenon, familiar in agricultural practice since antiquity and found later in many other wind-pollinated arboreal (date palms) and insect-pollinated herbaceous plants (irises).

In nature, for example in Southern Europe, closely related trees often grow together in the same or nearly the same habitat. If, like in oaks, the reproductive barriers that isolate the different species and maintain their distinctive morphological features are weak, the result is the development of a whole series of intergrading forms defined by science as a hybrid swarm – the result of a powerful evolutionary process known as introgression. A recent publication* considers all these aspects in an experimental context.

In gardens and plant collections (and also rarely in nature!), actually two different pollinating scenarios can be described: that of a single specimen of oak in an environment devoid of oaks and another one of an isolated plant in a collection of other oak species. I have experienced both cases.

The first type is encountered with foreign, introduced oak trees in Israel. They were in the past handed out to gardeners to test their suitability for horticultural practice in different parts of Israel. A suitable case for this situation is a single, sexually mature specimen of the evergreen Californian *Quercus agrifolia* Née growing at Kibbutz Horshim in the coastal plain of Israel, north east of Tel Aviv, since 1985.

The second type of case is the single, sexually mature, deciduous plant of *Q. pontica* K. Koch cultivated at the Jerusalem Botanical Garden. In both cases the characteristic outcrossing mating system of oaks produces two profoundly different results:

a) The *Q. agrifolia* in the coastal plain of Israel is exposed to only three types of pollen donors: the native evergreen Kermes oak (*Quercus coccifera* subsp.

calliprinos (Webb) Holmboe), the cork oak (*Q. suber* L.), and the holm oak (*Q. ilex* L.) – all characteristic and ancient natives of the Mediterranean region and not native to California. But in spite of this fact the tree is heavily loaded with perfectly viable acorns.

b) Contrarily, the *Q. pontica* in the Botanical Garden grows in the immediate close proximity of a significant number of mature trees from different deciduous European species – but is absolutely barren of any ripe acorns! Though it usually flowers, any pollinated female flowers are aborted and shed in the course of the summer.



Author with *Quercus pontica*. Photo: Michael Avishai

These two examples can be interpreted in different ways, but there can be no doubt that their significance and interest is much greater than what the casual observer might think. For example, let us consider the case of the Californian and the native Israeli or Mediterranean species: all evolved under very different geological historical scenarios. If they are compatible it means they share not only the same chromosome number but much more in their molecular makeup. Given that all three Israeli species represent a very ancient element (probably Miocene) in the circum-Mediterranean Flora, this makes the elucidation of the phyloge-



Quercus agrifolia seedling. Photo: Micheal Avishai

netic background most interesting in its implications.

The first scenario that comes to mind is one where all of the four species share the same chromosome type and the same type of pollen grain. The ability of the Israeli species to pollinate and fertilize the Californian species – and to a lesser degree the cork oak – while holm oak remains sterile and isolated, might indicate their very ancient origin from times before the breakup of the ancient single continent, when their distribution comprised all the Northern Hemisphere. Other mating patterns could be described, but all would need critical experimental verification.

To sum up: watch the mating of your isolated species – they could tell a fascinating story.

Michael Avishai

*Lapais, O., G. Roussel, F. Hubert, A. Kremer and S. Gerber, Strength and variability of postmating reproductive isolating barriers between four European white oak species, *Tree Genetics & Genomes*, 2013, Vol. 9, Issue 3: 841-853.

Editor's note: The author now considers that the tree of *Q. agrifolia* may be self-compatible and could have pollinated itself.



Did you know?

According to www.monumentaltrees.com, a site that records height, age, and size records for Europe's largest English oaks (*Quercus robur* L.), the tallest is found in Poland's National Park of Białowieża. This tree is 43.6 m/142 ft tall. The oldest is the Granit oak in Bulgaria at an estimated 1,664 years old, and the oak with the thickest girth at 14.75 m/48 ft. is found in Sweden.

In Memoriam

This past year we lost two of our prominent members. Richard Earle, together with his late wife Jo, had been involved with many of our



Jo and Richard Earle at their home in Dorset, England. Photo: Guy Sternberg

activities. Together they helped to organize the Winchester conference in 2003, and they were very active participants in some of our European Oak Open Days and tours, including the Spain tour. Frankham, their historic farm in Dorset, England, was the home for several oaks grown from IOS seed as well as some native veteran trees. It continues in operation under the care of their daughters Susan and Elizabeth.

Michel Decalut was the founder and operator of a nursery and collection of



Michel Decalut looking over his selection of *Q. cerris* 'Wasland Compact'. Photo: Philippe de Spoelberch

rare plants named Waasland in Nieukerken, near Antwerp, Belgium. He was active in selecting and propagating oak cultivars and volunteered many hours helping the nearby historic chateau and arboretum of Hof ter Saksen with their trees.

I have been the grateful recipient of their hospitality on several occasions, staying in their homes, hearing some of their tree stories, being toured around their regions, and leaving with some of their acorns. I, like many other longtime members, already miss them.

Guy Sternberg

CCSV13: In Search of Vietnam's Elusive Oaks

Since 1987, when Vietnam officially reopened its doors to foreigners, there have been numerous botanical expeditions organized by official institutions as well as by amateurs. None have specifically targeted oaks or even the *Fagaceae* in general, although the diversity of this family in Vietnam is quite extraordinary.

From October 24 to November 17, Olivier Colin, Charles Snyers, and I explored northern Vietnam with the aim of finding its oaks. The great French explorers of the first half of the



Quercus austroglauca (Y.T. Chang) Y.T. Chang.
Photo: Charles Snyers

20th century who roamed the wilderness of what was at the time called Tonkin (northern Vietnam) and Annam (central Vietnam) left a legacy of oak discoveries behind them as can be seen in Madame Camus' *Les Chênes*, (*The Oaks, Monograph of the Genus Quercus*) and in Henri Lecomte's *Flore Générale de l'Indochine* (*General Flora of Indochina*). Unfortunately for us, their descriptions did not include extremely precise indications of where the oaks could be found. But the question comes to mind: would a modern-day explorer write a detailed description of where to find *Quercus robur* L. in France? That would be silly—it is all over the place! He would probably just write, “very common in...” which is exactly what the French explorers wrote for a number of the oaks in Vietnam. Are many of these species no longer common? Significantly, hardly any of the farmers and villagers (who use everything the forest offers) to whom we showed acorns and drawings knew what these were. And except on one or two occasions, when they said they did they would show us *Lithocarpus* or *Castanopsis* species.

The first part of CCSV13 (our abbrevi-

ation for Chassé-Colin-Snyers-Vietnam 2013) took us to Ba Vi National Park and to Tam Dao National Park (west of Hanoi) and then further north to the area around a village called Mu Cang Chai, where we had the opportunity to eat fried grasshoppers and drink rice wine that our hosts explained was flavored with opium, though it seemed to us upon drinking that it is probably another part of the poppy that is used.

Some of the oaks encountered along the way included *Q. braianensis* A. Camus, *Q. xanthotricha* Drake, *Q. neglecta* (Schottky) Koidz., *Q. macrocalyx* Hickel & A. Camus, and several other as yet unidentified oaks (hopefully these questions will be resolved by the time a full account of this expedition is published in *Interna-*



Charles Snyers on Thac Bac Mountain at 2,200 m/7,200 ft.
Photo: Béatrice Chassé

tional Oaks, No. 25). Even more frustrating than the difficulties encountered in finding the oaks were the difficulties encountered in identifying them correctly! Without the help of Dr. Min Deng, who has spent a great deal of time looking at our photographs and herbarium specimens, I would have given up a long time ago.

Continuing our route north, the second part of the trip was spent exploring different areas near Sa Pa, the mythical Phan Xi Pang mountain, and another mountain called Nhiu Co San, very near the Chinese border. *Lithocarpus* and *Castanopsis* spp. were in great abundance, but representatives of our favorite genus were few and far between as we climbed these steep mountains.

The last part of our voyage took us even further north and east to the Ha Giang Province, before eventually heading south back to Hanoi. This is probably one of the most unexplored regions of Vietnam to date. Here we found (along with numerous species of *Lithocarpus* and *Castanopsis*) *Q. gomeziana* A. Camus, *Q. asymmetrica* Hickel & A. Camus, *Q. aliena* Blume, and *Q. austroglauca* Y.T. Chang.

A lot of work remains to be done to identify all of the things we saw, collected and/or photographed. The mind boggles at the diversity of these forests where extraordinary names abound: *Rehderodendron*, *Polyspora*, *Aspidistra*, *Cryptocarya*, *Holboellia*... the list is seemingly endless and a great lesson in humility for one coming from the very calmest of places botanically speaking, i.e., the temperate forest.

This voyage would not have been possible without the generous support of different individuals who recognized the importance of attempting to update our knowledge of the oaks of Vietnam.

Béatrice Chassé

Changes in Oak Cultivar Registration

The Cultivar Registration Form has received a few needed updates and is now available as an editable PDF. The Registration Help Form has also been updated and both can be found at www.internationaloaksociety.org under the heading: *Resources*

Member Spotlight: Bob McCartney

A virtual botanic dictionary wrapped in a smooth southern drawl, Virginia born and longtime IOS member Bob McCartney is a rarity among nurserymen. Bob started with Woodlanders Nursery in Aiken, South Carolina more than 30 years ago and soon took over operation of the nursery. This was around the same time Bob started working with the City of Aiken planting trees and shrubs in various areas of the city. Bob also worked on several private estates in Aiken, planting many trees and shrubs. And these were no ordinary, run-of-the-mill trees and shrubs. Since Woodlanders specializes in rare and unusual plant material, Bob began using some of this material to plant around the city. Over the years, Bob has slowly built a botanic treasure with few peers. His efforts have not gone unnoticed, as this past July the Mayor of Aiken proclaimed July 14 as Bob McCartney Day.

Many of the rare plants placed around Aiken were collected on expeditions Bob has taken over the years. These trips have taken Bob to Argentina,



Bob McCartney taking in the flora of Mexico during the 2009 IOS Conference. Photo: Guy Sternberg

France, Mexico, and several US states. Many of the oaks now planted around Aiken were collected by Bob at IOS conferences or gifted to him by friends made through the IOS. Naturally, one of his favorite taxa is *Quercus* and the City of Aiken is home to one of the most comprehensive oak collections in the United States. The collection includes some of the rarest oaks in the world, a fact helped out immensely by the ideal mix of sandy, low pH soils and USDA zone 8, not to mention the fact that South Carolina boasts one of the highest numbers of oak species native to one state. Oaks from Mexico, Japan, China, and most parts of the US all grow very well here. Truly a botanist's dream come true.

When asked what his favorite oak was, Bob's reply was something like: "Well, should my favorite oak be *Quercus alba*, which is everyone's favorite if only because it provides the barrels for Jack Daniel's whiskey? I like *Q. laevis* which is common on my property, but regarded with contempt as "scrub oak" by most neighbors, or a real scrub oak like *Q. inopina* which most people have never heard of. Then of course I do really like *Q. affinis* from Mexico." A reply that sounds very familiar.

Two areas that have received Bob's attention are The Rye Patch and Hope-lands Gardens. These were once private estates, but are now public gardens. Between these two areas Bob has planted over 200 plants that are now a significant part of each collection. Then there are the city tree trails that Bob has had a heavy hand putting in place. This includes two mile-long stretches of oaks as well as a mile-long stretch of rare trees and shrubs that run along Colleton Avenue in Aiken. Most of these trees were planted by Bob over the years.

Bob hosted an Oak Open Day event this past November in Aiken (see "Aiken Oak Open Days," page 8) and it was a real pleasure for this novice to

listen to attendees such as Allen Coombes and Guy Sternberg talk plants with Bob as he led our tours. I must admit it was hard to keep up, but very enjoyable nonetheless.

Quick to joke, a fantastic story teller, and humble to his core, Bob McCartney is one of the members that makes the IOS a great organization.



Bob showing one of his hoophouse structures. Photo: Roderick Cameron

Ryan Russell

Did you know?

In 1831, the Swedish King, Carl Johan (Charles XIV John) commissioned the planting of 300,000 oak seedlings on the island of Visingö for the building of naval battleships. Oak wood was the best ship building material of the day, but by the time the oaks were ready to be used, in 1975, all ships were made of steel. Today the forest on Visingö covers over 360 ha/ 890 ac and some of the harvested trees have been used for flooring, furniture, and whiskey casks.

Tour Committee Update

Not everyone has either the time or the money to participate in tours of several days, so probably the most important function of the Tour Committee is to offer shorter annual meetings, Oak Open Days, accessible to as

much of our worldwide membership as possible, at which oaks can be enjoyed and friendships made and renewed. Looking back to 2013, OODs were held in the UK (the Sir Harold Hillier Gardens), Pavia Nurseries in Belgium, and the City of Aiken, South Carolina, USA (the latter two events reviewed in this newsletter). Both the Hillier and Pavia days were well attended, as were similar events held previously in Europe; thus we attempted in 2013 to export the successful formula to the USA, where a warm Southern welcome was offered at the wonderful venue of Aiken. Somewhat surprisingly, in view of the fact that the USA is our most populous IOS nation by far, just over 20 members attended (and of those, some came from as far afield as Uruguay and Mexico!), a disappointing return for the efforts of the organizers. Perhaps the problem lies in the distances involved in the USA, but please, US members, if you have any ideas how to increase attendance (for example, a joint venue with another society of your acquaintance), let the Tour Committee know. We would like such events to become a dependable annual fixture.

Our most sincere thanks are due to Wolfgang Bopp and his team at Hillier; Dirk Benoit at Pavia; and at Aiken the irrepressible Bob McCartney, who with the help of Elizabeth Harm and others from the City of Aiken organized the event there.

Looking forward to 2014, the first event of the year will be in the UK, where turnout has been so encouraging that we are offering a two-day event (but members may opt to attend either day on its own). On Sunday, July 6 Christine Battle has kindly offered to open her collection of rare oaks and other unusual trees at Congreve to the IOS commencing with a buffet lunch at 12:30. Monday July 7, we make an all-day visit to the well-known arboretum at Westonbirt, with its many superb mature trees – please register with shaun.haddock@orange.fr for further information. There will be a two-day

event at Trompenburg Arboretum in the Netherlands on August 28-29. The event will showcase the splendid collection of oaks and include a seminar, and those who attend will have the option of spending the subsequent week-end touring the area. In the USA, Board member Ryan Russell is expecting to host a sticky summer meeting in the Southeast. In addition, a longer tour is being planned for the autumn in southern Italy, most probably at the end of October, so start saving or hedging your euros now! Please check the IOS website or contact Shaun Haddock for updates on these latter events. And, most importantly, please reward the efforts of the organizers by making an effort to attend – I promise you won't be disappointed!

Shaun Haddock

Oaks in Shakespeare

Oaks are plentiful in Shakespeare's works, more than any other tree and second only to roses as far as plants go. Oaks are referred to 34 times in 16 of the 37 plays and in one narrative poem, mostly as nouns, but twice as an adjective ("oaken") and once as part of a compound adjective in Lear's "oak-cleaving thunderbolts."

As regards distribution of the references, the most English of Shakespeare's comedies, *The Merry Wives of Windsor*, is in pole position with eight instances, but that is largely due to the plan to ambush Falstaff at Herne's Oak, a traditional Windsor landmark. In *Coriolanus*, which ranks second with seven instances, the protagonist is crowned with a garland of oak leaves as a mark of military victory. Four references mention the oaken garland, including a stage direction (always rare in Shakespeare) that specifies that Coriolanus enters "crowned with an oaken garland." But with three instances where *Quercus* is used for poetic purposes, *Coriolanus* appears to be the most genuinely oak-rich play.

The adjectives the Bard uses to describe oaks center around strength and robustness, e.g., "stout," "sound," "hardest-timber'd," but also refer to the timber ("knotted," "knotty," "gnarled," "close"—as in close-grained). However, the most striking adjective he used for an oak is "unwedgeable" (impervious to wedges). In fact, his is the first recorded use of the word in that sense (in 1603) and the next recorded instance, according to the Oxford English Dictionary, does not occur till about 200 years later.

Shakespeare refers to oaks mostly as a landmark (blame that on Falstaff), but as far as imagery is concerned, he most often mentions it as a symbol of fortitude, physical and moral, and in many cases in the context of a storm, whether on land or at sea as part of a ship. Specifically, an oak is four times depicted as a victim of lightning: aside from Lear on the heath (see above), Coriolanus' mother Volumnia refers to "a bolt/That should but rive an oak," Prospero in *The Tempest* boasts he has "rifted Jove's stout oak/With his own bolt," and in *Measure for Measure* Isabella claims Heaven is merciful because it chooses a tree its own size rather than a weakling to aim its lightning at:

Merciful Heaven,
Thou rather with thy sharp and sulphurous bolt
Split'st the unwedgeable and gnarled oak
Than the soft myrtle.

Roderick Cameron

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